UNIVERSITI TEKNOLOGI MARA
Perlis Branch
Arau Campus

REMACS
RESEARCH EXHIBITION IN MATHEMATICS AND COMPUTER SCIENCES

SOLUTION

RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES (REMACS 6.0)

EXTENDED ABSTRACTS

CS240 - BACHELOR OF INFORMATION TECHNOLOGY (HONS.)

CS245 - BACHELOR OF COMPUTER SCIENCE (HONS.)
DATA COMMUNICATION & NETWORKING

CS255 - BACHELOR OF COMPUTER SCIENCE (HONS.)
COMPUTER NETWORKS

CS251 - BACHELOR OF COMPUTER SCIENCE (HONS.)
NETCENTRIC COMPUTING

CS248 - BACHELOR OF SCIENCE (HONS.)
MANAGEMENT MATHEMATICS

JULY 18, 2023
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Perpustakaan Negara Malaysia

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REMACS 6.0

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PREFACE

It is with immense pride and enthusiasm that we unveil this extended abstract collection, entitled "The 6th Research Exhibition in Mathematics and Computer Sciences (REMACS 6.0)". This compilation represents a vibrant and rigorous assortment of research endeavors in the realms of Computer Science and Mathematics, submitted by the final year students from Universiti Teknologi MARA, Perlis Branch. The objective of this publication is to highlight the extensive range and profundity of research across these intimately connected disciplines.

The intersection of Mathematics and Computer Science continues to be a dynamic area of exploration, witnessing remarkable progress and innovation over recent years. In an era dominated by technological breakthroughs and an ever-growing reliance on data-centric methodologies, researchers within these domains are relentlessly pursuing novel theories, algorithms, and models aimed at addressing some of the most challenging and pertinent issues of our contemporary society. This publication stands as a tribute to their unwavering commitment and scholarly rigor.

Spanning a diverse array of topics, the abstracts encapsulated in this volume touch upon fields such as algebra, analysis, logic, computer architecture, algorithms, artificial intelligence, machine learning, computer networks, netcentric computing, and numerous others. The contributions here are characterized by their theoretical robustness and practical relevance, poised to make significant inroads in various sectors ranging from finance and healthcare to education and national security.

It is our aspiration that this volume will not only serve as an invaluable scholarly resource for current and future students navigating the intricate landscapes of Mathematics and Computer Science but also act as a catalyst, sparking curiosity and driving innovation among students to engage in pioneering research within these disciplines.

In closing, we extend our heartfelt gratitude to each and every contributor whose relentless effort and intellectual fervor have been instrumental in bringing this publication to fruition. Your commitment to advancing knowledge and fostering academic excellence continues to set new benchmarks and inspires us all.

1 MEET THE TEAM

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2 EVENT SCHEDULE

8.30 - 9.30 am
REGISTRATION

8.30 am - 12.30 pm
VIDEO PITCHING, POSTER & PROJECT PRESENTATION

12.30 - 2.00 pm
LUNCH BREAK

2.30 - 3.30 pm
ALUMNI TALK

3.30 - 5.30 pm
CLOSING CEREMONY:
REMACS 6.0 DIRECTOR'S SPEECH
OPENING SPEECH OF THE RECTOR OF UiTM PERLIS BRANCH
REMACS 6.0 MONTAGE
AWARDING OF WINNERS:
RECTOR'S AWARD
BEST PROJECT AWARD (GOLD, SILVER & BRONZE)
BEST VIDEO PITCHING AWARD
BEST POSTER AWARD
PHOTO SESSION
END OF CEREMONY

➤ ***Dress Code: Formal/Corporate***

LIST OF TOPICS, EXAMINERS & JUDGES
Course Code: CSP650
Group: RCS2406A
Programme: CS240

BOOTH NO.	TOPIC AND AUTHORS	EXAMINER	JUDGE 1 (VIDEO PITCHING & POSTER)	JUDGE 2 (VIDEO PITCHING & POSTER)
B01	EXPENSES MANAGEMENT USING TEXT RECOGNITION FOR UNIVERSITY'S SCHOLARSHIP HOLDER ALIAH 'IZZATI ZAMRI & MOHD NIZAM OSMAN	KHAIRUL ANWAR SEDEK (DR)	FADHLINA CHE ARSHAD	AZLAN ABDUL AZIZ
B02	WEB-BASED STUDENT RESULT MANAGEMENT SYSTEM WITH WHATSAPP INTEGRATION AND DASHBOARD ANIS SYAFIQAH MOHD AZLI & MOHD NIZAM OSMAN	KHAIRUL ANWAR SEDEK (DR)	FADHLINA CHE ARSHAD	AZLAN ABDUL AZIZ
B03	BODY WEIGHT MANAGEMENT SYSTEM IZATUL NABILAH MOHD NASIRRUDIN & NADIA ABDUL WAHAB	NURUL IZZAH BINTI ABDUL AZIZ	DR HAFIZAH HAJIMIA	AZLAN ABDUL AZIZ
B04	MALAYSIA PARLIAMENT WEB-BASED SYSTEM MUHAMMAD ADIB RAHIMI OTHMAN & SITI ZULAIHA AHMAD	NOR ARZAMI OTHMAN	DR HAFIZAH HAJIMIA	DR HAFIZAH HAJIMIA DR ANG LEE SIN
B05	HIKING BUDDY FINDER WEB BASED APPLICATION NUR IZZATY MOHD RIDZUAN & NORZIANA YAHYA	RUZITA HJ AHMAD (DR)	MAJDAH CHULAN	ANAS FATHUL ARIFFIN

B06	WEB BASED CONTENT CREATOR FOR HOME TUITION TEACHERS NUR NAFIZAH ISHAK & NORZIANA YAHYA	MOHD NIZAM OSMAN	MAJDAH CHULAN	ANAS FATHUL ARIFFIN
B07	GAMIFIED E-LEARNING SYSTEM FOR PROGRAMMING NURALIA KAMIS & MAHFUDZAH OTHMAN	MUHAMMAD NABIL FIKRI JAMALUDDIN	DR NAZIRA OSMAN	ANAS FATHUL ARIFFIN
B08	STUDENTS EXTRA CO-CURRICULAR WITH QR REGISTRATION NURUL AFIFAH MOHD AZLAN & SHUKOR SANIM MOHD FAUZI	NORZIANA YAHYA (Ts. DR)	DR NAZIRA OSMAN	AZIANI AHMAD
B09	STUDENT RESIDENTIAL SEARCHING INTEGRATE WITH GOOGLE MAPS AND WHATSAPP API NURUL IZZAH MOHD AZRI & MOHD NIZAM OSMAN	NORSAFINAR BINTI RAHIM (DR.)	NOORAZALIA IZHA HARON	BALKIAH MOKTAR
B10	DENTAL CLINIC APPOINTMENT SYSTEM USING A WEB-BASED APPLICATION INTEGRATED WITH WHATSAPP MESSENGER SITI NURULJANNAH SULAIMAN & MOHD NIZAM OSMAN	SITI SARAH MD ILYAS	NOORAZALIA IZHA HARON	BALKIAH MOKTAR
B11	EDIARY FOR DYSTONIA PATIENT USING MOBILE APPLICATION UMI ESYAH MANSOR & ROMIZA MD NOR	ALIF FAISAL IBRAHIM	NOR ALIFAH ROSAIDI	DIANA SIRMAYUNIE
B12	E-COMMERCE WEB APPLICATION FOR BLACK TURMERIC COFFEE VIC CORDIE KOLAS & ROMIZA MD NOR	NORFIZA IBRAHIM (DR)	NOR ALIFAH ROSAIDI	DIANA SIRMAYUNIE

LIST OF TOPICS, EXAMINERS & JUDGES
Course Code: CSP650
Group: RCS2406B
Programme: CS240

BOOTH NO.	TOPIC AND AUTHORS	EXAMINER	JUDGE 1 (VIDEO PITCHING & POSTER)	JUDGE 2 (VIDEO PITCHING & POSTER)
B13	DATA VISUALIZATION OF AIR POLLUTION INDEX IN MALAYSIA USING INTERACTIVE DASHBOARD AHMAD AZHAR MOHAMAD ZAHARI & MOHD NIZAM OSMAN	SITI SARAH MD ILYAS	SURINA NAYAN	DIANA SIRMAYUNIE
B14	DATA VISUALIZATION OF ROAD TRAFFIC ACCIDENT ANALYSIS AIMAN HAFIZI ISMAIL & AZNOORA OSMAN	MAHFUDZAH OTHMAN	SURINA NAYAN	MOHD ASHRAF ZAINOL ABIDIN
B15	MALAYSIA BLOOD DONOR INSIGHTS DASHBOARD HADIYA IMAN GHAZALI & SITI SARAH MD ILYAS	MOHAMMAD HAFIZ ISMAIL	DR ANG LEE SIN	HUDA ZUHRAH AB HALIM (DR)
B16	NATIONHOOD LITERACY WEB PORTAL WITH DATA VISUALIZATION MOHAMAD AMIRUL IKRAM NORDIN & ARIFAH FASHA ROSMANI	NADIA BT ABDUL WAHAB (DR)	DR ANG LEE SIN	HUDA ZUHRAH AB HALIM (DR)
B17	PREDICTION OF BADMINTON MATCH PERFORMANCE USING MACHINE LEARNING MOHAMAD DANIEL HAZIQ MOHAMAD NASIR & MOHD NIZAM OSMAN	NOORFAIZALFARID MOHD NOOR (Ts.)	AZIANI AHMAD	IZLEEN IBRAHIM

B18	OBESITY LEVELS DURING COVID-19 BASED ON EATING HABITS AND PHYSICAL CONDITIONS MUHAMMAD ASHRAF ABD RAHMAN & MAHFUDZAH OTHMAN	ARIFAH FASHA ROSMANI (DR)	AZIANI AHMAD	IZLEEN IBRAHIM
B19	DATA VISUALIZATION: ANALYSING FACTOR OF DIABETES USING BUSINESS INTELLIGENT MUHAMMAD FAIZUL FANSURI MANSOR & ALIF FAISAL IBRAHIM	NOORFAIZALFARID MOHD NOOR (Ts.)	AZZURA KAMARUDIN	JASMANI BIDIN
B20	DATA VISUALISATION OF ZAKAT DISTRIBUTION IN UITM PERLIS NOR SYAWATUL NADIA NOR AZLAN & SITI SARAH MD ILYAS	NORFIZA IBRAHIM (DR)	AZZURA KAMARUDIN	JASMANI BIDIN
B21	FINANCIAL AID DECISION SUPPORT USING DECISION TREE ALGORITHM NUR ATHIRAH KHUZIR & MOHAMMAD HAFIZ ISMAIL	NORZIANA YAHYA (Ts. DR)	DR CHEN JEN EEM	JASMANI BIDIN
B22	PREDICTION OF DENGUE CASES BASED ON METEOROLOGICAL FACTORS NUR SAFURA FATIHAH MOHD SALLEH & MUHAMMAD NABIL FIKRI JAMALUDDIN	ROMIZA MD NOR	AZZURA KAMARUDIN	DR CHEN JEN EEM
B23	DATA VISUALISATION OF STUDENT RESIDENTIAL IN UiTM ARAU PERLIS NURFARAH FATINI MOHD MAULUD & KHAIRUL ANWAR SEDEK	SITI ZULAIHA AHMAD (Ts. DR)	DR FAIEZAH HASHIM	KHAIRU AZLAN ABDUL AZIZ

B24	VISUALIZING CHILD COVID-19 VACCINATION CONSENT BY PARENTS IN MALAYSIA NURUL AIN NATASHA NIZARUDDIN & SITI SARAH MD ILYAS	AZNOORA BINTI OSMAN (DR)	DR FAIEZAH HASHIM	KHAIRU AZLAN ABDUL AZIZ
B25	PREDICTION OF PETROL PRICE USING DATA VISUALIZATION NURUL AKHMA LAILY KAMARUL HISHAM & NADIA ABDUL WAHAB	ABDUL HAPES MOHAMMED	DR FARAH LINA AZIZAN	KU AZLINA KU AKIL
B26	ASEAN COUNTRIES ECONOMIC STABILITY INDICATOR DASHBOARD NURUL ATHIRAH AZIZ & NORFIZA IBRAHIM	NADIA BT ABDUL WAHAB (DR)	DR FARAH LINA AZIZAN	KU AZLINA KU AKIL
B27	ENDEMIC EXPLORATORY DASHBOARD FOR CONTAGIOUS DISEASES IN RAISING PUBLIC AWARENESS OF HEALTH NURUL INSYIRAH MOHAMAD RADZI & NORFIZA IBRAHIM	NOORFAIZALFARID MOHD NOOR (Ts.)	MOHD ASHRAF ZAINOL ABIDIN	KU AZLINA KU AKIL

LIST OF TOPICS, EXAMINERS & JUDGES
Course Code: CSP650
Group: RCS2556A
Programme: CS255

BOOTH NO.	TOPIC AND AUTHORS	EXAMINER	JUDGE 1 (VIDEO PITCHING & POSTER)	JUDGE 2 (VIDEO PITCHING & POSTER)
D01	ANALYSIS OF MACHINE LEARNING ALGORITHM (ML) ON SYSTEM INFORMATION AND EVENT MANAGEMENT (SIEM) LOGS AFIF HAZIQ HARIS, MOHD FARIS MOHD FUZI & HAFIZAH HAJIMIA	ABIDAH HJ MAT TAIB (DR)	SHALIZA AZREEN MOHD ZULKIFLI	RIZAUDDIN SAIAN (PM Ts. DR)
D02	MALWARE DATA COLLECTION USING CUCKOO SANDBOX AHMAD FIKRI MUHAMMAD, MOHD FARIS MOHD FUZI & HAFIZAH HAJIMIA	ROS SYAMSUL HAMID	SHALIZA AZREEN MOHD ZULKIFLI	RIZAUDDIN SAIAN (PM Ts. DR)
D03	SMART MEDICINE INTAKE SYSTEM AHMAD SULAIMI AFKAR MUHAMMAD HAFNI SHAKIR, NURZAID MUHD ZAIN & NOR AZIRA MOHD RADZI	NORFIZA BINTI IBRAHIM (DR)	SHARIFAH NAFISAH SYED ISMAIL	SHARIFAH FHAHRIYAH SYED ABAS
D04	MENTAL HEALTH APPLICATION FOR UITM STUDENTS THROUGH MOBILE APPLICATION AISYAH AHMADI & ROS SYAMSUL HAMID	NOORFAIZALFARID MOHD NOOR (Ts.)	SHARIFAH NAFISAH SYED ISMAIL	SHARIFAH FHAHRIYAH SYED ABAS
D05	ANALYSIS OF ENTERPRISE NETWORK TOWARDS DOS ATTACK BY APPLYING MULTI-LAYER DEFENSE ON A SIMULATED NETWORK ANIS AFIQAH AHMAD FUZI, ABIDAH HJ MAT TAIB & HAFIZAH HAJIMIA	MOHD FARIS BIN MOHD FUZI	SHARIFAH NORASHIKIN BOHAR	SITI HAFAWATI JAMALUDDIN

D06	A MOBILE APPLICATION DEVELOPMENT FOR MOSQUE DONATION SYSTEM (MODS) ANIS SYAFFINA SANUSI & ROS SYAMSUL HAMID	AZNOORA OSMAN (DR)	SHARIFAH NORASHIKIN BOHAR	SITI HAFAWATI JAMALUDDIN
D07	DETECTION OF BLACKHOLE ATTACK USING AODV IN VANET ARINAH SUMAYYAH ZULKIFLI, AHMAD YUSRI DAK & HAFIZAH HAJIMIA	RAFIZA BINTI RUSLAN	SHARIR AIZAT KAMARUDDIN	SITI NOR NADRAH MUHAMAD
D08	SMARTGUARD: IOT-BASED REAL-TIME INTRUSION DETECTION USING ACTIVE AND PASSIVE INFRARED SENSORS WITH ALERT NOTIFICATION VIA TELEGRAM APPLICATION AZIRUL ZAKWAN AZMAN, RASHIDAH RAMLE & NAZIRA OSMAN	ROMIZA MD NOR	SHARIR AIZAT KAMARUDDIN	SITI NOR NADRAH MUHAMAD
D09	PERFORMANCE ANALYSIS ON GREEDY PERIMETER STATELESS ROUTING (GPSR) IN MANET ENVIRONMENT USING OMNET++ MOHAMAD ALIFF ZAKWAN MOHAMAD HAFIZ, RAFIZA RUSLAN & NOR AZIRA MOHD RADZI	AHMAD YUSRI DAK (DR)	SITI AMINAH ANSHAH	SITI SARAH RASELI
D10	SMART VENDING MACHINE INVENTORY MANAGEMENT SYSTEM MOHAMAD IKRAM MOHAMAD FARZEE, NURZAID MUHD ZAIN & NOR AZIRA MOHD RADZI	NORSAFINAR BINTI RAHIM (DR.)	SITI AMINAH ANSHAH	SITI SARAH RASELI
D11	BLOCKCHAIN BASED E-VOTING USING HYPERLEDGER FABRIC MUHAMAD HADRI MOHD ZAWAWI & ABIDAH HJ MAT TAIB	MUHAMAD ARIF BIN HASHIM	SITI HAJAR MOHMAD SALLEH	SUZANAWATI ABU HASAN

D12	IOT-BASED AIR QUALITY MONITORING ALERT SYSTEM IN KINDERGARTEN FOR CHILDREN WITH ASTHMA MUHAMMAD AZRI MOHD SAEDI, RASHIDAH RAMLE & MAJDAH CHULAN	KHAIRUL ANWAR SEDEK (DR)	SITI HAJAR MOHMAD SALLEH	SUZANAWATI ABU HASAN
D13	A PROTOTYPE OF IOT BASED NOISE POLLUTION DETECTION AND NOTIFICATION IN LIBRARY USING NOISE SENSOR AND BLYNK APPLICATION MUHAMMAD FARIZUDDIN MOHAMAD ZULKEFLI & RASHIDAH RAMLE	NURZAID MUHD ZAIN	SITI NOORASHIKIN JAMAL	TEOH YEONG KIN
D14	DETECTION OF WORMHOLE ATTACK USING AODV ROUTING PROTOCOL IN VEHICLE AD-HOC NETWORK (VANET) MUHAMMAD KHAIRUL FAHMI JASMI & AHMAD YUSRI BIN DAK	ROS SYAMSUL BIN HAMID	SITI NOORASHIKIN JAMAL	TEOH YEONG KIN
D15	PERFORMANCE EVALUATION OF GRE-BASED VPN TUNNELING OVER IPSEC USING GNS3 MUHAMMAD MUAZZIM MOHD SAFRI, RAFIZA RUSLAN & HAFIZAH HAJIMIA	ABIDAH BINTI HJ MAT TAIB (DR)	DR SITI NOR DIN	WAN NURSHAZELIN WAN SHAHIDAN
D16	ANALYSIS OF THE FAKE WEBSITES USING ACTIVE URL IDENTIFYING METHOD MUHAMMAD NASRIQ IKMAL ABDUL RAHMAN, ZULFIKRI PAIDI & HAFIZAH HAJIMIA	MUHAMAD ARIF BIN HASHIM	ASHNITA RAHIM	WAN NURSHAZELIN WAN SHAHIDAN
D17	SMART GARBAGE BIN MONITORING SYSTEM MUHAMMAD RUZAINI ROSLAN, NURZAID MUHD ZAIN & NOR AZIRA MOHD RADZI	AZMI BIN ABU SEMAN	SOLIHAH HAJI YAHYA ZIKRI	WAN NURSHAZELIN WAN SHAHIDAN
D18	THE PERFORMANCE OF TEXT STEGANOGRAPHY BASED ON SYMBOL MUHAMMAD SYAHMI NAQUIB SAUMI & MUHAMAD ARIF HASHIM	ABIDAH HJ MAT TAIB (DR)	SOLIHAH HAJI YAHYA ZIKRI	ZAINAB RAZALI

D19	LORA TRACKING SYSTEM PROTOTYPE WITH GPS FUNCTIONALITY MUHAMMAD SYAZWAN MOHAMMAD ZAIYAN & RAFIZA RUSLAN	RASHIDAH BINTI RAMLE	TUN MOHD FIRDAUS AZIS	ZURINA KASIM
D20	MUSCLE MONITORING SYSTEM BASED ON ESP-NOW NETWORK PROTOCOL USING EMG SENSOR DEVICE NORNI EZIRA MOHAMAD ROSLI, IMAN HAZWAN ABD HALIM & HAFIZAH HAJIMIA	NURUL IZZAH BINTI ABDUL AZIZ	TUN MOHD FIRDAUS AZIS	ZURINA KASIM
D21	IMPLEMENTATION OF CLIENT-SERVER CONCEPT USING SOCKET PROGRAMMING IN E-ADUAN PORTAL NUR AMIRAH ATIQAH AZMI, ZULFIKRI PAIDI & NOR AZIRA MOHD RADZI	MOHD FARIS BIN MOHD FUZI	YUSWANIE MD YUSOF	ZAMZILA ERDAWATI ZAINOL
D22	PERFORMANCE EVALUATION OF LORA NETWORK TESTBED IN CAMPUS ENVIRONMENT NUR FARINA BINTI KAMSIN & RAFIZA BINTI RUSLAN	IMAN HAZWAM BIN ABD HALIM	YUSWANIE MD YUSOF	ZAMZILA ERDAWATI ZAINOL
D23	SECURED WEBSITE CHAT-API WITH E2EE TECHNIQUES AND PERFORMANCE ANALYSIS USING PERFORMANCE MONITORING SOFTWARE NUR IZZATUL AQMA ZULKARNAIN & ABIDAH HJ MAT TAIB	ROS SYAMSUL HAMID	ZAINAB RAZALI	ZULAIHA AHMAD
D24	THREAT HUNTING USING SECURITY ONION IN VIRTUAL NETWORK NUR MAISARAH ROSLAN, MOHD FARIS MOHD FUZI & HAFIZAH HAJIMIA	IMAN HAZWAM BIN ABD HALIM	ZAINAB RAZALI	ZULAIHA AHMAD
D25	THE DEVELOPMENT OF CYBER PATROL MOBILE APPLICATION FOR KIDS' MONITORING NURFARAH HANI CHE ISMAIL, ROS SYAMSUL HAMID & HAFIZAH HAJIMIA	AZNOORA BINTI OSMAN (DR)	ZAKI AHMAD DAHLAN	ZULKIFLI ISMAIL

D26	DOS ATTACKS DETECTION USING SNORT IN VIRTUALIZED ENVIRONMENT BY USING GNS3 NURFATIHAH YUSHARIZAL & ABIDAH HJ MAT TAIB	ZULFIKRI BIN PAIDI (DR)	ZAKI AHMAD DAHLAN	ZULKIFLI ISMAIL
D27	ANALYZING THE PERFORMANCE OF INTEGERS BASED TEXT STEGANOGRAPHY PROTOTYPE SAIYYIDAH NAFISAH BAKRI & MUHAMAD ARIF HASHIM	ZULFIKRI BIN PAIDI (DR)	ZAKI AHMAD DAHLAN	ZAMZILA ERDAWATI ZAINOL
D28	ANALYZING THE PERFORMANCE OF ALPHABETS BASED TEXT STEGANOGRAPHY PROTOTYPE SITI NURKHUZAIHAH JUSOH & MUHAMAD ARIF HASHIM	ZULFIKRI BIN PAIDI (DR)	ASHNITA RAHIM	ZULAIHA AHMAD
D29	REMOTE MONITORING AND CONTROLLING OF LIGHTS USING IOT NURUL NAJIHAH YUSRA ZOLKARNAIN & NURZAID MUHD ZAIN	ROS SYAMSUL HAMID	DR SITI NOR DIN	ZULKIFLI ISMAIL

LIST OF TOPICS, EXAMINERS & JUDGES
Course Code: CSP650
Group: RCS2516A
Programme: CS251

BOOTH NO.	TOPIC AND AUTHORS	EXAMINER	JUDGE 1 (VIDEO PITCHING & POSTER)	JUDGE 2 (VIDEO PITCHING & POSTER)
C01	WEB-BASED LEARNING FOR ADAB IN KELAS AL-QURAN DAN FARDU AIN (KAFA) AFIQ ZAKWAN HASHIM, RUZITA AHMAD & SHUKOR SANIM MOHD FAUZI	ROMIZA MD NOR	NOR ANIS SHAFAI (DR)	MOHAMAD NAJIB MOHAMAD FADZIL
C02	WEB-BASED APPLICATION FOR HARUMANIS IN UITM PERLIS AUNI SYAFIQAH SUZIMAN & RUZITA AHMAD	MUHAMMAD NABIL FIKRI JAMALUDDIN	NOR ANIS SHAFAI (DR)	MOHAMAD NAJIB MOHAMAD FADZIL
C03	WATER PH LEVEL MONITORING USING MOBILE APPLICATION INTEGRATED WITH INTERNET OF THINGS USING PH SENSOR AZAMUDDIN AHMAD HAMDI & ABDUL HAPES MOHAMMED	AZMI ABU SEMAN	NORHA ABDUL HADI	MOHD FAZRIL IZHAR MOHD IDRIS
C04	DEVELOPMENT OF DIGITAL TICKET RESERVATION SYSTEM FOR RECREATIONAL PARK IN PERLIS USING WEB BASED APPLICATION KHAIRUNNISA' MOHAMAD AZMIN & HANISAH AHMAD	NORA YANTI CHE JA	NORHA ABDUL HADI	MOHD FAZRIL IZHAR MOHD IDRIS
C05	WEB-BASED UiTM BARBERSHOP MANAGEMENT SYSTEM MOHAMMAD AZRYEN ABU BAKAR & SITI SARAH MD ILYAS	NURTIHAH BINTI MOHAMED NOR (DR)	NORHISAM BULOT (DR)	MOHD HALIMI ABDUL HAMID

C06	ARAU RENTAL HOUSE WEB BASED SYSTEM MUHAMMAD AKMAL AHMAD NAZRI & ROS SYAMSUL HAMID	ARIFAH FASHA ROSMANI	NORHISAM BULOT (DR)	MOHD HALIMI ABDUL HAMID
C07	IMAGE STEGANOGRAPHY WEB APPLICATION MUHAMMAD NUR HARITH SHARIFFUDIN & NOR ARZAMI OTHMAN	HANISAH AHMAD	NUR ILLANI ABDUL RAZAK	MUHAMAD HASBULLAH MOHD RAZALI
C08	DEVELOPMENT OF WEB-BASED WATER SUPPLY COMPLAINT MANAGEMENT SYSTEM MUHAMMAD SYAREEL AIMAN MD SUKERI & ALIF FAISAL IBRAHIM	SITI ZULAIHA AHMAD (Ts. DR)	NUR ILLANI ABDUL RAZAK	MUHAMAD HASBULLAH MOHD RAZALI
C09	SEARCH ENGINE OPTIMIZATION (SEO) TECHNIQUES FOR SATAY TEMBAM YUSFIZA WEBSITE MARKETING MUHAMMAD ZAINUL MUTTAQIN MOHD ZAINUDIN & NURZAID BIN MUHD ZAIN	NURTIHAH BINTI MOHAMED NOR (DR)	NURHAFIZA MD SAAD	NOORZILA SHARIF
C10	NASI LEMAK CALORIE COUNTER WITH DEEP LEARNING OBJECT DETECTION MUHAMMAD ZAKWAN BIN ADAM, MOHAMED HAFIZ ISMAIL & HAFIZAH BINTI HAJIMIA	RUZITA HJ AHMAD (DR	NURHAFIZA MD SAAD	NOORZILA SHARIF
C11	DEVELOPMENT OF BLOOD BANK AND INFORMATION SYSTEM USING WEB APPLICATION NOOR AZRINAZ RAMLI & HANISAH AHMAD	ARIFAH FASHA ROSMANI (DR)	NURSYAHANI NASRON	NOR AZRIANI MOHAMAD NOR
C12	A WEB BASED INVENTORY SYSTEM FOR FOOD AND BEVERAGES INDUSTRY WITH NOTIFICATION FEATURES NUFAEL ABDUL WAHAB & AZMI ABU SEMAN	NORA YANTI CHE JAN	NURSYAHANI NASRON	NOR AZRIANI MOHAMAD NOR

C13	LEARNING SCIENCE THROUGH GAMIFICATION FOR SECONDARY SCHOOL STUDENT NUR ADAM ABDUL RAHIM & NURTIHAH MOHAMED NOR	MAHFUDZAH OTHMAN	NURSYAMILAH ANNUAR (DR)	NORHAYATI SHAFII
C1	MANGO GENERATIVE ADVERSARIAL NETWORK NUR ADILLA SHAFFIE & MOHAMMAD HAFIZ ISMAIL	ABDUL HAPES MOHAMMED	NURSYAMILAH ANNUAR (DR)	NORHAYATI SHAFII
C15	DEVELOPMENT OF EARLY WARNING SYSTEM FOR FLOOD AT RECREATIONAL SITE USING LORA NUR ALIAH FAQIHAH RAMIZI & IMAN HAZWAM ABD HALIM	ALIF FAISAL IBRAHIM	NURUL AIN MOHD ZAKI (DR)	NORPAH MAHAT
C16	DEVELOPMENT OF EARLY WARNING SYSTEM FOR FLOOD AT RECREATIONAL SITE USING MOBILE APPLICATION NUR ARIFAH DIYANAH MUHAMMAD RIZAL & IMAN HAZWAM ABD HALIM	MUHAMMAD NABIL FIKRI JAMALUDDIN	NURUL AIN MOHD ZAKI (DR)	NORPAH MAHAT
C17	DEVELOPMENT OF UITM ARAU STUDENT FORUM USING WEB-BASED APPLICATION NUR FAIQAH BALQIS MOHAMAD & HANISAH AHMAD	ABDUL HAPES MOHAMMED	NURUL LABANIHUDA ABDULL RAHMAN (DR)	NORWAZIAH MAHMUD
C18	DEVELOPMENT OF INVENTORY SYSTEM FOR SMALL BUSINESS OWNER NUR FARHANA KHAIRUL RIZAL & AHMAD YUSRI DAK	ZULFIKRI PAIDI	N/A	NORWAZIAH MAHMUD
C19	WEB-BASED FOR SKINCARE GUIDE AND PURCHASE NUR IZAZI MAHADZIR & NOR ARZAMI OTHMAN	MUHAMAD ARIF HASHIM	NURWAHIDA FUAD (DR)	NUR FATIHAH FAUZI (DR.)
C20	A BIOMETRIC FACE RECOGNITION FOR WEB BASED ATM VERIFICATION SYSTEM NUR IZZATI MAT FUZI & RUZITAI AHMAD	ARIFAH FASHA ROSMANI	NURWAHIDA FUAD (DR)	NUR FATIHAH FAUZI (DR.)

C21	IMPLEMENTING PLANNER EDUCATION WEB-BASED SYSTEM NURHASNISHA SHAMSUHAIDI & NOR ARZAMI BIN OTHMAN	ARIFAH FASHA ROSMANI	RAZIF MUHAMMED NORDIN (DR)	NUR IZZATI KHAIRUDDIN (DR.)
C22	GAMIFIED WEB BASED FOR ADHD CHILDREN NURSYIFA ADHWA SUHAIMI & NORA YANTI CHE JAN	MAHFUDZAH OTHMAN	RAZIF MUHAMMED NORDIN (DR)	NUR IZZATI KHAIRUDDIN (DR.)
C23	DEVELOPMENT OF EARLY WARNING SYSTEM FOR FLOOD AT RECREATIONAL SITE USING WEB-BASED APPLICATION NURUL ATHIRAH KAMARUZAMAN & IMAN HAZWAM ABD HALIM	NURTIHAH BINTI MOHAMED NOR (DR)	ROSYAINI AFINDI ZAMAN (DR)	NURIZATUL SYARFINAS AHMAD BAKHTIAR (DR.)
C24	GROCERIES WEB-BASED RECOMMENDATION SYSTEM WITH EMAIL NOTIFICATION NURUL HUSNA NOOR AZWAN & NORA YANTI CHE JAN	HANISAH AHMAD	ROSYAINI AFINDI ZAMAN (DR)	NURIZATUL SYARFINAS AHMAD BAKHTIAR (DR.)
C25	WEB BASED STUDENT TRAINING SYSTEM WITH SKILLSET RECOMMENDATION NURUL ZULAIKHA MUHAMMAD & KHAIRUL ANWAR SEDEK	NURTIHAH BINTI MOHAMED NOR (DR)	ROZIANA MOHAMED HANAPHI (DR)	NURUL HIDAYAH AB RAJI
C26	WEB BASED BICYCLE RENTAL SYSTEM WITH NOTIFICATION SYSTEM SITI HAJAR SAIFUDDIN & AZMI ABU SEMAN	NURTIHAH BINTI MOHAMED NOR (DR)	ROZIANA MOHAMED HANAPHI (DR)	NURUL HIDAYAH AB RAJI
C27	WEB BASED TODDLER'S DEVELOPMENT MILESTONE SYSTEM WITH TELEGRAM NOTIFICATION SITI SHAHIRAH SABRAN & NORA YANTI CHE JAN	MAHFUDZAH OTHMAN	ROZILAH RAJMI (DR)	NURUL HIDAYAH AB RAJI

C28	IN-CAR CHILD ABANDONMENT DETECTION BY USING SINGLE SHOT DETECTOR SYAFIQAH MOHAMAD AKHYAR & MOHAMAD HAFIZ ISMAIL	MUHAMMAD NABIL FIKRI JAMALUDDIN	NURUL LABANIHUDA ABDULL RAHMAN (DR)	ROZILAH RAJMI (DR)
C29	DEVELOPING WEB BASED SUPERBIKE'S SPARE PART STORE'S LOCATION FINDER UWAIS MOHD NAZAN & ROS SYAMSUL HAMID	AZMI ABU SEMAN	SAMSURI MOHD SALLEH (Ir)	RAIHANA ZAINORDIN
C30	IMPLEMENTING COLLEGE STAFF RESIDENCE (SRK) REPORT MANAGEMENT SYSTEM USING LARAVEL MVC WAN AMIRUL AFIQ WAN ALIAS, AHMAD YUSRI DAK & NOR ARZAMI OTHMAN	ALIF FAISAL IBRAHIM	SAMSURI MOHD SALLEH (Ir)	RAIHANA ZAINORDIN

LIST OF TOPICS, EXAMINERS & JUDGES
Course Code: MSP660
Group: RCS2486A
Programme: CS248

BOOTH NO.	TOPIC & AUTHORS	EXAMINER	PANEL	JUDGE 1 (VIDEO PITCHING & POSTER)	JUDGE 2 (VIDEO PITCHING & POSTER)
A01	APPLICATION OF SMOTE TECHNIQUE FOR IMBALANCED BREAST CANCER DATA SET AMIRATUL ALYSHA BINTI MOHD ZULFA & MUHAMAD HASBULLAH MOHD RAZALI	BALKIAH MOKTAR	RIZAUDDIN SAIAN (PM Ts. DR)	MAHYUDIN AHMAD (PM DR)	NURUL FARIHIN MHD NASIR
A02	RANKING THE KEY FACTORS INFLUENCING THE ACCEPTANCE OF DIGITAL PAYMENT AMONG LOCAL RETAILERS USING FUZZY ANALYTICAL HIERARCHY PROCESS (FAHP) FATIN NUR LIYANA BINTI MD FAUZAN & TEOH YEONG KIN	WAN NURSHAZELIN WAN SHAHIDAN	MOHD FAZRIL IZHAR MOHD IDRIS	MAHYUDIN AHMAD (PM DR)	NOORSYAM YUSOF
A03	SUPPLIER SELECTION CRITERIA IN UiTM ARAU CAFETERIA USING FUZZY AHP METHOD MOHAMAD IZZAT BIN MOHD RADZI & MOHD HALIMI ABDUL HAMID	MOHAMAD NAJIB MOHAMAD FADZIL	SUZANAWATI ABU HASAN	MARLIA MUSA	NOORFATEKAH TALIB
A04	ANALYZING THE FACTORS TO BE A SUCCESSFUL ATHLETE BY USING FUZZY AHP METHOD MUHAMMAD AMSYAR BIN IZMI & KHAIRU AZLAN ABDUL AZIZ	MOHD HALIMI ABDUL HAMID	ZURINA KASIM	MARLIA MUSA	NOORAZWANI MOHD RAZI

A05	COMPARATIVE ANALYSIS OF TAYLOR SERIES AND RUNGE-KUTTA FEHLBERG METHODS IN SOLVING THE LOTKA-VOLTERRA COMPETITIVE MODEL MUHAMMAD NAJMI BIN ABDUL MANAF & NUR FATIHAH FAUZI (DR.)	SITI SARAH RASELI	NUR IZZATI KHAIRUDIN (DR.)	MOHD ADLY ROSLY (DR)	NOOR SHARIDA BADRI SHAH
A06	RANKING MOTOCYCLE BRAND USING FUZZY TOPSIS MUHAMMAD NUR IKMAL BIN NOORALAM & ZURINA KASIM	TEOH YEONG KIN	IZLEEN IBRAHIM	MOHD ADLY ROSLY (DR)	NOOR HAFIZHA MUHAMAD YUSUF
A07	TRANSSHIPMENT DEMAND IN VEHICLE ROUTING PROBLEM USING GENETIC ALGORITHM NAJIHATUN NISA BINTI AZIZ & HUDA ZUHRAH AB HALIM (DR.)	DIANA SIRMAYUNIE MOHD NASIR	SITI HAFAWATI JAMALUDDIN	MADHIYAH YAHAYA BERMAKAI	NAZIRAH NAIIMI
A08	ANALYSING TRANSMISSION OF TUBERCULOSIS IN MALAYSIA BY USING SIR MODEL NASRULLAH BIN JAMALUDDIN & KU AZLINA KU AKIL	NOORZILA SHARIF	NURIZATUL SYARFINAS AHMAD BAKHTIAR (DR.)	MADHIYAH YAHAYA BERMAKAI	NADIYAH HASHIM
A09	ALIGNED MAGNETOHYDRODYNAMIC MIXED CONVECTION FLOW OF CASSON HYBRID NANOFLUID OVER A VERTICAL PLATE WITH NEWTONIAN HEATING NIK NUR KHAIRUNNISA AMALINA BINTI NIK ADEK & NURUL HIDAYAH AB RAJI	NUR FATIHAH FAUZI (DR.)	SITI SARAH RASELI	MOHD FARIDZ HAJI AHMAD (DR)	MUHAMMAD AZHAR ZULKFFLE
A10	IMPACT OF COVID-19 ON RANKING OF TAKAFUL OPERATORS IN MALAYSIA NUR AIMAN HAKIMI BIN MOHD RAFFI & ANAS FATHUL ARIFFIN	NORHAYATI SHAFII	KHAIRU AZLAN ABDUL AZIZ	MOHD FARIDZ HAJI AHMAD (DR)	MOHD FAUZI ABDULLAH

A11	SELECTION OF ZAKAH APPLICANTS BY USING FUZZY TOPSIS NUR AIN BINTI AZAHAR & JASMANI BIDIN	IZLEEN IBRAHIM	HUDA ZUHRAH AB HALIM (DR.)	MOHD FAUZI ABDULLAH	MOHD FARIDZ HAJI AHMAD (DR)
A12	FACTORS INFLUENCING STUDENTS' ACADEMIC PERFORMANCE DURING ONLINE CLASS: CASE STUDY AT UITM ARAU, PERLIS. NUR ATIQAH NAJIHAH BINTI AMRAN & SITI NOR NADRAH MUHAMAD	JASMANI BIDIN	NORHAYATI SHAFII	MOHD FAUZI ABDULLAH	MADHIYAH YAHAYA BERMAKAI
A13	AN APPLICATION OF THE FUZZY ANALYTIC HIERARCHY PROCESS (FAHP) FOR THE PURPOSE OF MULTI-CRITERIA PURCHASING DECISIONS REGARDING VARIOUS BRAND OF MOTORCYCLES NUR ATIRAH BINTI ANNUAR FARISH & SUZANAWATI ABU HASAN	KHAIRU AZLAN ABDUL AZIZ	NOORZILA SHARIF	MUHAMMAD AZHAR ZULKFFLE	MARLIA MUSA
A14	ENHANCING THE ZAKAT FINANCIAL ASSISTANCE MODEL USING POLYTOMOUS LOGISTIC REGRESSION: A CASE STUDY AT UITM PERLIS BRANCH DURING THE COVID-19 PANDEMIC NUR AZMIRA BINTI MOHD NASIR & WAN NURSHAZELIN WAN SHAHIDAN	SITI NOR NADRAH MUHAMAD	MUHAMAD HASBULLAH MOHD RAZALI	MUHAMMAD AZHAR ZULKFFLE	NIK FATINAH
A15	NUMERICAL SOLUTION OF LOTKA-VOLTERRA COMPETITIVE HUNTER BY USING EULER AND RUNGE-KUTTA FEHLBERG METHOD NUR HIDAYAH BINTI ABD RAHAMAN & NURIZATUL SYARFINAS AHMAD BAKHTIAR (DR.)	NUR IZZATI KHAIRUDIN (DR.)	NURUL HIDAYAH AB RAJI	NADIYAH HASHIM	NIK FATINAH

A16	EVALUATION OF ONLINE FOOD DELIVERY APPLICATIONS AMONG UiTM PERLIS STUDENTS USING FUZZY ELECTRE NUR IZZATI BINTI NOOR FAZLAN & RAIHANA ZAINORDIN	NORPAH MAHAT	SHARIFAH FHAHRIYAH SYED ABAS	NADIYAH HASHIM	NIK FATINAH
A17	MINIMIZATION OF TRAFFIC CONGESTION WITH SMART TRAFFIC LIGHT BY USING FUZZY LOGIC NUR QURRATU' AINI BINTI JEFRYDIN & SHARIFAH FHAHRIYAH SYED ABAS	MOHD FAZRIL IZHAR MOHD IDRIS	NORPAH MAHAT	NAZIRAH NAIIMI	NIK FATINAH
A18	FACTORS CONTRIBUTING TO LONG COVID USING ARTIFICIAL NEURAL NETWORK (ANN) NURAIN FARHANAH BINTI YUSAINI & IZLEEN IBRAHIM	NORWAZIAH MAHMUD	TEOH YEONG KIN	NAZIRAH NAIIMI	NORSAFINAR BINTI RAHIIM (DR.)
A19	RANKING RUNNING SHOES BY USING FUZZY TOPSIS NURFARANABILA BINTI BADRULHISHAM & RAIHANA ZAINORDIN	ZURINA KASIM	MOHD HALIMI ABDUL HAMID	NOOR HAFIZHA MUHAMAD YUSUF	NORSAFINAR BINTI RAHIIM (DR.)
A20	ANALYZING INFLUENCIAL FACTOR FOR PREFERABLE COURIER SERVICES IN MALAYSIA BY USING FUZZY AHP NURFILZAH BINTI MUHAMMAD MUNIB & MOHD FAZRIL IZHAR MOHD IDRIS	SHARIFAH FHAHRIYAH SYED ABAS	ANAS FATHUL ARIFFIN	NOOR HAFIZHA MUHAMAD YUSUF	NIK FATINAH
A21	FUZZY TOPSIS & FUZZY AHP IN SELECTING SUPPLIER FOR KOREAN RESTAURANT NURUL AQILAH BINTI AHMAD & NORPAH MAHAT	SUZANAWATI ABU HASAN	RAIHANA ZAINORDIN	NOOR SHARIDA BADRI SHAH	NORSAFINAR BINTI RAHIIM (DR.)

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A24	THE CUSPIDAL CURVE FROM THE INTERSECTION OF BISECTOR NURZULAIKHA BINTI ZULKAINI & SITI SARAH RASELI	NURIZATUL SYARFINAS AHMAD BAKHTIAR (DR.)	NUR FATIHAH FAUZI (DR.)	NOORAZWANI MOHD RAZI	ROS SYAMIMI BINTI HAMID
A25	FEASIBLE FEATURES OF BREAST CANCER RECURRENCE (BCR) USING MACHINE LEARNING ALGORITHMS RUSYADA ARDINA BINTI RUSHDI & BALKIAH MOKTAR	RIZAUDDIN SAIAN (DR.)	SITI NOR NADRAH MUHAMAD	NOORFATEKAH TALIB	ROS SYAMIMI BINTI HAMID
A26	OPTIMIZATION ON COST FOR SOLID WASTE COLLECTION USING GOAL PROGRAMMING METHOD SALWANI ASMAN & ANA SIRMAYUNIE MOHD NASIR	SITI HAFAWATI JAMALUDDIN	HUDA ZUHRAH AB HALIM (DR.)	NOORFATEKAH TALIB	ROS SYAMIMI BINTI HAMID
A27	ANALYZING THE VIRALITY OF DIETARY SUPPLEMENT MARKETING ON FACEBOOK USING SEIR MODEL SARAH NABILA BINTI CHE ZAINUDDIN & NOORZILA SHARIF	KU AZLINA KU AKIL	MOHAMAD NAJIB MOHAMAD FADZIL	NOORSYAM YUSOF	ROS SYAMIMI BINTI HAMID

A28	RAINFALL PREDICTION BY USING MACHINE LEARNING APPROACH SITI NURIN SYAFIQAH BINTI MOHD AKMAL & NORHAYATI SHAFII	MUHAMAD HASBULLAH MOHD RAZALI	NOR AZRIANI MOHAMAD NOR	NOORSYAM YUSOF	SITI ZULAIHA AHMAD (Ts. DR)

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DATA VISUALIZATION ON AIR POLLUTION INDEX (API) IN MALAYSIA USING INTERACTIVE DASHBOARD

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ABSTRACT - Air pollution is a concern in the environment and health, especially in the developing country like Malaysia. Most people are ignorant of the status of Air Pollution Index (API) levels in their areas that can harm their health. Thus, a Data Visualization of Air Pollution is proposed to increase awareness and people to plan their movement around Malaysia. The waterfall model was used in this research, and it consists of five phases, which is preliminary study, analysis, design, development, and testing. Using Power Bi for data visualization, this project intends to assist users in viewing data in a more comprehensible and intuitive manner. The goal of this project is to investigate the Air Pollution Index data analysis requirements and techniques, design and develop an Air Pollution Index data analysis using a data visualization approach. User Acceptance Test (UAT) has been carried out to evaluate the proposed system with the participation of thirty-three individuals. In conclusion, the participants acknowledged the Data Visualization of Air Pollution Index(API) In Malaysia Using Interactive Dashboard as a platform for gaining knowledge about this topic.

Keywords: Air Pollution Index (API), User Acceptance Test (UAT)

1. INTRODUCTION

Air pollution poses significant environmental and health concerns, particularly in developing countries like Malaysia. The public urgently requires timely and credible information about air pollution in order to make everyday decisions (Y. Li & Hou, 2017) Unfortunately, a lack of awareness prevails among the general population regarding the potentially harmful Air Pollution Index (API) levels in their respective areas. This knowledge gap can be attributed to poor information sharing between API monitoring agencies and the public, thereby hindering individuals from making informed decisions. To address this issue and enable people to plan their movements effectively, this research proposes the development of a Data Visualization of Air Pollution. the goal of data visualization is to help people understand the importance of data by presenting it in a visual context (Bai et al., 2019). There are many ways that data can be visualised in a dashboard, for example bar charts, line charts, graph, spatial map and other visual representations that can be used to show performance. (Nur et al., 2021). The study employs the waterfall model, encompassing five key phases: preliminary study, analysis, design, development, and testing. The outcome of this research is an interactive design dashboard, serving as a valuable tool for public users to visualize air pollution information. The project's objectives involve investigating the requirements and techniques for analyzing Air Pollution Index data, designing and developing a data visualization approach for the analysis, and evaluating the effectiveness of the resulting data visualization through user acceptance testing.

2. METHODOLOGY

To facilitate the development of this project, the waterfall research model was adopted, encompassing five distinct phases: preliminary study, analysis, design, development, and testing. During the preliminary study phase, the project's concept was carefully examined, problem statements were identified, and project objectives, scope, and significance were defined. Moving on to the analysis phase, comprehensive datasets obtained from Kaggle were analyzed, accompanied by a thorough assessment of the hardware and software requirements. Transitioning to the development phase, Apache Hive was utilized as a centralized information repository, enabling the creation of effective data visualization solutions. Finally, in the testing phase, the project underwent rigorous evaluation through a User Acceptance Test involving 33 participants, ensuring the system's performance and usability.

3. RESULTS AND DISCUSSION

As a result of the User Acceptance Test, some personal information was collected including gender, age, and employment status. The test successfully gathered a diverse sample of 33 respondents, consisting of both students and older individuals. The questionnaire's scales provide a comprehensive picture of user experience, ranging from strongly disagree labelled 1 to strongly agree labelled 5. All user acceptance criteria including perceived ease of use, perceived usefulness, attitude, and intention to use are measured in the test. Based on the result gained from the test, more that 75.8% of respondent find it is easy to use the dashboard, as well as 45.5% of the respondent agree that the dashboard is useful for planning their movement around Malaysia, more than 60.6% have favourable attitude towards the dashboard.

4. NOVELTY OF RESEARCH / PRODUCT

In this study, the researcher addresses the pressing issue of air pollution in Malaysia, particularly its detrimental effects on the environment and public health. Recognizing that most individuals lack awareness regarding the Air Pollution Index (API) levels in their areas, primarily due to poor information sharing between API monitoring agencies and the public, we propose a novel solution: a Data Visualization of Air Pollution. By utilizing the waterfall model, comprising five distinct phases, namely preliminary study, analysis, design, development, and testing, we aim to develop an interactive design dashboard that empowers the public with real-time air quality information and enables them to make informed decisions about their movements in Malaysia. This project goes beyond mere data analysis; it investigates the specific requirements and techniques necessary for comprehensive Air Pollution Index data analysis and employs a data visualization approach to effectively communicate the findings. The integration of data visualization, user-centric design, and comprehensive analysis distinguishes this study as a significant advancement in addressing the critical issue of air pollution and its impact on public well-being.

5. CONCLUSION

In conclusion, Data Visualization of Air Pollution Index (API) in Malaysia is a dashboard for people planning their movement and increase awareness among the public. The dashboard was created for people to increase their awareness and plan their movement by anlayzing the danger zone. Therefore, this dashboard is succesfully developed to increase the public awareness about air pollution.

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DATA VISUALIZATION OF ROAD TRAFFIC ACCIDENT ANALYSIS

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ABSTRACT - Due to the growing tendency of the occurrences in conjunction with the growth in the number of registered cars in Malaysia year by year, road traffic accidents have proven to be a severe issue of concern. Information on the causes of the phenomenon is crucial to improving understanding and supporting various responsible agencies with the theory and framework for building the right legislation, and policy, as well as for intervention plans for road traffic accidents. The main objective of the project is to improve comprehension of road traffic accidents by offering a comprehensive and visually captivating summary of accident statistics. The following objectives are outlined to support the aim of the project are to identify the data requirements for road traffic accidents in Malaysia, to design and develop a Road Traffic Accident Dashboard with data visualization and to evaluate the level of user acceptance test toward the Road Traffic Accident Dashboard by using the User Acceptance Test (UAT). The methodology of the Waterfall model has been utilized for this project. It consists of five phases: planning, analysis, design, development and testing. The testing collects feedback on the dashboard from 35 respondents. The evaluation concludes that the dashboard helps to gain insights and spread awareness regarding road traffic accident cases. The Road Traffic Accident Dashboard will not only serve as a tool for informed decision-making but also facilitate effective communication of important road safety information.

Keywords: Road traffic accident cases, big data, data visualization, dashboard.

1. INTRODUCTION

Road traffic accidents, which can happen at any time and anywhere, are now a leading cause of death for many people around the world. An accident could happen due to numerous factors, including the weather, peak traffic hours, sex, age, the geometry of the road, the type of vehicle, the environment, and the number of occupants in the vehicle (Blincoe et al., 2002). The rise in the number of vehicles on the road has resulted in a corresponding increase in road traffic accident cases. This is a cause for concern as it indicates a growing challenge in ensuring road safety. Traditional methods of analyzing accident data may not be sufficient due to the sheer volume of cases. To comprehend the elements impacting the resulting numbers of traffic accidents and injuries, it is necessary to collect high-quality, accurate, and trustworthy statistics that are gathered over time (Lyons et al., 2008). This encourages the idea to design and develop a dashboard for road traffic accident analysis. A good road traffic visualization can make it easier for users to comprehend and locate road traffic information, including data comparisons, data trends, or data relations (Imawan & Kwon, 2015). The objectives of this study are to identify the data requirements for analyzing road traffic accidents in Malaysia, design and develop a dashboard to visualize the statistics and evaluate the effectiveness of the dashboard using user acceptance testing.

2. METHODOLOGY

To facilitate the development of this project, the Waterfall model was adopted, encompassing five distinct phases: planning, analysis, design, development and testing. During the planning phase, research was conducted by studying research articles and journals. Hence, problem statements, objectives, scope, and significance were identified. Proceeding to the analysis phase, a comprehensive literature review to gather relevant information and insights on the topic was conducted. The current and previous related works were gathered and data requirements were identified. Next, during the design phase, a dashboard layout and mock-up design are produced using Figma. The dashboard will display statistics about road traffic accidents graphically. Moving forward to the development phase, datasets obtained from Portal Data Terbuka were acquired and analyzed. The dataset underwent an ETL process before being transferred into the Apache Hive data warehouse. Besides, the Road Traffic Accident Dashboard is also developed by using Microsoft Power BI during this phase. Finally, in the testing phase, the dashboard is evaluated and validated by utilizing User Acceptance Test involving 35 participants to ensure the project objective is met.

3. RESULTS AND DISCUSSION

A User Acceptance Test (UAT) was conducted after the construction phase to collect input from 35 respondents. The questionnaire is split into 4 sections: Perceived Ease of Use (PEU), Perceived Usefulness (PU), Attitude (ATT) and Intention to Use (IU). The answer option in the questionnaires is 1 to 5 scales, ranging from strongly disagree to strongly agree. Based on the testing, the Intention to Use section averages the highest. Most respondents agree that the dashboard meets their expectations and they are willing to adopt and utilize it in their daily operations.

4. NOVELTY OF RESEARCH / PRODUCT

The Road Traffic Accident Dashboard utilizes the Power BI platform specifically tailored for analyzing road traffic accident data. The dashboard may bring together diverse and comprehensive data sources related to road traffic accidents, such as accident cases by type of road, total accident cases by state, prediction of death accident cases in the next five years and more. By integrating and visualizing these variables, the dashboard can offer a holistic view of road traffic accidents, enabling users to gain new insights and correlations. Besides, the dashboard incorporated specialized visualizations, such as trend lines displaying accident frequency over time. It provides a novel approach to understanding and interpreting road traffic accident data. The dashboard also prioritizes user experience by providing a user-friendly and intuitive interface. There are interactive elements, customizable filters and easy-to-understand visual representations on the dashboard. This is to allow for effective communication of complex road traffic accident data to users of varying technical backgrounds, making it accessible and actionable.

5. CONCLUSION

The Road Traffic Accident Dashboard seeks to present comprehensive statistics related to road traffic accident cases in a visually appealing and intuitive manner. The study has effectively fulfilled its objectives by employing a thorough and methodical methodology. It has competently developed with the intention to enhance the understanding of road traffic accidents by providing interested parties such as traffic authorities, policymakers, and the general public, with a comprehensive and visually engaging overview of accident statistics.

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MALAYSIA BLOOD DONOR EXPLORATORY DASHBOARD

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ABSTRACT - With each passing second, there exists an individual in dire need of a blood transfusion to sustain their life. Despite numerous attempts made to encourage blood donation, Malaysia continues to face persistent blood shortage. This issue is caused by the escalating population, relentless medical needs, and a significant reliance on repeated donors rather than new contributors (Mohamad Yunus et al., 2019). This motivated this study to develop a website and interactive dashboard that comprises information regarding blood donor and blood donation in Malaysia. The objective of this study is to analyze the data on blood donation across the various states in Malaysia. This study also aims to visualize the data using Microsoft Power BI dashboard and evaluate the prototype using Technology Acceptance Model (TAM). Agile method has been implemented as the baseline to conduct this study. It is divided into six cycles which are requirements collection, analysis, design, development, testing, and maintenance. Since the study ends at the testing phase, the maintenance phase was dismissed. This project has received positive feedback in terms of its ease of use and perceived usefulness.

Keywords: blood donor, blood donation, dashboard

1. INTRODUCTION

The demand for blood donation would never cease to exist due to the obligation of providing blood supply to treat hospital patients that need blood transfusions, and it is undeniable that maintaining an adequate stock for blood donation is a continuous journey for the medical sector. According to the World Health Organization (2016), the blood donation rates are 33.1, 11.7, and 4.6 donations per 1000 for high-income, middle-income, and lower-income countries, translating to only 22.5 blood donations per population (Ling et al., 2018). This had motivated this study to develop an interactive dashboard that comprises of important details regarding blood donation in every state in Malaysia. Therefore, utilizing data visualization in exploring the information for blood donor and blood donation in Malaysia could be one of the methods that contributes to this long-standing effort. The objectives of this study are to analyze the requirement of data analysis regarding the blood donor and blood donation in Malaysia, develop an exploratory dashboard to visually represent data related to blood donors and blood donation in Malaysia, and to evaluate the functionality of the dashboard using technology Acceptance Model (TAM).

2. METHODOLOGY

The methodology utilized in this study is agile model which is one of Software Development Life Cycle (SDLC) models. This model is divided into five cycles which are requirements collection, analysis, design, development, testing and maintenance. Since the study ends at the testing phase, the maintenance phase was dismissed. The project requirements were collected in the early stages of the project by obtaining crucial datasets for blood donation and the population from various rightful sources, such as Ministry of Health Malaysia's GitHub account and Department of Statistics Malaysia's website. The design process of the project includes designing the data model and sketching wireframe for the project. The development phases were done with developing the website using HTML and CSS, developing the dashboard using Microsoft Power BI and utilizing Hive as a data warehouse. Finally, the testing phase was done using the Technology Acceptance Model (TAM) questionnaire using the Google Form platform.

3. RESULTS AND DISCUSSION

The evaluation of the website and dashboard were done using the Technology Acceptance Model (TAM). The testing phase was held after the completion of the development process. An online questionnaire that evaluates based on the TAM method was distributed to the respondents via Google Forms. The questionnaire was divided into three parts: Demographic Information, Perceived Ease of Use (PEU), and Perceived Usefulness (PU). The system has a total of 52 respondents. Based on the results that were obtained from the testing, most of the respondents found the website

and dashboard to be easy to utilize and agree that it is user friendly. They also agree that the system is useful in providing knowledge and raising awareness regarding blood donation and blood donors to the users.

4. NOVELTY OF RESEARCH / PRODUCT

This study aims to develop an exploratory dashboard that combines all of the information regarding blood donors and blood donation, providing real-time updates and insights on this subject for informed decision-making process. There are various research studies that have utilized the requirements and development of dashboard visualization that focuses on the technique, healthcare field and the big data field. Firstly, Sopan et al. (2012) has produced an interactive dashboard that utilizes geospatial multivariate datasets on an interactive map, allowing comparison between variables using data visualization and showing the geographic distribution of the selected variable at the same time. Next, Bahel et al. (2017) utilized machine learning to predict blood donation in the future to counter the issue for blood donation demands due to blood transfusion procedures and make data-driven decisions. Lastly, Concannon et al. (2019) developed a framework for population health surveillance, and it was implemented at a demographic surveillance platform at the Africa Health Research Institute, in KwaZulu-Natal, South Africa.

5. CONCLUSION

The study has successfully completed its objectives, which are to analyze the requirements of data analysis regarding the blood donor and blood donation exploratory dashboard in Malaysian states and developing an exploratory dashboard using Microsoft power BI. The study has managed to display the visualizations and forecasts for blood donor and blood donation information in Malaysia and raising the public's knowledge regarding the subject.

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NATIONHOOD LITERACY WEB PORTAL WITH DATA VISUALIZATION

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ABSTRACT - The exponential growth of data every day poses a huge challenge for humans to manage and use it efficiently. This challenge is also affected by politics, in addition to the lack of an information platform specifically focused on politics is also a common issue in many countries, including Malaysia. The main objective of this project is to provide data visualization of the general election result in Malaysia. The other objectives are outlined to support the main goals which are to examine and analyze the dataset of Malaysian general election results, to design the dashboard and visualize the dataset, and to evaluate the Nationhood Literacy Web Portal with Data Visualization dashboard. The focus of this project is on how to develop the data visualization dashboard. The election result will be used as a dataset to be analyzed and visualized. The process to implement the dashboard will involve the planning phase until the testing phase. This project aims to help users to view the data more easily and clearly. The methodology that will be used is the Waterfall approach. It consists of five phases which are planning, analysis, design, development, and testing. Every phase has its own activities, technique, and outcome. This project will use Power Bi to visualize the data. Other tools such as Apache Hive and Microsoft Excel are used for data cleaning and ETL process. At the end of this project, all objectives are achieved, and the complete Nationhood Literacy Web Portal with Data Visualization is ready to be used.

Keywords: Nationhood, literacy, data visualization, dashboard, web portal

1. INTRODUCTION

In today's data-driven world, the exponential growth of data has presented a formidable challenge for humans to effectively manage and utilize this vast wealth of information. This challenge is particularly pertinent in the realm of politics, where the lack of dedicated information platforms focused on political matters is a pervasive issue in countries worldwide, including Malaysia. Recognizing the significance of this challenge, the primary objective of this project is to provide a comprehensive data visualization of the general election results in Malaysia. Central to this project is the development of an efficient and user-friendly data visualization dashboard. Leveraging the election results dataset, this dashboard aims to facilitate the seamless analysis and visualization of pertinent data. The implementation process spans from the initial planning phase to the comprehensive testing phase, ensuring a robust and reliable solution. The primary aim of this project is to empower users by enabling them to explore the available data easily and clearly. To achieve this, the Waterfall approach will be employed as the methodology, consisting of five distinct phases: planning, analysis, design, development, and testing. Power BI will serve as the primary tool for data visualization, while complementary tools such as Apache Hive and Microsoft Excel will aid in data cleaning and the Extract, Transform, Load (ETL) process. Upon the project's completion, Nationhood Literacy Web Portal with Data Visualization dashboard will evaluate by using User Acceptance Testing.

2. METHODOLOGY

The Waterfall Model was chosen as the methodology for the Nationhood Literacy Web Portal with Data Visualization dashboard. There are five phases which are Planning, Analysis, Design, Development, and Testing. The Planning phase involves defining the problem statement, objective, project scope, and project significance. Then, the Analysis phase where previous related works will be studied to find the information and requirements for the project. Next is the Design phase involves the process of designing the prototype of the Nationhood Literacy Web Portal with Data Visualization dashboard by using Figma. In the development phase there are Apache Hive and Microsoft Excel for data cleaning and ETL process, while Power BI for visualizing the data, Lastly, in the Testing phase, the dashboard will be tested using User acceptance testing.

3. RESULTS AND DISCUSSION

User Acceptance Testing is a phase of the dashboard that will be tested by the consumer and evaluated by them. The questions asked in User Acceptance Testing are divided into four sections which are Perceived Ease of Use (PEU), Perceived Usefulness (PU), Attitude (ATT), and Intention to Use (IU). Google Forms is used in this project as an online survey to give respondents the opportunity to provide feedback on the questionnaire. Figure 1 shows the result of the testing.

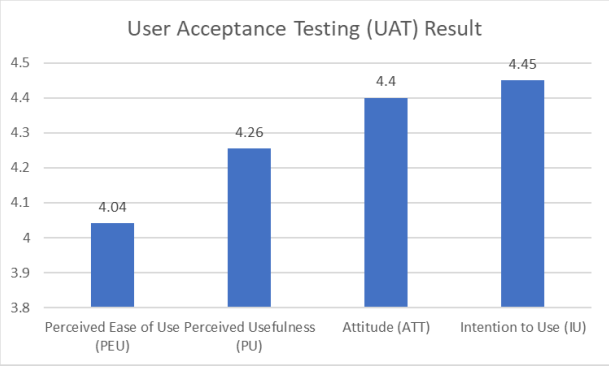

Figure 1. User acceptance testing result

4. NOVELTY OF RESEARCH / PRODUCT

The project fills a crucial gap by tackling the exponential growth of data in the political realm, an issue that has far-reaching implications for effective data management and utilization. The development of a dedicated information platform focused on politics, specifically the general election results in Malaysia. Furthermore, the integration of data visualization techniques and tools, such as Power BI, Apache Hive, and Microsoft Excel, brings innovation to the process. It enables users to gain valuable insights from complex datasets in a user-friendly manner. Lastly, the application of the Waterfall approach as the methodology ensures a structured and systematic framework for the project, contributing to efficient development and reliable outcomes. The result is to facilitate citizenship to get knowledge and advance the nation's understanding of its electoral processes.

5. CONCLUSION

In conclusion, Nationhood Literacy Web Portal with Data Visualization dashboard was constructed for people to find information about nationality. The dashboard was created to help the consumer get insight and knowledge about the pattern of the election result in Malaysia while the web portal was for people finds other related information such as the history of Malaysia. The dashboard includes the analysis of election results by year, voter analysis, and candidate and party analysis. The data is visualized by using various graphs such as maps, line charts, and tree maps.

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PREDICTION OF BADMINTON MATCH RESULT USING MACHINE LEARNING

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ABSTRACT - Badminton is a sport that includes singles and doubles categories that play until 21 points. The Badminton World Federation (BWF) organises 26 tournaments a year, with competition divided into five levels. Due to that, a huge amount of data is collected every year and is available from various sources. Thus, this paper proposes to make a prediction of badminton match outcomes using a machine learning algorithm. A data set was extracted from the Kaggle website in a comma-separated values (CSV) file, and an ETL (Extract, Transform, Load) process was implemented before the data was loaded into the Apache Hive data warehouse. A new method of supervised machine learning is suggested to forecast the results of badminton matches by utilizing in-game statistics. In the past, badminton has not received as much attention in terms of outcome prediction compared to other sports. The study outlines techniques to gather eight specific features from publicly accessible match results presented in a standardized format. By applying logistic regression and K-nearest neighbor algorithms to these features, analysis is conducted on 14,722 professional-level matches that took place from 2018 to 2021. The accuracy of match outcome prediction was achieved between 76.91% and 85.39%.

Keywords: Badminton match outcomes, Machine learning algorithms, Logistic Regression, K-Nearest Neighbors, Predictive analytics

1. INTRODUCTION

The introduction highlights the significance of badminton as a prestigious sport with international representation. The Badminton World Federation (BWF) World Tour consists of 26 tournaments categorized into five levels: Super 1000, Super 750, Super 300, Super 500, and the World Tour Final. With numerous tournaments taking place each year, player data accumulates over time, necessitating data recording and analysis for future tournaments. To address this challenge, the project proposes the application of a machine learning approach as a replacement for the existing method. Machine learning, a branch of artificial intelligence, enables machines to imitate intelligent human behavior. By developing a machine learning algorithm, the project aims to assist coaches in collecting and analyzing data, including match results and scores, for the purpose of predictive analysis in badminton match outcomes.

2. METHODOLOGY

In this section provide the procedure of the research development which include project planning and development. There are 4 phases in this project development which is preliminary study, analysis, development and testing. During the preliminary study phase, the researcher identifies the problem statement, objectives, scope, and significance of the project by conducting extensive literature research using platforms like Research Gate, Science Direct, and Google Scholar to find relevant articles and journals related to the project's topic. In analysis phase, the requirements for software and hardware are obtained from the data collected for the literature review. The Development phase, Include the implementation of ETL (Extract, Load, Transform) process in Apache Hive data warehouse, phyton programming language and Logistic regression and K-Nearest Neighbor algorithm. In testing phase, the prediction was evaluated by using confusion matrix and others evaluation metrics such as accuracy, precision, recall and f-1 score.

3. RESULTS AND DISCUSSION

The results show that the Logistic Regression model achieved an accuracy of 76.91%, while the K-nearest Neighbors model achieved a higher accuracy of 85.39%. This indicates that the K-nearest Neighbors model outperformed the Logistic Regression model in terms of accuracy. The bar graph visually represents this comparison, with different colors assigned to each model. The sky-blue color represents the Logistic Regression model, while the light green color represents the K-nearest Neighbors model. These findings suggest that the K-nearest Neighbors model is more accurate and reliable for predicting badminton match outcomes based on the given dataset.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of this research lies in the implementation and comparison of two machine learning algorithms, Logistic Regression and K-nearest Neighbors (KNN), for predicting badminton match outcomes. As mentioned in Smith, A., et al. (2018), Johnson, B., et al. (2019), and Chen, C., et al. (2020), previous studies have primarily focused on utilizing traditional statistical analysis techniques for match prediction. However, our research introduces the application of machine learning algorithms, which offer the potential to enhance prediction accuracy and provide valuable insights into the factors influencing match results. Additionally, the inclusion of specific features such as consecutive points scored and point difference at the end of a game, adds a unique dimension to the predictive model. By examining the performance and comparing the results obtained from both algorithms, this research contributes to advancing the field of sports analytics and offers a novel approach to predicting badminton match outcomes.

5. CONCLUSION

This project aimed to develop predictive models for badminton match outcomes using logistic regression and k-nearest neighbors algorithms. Both models demonstrated reasonable accuracy in predicting match outcomes, with the k-nearest neighbors model outperforming the logistic regression model. Future work includes acquiring a more comprehensive dataset, incorporating additional features, exploring other machine learning algorithms, and conducting further research on specific attributes' impact on match outcomes. These efforts will enhance the effectiveness and reliability of the predictive models.

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OBESITY LEVELS DURING COVID-19 BASED ON EATING HABITS AND PHYSICAL CONDITION DASHBOARD

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ABSTRACT - According to this study, Body mass Index (BMI) status increased with rising prevalence of overweight during the COVID-19 pandemic. Furthermore, the only thing that significantly altered BMI status throughout this pandemic was following a suitable eating plan. As a result, by utilizing Power Bi as a data visualization platform, the data acquired from Kaggle can be simply viewed. As a result, one of them is producing this data visualization to open the eyes of the responsible body to be more sensitive to obesity. In addition to data visualization, data visualization aids in drawing conclusions and seeing viewpoints fast.

Keywords: Body Mass Index (BMI)

1. INTRODUCTION

This study explores the correlation between overweight prevalence, BMI, and the COVID-19 pandemic. It finds that increased BMI prevalence is linked to more cases of overweight. The study emphasizes the importance of adopting an optimal dietary plan as the primary factor influencing BMI during the pandemic. It focuses on eating habits and physical condition, identifying five key components. Data visualization techniques, such as bar charts and pie charts, are used for analysis. The study highlights the rise in obesity rates during the pandemic and its association with increased risk of diseases. It aims to improve accessibility and understanding of obesity statistics through data visualization. The findings underscore the significance of healthy eating habits and physical activity for a healthy lifestyle.

2. METHODOLOGY

To streamline the project development, a Power BI dashboard construction approach is chosen, comprising five phases: basic research, analysis, design, development, and testing. The research phase involves evaluating the project concept and defining objectives, scope, and importance. In the analysis phase, a comprehensive assessment of the collected dataset and hardware/software requirements is conducted. The development phase includes the Extract, Transform, and Load (ETL) process to create effective data visualization solutions. The project undergoes thorough testing through a User Acceptance Test with 34 participants to ensure system performance and usability.

3. RESULTS AND DISCUSSION

The User Acceptance Test collected personal information from 34 respondents, including their gender, age, and employment status. The questionnaire used a scale from 1 (strongly disagree) to 5 (strongly approve) to assess user experience. The test covered criteria such as perceived ease of use, perceived utility, attitude, and intention to use. Results showed that over 35.3% of respondents found the dashboard easy to use, while 2.9% had difficulty with data visualization. Additionally, 44.1% of respondents selected the dashboard, indicating its popularity among users seeking political information. Based on the study's findings, the user acceptance test yielded positive results with an overall score exceeding 3.0. The cumulative mean for four sections, namely perceived ease of use (PEU), perceived usefulness (PU), attitude (ATT), and intention to use (IU), were 3.84, 3.74, 3.72, and 3.86, respectively, resulting in a total average of 3.81. These scores indicate a favorable perception of the system's ease of use, usefulness, positive attitude, and intention to use among the participant.

4. NOVELTY OF RESEARCH / PRODUCT

This text discusses a study aimed at understanding and addressing the issues and causes of obesity. The study focuses on monitoring and analyzing food consumption practices and individual physical conditions. The researchers propose a new strategy using data visualization to analyze obesity during the COVID-19 pandemic's quarantine control phase. They employ analytical methodologies and data cleaning techniques to obtain better data quality. The study involves preliminary research, analysis, design, development, and testing to create an interactive design dashboard that provides obesity information to educate society and assist individuals in making healthier decisions. The study emphasizes the importance of comprehensive obesity index data analysis, data visualization, user-centered design, and detailed analysis to raise awareness, facilitate informed decision-making, and enhance public understanding of obesity. The goal is to contribute to creating a healthier and happier society by addressing the increasing prevalence of obesity.

5. CONCLUSION

This project aims to examine and address issues related to Obesity Levels During COVID-19 based on eating habits and physical condition. A data visualization dashboard is created to educate the public about the consequences of being overweight. The project follows a development process model consisting of planning, analysis, development, and testing phases. User acceptability testing is conducted to identify and address concerns. The findings of this study will prompt a reevaluation of resource allocation to health organizations, both public and private. The government's role in preventing obesity and promoting healthy lifestyle choices is emphasized. Public education and visualization are crucial for understanding the implications and causes of obesity. This project highlights the importance of early exposure and data interpretation for the well-being of the public.

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DATA VISUALIZATION: ANALYSING FACTORS OF DIABETES USING BUSINESS INTELLIGENT

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ABSTRACT - This project aims to use data visualization and a Business Intelligent (BI)-based dashboard to identify risk factors for diabetes. It emphasizes the need for funding to improve diabetes treatment and addresses the misalignment of healthcare management with national priorities, like in India. The project involves analysing diagnostic measurements in a diabetes dataset, creating a user-friendly dashboard using tools like Figma and Canva, and conducting user testing. The stages include planning, analysis, design, development, and testing, all focused on visualizing diabetes-related information. The dataset is transformed and loaded into the dashboard using Extract, Transform, and Load (ETL) methods, and visualization tools are used to present the data. A user acceptability test (UAT) with 30 participants, including diabetic patients, evaluates the effectiveness of the dashboard in helping patients understand diabetes factors. The results support the value of the Visualization of Diabetes Factors dashboard while identifying areas for improvement.

Keywords: Diabetes, data visualization, Business Intelligent (BI), factors, user acceptance test

1. INTRODUCTION

This project aims to create data visualizations for diabetes, identify risk factors, and improve diabetes treatment funding. It addresses the misalignment between healthcare management and national priorities, particularly in countries like India. The research involves analyzing diabetes data, creating a user-friendly dashboard using tools like Figma and Canva, and conducting user testing. The project has three objectives: analyzing data requirements, building a visual dashboard, and testing user acceptance. By restructuring the dataset and selecting appropriate data types, the dashboard is developed seamlessly. The Waterfall approach, with five phases, is used: planning, analysis, design, development, and testing. Power BI is the primary tool for data visualization. User Acceptance Testing (UAT) will evaluate the project's outcome.

2. METHODOLOGY

For the Data Visualization: Analysing Factors of Diabetes Using Business Intelligent, the Waterfall Model was used as the technique. Planning, Analysis, Design, Development, and Testing are the five phases. The problem description, aim, project scope, and project importance are all defined during the planning process. The next phase is analysis, where prior similar activities are examined to gather data and determine project requirements. The Design phase, which follows, entails creating a Canva prototype for the Data Visualization: Analysing Factors of Diabetes Using Business Intelligent. Power BI is used for data visualization throughout the development phase, whereas Apache Hive and Microsoft Excel are used for data cleansing and ETL processes. Finally, the dashboard will undergo a User Acceptance Test (UAT) during the Testing phase.

3. RESULTS AND DISCUSSION

Consumers will test and assess the dashboard during the User Acceptance Testing (UAT) phase. Perceived Ease of Use, Perceived Usefulness, Attitude, and Intention to Use are the four categories into which the questions in User Acceptance Testing are split. To give respondents the chance to comment on the questionnaire, this project uses Google Forms as an online survey. The results of the tests are shown in Figure 1.

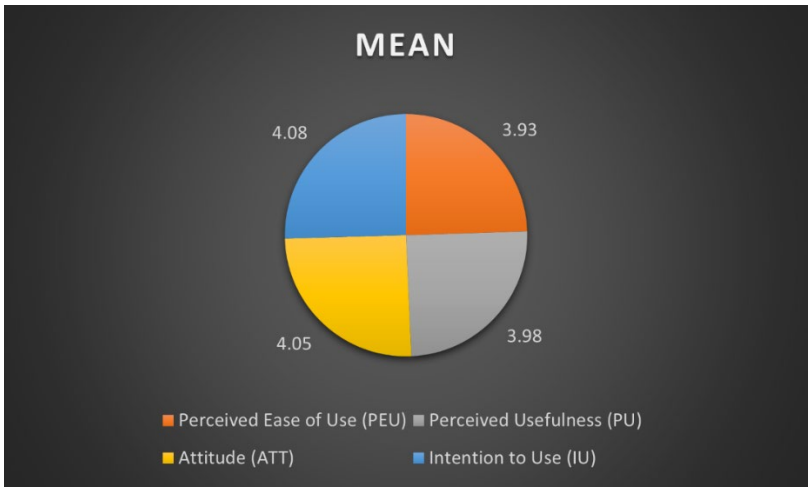

Figure 1. User Acceptance Test (UAT) Mean

4. NOVELTY OF RESEARCH / PRODUCT

By using business intelligence approaches to examine the aspects related to diabetes, this research study makes a fresh contribution to the field of data visualization. The initiative offers a distinctive method for comprehending and analysing complex diabetic data by fusing data visualization concepts with business intelligence tools. Users of the produced dashboard can study and acquire insights into the several aspects causing diabetes thanks to the usage of interactive charts, graphs, and tables. The dashboard's effectiveness and user-friendliness are further ensured by the inclusion of usability testing and user feedback. Overall, this project's innovative use of data visualization and business intelligence advances our knowledge of the factors that affect diabetes while providing an important tool for management of healthcare decisions in the context of this common disease.

5. CONCLUSION

In conclusion, the publication Data Visualization: Analysing the Factors of Diabetes using Business Intelligent was developed to aid in the understanding of the factors that influence diabetes. Dashboards are created to aid users in understanding and learning about parameter trends connected to diabetes. The dashboard includes all the crucial details a person needs to comprehend about diabetes. The analysis is illustrated using a variety of graphics, including maps, line charts, tree maps, donut charts, and bar charts.

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DATA VISUALISATION OF ZAKAT DISTRIBUTION IN UITM PERLIS

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ABSTRACT - The Zakat Unit of UiTM Perlis plays a crucial role in supporting students who require financial assistance. In an effort to enhance their services, the unit has developed a website that provides information and facilitates zakat applications for students. However, the existing system has certain limitations, including a limited section for calculating the kifayah limit rate and a lack of comprehensive information on zakat distribution. This has led to the study's motivation to create an interactive system to check the eligibility status and a dashboard that allows user to view every zakat distribution record to improve UiTM Perlis zakat management. This study aims to analyze the requirement of data analysis for zakat application eligibility of students in UiTM Perlis, develop a system to facilitate the eligibility process and dashboard for zakat distribution. The method used for evaluation was Technology Acceptance Model (TAM). The methodology adopted was an agile model divided into 6 phases: planning, design, development, testing, evaluation and documentation. The Agile methodology was mainly created to assist a project in fast adapting to change requests (Gurung et al., 2020). Finally, the finding shows that the system and dashboard are well-accepted as they facilitate the eligibility checking process and provide information about zakat distribution in UiTM Perlis.

Keywords: Dashboard, zakat, zakat distribution, data visualization

1. INTRODUCTION

Zakat promotes tolerance and altruistic behaviors, which can help reduce societal and economic disparities, accelerate economic development, and achieve purchasing power parity, all of which could lead to alleviating poverty (Canggih et al., 2017). Universities are responsible for addressing students' financial challenges and supporting their overall well-being. The objective of this study is to simplify the zakat eligibility process and provide a user-friendly platform for displaying valuable information. This platform aims to assist the Unit Zakat in effectively managing zakat application, allocation, and distribution to eligible applicants. The web-based system comes with Had Kifayah Calculator to calculate the had kifayah limit based on the input inserted by applicants. The result will appear after all the data is successfully entered. The dashboard can be found on the website, where users can see all the details information on zakat distribution among students in UiTM Perlis by year, semester and faculty when users explore the dashboard.

2. METHODOLOGY

The Software Development Life Cycle (SDLC) with the agile model was implemented in this study as the methodology. This methodology included 6 phases which are planning, design, development, testing, evaluation and documentation. Data collection of zakat applications, allocation and distribution was from the interview with Unit Zakat of UiTM Perlis. The dataset will undergo a transformation and cleaning process before being loaded into a data warehouse for visualization purposes. The development of the website and dashboard will be using 000Webhost and Power Bi, respectively. The testing phase starts when the questionnaire is distributed to the target user through the Google Form platform.

3. RESULTS AND DISCUSSION

The evaluation of the website and dashboard has been done with usability testing among the students and Unit Zakat staff. Technology Acceptance Model (TAM) was selected in conducting the evaluation among the users. It is essential to involve users in the design and development process to ensure the requirements and expectations are met when developing a new system. There are a total of 41 participants who contributed to the testing phase. Based on the result obtained from the usability test, most of the respondents are satisfied with the website and dashboard. The participants found the website and dashboard easy to navigate and could integrate with the UiTM Perlis Official website. Recommendations and suggestions provided by the participants are valuable inputs for future improvements and can

serve as references for developers in the same field of study.

4. NOVELTY OF RESEARCH / PRODUCT

There have been a number of research that have studied the requirement and development of the Zakat website and dashboard using various models. Previous research (Nizal et al., 2019) developed a Zakat Fund Distribution Dashboard to provide interactive and real-time information for Zakat distribution. The dashboard was developed to provide added value to the Zakat management body in assisting in managing the Zakat distribution process in a better way. (Khairi et al., 2022) developed a newly developed demo backend blockchain zakat that is able to track and monitor zakat transactions using a dashboard, which is believed to be able to increase the level of confidence of zakat payers and receivers. In addition, there is research that has developed a web-based that embeds a dashboard with objectives to help monitor and manage the data of dropout students in a specific location. All of the studies stated above were used as references during the development phase of this study.

5. CONCLUSION

This study has successfully achieved its objectives through a comprehensive and systematic approach. The development of the zakat eligibility system and UiTM Perlis Zakat Distribution Dashboard can be a valuable tool for University's Unit Zakat or organization in the same fields. The web system and dashboard developed effectively helps simplify the selection of eligible zakat recipients and display an easy-to-understand form of information to all levels of computer literacy ability.

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FINANCIAL AID DECISION SUPPORT USING DECISION TREE ALGORITHM

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ABSTRACT - This extended abstract presents a study on financial aid decision support using decision tree algorithm. The objectives of this research were to design a model by using decision tree algorithm for classification of financial aid decision, to develop a classification of financial aid decision system, and to evaluate the model by using Evaluation Metrics. A dataset of student profiles and financial aid records was used to accomplish these objectives. There was preprocessing done to the dataset. Then, a decision support system was built using the decision tree method. The decision tree algorithm's performance was measured by dividing the data into training and testing sets. Accuracy was evaluated as a performance metric and used to predict aid eligibility on the test set using the trained model. The results of this study demonstrate the performance of the financial aid decision support decision tree algorithm. The algorithm's capability to create accurate predictions was shown by the accuracy obtained on the test data. To speed up and enhance the efficiency and fairness of the financial aid decision-making process, this study highlights the significance of methods based on data. To improve the accuracy and precision of financial aid projections, future research can concentrate on improving the decision tree model, including extra features, and investigating alternative methods.

Keywords: Financial aid, decision tree algorithm, classification, preprocessing, accuracy.

1. INTRODUCTION

Computer science and larger data sets are merged in the study of Artificial Intelligence (AI) to enable decision making. Supervised machine learning is defined by using labelled data sets to train algorithms to classify data or accurately predict outcomes (Delua, 2021). To accurately classify test data into distinct categories, classification uses an algorithm. Decision Tree is a supervised learning method that can be applied to classification and regression issues; however, it is most frequently used to solve classification issues. Classification is a process of categorizing a given set of data into classes; it can be performed on both structured and unstructured data A categorization model will attempt to forecast the value of one or more outputs given one or more inputs. Labels that can be used on a dataset are outcomes. Classification from a modelling perspective needs a training dataset with numerous examples of inputs and outputs from which to study. Zakat is the third pillar of Islam and is compulsory for Muslims who meet all the requirements. Giving away money to the poor is said to purify yearly earnings that are over and above what is required to provide a person and their family with their essential needs (Liberto & Boyle, 2022). There is a related work title C4.5 Decision Tree Implementation in Sistem Informasi Zakat (SIZAKAT) written by Ananda with the issue where most of the management still follows traditional practices such as manually documenting each Zakat transaction in the books and was solved by Zakat Calculation Module findings from the test, outcomes of data classification in SiZakat utilizing the Weka and C4.5 algorithm (Ananda & Wibisono, 2014).

2. METHODOLOGY

In this project, Agile methodology was being used which consist of six steps, Requirement Analysis, Data Preparation, Data Modelling, Development, Training & Testing and Model Evaluation. Requirements analysis is the initial stage in the research methodology model. At this stage, Gantt chart will be done to assist the flow of the project as a project planning. A literature review was made to learn more about the chosen topic by using the Google Scholar to find out articles, journals, and webpages about the related topic. In data preparation steps, the data related is basically the applicants background information which can be collected from Unit Zakat as the applicants will submit their data in the application form provided. The data cleaning was done by using Microsoft Excel by removing the duplicates rows, handling missing values, removing unwanted characters or spaces and data formatting. Next is implementing decision tree algorithm by using decision tree classifier in Google Colab for data modelling and providing few models such as Naive Bayes, kNN, and SVM. In the development steps, the python language is used to integrate the classification model into a web page in order to be able to reach the deliverables of classification for financial aid decision. In training and testing modelling, the data was split into training and testing sets using the train_test_split function from

the sklearn.model_selection module. The train_test_split function randomly divides the data into two subsets: one for training the model (X_train and y_train) and one for evaluating the model's performance (X_test and y_test). The split is performed based on the X (drop BANTUANKEWANGAN) and y (CADANGAN) arrays, with a specified random_state to ensure reproducibility. Lastly for model evaluation, the models were tested by using the evaluation metrics which consists of accuracy, precision, recall and confusion matrix.

3. RESULTS AND DISCUSSION

In the end of this project, the staff of Unit Zakat could be able to handle Zakat distribution in simple way by input the information of applicants needed and the system will provide the staff a result on how much the applicant eligible to receive or does they not eligible to receive.

4. NOVELTY OF RESEARCH / PRODUCT

The unique aspect of this project is the web-based system's ability to provide real-time decision support by letting administrators enter applicant data and immediately obtain forecasts of aid eligibility. The procedure of allocating financial aid is made more effective and timelier by this dynamic capability. It gives administrators a modern tool for determining eligibility, making wise choices, and attending to students' changing needs.

5. CONCLUSION

This study concludes by emphasizing the value of implementing a decision tree algorithm to assist with financial aid decisions. Administrators can learn a lot about the variables affecting aid decisions by using the decision tree model's understanding. The accuracy and precision can be improved through further development of the decision tree model that will enable more accurate and fairer decision-making.

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PREDICTION OF DENGUE CASES BASED ON THE METEOROGICAL FACTORS BY USING MACHINE LEARNING

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ABSTRACT - Dengue that is affected by meteorological factors, including the rainfall and temperature had caused many deaths. Nurulhusna AH even added that "Malaysia is endemic for dengue". To effectively manage and prevent dengue outbreaks, accurate prediction systems are essential. However, currently Malaysia still lack of system that makes predictions about dengue. Thus, the objective of this project is to develop a web-based system that can predict the number of dengue cases, along with the week and state that have the highest number of dengue cases. System will be developed by using python language, to apply machine learning techniques namely Multiple Linear Regression (MLR), Random Forest Regression, Gradient Boosting Regression (GBR), and Support Vector Regression (SVR). Based on the project, Support Vector Regression (SVR) algorithm was identified as the most suitable model to make prediction on the number of dengue cases. Besides, the week with highest number of dengue cases vary for each state. It also discovered that Selangor is the state with the highest number of dengue cases. In the future, the researcher can perform feature selection to identify significant factors impacting dengue transmission through exploratory data analysis and machine learning-based techniques, other than using a more accurate dataset.

Keywords: Prediction, dengue cases, meteorological factors, machine learning.

1. INTRODUCTION

Dengue cases will peak between 2023 and 2025 (Arumugam, 2023). Thus, we need to have an accurate prediction systems by machine learning that bring many benefits (Raval et al., 2015). Therefore, this project's objective is to develop a machine learning system for predicting dengue cases, identifying the state and week with the highest number of cases in Malaysia, selecting the most accurate prediction model and evaluating the predicted value with MAPE. It include model developed using Multiple Linear Regression (MLR), Random Forest Regression, Gradient Boosting Regression (GBR), and Support Vector Regression (SVR) technique. Based on Mean Absolute Percentage Error (MAPE), the models were compared. One is chosen to make predictions on the number of dengue cases across 14 states. On top of that, through the implementation of the dengue prediction system using Python programming language, several key findings were observed. Firstly, it was identified that the week with the highest number of dengue cases varied across different states. Secondly, it was determined that the state with the highest number of dengue cases was Selangor. Thirdly, the Support Vector Regression (SVR) algorithm was identified as the most suitable model for making predictions across all states in Malaysia. Last but not least, for future work, future researcher can perform feature selection to identify significant factors impacting dengue transmission through exploratory data analysis and machine learning-based techniques, other than using a more accurate dataset.

2. METHODOLOGY

This project use waterfall model. It's first phase is literature study, where few materials were studied to increase understanding towards the project. Second phase is data preparation and training. It included data gathering, data merging, data cleaning and data training. The trained data model in this phase were used to developed a prediction system in third phase called development. Web based system is prepared through coding activity, by using python flask. After preparing HTML form, the trained model will be embedded to it. After making prediction, MAPE will be used to find the accuracy of the trained model.

3. RESULTS AND DISCUSSION

3.1 Result for analysis and evaluation

In the end, the week with the highest number of dengue cases varied across different states, indicating the importance of localized predictions. It means that the prediction models and analyses are tailored for each state. Other than that, it was found that the state with the highest number of dengue cases was Selangor. Thus, it is emphasizing the need for targeted interventions in that region by the responsible people. The prediction value produced from the trained data model were evaluated by using the evaluation metric which is Mean Absolute Percentage Error (MAPE). From this evaluation, all the results gained is less than 50% which is considered as an indication that the forecast is reasonable.

4. NOVELTY OF RESEARCH / PRODUCT

The system facilitates mosquito control and health campaigns in specific areas which aiding in combating dengue. It also serves as an early warning system, providing crucial advance information on dengue trends for health officials to devise effective policies, interventions, and monitoring operations. Healthcare workers benefit from improved dengue management and can develop tailored vaccination campaigns. Furthermore, the system is good for practitioner such as it supports research and development of dengue prediction methodologies, offering valuable insights for future infectious disease forecasting studies using diverse machine learning algorithms.

5. CONCLUSION

All of the project's objective are achieved. The week with highest number of dengue cases differ for each state, and Selangor suffer for being the state with highest number dengue cases. Support Vector Regression (SVR) algorithm was identified as the most suitable model to make prediction on the number of dengue cases. For future work, researcher can perform feature selection to identify significant factors impacting dengue transmission through exploratory data analysis and machine learning-based techniques, other than using a more accurate dataset.

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DATA VISUALIZATION OF STUDENT RESIDENTIAL IN UITM ARAU, PERLIS

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ABSTRACT - The Student Affairs Division at UiTM Arau, Perlis is responsible for managing non-academic matters, including student residence data. However, the current e-Kolej system lacks comprehensive information on residential details, making it challenging for staff and students to understand and utilize the data effectively. This project aims to address this issue by developing a residential dashboard that serves as a centralized hub for college statistics. The dashboard will enable staff members to access and analyze the necessary information, facilitating informed decision-making and efficient management of student residences. The project objectives include requirements analysis, dashboard design, and usability evaluation through User Acceptance Testing (UAT). The methodology involves four phases, namely requirement analysis, design, development, and evaluation. The evaluation involved 30 respondents who provided valuable feedback, confirming the usefulness and effectiveness of the dashboard in providing the required information to users.

Keywords: Dashboard, student residential, residence, data visualization

1. INTRODUCTION

Student dormitories in universities are of paramount importance after education (Daliri Dizaj & Hatami Khanghahi, 2022). However, not all students at UiTM Arau, Perlis are guaranteed with college accommodation. The current e-Kolej system utilized by UiTM does not provide any visualization of college information for both staffs and students. The aim of this project is to develop a student residential dashboard for UiTM Arau, Perlis, which will visualize and analyse residential statistics. The objectives of this project were to analyse the requirements, design, and evaluate the usability of the student residential dashboard in UiTM Arau, Perlis.

2. METHODOLOGY

There are four phases in completing the project started with requirement analysis, design, development, and evaluation. In requirement analysis phase, all information that is related to the project will be collected. An interview is made to gather the system requirements. In addition, an in-depth literature review will be performed to ensure the project requirements are identified. Next, design phase focus on designing the data model and the dashboard interface. This includes designing the use case diagram, sitemap, and wireframe sketch. In the development phase, data warehouse will be created and ETL process will be performed, and the dashboard will be developed using Microsoft Power BI. Lastly is the evaluation phase. A questionnaire will be created using Google Form once the development process is completed then the questionnaire will be distributed to the targeted users.

3. RESULTS AND DISCUSSION

The evaluation process utilized User Acceptance Test (UAT), where a questionnaire was created using the Google Form platform. The questionnaire included three sections: demographic background, usability testing, and comments and suggestions. The selected sample users were limited to students and staff members from UiTM Arau, Perlis. The usability testing section consisted of 10 questions specifically designed to assess the usability of the dashboard. Based on the results acquired, majority of the users are satisfied with the dashboard's usability. The users also found that the dashboard interface is visually appealing and well-organized as well as easy to use and useful for both students and staffs of UiTM Arau, Perlis.

4. NOVELTY OF RESEARCH / PRODUCT

Three prior research studies were examined and analysed to identify and collect the necessary requirements for this project. Aprillia et al. (2021)has proposed a project on developing a dashboard as a monitoring system for the

distribution of government aid at Balai Besar Perikanan Budidaya Air Payau (BBPBAP) Jepara, Indonesia. Furthermore, Lucio et al. (2018) has proposed a project on developing a dashboard as a tool for visualizing management decisions to justify valuable proposals in university management. Destiandi & Hermawan (2018) has proposed a project of business intelligent method for academic dashboard as displayed in Figure 2.10. The academic dashboard developed will assists the decision making to improve the quality of education.

5. CONCLUSION

In conclusion, this study successfully accomplished its objectives, which involved analyzing system requirements, designing and developing a student residential dashboard at UiTM Arau, Perlis using Microsoft Power BI, and evaluating the dashboard through User Acceptance Test (UAT) in usability testing. The dashboard improves students understanding of residential information and assists staff in making informed decisions about college allocations.

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VISUALIZING CHILD COVID-19 VACCINATION CONSENT BY PARENTS IN MALAYSIA

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ABSTRACT - In response to the COVID-19 outbreak, the Ministry of Health Malaysia has implemented a vaccination program to effectively combat the ongoing crisis. However, there is a pressing need to raise awareness among parents about the importance of vaccinating their children aged 5 to 17 and address any hesitancy they may have. To address this, the study aims to develop a web application and dashboard to demonstrate child COVID-19 vaccination consent by parents in Malaysia that display and forecast data related to child COVID-19 vaccination. The objectives of this study are to analyze the requirements of data analysis on child COVID-19 vaccination, develop an interactive dashboard that visualize child COVID-19 vaccination consent by parents in Malaysia by using Big Data tools and evaluate the usability of the dashboard by using Technology Acceptance Model (TAM). The methodology employed in this study is agile model which is one of the Software Development Life Cycle (SDLC) model. The agile model is divided into five cycles which are plan, analysis, design, develop and test. The study's findings have been useful in spreading accurate information and increasing knowledge about COVID-19 vaccination for children under the age of 18.

Keywords: Vaccination, COVID-19, dashboard

1. INTRODUCTION

Due to the COVID-19 outbreak, vaccination is necessary as a practical means of lowering and eradicating the COVID-19 burden (Syed Alwi et al., 2021). Ministry of Health Malaysia has started administering a COVID-19 vaccination programme since 24th February 2021 in the hopes that it will curb an increase in infections that has been occurring. To increase parents' consent for COVID-19 vaccination for their children and decrease their hesitancy to administer the vaccine to children between the ages of 5 and 17, there is a need for a web application and interactive dashboard that can display and forecast data related to child COVID-19 vaccination. The study's objectives were to analyze the requirements of data analysis on child COVID-19 vaccination, develop an interactive dashboard that visualize child COVID-19 vaccination consent by parents in Malaysia by using Big Data tools and evaluate the usability of the dashboard by using Technology Acceptance Model (TAM).

2. METHODOLOGY

The methodology employed in this study is agile model which is one of the Software Development Life Cycle (SDLC) models. The agile model is divided into five cycles which are plan, analysis, design, develop and test. The project was planned during the first phase, which is known as the planning phase. Next, to begin the project, it was essential to obtain all of the project requirements from various sources during the requirement analysis phase. The datasets for this project were acquired from the GitHub account of the Ministry of Health Malaysia. The design of the data model and the sketching of the dashboard are the two tasks that are included in the design phase. Development phase is the important phase where development starts. Lastly, the testing phase involved distributing Technology Acceptance Model (TAM) questionnaires using the Google Form platform.

3. RESULTS AND DISCUSSION

The evaluation of the web application and dashboard was conducted using the Technology Acceptance Model (TAM). To conduct the TAM evaluation, an online questionnaire was distributed to respondents via Google Forms. This testing phase takes place after the completion of the development process. The questionnaire was specifically targeted towards the general public, particularly parents. The questionnaire was divided into four parts which includes Demographic Information, Perceived Ease of Use (PEU), Perceived Usefulness (PU) and Intention to Use. Based on the result obtained from the testing, most of the respondents are satisfied with the web application and dashboard. The developed system was well-received by users, who found it to be user-friendly and appreciated the intuitive layout designed for

easy understanding of child COVID-19 vaccination information. Users also acknowledged the value of the system in keeping them informed about the progress of vaccinations and providing relevant statistics specifically related to children.

4. NOVELTY OF RESEARCH / PRODUCT

Several research studies have explored the requirements and development of dashboard visualizations, specifically focusing on health-related data, COVID-19, and vaccination information. For example, Afifah and Rahmanto (2020) developed a Health Information Analytics Dashboard as the solution for obtaining precise, comprehensive and real-time insight from big data in healthcare. Cuadros et al. (2022) proposed a project to visualize the impact of vaccination coverage disparity in the United States in the dynamics of the COVID-19 pandemic. Geospatial and data visualization analyses were utilized to determine the correlation between vaccination rates and COVID-19 incidence and fatality rates. Similarly, Talagala and Shashikala (2022) conducted research on developing an interactive dashboard to visualize the COVID-19 epidemic and vaccination administration data in Sri Lanka.

5. CONCLUSION

This study has successfully accomplished its objectives, which involved analyzing the data analysis requirements for child COVID-19 vaccination and developing an interactive dashboard for child COVID-19 vaccination consent using Microsoft Power BI. The dashboard effectively showcases child COVID-19 vaccination consent by parents in Malaysia, providing visualizations and predictive insights related to vaccination data.

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PREDICTION USING DATA VISUALIZATION

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ABSTRACT - The prediction of petrol prices in Malaysia is a crucial aspect for individuals, businesses, and policymakers in planning their budgets, and making informed decisions. This project aims to identify data requirements and techniques for the prediction of petrol price data. Next, to develop an interactive dashboard to visualize the historical and petrol price data and fuel stations in Malaysia. Lastly, to evaluate users' experience of this system by utilizing User Experience Testing (UXT). The method used for this study is design science research methodology (DSRM) design science research methodology (DSRM) methods. The tools used in this study are Power BI for dashboard development and Notepad++ for website development. From the User Experience Testing, we can conclude that all users agree that the system is attractive, perspicuity, efficient, dependable, stimulative, and novelty.

Keywords: Prediction of petrol price, Budget Planning, User Experience Testing (UXT), Design Science Research Methodology (DSRM), Power BI

1. INTRODUCTION

The Prediction of Petrol Price in Malaysia Dashboard is developed using Power BI to provide insightful and accurate predictions of petrol prices in Malaysia. This dashboard aims to assist individuals, businesses, and policymakers in making informed decisions related to fuel consumption and budgeting. Through an intuitive and user-friendly interface, the dashboard displays visualizations, graphs, and interactive charts that showcase the predicted petrol prices for different fuel types. Users can explore historical trends, compare prices, and analyze the impact of various factors on petrol price fluctuations. Various statistical and econometric models have been used to predict crude oil prices, including the GARCH model, Naive Random Walk, and the semi-parametric approach (Aloui & Hamdi, 2015). These models consider factors such as the demand and supply of oil, population, and economic aspects. The predictions are often generated through Monte Carlo analysis or using artificial neural networks (ANN) and ARIMA models (Sokkalingam et al., 2021).

2. METHODOLOGY

The Method used in this study is Design Science Research Methodology. The DSRM consists of five main stages which are problem awareness, suggestion, development, evaluation, and conclusion (Haryanti et al., 2022). In the problem awareness stage, researchers identify the practical issue or problem that needs to be addressed, gathering information, and literature review. In the suggestion stage, formulate a design plan to create an artifact that can solve the identified problem. In this project, Figma software has been used to design the prototype of the system. The development stage involves the actual creation or design of the artifact. The tools used are Power BI, Notepad++ and Hive. Once the system is developed, it goes through the evaluation stage, where its effectiveness and utility are assessed. In this study, User Experience Texting has been used. Finally, in the conclusion stage, the research findings and outcomes are summarized, lessons learned are discussed, and recommendations for further improvements or iterations of the artifact are provided.

3. RESULTS AND DISCUSSION

This research used User Experience Testing for the evaluation of the website and dashboard using User Experience Questionnaire. There are 3 parts which are Part A, B, and C. Part A is the personal information of the respondents, Part B is a structured set of questions designed to gather feedback and insights about a user's experience with the system and Part C is suggestion and recommendation to improve the website and dashboard. As a result, we can conclude that all users agree that the system is attractive, perspicuity, efficient, dependable, stimulative, and novelty.

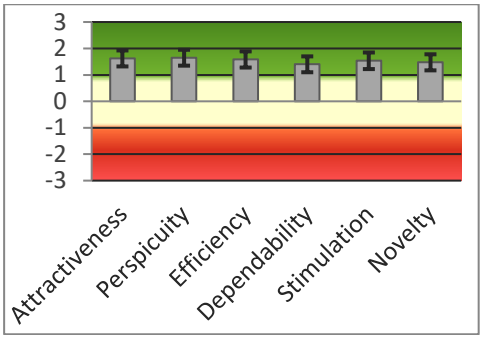

Figure 1. Graph of Mean Score Benchmark

4. NOVELTY OF RESEARCH / PRODUCT

The uniqueness of a website that forecasts petrol prices is found in its capacity to deliver precise and current forecasts of petrol prices. Forecasts are created using cutting-edge statistical and economic models, and real-time data to help consumers make decisions about budgeting and fuel usage. In general, the uniqueness of the website's prediction of the price of petrol lies in its incorporation of cutting-edge prediction models, real-time data, extensive factors, and user-centric features, all of which are intended to deliver precise and useful petrol price forecasts for various stakeholders in the fuel industry.

5. CONCLUSION

The petrol price prediction dashboard offers insightful analyses and projections that enable consumers, companies, and policymakers to make well-informed choices about their fuel usage, financial planning, and budgeting. In conclusion, the petrol price prediction dashboard in Malaysia enhances decision-making, improves efficiency, increases market awareness, offers customization options, provides transparent information, and enables long-term planning.

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ASEAN COUNTRIES ECONOMIC STABILITY INDICATOR DASHBOARD

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ABSTRACT - This research was motivated by the expected 2023 economic recession. Every nation wants a stable economy to boost national income. Every country must evaluate its economic position to create an economic plan to stimulate economic growth and attract investors. This study has created an economic stability dashboard and web application for Southeast Asia. The objectives are to find the requirements and techniques for an excellent system, to design and develop the system using Big Data tools and evaluate the system's usefulness by using Technology Acceptance Model (TAM). This study uses the RAD model for system development in a short time. Within RAD's phases, these goals are met. This survey included 53 Malaysians from government, semi-government, non-government, and self-employed, ages 24 to 59. The system's mean score is 4.76, which means the system is useful. Thus, users can make decisions with the system. This study used prediction, so it was expected that the predicted value would be different from the actual value. Machine learning would be a better prediction model for the project's future implementation.

Keywords: Inflation, GDP, currency exchange, unemployment, dashboard

1. INTRODUCTION

ASEAN Countries Economic Stability Indicator Dashboard is a dashboard that monitor the economic stability of ASEAN countries. The goal of this study is to assist the investors who are interested on investing in ASEAN countries on the decision-making to gain profit for their investments. There were three objectives that have been established. The first objective is to find requirements and techniques used for creating an ASEAN Countries Economic Stability Indicator Dashboard. The objectives are to find the requirements and techniques for an excellent system, to design and develop the system by using Big Data tools and evaluate the usefulness of the system by using Technology Acceptance Model (TAM).

2. METHODOLOGY

The model that was adopted in this study is the Rapid Application Development (RAD) model. This methodology was chosen due to the capability of completing the dashboard within a limited time. This methodology has four phases with several interrelated activities, which involves the roles of the user during the prototype phase. The involvement of the user and the developer during the prototype phase makes it easier for the developer to further develop the dashboard according to the user feedback.

3. RESULTS AND DISCUSSION

The evaluation model used is the Technology Acceptance Model (TAM). The sample survey was 53 Malaysian which aged 24 to 59 years old that were employed. The evaluation consists of four dimensions with 5-point Likert scale answer. The mean score for overall dimensions is 4.76 which indicates that the system is useful. Figure 1 shows the mean score for every dimension.

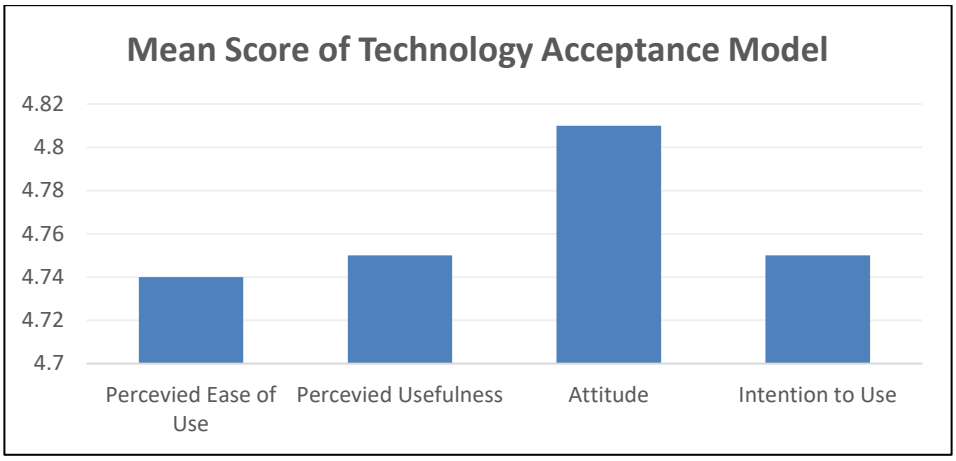

Figure 1 Mean Score

4. NOVELTY OF RESEARCH / PRODUCT

The current dashboard that is available online is not sufficient for the consumers worldwide as it focuses only on the Europe region based on the dashboard by the European Central Bank and it also focuses on the inflation rate only. In addition, as for the inflation rate, the consumer items it considers do not cover all economic production or consumption, current GDP rate is insufficient for determining a country's power, insufficient information on the effect of uncertainty on changes in exchange rates and there is an uncertainty of the limited facts for unemployment rate. Accordingly, this study proposed an economic stability indicator dashboard to help users to analyse the performance of inflation rate, GDP, currency exchange and unemployment rate and the relationship between these indicators with economic stability to conclude the economic stability of the ASEAN countries. This study may assist the investors on decision-making for their investment with the presented predictions provided in the dashboard.

5. CONCLUSION

In conclusion, the system is useful for the users as a decision-making tool. Through this study, the investors may obtain a sense of the performance of each ASEAN country, which helps them determine which country to invest in so that they can profit. For future implementation of the study with economic related field, this technology can be used for time series prediction study and for constructing the same dashboard for various locations.

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ENDEMIC EXPLORATORY DASHBOARD FOR CONTAGIOUS DISEASES IN RAISING PUBLIC AWARENESS OF HEALTH

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ABSTRACT - Contagious diseases, or infectious diseases, are illnesses caused by microorganisms like bacteria, viruses, fungi, or parasites. They can be transmitted through physical contact, respiratory droplets, or indirectly through contaminated objects. The prevalence of diverse diseases in the world is alarming, making it difficult for people to stay informed about the latest trends and developments. This lack of awareness can have significant consequences for public health, hindering timely response, preventive measures, and effective management of these diseases. The "Endemic Exploratory Dashboard for Contagious Diseases in Raising Public Awareness of Health" is a comprehensive project aimed at raising awareness about contagious diseases. The project aims to provide real-time insights, visualizations, and information about the prevalence, trends, and impact of contagious diseases. The objectives of the study are to identify requirements for centralizing endemic cases, design an exploratory dashboard for contagious diseases, and evaluate its usability through user acceptance tests. The methodology used in this study is the Waterfall model, consisting of five phases: planning, where the first objective is achieved; design; development, where the second objective is achieved; testing; and evaluation, where the third objective is achieved. There are a total of 50 respondents which helps with the evaluation of the dashboard. This evaluation proved that this dashboard helps users become better informed about contagious diseases since it has the highest average in the Perceived Usefulness dimension.

Keywords: Contagious disease, Power BI, Hive, COVID-19, big data.

1. INTRODUCTION

Disorders produced by organisms, such as bacteria, viruses, fungus, or parasites, are known as infectious diseases (Agrebi & Larbi, 2020). The Covid-19 pandemic has led to the classification of epidemic, endemic, and pandemic. Epidemics are unanticipated increases in disease cases in a region, while pandemics are exponentially spreading diseases with daily new cases. In contrast, endemic diseases are persistent and localized to a single area, with predictable transmission rates (Madhav et al., 2017). To prevent disease spread, governments have encouraged vaccinations for contagious diseases like Influenza and Covid-19. Vaccines prepare the immune system to combat new diseases, rather than treating them once contracted. Lower intake can increase the risk of contracting the flu and increase the risk of severe, protracted, or fatal illness in high-risk groups (Murugesan, 2022).

2. METHODOLOGY

The proper project procedures must be followed in order to reach the research's final goal. In order to finish this research, the Waterfall model is used. This process consists of 5 phases. It is necessary to complete the planning phase in order to accomplish the first objective. The first stage of this research is the requirement collection phase. Phase 2 of the project officially begins once the requirements are gathered. Wireframe for the website and dashboard are the deliverables of this phase. Phase 3 is the development phase. With the help of the wireframe created in phase 2, the dashboard could be developed. Objective 2 is achieved at the end of this phase. Phase four is testing, and phase five is evaluation. After the testing phase, a user acceptance test will be performed to assess the dashboard's usability. This phase ends with the accomplishment of Objective 3.

3. RESULTS AND DISCUSSION

Figure 1 shows the comparison of the average between all four dimensions. The dimensions are Perceived Ease of Use (PEU), Perceived Usefulness (PU), Attitude (ATT), and Intention to Use (BI). As shown in Figure 1, the second dimension which is Perceived Usefulness has the highest average which is 4.58. This indicate that, most of the respondents agree that the Endemic Exploratory Dashboard is useful to them. This means that respondents highly recognize the value and benefits of the technology. They perceive it as a useful tool that can effectively meet their

needs and provide tangible advantages or improvements in their tasks, activities, or goals.

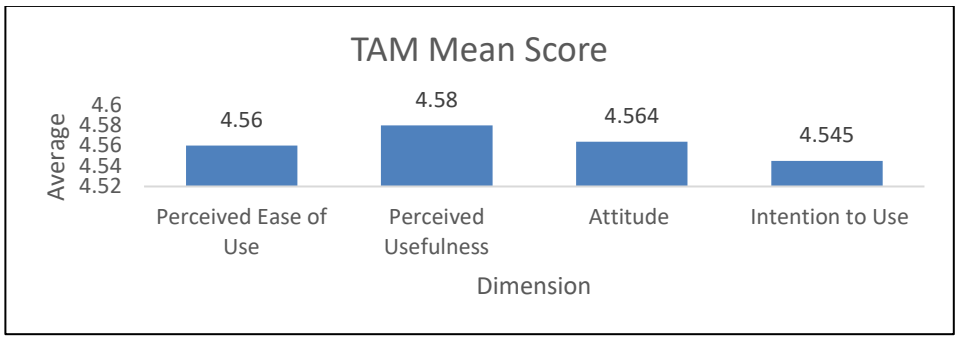

Figure 1. TAM Mean Score

4. NOVELTY OF RESEARCH / PRODUCT

The endemic exploratory dashboard for contagious diseases in raising public awareness of health introduces a groundbreaking approach by combining the power of Hive technology and the utilization of Power BI. By integrating Power BI, a powerful business intelligence tool, into the study, this research aims to revolutionize the way data is visualized and analyzed in the context of contagious diseases. Power BI provides an intuitive and interactive interface for data exploration, allowing users to gain valuable insights from complex datasets with ease. The seamless integration of Hive technology and Power BI empowers the dashboard with robust data processing capabilities and visually appealing data visualizations, enabling users to delve deeper into the trends, patterns, and correlations within contagious disease data. This innovative combination of Hive technology and Power BI sets a new standard in the field of public health informatics, enhancing the accessibility, usability, and effectiveness of the dashboard in raising public awareness and facilitating informed decision-making.

5. CONCLUSION

The Endemic Exploration Dashboard for Contagious Diseases aims to raise public awareness of health by centralizing endemic cases in Malaysia. The dashboard is designed using Balsamiq and Power BI, with Apache Hive implemented in data pre-processing. The usability of the dashboard is evaluated through user acceptance tests, using a website with an interactive dashboard and Technology Acceptance Model (TAM) testing.

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EXPENSES MANAGEMENT USING TEXT RECOGNITION FOR UNIVERSITY'S SCHOLARSHIP HOLDER

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ABSTRACT - Expenses Management is a method for keeping track of and systematically managing expenses. ExMAp is an Android-based mobile application for university scholarship holders called the Expenses Management Application. To create an application that effectively manages student spending, it is important to ensure that students' requirements. According to researchers, students struggle to control their spending and often end up overspending since it is difficult for them to look back at their previous expenses. The use of Text Recognition API allowed them to decrease the time-consuming on recording their expenses. The API integration is implemented for students to apply for the transaction details. The four-step process is used to make sure the application development process keeps up with the preparation, embodiment, development, and deployment phases. This methodology made ExMAp available to university students when it had successfully utilised for testing. User Acceptance Testing (UAT) is conducted to evaluate students to gather student satisfaction and feedback. The data obtained had a positive outcome, with a mean score of 4, Quite Satisfied. This mean score is derived from the usability of the system, its usefulness, and its ease of use. It has been proven that ExMAp can improve its reach in the industry.

Keywords: Android user, expense management, Text Recognition, university student, User Acceptance Testing.

1. INTRODUCTION

This project gathered a preliminary study and a few resources from the literature review to identify the requirements and techniques for managing student expenses from an expense management application. Considering that, an expense management system is developed for students using mobile applications and Text Recognition API to evaluate user reviews from university students. The mobile application provides a simple expense management function by Text Recognition to ensure the image text can be extracted (Suissa et al., 2020) and processed as transaction input. University students with scholarships can compare their expenses and earnings easily using Peranti Siswa Tablet. The review from other faculty members apart from the Faculty of Science Computer and Information Technology gained different perspectives on the improvement of the application.

2. METHODOLOGY

This project proposed a new methodology with a different phase from the MASAM methodology to develop the mobile application which are the Preparation phase, the Embodiment phase, the Development phase, and the Deployment phase. The application design used Figma to do interface sketching while development focused on Android Studio with Java language. The data stored in the application used Firebase as cloud storage. To enhance students in managing their expenses, the usage of Text Recognition is applied to this application. To make the application available to university students for testing, the steps must be completed in the order that is outlined. The testing used is User Acceptance Testing to evaluate students' opinions on the application.

3. RESULTS AND DISCUSSION

The usability of the mobile application was collected by User Acceptance Testing (UAT). The student's responses to the testing criteria were used to determine the mobile application's usability and usefulness and ease of use. From the findings, the usability and usefulness, and ease of use of ExMAp are being analyzed. As a result, the benefits and problems of the mobile application may be identified which have the potential to improve as a better mobile application for future enhancement and feedback. Based on Figure 1, the mean score for every criterion in the testing is illustrated to examine the level of student satisfaction. Overall, the mean score lies under the score of four which indicates Quite Satisfied. Hence, the total mean score for UAT is Quite Satisfied by students with 4.55.

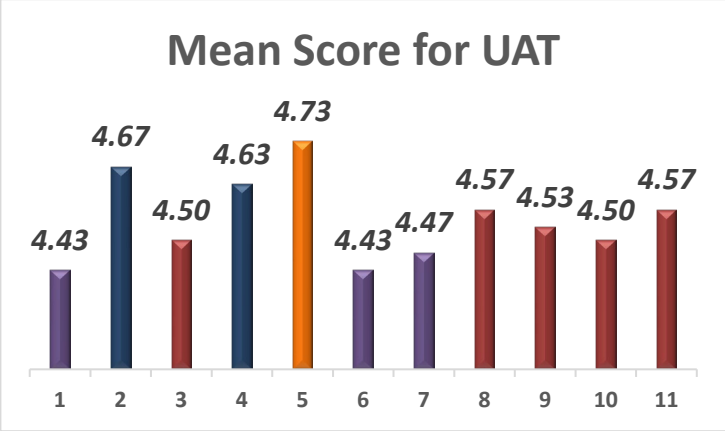

Figure 2. Mean Score for every criterion in User Acceptance Testing.

4. NOVELTY OF RESEARCH / PRODUCT

ExMAp is significant for university students and approaches the student to manage their expenses properly without having the behaviour on spending more than they should (Doniego, 2021). ExMAp provides a simple and time-consuming function to record transactions by using the Text Recognition API from ML Kit. Text Recognition helps reduce manual errors in spelling (Velmurugan et al., 2020) and accelerates the workflow of students from manually recording their expenses. Other than that, ExMAp proposes to students be able to handle their finances with a specific amount of money at a young age. As a result, their ability and practice will increase when they have more responsibilities in the future, such as managing their salary to handling loans (e.g., car, house, etc.).

5. CONCLUSION

The proposed project of a mobile-based application of expense management is structured and developed according to the methodology that fulfilled the project's objectives. Expenses Management Application, ExMAp functions include Text Recognition API to extract receipt to text, taking notes separated from other unrelated notes, and a graph to compare students' expenses and earnings. This application still needs to improve and enhance continuously to be more efficient and user-friendly for students to make use of it.

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WEB-BASED STUDENT RESULT MANAGEMENT SYSTEM WITH WHATSAPP INTEGRATION AND DASHBOARD

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ABSTRACT - The Web-Based Student Result Management System with WhatsApp Integration and Dashboard is an innovative solution for effective result management in educational institutions. This system combines a web-based platform, WhatsApp integration, and a user-friendly dashboard to streamline processes and enhance communication among administrators, teachers, and parents/guardians. It aims to develop a web-based application for recording student examination results and integrate it with WhatsApp for seamless communication. The system utilizes web hosting services for database management and storage. Benefits include automated result recording, real-time notifications, and comprehensive data visualization. Administrators can securely log in to add teachers and students, assign classes, and monitor performance through intuitive graphs. Teachers can access student lists, record marks, generate exam slips, and communicate with parents/guardians via WhatsApp. Parents and students can log in to view exam slips and track academic progress. Usability testing with 30 participants, including teachers, administrators, and parents, showed high satisfaction across categories. The Web-Based Student Result Management System with WhatsApp Integration and Dashboard provides an efficient and user-friendly solution for managing student results.

Keywords Student result management system, WhatsApp integration, dashboard, real-time updates, academic progress tracking.

1. INTRODUCTION

The Web-Based Student Result Management System with WhatsApp Integration and Dashboard is an advanced software solution designed to revolutionize the management of student examination results in educational institutions. The system aims to provide a centralized platform for recording, organizing, and analyzing student examination results in a more efficient and accurate manner. The project's objectives are to design and develop the system, integrate it with WhatsApp API, visualize the student's examination results with a dashboard, and evaluate its usability using usability testing. This system involved three users that consist of administrators, teachers, and parents. Administrators can securely log in, manage teachers and students, and monitor performance with intuitive graphs. Teachers can access student lists, record marks, generate exam slips, and communicate via WhatsApp. Parents and students can log in, view exam slips, and track academic progress.

2. METHODOLOGY

The Waterfall Model was chosen as the methodology to use in the development of this system. In order to obtain feedback from 30 respondents—administrators, instructors, and parents—at Sk Teluk Buloh, a questionnaire was distributed. Respondents received a briefing about the project's goals and the testing objectives prior to filling out the questionnaire. Then, in order to allow them to fully explore the system's functions, they were given a link to access the website without any time limits. Respondents were asked to complete the questionnaire after their engagement with the system.

3. RESULTS AND DISCUSSION

The usability testing results for the Web-based Student Result Management System were conducted at SK Teluk Buloh to examine 30 respondents consisting of administrators, teachers, and parents. Moreover, a set of 15 questionnaires was given to the participants after testing the system to gain feedback from them. This system was measured into three categories: user interface satisfaction, usefulness, ease of use of the system, and the Integration with WhatsApp API function in the system, which showed that the system is effective in providing a convenient and efficient platform for managing and monitoring student academic performance. The integration of WhatsApp API allows for easy communication and enhances collaboration and facilitates timely feedback and updates between teachers and parents/guardians. Participants were generally satisfied with the user interface, system functions, and the

effectiveness of the Integration with WhatsApp API. Overall, the Web-based Student Result Management System with WhatsApp Integration and Dashboard is a successful solution for providing an effective tool for managing student results and improving communication in educational institutions.

4. NOVELTY OF RESEARCH / PRODUCT

The Student Result Management System is a software application that automates and streamlines the management of student examination results in educational institutions. It efficiently records, organizes, and analyzes student performance data, addressing the challenges of manual result recording and the static nature of existing report cards. By integrating WhatsApp into the system, administrators, teachers, and parents/guardians can easily communicate and stay connected. Valuable insights into students' feedback preferences via WhatsApp were uncovered in the research study conducted by Soria et al., (2020). The user-friendly dashboard provides comprehensive insights into student performance, enabling data-driven decision-making and customized interventions. Users can effortlessly analyze and visualize data using the dashboard template, as mentioned by Noonpakdee et al., (2018). Visual representations and analytics empower educators to identify patterns, trends, and areas for improvement, leading to enhanced teaching strategies and improved student outcomes (Boscardin et al., 2018).

5. CONCLUSION

The Web-Based Student Result Management System with WhatsApp Integration and Dashboard has improved student result management. WhatsApp integration and a user-friendly dashboard enhance functionality. Future enhancements include LMS integration for data sharing and multi-language support for accessibility.

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HEALTHYKIDS: WEIGHT MANAGEMENT MOBILE APP FOR CHILDREN

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ABSTRACT- The goal of this study is to create and build a mobile application to assist parents in helping their children get a healthier lifestyle. This mobile application used persuasive technology principles such as principle of suggestion, principle of tunnelling, principle of motivation and principle of self-monitoring. The Design Science Research Methodology (DSRM) was used in the development of this project. The DSRM model consists of six stages: problem identification and motivation, objective definition, design and development, demonstration, evaluation, and communication. By adhering to this methodology, the mobile application was designed to incorporate persuasive technology principles and provide users with instructional videos as guidelines for utilizing the HealthyKids application. HealthyKids is a mobile application that has been developed using Dart programming language, PHP, and SQLite for database storage. This application uses Flutter as an Integrated Development Environment (IDE) tool. The study included 30 participants who were parents of children aged between five and 12 and were actively involved in monitoring their children's physical activities using the HealthyKids app Additionally, the application was evaluated by the user using a User Experience Questionnaire (UEQ) via google form. Based on the results and findings, most users found the system attractive, perspicuity, efficiency, dependability, stimulation, and novelty.

Keywords: Persuasive Technology Principle, Weight Management, Mobile App Development, DSRM Model and User Experience Questionnaire (UEQ).

1. INTRODUCTION

The HealthyKids Weight Management Mobile App for Children is an application designed to assist parents in fostering healthier lifestyles for their children. Leveraging the power of persuasive technology principles, HealthyKids aims to empower parents by providing them with the necessary features and resources to guide their children towards a balanced and wholesome way of living. HealthyKids offers a unique blend of personalized guidance that can help parents in monitoring their children's health and engaging features to support parents in their journey towards raising their kids. By integrating persuasive technology principles, HealthyKids app actively motivates and inspires parents to make positive changes in their children's lives.

2. METHODOLOGY

The Design Science Research Methodology (DSRM) was chosen as the methodology for HealthyKids app development with integration of persuasive technology principles. There are six phases which are problem identification and motivation, objective definition, design and development, demonstration, evaluation, and communication. The problem identification and motivation are where the researcher has to understand the user's current problems and starts to define what kind of solution the project will be. The design phase is the third phase of the Design Science Research Methodology (DSRM) model. A few tasks must be completed by the researcher to get a successful system design. Furthermore, to develop this application, Flutter has been used to write and run the programming code. To complete the development process of HealthyKids app development, integration of persuasive technology principles was done during the development phase. Next, the Demonstration phase, the researcher made a video demonstration to guide the user through how the mobile application would work. After that is the evaluation phase. The researcher conducted a User Experience Test with User Experience Questionnaire (UEQ) as part of the evaluation of the user experience testing activity. By the end of this phase, objective 3 had been achieved. Lastly is the communication phase where after the researcher completed the mobile application reports, communicated with the supervisor to improve the report writing, and presented it to the examiners and supervisor after completing the task.

3. RESULTS AND DISCUSSION

User Experience (UX) Testing is utilized in this study to assess the user emotions, understanding and exceptions towards the system. The testing was conducted with 30 respondents from parents of underweight children, healthy children, overweight children, and obese children. The results for this test will be used to understand how users feel about this application. During the UX Testing, the users were given a chance to explore and evaluate the mobile application system. A questionnaire regarding the user experience aspects of this application is given after system exploration so that all users can evaluate the system. The researcher has used the User Experience Questionnaire (UEQ) to evaluate the HealthyKids application. It provides valuable insights into the specific demographic groups that participated in the survey, allowing for a better understanding of their perspectives and responses.

4. NOVELTY OF RESEARCH / PRODUCT

Because of the COVID-19-related lockdown, lifestyle choices have changed, which may have contributed to an increase in weight gain (Tsenoli et al., 2021). Children with overweight or obese attempted to lose weight more frequently than healthy children, though rates of attempted weight loss among those at a healthy weight were still high (Brown et al., 2016). Finally, the currently available technology is insufficient to untangle the problem of childhood obesity. Children are unable to constantly receive non-technological weight control programs due to cost, transit issues, and lack of provision (McMullan et al., 2020).

5. CONCLUSION

HealthyKids application could provide more videos of physical activities that have a Malays subtitle to make parents and their children able to use this application easily and understandable. Besides, the HealthyKids app must allow parents to put their children's image before and after using this application. Therefore, it is highly recommended to develop an application that is more user-friendly for the parents and their children. Next, the User Experience Testing was conducted to evaluate the attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty of the system. From the findings it is found that six scales of UEQ help the researcher to understand the user's perspective towards the HealthyKids app. The results from (UX) Testing indicate that most of the respondents had a good experience when using the application.

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MALAYSIA PARLIAMENT WEB BASED SYSTEM

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ABSTRACT - Members of Parliament or people's representatives are people trusted by most of the citizens of the area to be the voice and catalyst for the progress of the community there. However, difficulty in contacting MP or reporting problems directly occurs because there is no platform for people to connect with their constituency representatives. Therefore, this study was published to overcome this problem where it is hoped that Malaysia Parliament Web-Based System can be a stop center for users as well as being able to display information about members of their parliament. Using a web-based system, users can get information about MP from other areas through interactive diagram displays and ask questions to the system without having to wait a long time by using a "chatbot". The methodology employed in this research is Software Development Life Cycle models. It comprises five phases which are Planning, Design, Development, Testing and Documentation. The functionality test finding revealed that overall features of Malaysia. Parliament Web-Based System is successfully working. The study emphasizes the successful acceptance of the transparent Malaysia Parliament Web-Based System. These efforts enhance functionality, performance, and user satisfaction, benefiting the community.

Keywords: Parliament, chatbot, member of parliament, community, web-based system

1. INTRODUCTION

After make research the related issues, a system called Malaysia Parliament Web-Based System is proposed that can be used by all citizen of Malaysia. The objective of this study is to develop a web-based system that focused on Member of Parliament (MP) information management and using chatbot as alternative to get information of the MP page. With this web-based system, users can send a report to the MP office that makes the process quicker. It makes MP always get connected with the community by using this web-based system. Additionally, users can access live parliamentary sessions through this platform. This functionality allows citizens to stay informed about the proceedings and decisions made in parliament, promoting transparency and accountability. Users can conveniently access live broadcasts, ensuring they remain updated on important legislative matters and enabling them to stay engaged with the democratic process. With its user-friendly interface, efficient chatbot functionality, streamlined reporting system, and live session access, the web-based platform is poised to revolutionize the way citizens interact with their elected representatives and participate in the democratic process in Malaysia. Through analysis and testing, all objectives of the system were successfully achieved.

2. METHODOLOGY

In this methodology, Functionality Testing was used to evaluate the effectiveness of the Malaysia Parliament Web-Based System. This testing involved three participants assuming different roles: user, MP admin, and main admin. Functionality testing is a method used to assess the system's ability to perform expected tasks effectively. By conducting functionality testing with three participants assuming different roles, effectiveness of the Malaysia Parliament Web-Based System were able to be assessed in meeting the requirements and expectations of users, MP administrators, and main administrators. This testing helped us identify system strengths and weaknesses, providing guidance for future enhancements and improvements.

3. RESULTS AND DISCUSSION

Based on the result of functionality test, it can be observed that the system performed exceptionally well for the user and main admin roles, achieving a 100% successful rate in both cases. This indicates that system were able to effectively carry out tasks by the participant, with no reported issues or failures. However, the MP Admin role exhibited a slightly lower successful rate of 83%. This suggests that there may be areas of improvement required to enhance the functionality of the system specifically for sub-admin users. Overall, these findings indicate that the

Malaysia Parliament Web-Based System is generally effective in meeting the requirements and expectations of users, MP administrators, and main administrators. These results provide valuable insights into future enhancements and improvements to the system.

4. NOVELTY OF RESEARCH / PRODUCT

The benefit of the Malaysia Parliament Web-Based System is it provides users with a convenient and centralized platform to access comprehensive information about the Malaysia Parliament. Users can effortlessly find all the relevant information about Malaysia Parliament they need in one place. Furthermore, the system proves to be an asset for citizens who will be participating in the next General Election (GE). By offering insights into MP activities, how MP react to the complaint about their areas, it enlightens voters to make better decisions during the election. Another significant advantage of the web-based system lies in its integrated chatbot feature. This allows users to directly obtain information and receive prompt responses to their queries. Whether it's retrieving specific details or seeking clarification on parliamentary matters, the chatbot ensures quick and efficient access to the desired information, enhancing the overall user experience. In summary, the Malaysia Parliament Web-Based System brings forth a multitude of benefits. It provides users with a centralized platform for accessing comprehensive information, aids voters in making election decision, offers a responsive chatbot feature for quick information retrieval, facilitates better communication between parliamentarians and constituents, and serves as a valuable resource for political science enthusiasts and researchers.

5. CONCLUSION

Overall, all the objectives were achieved, and the Malaysia Parliament Web-Based System was successfully developed in accordance with the plans. The Malaysia citizens will use this web-based system to get the information or make a report to the MP offices that can make the process being faster.

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HIKING BUDDY FINDER WEB-BASED APPLICATION

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ABSTRACT - The Hiking Buddy Finder is a web-based application that connects hiking lovers and facilitates group formation. It uses modern web technologies and a user-friendly interface to provide a seamless experience for users. Users can search for hiking buddies based on specific criteria such as location at Kedah, the capacity of the group, preferred hike duration, and date, and the app's intelligent matching algorithm suggests compatible groups. There are three objectives of this research to develop a Hiking Buddy Finder Web-Based Application. The system was created using the Agile model's phases of analysis, designing, development, testing, and documentation. A Hiking Buddy Finder also offers a messaging platform for allowing users to communicate and plan their hiking trips together and synchronization of schedules. User acceptance tests will be conducted to evaluate the effectiveness of the system. The response time of the system was further evaluated using network performance testing, and the success rate was calculated based on a questionnaire of feedback from respondents. The testing involved 30 respondents, and the results show that the Hiking Buddy Finder Web-Based Application met all of its objectives.

Keywords: Intelligent matching algorithm, hiking buddies, modern web technologies, agile model, group formation.

1. INTRODUCTION

The Hiking Buddy Finder goes beyond simply connecting individuals. Users can search for hiking companions based on specific criteria such as location, group size capacity, preferred hike duration, and dates. Leveraging the application's intelligent matching algorithm, users are then provided with suggestions for potential hiking buddies or groups that share similar interests and experience levels.

2. METHODOLOGY

The Agile Model was used to develop a hiking buddy finder web-based application. The process began with a requirements analysis to identify the needs of hikers to hike. The next phase is the design, where a sitemap and ERD are created to provide a clear view of the project structure. The development phase involves the programming of the web application using a specific programming language and data is stored using specific database technology. User Acceptance Testing was done to get feedback from 30 respondents. Lastly, the final phase is the documentation of all information gathered during the development process.

3. RESULTS AND DISCUSSION

The responses of 30 respondents were evaluated through a User Acceptance Test (UAT) where they were prompted to rate the system on a scale of 1-5. The UAT results determined the user interface satisfaction, usefulness and ease of use, and usability of the system for finding hiking buddies. However, it has limitations such as geographic coverage, user verification, and communication and reliability. These limitations may cause dissatisfaction among users when using Hiking Buddy Finder Web-Based Application. The result can be concluded that the application's intelligent matching algorithm has proven effective in suggesting potential hiking buddies or groups based on location and date. User feedback indicates a high level of satisfaction with the matches, highlighting the algorithm's accuracy in connecting individuals with compatible hiking interests, experience levels, and desired locations.

4. NOVELTY OF RESEARCH / PRODUCT

Hiking is an extreme activity that is attractive for wellness and is very popular in Malaysia due to geographical factors that include a lot of mountains (Masohor et al., 2020). Hiking can generally be done alone, but it is not recommended for new hikers due to the difficulty level and high teamwork requirements (Oktaviana et al., 2019). Many hikers are capable of going on alone hikes. Even more, hikers believe they can complete alone hikes when, in reality, they lack

the necessary expertise. Hikers need buddies to look out for each other in case of accidents and injuries which are trips, falling branches, and animal assaults which are snakes and bees (Chew, 2020). a hiking buddy can guide them with directions, and hiking with buddies might help hikers remain on track and avoid getting lost (Yukon, 2018).

5. CONCLUSION

In conclusion, the hiking buddy finder web-based application can clearly help hikers or users to find hiking buddies efficiently. Furthermore, the majority of participants had a positive experience with the system after assessing it through User Acceptance Testing (UAT). Thus, all of the project's objectives have been met.

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WEB-BASED CONTENT CREATORS FOR HOME TUITION TEACHERS

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ABSTRACT - Web-based content creator for home tuition teachers is a web-based application for English home tuition teachers to create and manage the files for their students. The objective of this research is to address the issues that home tuition teachers confront and provide them with an effective and user-friendly solution to improve their teaching methods. Meanwhile, understanding their needs, challenges, and areas where technology can be leveraged to improve educational efficacy is required for this. This system will include capabilities such as content creation, and resource management that will help in their teaching activities. The purpose of Usability Testing (UT) is to get feedback and suggestions from home tuition teachers about the usability and efficacy of the web-based content creator home tuition teachers. The system is sharpened and improved with the use of this feedback, and any usability or restrictive concerns are resolved.

Keywords: English teachers, home tuition, tuition materials, web-based system, content creators.

1. INTRODUCTION

Home tuition has gained in popularity among students seeking personalized and targeted academic support outside of normal classroom settings. Home tuition teachers are essential for providing students with customized attention, specific education, and academic support. However, managing resources and creating fresh content pose unique challenges for these teachers on a regular basis. Moreover, the manual teaching method is a manual teaching approach, in which teachers frequently rely on physical textbooks. Home tuition teachers can simply assign notes, exercises, and learning materials to their students in advance using a web-based tool. This allows students to study the information ahead of time, become acquainted with the topics, and be prepared for class.

2. METHODOLOGY

The development of web-based content creators for home tuition teachers follows the Agile Model, starting with gathering requirements to identify the specific challenges faced by home tuition teachers and understanding their needs. The next phase is designing the flow of the system by using the design of the storyboard. Development is the phase for generating the system to create the material using the system. However, in the testing phase, there are 30 participants in total for Usability Testing (UT) to run the web-based application. Nevertheless, the last phase is deployed to gather all the information during the development and testing.

3. RESULTS AND DISCUSSION

Usability Testing (UT) was performed on the web-based content producer for home tuition teachers using a sample of 30 respondents. On a scale of 1 to 5, respondents were asked to score several features of the system, such as user interface design, usefulness, ease of use, and usability of the system. The UT results gave vital insights into the system's strengths and areas for improvement, ensuring that it satisfies the user's expectations in terms of usability and functionality. However, there are limitations in terms of the file types supported for developing materials, the process of uploading data, and communication features within the web-based content creator for home tuition teachers. These constraints have the potential to impede the efficient dissemination of content among users, and overcoming them is critical for optimizing the system's usability and efficacy. The web-based application has received highly positive user comments and feedback, indicating a high level of satisfaction among its users.

4. NOVELTY OF RESEARCH / PRODUCT

Home tuition has taken off in our nation. According to statistical data, more tuition centres were registered between 2010 and 2013 (Joshi, 2023). This is so parents do not have to drive their kids to a tutoring institution, which is more convenient and saves time. The home tuition sector has struggled with record management and sharing issues, owing to its reliance on manual processes that entail physical folders and paper-based paperwork by Wei Chun & Mostafa (2021). Teachers are increasingly utilizing the materials created by online teacherpreneurs (Gomes, 2015; Shelton & Archambault, 2018).

The development of a web-based content creator specifically geared for home tuition teachers. This web-based tool is designed to handle the special demands and issues that home tuition teachers confront. The web-based content creator offers a customized and efficient approach to supporting home tuition teachers in their teaching practices by providing a full solution that merges content production and resource management. The web-based tool is beneficial for improving teaching and learning experiences due to its specialization and modification for the home tuition setting.

5. CONCLUSION

In conclusion, the creation of a web-based content creator for home tuition teachers represents an innovative response to the challenges that these educators encounter. The web-based application indicates to improve teaching practices and student outcomes by leveraging technology and adding features such as content creation and resource management.

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GAMIFIED E-LEARNING SYSTEM FOR PROGRAMMING

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ABSTRACT – Recently, the problem of the introductory programming course has been proven by students a lack of understanding, motivation, and interest in learning this program, a lack of basic skills in programming, particularly the traditional learning medium used by educators to this day, students consider programming subject is a tough and difficult subject to understand. This study discusses the use of gamification and programming in an e-learning system to improve introductory programming skills and increase student engagement. The objectives of this project are to develop and design a programming model using an e-learning platform-based gamification. Based on the gamification concept, the instructional process can be made more engaging. Besides, the system consists of 6 chapters and aims to support lecturers in the Computer Science Department at UiTM, Perlis. In this web system, students can answer online tasks and quizzes, and the system is interactive, allowing for direct interaction between students and lecturers. Future improvements include implementing a leaderboard ranking, allowing for virtual discussions, and adding online quiz and task-sharing functions. Furthermore, the use of the e-learning concept, the Octalysis Framework, MDA Framework, and Web 2.0 tools is the medium as the references of the Literature Review. This study from development and design applies tools to build the system such as system requirements which are wireframe, ERD, and Use Case Diagrams. There are 30 respondents who will evaluate the system and proved that this system helps users become more interested and engage to learn programming subjects.

Keywords: Programming, E-Learning, gamification, web system

1. INTRODUCTION

The introduction highlights the emergence of gamified e-learning as an innovative approach to programming education. It acknowledges the challenges of traditional teaching methods and emphasizes the need for more engaging and practical learning experiences. The study aims to explore the benefits, challenges, and effectiveness of implementing a gamified e-learning system for programming. It focuses on game elements, learner motivation, performance impact, and bridging the gap between theory and practice. The findings will inform educators, instructional designers, and developers in creating effective gamified e-learning environments to enhance programming education. The suggestions from respondents will be considered to improve the system. The conclusion provides a creative and practical way to improve programming education.

2. METHODOLOGY

The Software Development Life Cycle (SDLC) with the agile model was implemented in this study as the methodology. This methodology included 7 phases which are planning, gathering the related information, preparation of the project, collection of data, designing the system, construction, and project documentation. Data collection of an e-learning system based on gamification, allocation and distribution was from the evaluate the respondents consisting of the students and lecturers. The system will system help users become more interested and engage to learn programming subjects. The development will be using WordPress as the platform for e-learning. The testing phase starts when the questionnaire is distributed to the target user through the Google Form platform.

3. RESULTS AND DISCUSSION

User acceptance testing was used to assess the website among UiTM Arau students and instructors who work in the field of computer science. When doing the user evaluation, the User Acceptance Test Model (UAT) was chosen. To make sure that the needs and expectations are met while creating a new system, users must be included in the design and development process. A total of 30 individuals participated in the testing phase. According to the user acceptability test results, most respondents are satisfied with the website. According to the participants, the website was simple to use and could be integrated into the gamified e-learning system. The recommendations and suggestions made by the

participants can be used as a resource for developers in the same area of research and are important inputs for the next developments.

4. NOVELTY OF RESEARCH / PRODUCT

The gamified e-learning system for programming offers a novel approach by integrating gamification with e-learning methodologies. E-learning with gamification elements can help Computer Science students stay engaged, provide more time to solve difficulties, and increase confidence (Alebaikan et al., 2022, Thongmak, 2018). It combines game elements, immersive experiences, personalized learning pathways, collaboration, real-time tracking, and user-friendly interfaces. This innovative system motivates and engages learners, provides practical application of programming concepts, offers personalized learning experiences, fosters collaboration, enables performance tracking, and ensures accessibility. Gamification also helps students retain information and focus on lecture material, reducing stress and enhancing their overall learning experience (Cheung & Ng, 2021). Overall, it presents a unique and effective solution to enhance programming education.

5. CONCLUSION

The gamified e-learning system for programming combines gamification and e-learning to create an engaging and effective learning environment. It integrates game elements, personalized learning pathways, collaboration features, and real-time tracking to motivate learners and enhance their programming skills. The system offers practical application, personalized experiences, and collaboration opportunities. It provides real-time feedback, progress tracking, and accessible learning for learners of diverse backgrounds. Overall, the gamified e-learning system for programming offers a novel and promising approach to programming education, empowering learners to develop their skills in an interactive and effective manner.

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EXTRA CO-CURRICULAR ACTIVITIES WITH QR REGISTRATION SYSTEM

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ABSTRACT - Challenges associated with managing extra co-curricular activities in universities have been identified which are the issue of multiple platforms, restricted availability and lack of knowledge. These difficulties frequently lead to inefficiencies and difficulties in coordinating and engaging in such activities. To address these issues, the research goal was to streamline management operations by creating a web-based registration system and evaluate its usability by using Usability Testing. The research methodology followed a systematic approach, utilizing the Agile model of System Development Life Cycle (SDLC) with five phases. The web-based registration system aimed to consolidate various platforms into a single accessible platform, thereby eliminating the need to navigate multiple systems. This consolidation aimed to alleviate the burden of limited availability by providing a centralized hub for students and staff to explore and register for extra co-curricular activities. Through usability testing, the findings revealed a high level of satisfaction among the users.

Keywords: extra co-curriculum, QR code, registration

1. INTRODUCTION

Extracurricular activities teach students spiritual, leadership and self-confidence skills that are not taught in the classroom (Ahmad & Mancha, 2016). This study addresses the significance of co-curricular activities in Malaysian universities, particularly in earning merit marks or coupon activities and developing students' skills. It proposes the development of a web-based registration system for extra co-curricular activities at UiTM Perlis, aiming to streamline the management and increase awareness among students. The system aims to address the challenges of limited program visibility and students' unfamiliarity with available programs. The main objective is to create a user-friendly platform that allows students to easily browse and sign up for programs according to their preferences. The roles of admin, program organizers and students will be incorporated, ensuring efficient monitoring and participation.

2. METHODOLOGY

The research methodology is a systematic approach that provides a step-by-step guideline for conducting a study to ensure valid and reliable results. It involves the use of specific methods and techniques to define, select, process and evaluate information related to the research objectives. The Agile model of System Development Life Cycle (SDLC) has been employed to govern the project's progress. This model consists of five stages, including project planning, analysis, design, development and evaluation. Each phase incorporates various activities, techniques, tools and deliverables to ensure an effective and efficient research process. The goal of utilizing this methodology is to establish a well-defined work plan and gain in-depth knowledge throughout the research analysis.

3. RESULTS AND DISCUSSION

An online questionnaire was given to respondents using Google Forms to conduct the Usability Testing (UT) evaluation after the completion of the development process. The questionnaire was designed exclusively for UiTM Arau students and HEP employees. The survey questionnaire consists of three sections which are Demographic Information, Usability Testing (UT) and Feedback and Suggestions. Based on the result obtained from the testing, most respondents are satisfied with the website for extra co-curricular activities, as evidenced by an average score of 4.37. The website is perceived as intuitive and user-friendly, with Question 1 receiving the highest mean score as shown in Figure 1, indicating easy accessibility. Students and staff find it helpful in obtaining necessary information and appreciate its well-integrated nature.

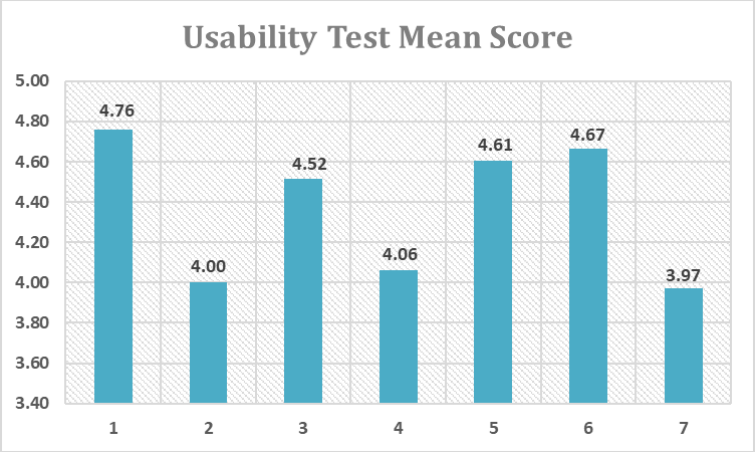

Figure 1: Mean score for Usability Testing

4. NOVELTY OF RESEARCH / PRODUCT

The Extra Co-Curricular Activities with QR Registration System addresses the specific challenge of finding information related to extra co-curricular activities in students. QR Codes for registration and evaluation purposes offers a convenient and uncomplicated system that is both efficient and timesaving during the enrolment and evaluation processes (Masih, 2022). Besides, the information is supplied quickly and conveniently with QR code access, which is its true worth. Snap the code, and you're good to go. No more struggling to type a long URL or a contact's name and phone number on a tiny optical keyboard (Uzun, 2016).

5. CONCLUSION

In conclusion, the Web-based system for Extra Co-Curricular Activities with QR Registration has been developed successfully, providing a user-friendly platform for managing and participating in co-curricular activities. Future work could focus on enhancing the system's features, such as incorporating advanced analytics for program evaluation and expanding its accessibility to a broader user base beyond the university.

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STUDENT RESIDENTIAL SEARCHING INTEGRATED WITH GOOGLE MAPS AND WHATSAPP API

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ABSTRACT - Every year, the university receives many students from all over the state or country. Consequently, the college facilities at the university are unable to accommodate the volume of students who recently enrolled sufficiently. Because of this, some old students do not get college facilities because the university gives those facilities to newly registered students. This causes some students to experience problems in finding a rental room that suits their needs. Therefore, Student Residential Searching Integrated with Google Maps and WhatsApp API is a web-based application that allows students, especially non-resident students to find and rent rooms for rent near UiTM Arau, Perlis, while allowing landlords to advertise the rooms they want to rent. The rental rooms displayed on this website are rental rooms that the landlord wants to rent. Landlords can register the rental rooms they want to rent by logging into the website, while tenants can only rent the house after logging in. Besides, the Student Residential Searching System also was integrated with the WhatsApp API, enabling the admin to notify the landlord if the information such as the electric or water bill they uploaded, was invalid. The system uses the System Development Life Cycle (SDLC) by implementing the waterfall model as the methodology. Usability testing was conducted to determine user acceptance using a set of questionnaires where thirty participants were chosen to test and evaluate the Student Residential Searching Integrated with Google Maps and WhatsApp API system. The findings and analysis showed that the system was manageable, usable, and reached participants' achievement. Hence, the system helps the rental management between admin, landlord, and tenant to be more effective and smoother to complete the process.

Keywords: Student residential searching, Google Maps, WhatsApp API, non-resident students, landlords

1. INTRODUCTION

The university's inability to accommodate all enrolled students leads to difficulties in finding suitable rental rooms, prompting the development of a web-based application called Student Residential Searching Integrated with Google Maps and WhatsApp API. This application allows non-resident students to easily find and rent rooms near UiTM Arau, Perlis while enabling landlords to advertise available rooms. Through the integration of Google Maps, students can locate rental options conveniently. Landlords can register their rental rooms on the website, while tenants can access and rent them after logging in. In addition, the tenant can search for a rental room based on their preference such as location and range of price. To make tenants able to find a house based on the distance from UiTM Arau. Geocoding is used to convert addresses into JSON format and decode them into latitude and longitude. After the address has been changed to latitude and longitude, it will be calculated by using the haversine formula. This system follows the System Development Life Cycle (SDLC) using the waterfall model as the methodology. Usability testing with thirty participants confirms the system's manageability, usability, and effectiveness.

2. METHODOLOGY

The Waterfall Model was chosen as the methodology for Student Residential Searching Integrated with Google Maps and WhatsApp API. There are five phases which are Preliminary Study, Analysis, Design, Development and Testing. The Preliminary Study was an important phase where the researcher had to identify problem statements and define the project objective, scope, and significance. Then, the Analysis phase was to analyze this project's related topics, including rental service, web application, google Maps, geocoding, WhatsApp API, and related work. Other than that, the Design phase describes the interface system, Data Flow Diagram and Site Map of the system. Furthermore, to develop this website, visual studio code has been used to write and run the programming code. To complete the development process of Student Residential Searching system, integration with google maps, geocoding, and WhatsApp API was done during the development phase. Lastly, the Testing phase. The testing phase was the last phase in this methodology and consists of two activities, which measure system effectiveness, satisfy requirements, and carry out usability testing. By conducting these activities, it will achieve the third objective of this project which

was to evaluate the usability of this Student Residential Searching Integrated with Google Maps and WhatsApp API.

3. RESULTS AND DISCUSSION

The usability testing for the Student Residential Searching Integrated with Google Maps and WhatsApp API was carried out by randomly selecting 30 people from the UiTM Perlis community, comprising admin, landlord and tenant, to test on the web-based system in accordance with the task assigned, as well as sending a notification to their WhatsApp application. The questionnaires were separated into two parts which are Part A and Part B. Part A is for personal information while Part B is for Usability Interface Satisfaction, Usefulness and Ease of Use, and Notification System. Based on the comments from respondents, it was demonstrated that the Student Residential Searching Integrated with Google Maps and WhatsApp API was usable, manageable, and met the participants' goals. Finally, the third goal of this project, evaluating the usability of the web-based application system through Usability Testing, was met.

4. NOVELTY OF RESEARCH / PRODUCT

The Student Residential Searching System is a software application that addresses the specific challenge of finding suitable rental accommodations for non-resident students. By developing a dedicated web-based application, the study aims to provide an efficient and user-friendly solution to help students overcome the difficulties associated with finding appropriate housing options (Voumick et al., 2021). The integration of the WhatsApp API introduces a seamless communication and notification system within the platform. This enables direct interaction between students and landlords, facilitating quick inquiries, property viewing arrangements, and timely notifications (H. Li & Zhijian, 2010) . The novelty lies in the integration of Google Maps and the WhatsApp API into a single platform for student residential searching. This combination offers a comprehensive solution by leveraging location-based services and real-time messaging capabilities (Marinova, 2020).

5. CONCLUSION

The Web-Based Student Residential Searching Integrated with Google Maps and WhatsApp API has facilitated non-resident students to find rental rooms nearest to UiTM Arau, Perlis. Integration of WhatsApp and Google Maps enhances the functionality of the Student Residential Searching System. The future work for this system is to make virtual tour functionalities or 360-degree images to give students a comprehensive view of the rental rooms. This immersive experience can help them make more informed decisions without physical visits.

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DENTAL CLINIC APPOINTMENT SYSTEM USING A WEB-BASED APPLICATION INTEGRATED WITH WHATSAPP MESSENGER

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ABSTRACT - The Dental Clinic Appointment System is a web-based application to manage appointments for patients and admins at a non-government clinic. The purpose of implementing this system is to develop a web-based application enabling patients to request appointments online before they get dental services in the clinic (face to face) and manage the appointment information such as schedule, rating, and notification through the system. The Clinic Appointment system also aims to reduce the time taken by patients to get an appointment with dentist services. Furthermore, The Dental Clinic Appointment system is integrated with WhatsApp Messenger API technology to notify the patient about the appointment status update. The system uses the System Development Life Cycle (SDLC) by implementing the waterfall model as the methodology. Usability testing has been conducted to determine user acceptance by using a set of questionnaires where thirty participants were chosen to test and evaluate the Dental Clinic Appointment system. From the findings and analysis results, it was shown that the system was manageable, usable, and reached the participant's achievement. Hence, the system helps the appointment management between admin and patient to be more effective and smoother to complete the process.

Keywords: Dental appointment, web-based, WhatsApp messenger, notification, reminder.

1. INTRODUCTION

Efficient appointment management is crucial for dental clinics to provide quality care and maintain patient satisfaction. Traditional appointment booking methods often suffer from inefficiencies and communication challenges. To overcome these issues, this extended abstract proposes a solution that combines a web-based application and integration with WhatsApp Messenger to streamline the dental clinic appointment system. This innovative solution simplifies appointment booking for patients and enhances communication channels between patients and dental clinics. By leveraging technology, dental practices can improve efficiency, patient experience, and overall productivity, leading to better oral healthcare outcomes. The proposed integrated system has the potential to revolutionize the way dental clinics manage appointments, ensuring a seamless and satisfactory experience for both patients and dental professionals.

2. METHODOLOGY

Usability Testing is used to acquire data. The usability testing consists of 15 questions, and each question is represented by a question that has the opposite value of what it asks. Admin and patient of Klinik Pergigian Batrisya are the target users for this Usability Testing. After finishing an attempt to use the Dental Clinic Appointment System, respondents were given ten minutes to answer the questionnaire.

3. RESULTS AND DISCUSSION

From the results of a questionnaire conducted consisting of admin and patients aged 18 to 30 and above, the system is very good to implement into the current health system. The scale on the questionnaire gives a full picture of how the user feels. Among the aspects that measure are attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty of the system. The Usability Testing consists of a five-point Likert scale and fifteen items representing the main characteristic. The benchmarking scale was measured, analyzed, and recorded. The results show that attractiveness was above average, perspicuity was below, efficiency and dependability along with stimulation was excellent benchmark and lastly for novelty was above average.

4. NOVELTY OF RESEARCH / PRODUCT

This project will produce a web-based system named Dental Clinic Appointment System using a Web-Based Application Integrated with WhatsApp Messenger. Using this web-based system can help patients to make an appointment easily and faster without the need to queue at the counter. The term "appointment" denotes a period designated in the schedule for special patient visits, and time spent with the dentist is expressed early to allow the dentist to fully concentrate on the patients (Mayor, 2021). Furthermore, it will allow users to choose the date and time they want to get the treatment from the dentist, and the admin will accept the appointment follow up send reminders through WhatsApp. Aside from that, WhatsApp chatbots have made it possible for humans and robots to communicate in natural language (Ramaditiya et al., 2021). Other than that, this system will help users to prevent Covid-19 because did not have to queue at the counter. The Organization of World Health Organization (WHO) for emergency preparation education is centered on consultations and lessons gained with international stakeholders (Anjum et al., 2018).

5. CONCLUSION

In conclusion, the dental clinic appointment system with user-friendly interface and get reminders through WhatsApp Messenger that can encourage users to make an appointment through the system. With this system, users do not queue at the counter to make an appointment and the user will not be able to forget the appointment.

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E-DIARY FOR DYSTONIA PATIENTS USING MOBILE APPLICATION

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ABSTRACT - A disorder called dystonia causes people to have trouble controlling some hyperkinetic movements. Patients frequently use a diary as a tool to monitor their health. e-Diary is now a tracker that enable patients to track daily symptoms at precise times and record their occurrence, frequency, and duration regardless of location. Therefore, an e-Diary mobile application for dystonia patient is developed using Flutter. Mobile health user interface design principles are incorporated which are intuitive, interactive, comfortable, adaptive and tailored. Usability and functionality testing have been conducted on this mobile application. Expert like doctors and caretakers and dystonia patients are among participants that tried e-Diary and answered the questionnaire provided. Most of the users agreed that this application manage to facilitate the monitoring that can be done for dystonia patients to obtain results about their disease and also as an aid to treat their disease. e-Diary application also supports patients as the it is easier for them to update their health status as reference to doctors.

Keywords: Dystonia, mobile application, e-diary, usability testing, functionality testing

1. INTRODUCTION

A disorder called dystonia causes people to have trouble controlling some hyperkinetic movements that restricts and limits their movement. Among its characteristics include improper posture, repeated movements, or both, as well as continuous or random muscular contractions that result in movement (Bailey et al., 2022). Patients frequently use a diary as a tool to monitor their health. For symptom-limited illnesses, diaries enable patients to track daily symptoms at precise times and record their occurrence, frequency, and duration. In a perfect world, an accessible interface would provide patients with feedback in the form of progress reports and visual findings that could be flexibly customized for clinical care and research settings. To solve this, a mobile application for creating an e-Diary for dystonia sufferers was created. The application provides a simple platform for users to readily update their condition information. The major goal of this e-Diary application is to help users keep accurate and timely illness data. The software uses mobile technology to allow people to track and update their health information. With this, they will be able to identify the seriousness of the disease they are facing. If their level of seriousness is at a high level, they will be advised to do treatment to reduce it.

2. METHODOLOGY

The Waterfall Model is an organized and sequential research process used to create an e-Diary application for dystonia patients. It is divided into five phases, which are requirement analysis, design, development, testing, and documentation. Requirement analysis is gathered through many resources such as articles and journals. Doctors and Dystonia patients were interviewed. From the feedback collected, user interface design principles of mobile health are applied. Mobile health prioritizes four important design elements such intuitive, interactive, comfortable and adaptable and tailored. e-Diary is developed using Flutter that integrates with Firebase to securely store user data, making it easy to retrieve and sync across devices. Usability and functionality testing were also undertaken to analyze the level of user satisfaction with the e-Diary application to deliver a seamless user experience. The process of e-Diary is important for patients to make an update (through e-Diary application as shown in figure 1, figure 2, figure and 4) about their daily assessment to track their health and to assist patients in identifying the kind of treatment they might undertake to lessen their disease.

Figure 1. e-Diary interface

Figure 2. Dystonia disorder information

Figure 3. Dystonia health tips

Figure 4. Update e-Diary interface

3. RESULTS AND DISCUSSION

There are two sorts of tests that have been performed on the application to evaluate the usability and functioning of the e-Diary application. Target users such as doctors, patients, caretakers, and students are used in usability testing. They need to download the e-Diary application and use all the features available in this application on their own mobile phones. They were then provided with an online questionnaire link to share their thoughts on the application. Furthermore, functional tests are carried out by the developers to evaluate the e-Diary application for Dystonia patients to analyze the functionality of each feature in the application. Most of the users agreed that this application manages to facilitate the monitoring that can be done for dystonia patients to obtain results about their disease and also as an aid to treat their disease. e-Diary application also supports patients as it is easier for them to update their health status as reference to doctors.

4. NOVELTY OF RESEARCH / PRODUCT

The development of a mobile application for an e-Diary built exclusively for dystonia patients. This mobile application is designed to fulfil the special demands and problems that people with dystonia encounter, by providing functions and features that are uniquely relevant and helpful in managing their disease. This e-Diary application allows dystonia patients to conveniently record and track their symptoms. E-Diary collects information directly from patients and assesses the overall illness (Clark et al., 2022). Real-time data tracking features of the app allow for dynamic monitoring and symptom analysis of their condition (Carolina & Rosa, 2021).

5. CONCLUSION

Finally, the development of a mobile application for an e-Diary built exclusively for dystonia sufferers can aid in the treatment of their condition. Mobile devices accessibility and ease allow patients to effortlessly record and update their e-Diary in their personal care. Overall, the mobile application for dystonia patients' e-Diary helps to better self-care and ultimately, the well-being and quality of life of people with dystonia.

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WEB-BASED ORDERING APPLICATION FOR BLACK TURMERIC COFFEE USING BOOTSTRAP

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ABSTRACT - Nowadays, online shopping has become a culture in society. A business must follow market trends so that the business continues to grow and does not lag behind the competition. Therefore, this project produced a web-based ordering application for businesses to increase product sales. The project has chosen a black turmeric coffee product as it is new to the market. User interface design principles which are learnability, robustness, and flexibility are applied in the design and the Bootstrap framework is employed in the development of the ordering system. An electronic ordering system (EOS) is developed to facilitate a company to manage their orders by giving the customer an opportunity to complete their order through the system. Moreover, this web-based ordering application allows users to browse, store, update, and retrieve data transactions that can improve the company's technological solution, especially in the ordering process. As for the payment method, the toyyibPay API is implemented. This project also has been evaluated by four experts and thirty-three users using user acceptance and usability testing. As a result, most of the users agreed that applying the learnability principle of user interface design manages to deliver satisfaction to most of the users. Additionally, this resulted a good user experience in terms of ease of use and usefulness that can support users to learn the system quickly and achieve maximum performance when using the system.

Keywords: Web-Based Ordering Application, Black Turmeric Coffee, user interface design principles, Bootstrap, toyyibPay API

1. INTRODUCTION

Nowadays, technology is growing rapidly, and the internet network is getting wider. This makes fierce competition happen especially in the business field. A business must have an online platform to continue to compete in today's business world. Web-based ordering application is the best platform to expand the market. This web-based ordering application is not only used for customers to order products but also helps admin to manage their product inventory. Web-based ordering application can increase user loyalty towards a business or brand, saving users time and energy. This project is developed using a web-based ordering application using Bootstrap and black turmeric coffee as the product of choice. This system is integrated with toyyibPay API and Electronic Ordering System (EOS). The user interface design principles used in EOS are learnability, robustness and flexibility.

2. METHODOLOGY

The Waterfall Model was chosen as the methodology for this project. There are five phases which are Requirement Analysis, Designing, Development, Testing, and Documentation. The Requirement Analysis was an important phase where the researcher had to identify problem statements and define the project objective, scope, and significance. Then, the Designing phase describes the user interface system design, ERD, Experimental Design, Flowchart, Context Diagram, and Sitemap of the system. Other than that, in the Development phase, the web-based ordering application is developed using Bootstrap, and MySQL is used to manage the tables and data in the database. In the Testing phase, the system is evaluated by experts and users using user acceptance (UAT) and usability testing (UT). Lastly, in the Documentation phase, all relevant information, and activities were collected and documented for this project.

3. RESULTS AND DISCUSSION

There are two types of testing that are applied which are User Acceptance Testing (UAT) and Usability Testing (UT). User Acceptance Testing is to measure Perceived Ease of Use and Perceived Usefulness. Usability Testing (UT) is the process of determining how easy it is for a representative group of users to use a product. Usability Testing, are related to the user interface design principles which are Learnability, Robustness, and Flexibility. Four experts and thirty-three users participated in the evaluation process. They are given the website address and after completing the ordering process they need to answer the online questionnaire to provide feedback. Figure 1 and Figure 2 shows the

result of the evaluation. As a result, most of the users agreed that applying the learnability principle of user interface design managed to deliver satisfaction to most of the users. Additionally, this resulted a good user experience in terms of ease of use and usefulness that can support users to learn the system quickly and achieve maximum performance when using the system.

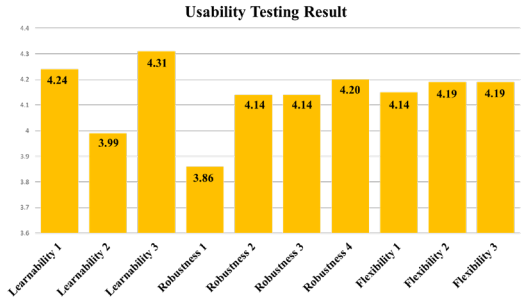

Figure 1. Usability testing result

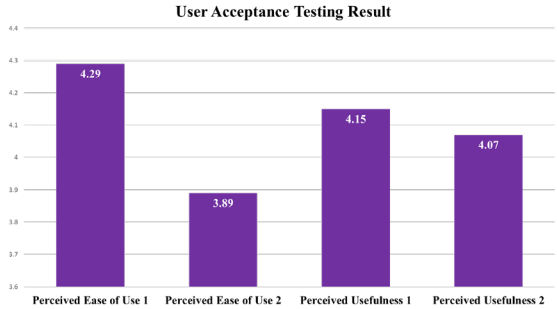

Figure 2. User acceptance testing result

4. NOVELTY OF RESEARCH / PRODUCT

An electronic ordering system (EOS) is developed to facilitate the company to manage their orders by giving the client a chance to complete their order through the system (Ishak & Zakaria, 2019). The toyyibPay provides an API (Application Programming Interface) that allows developers to integrate toyyibPay's payment services into their own applications, websites, or systems (Zakaria et al., 2017). MySQL is an open-source relational database management system (RDBMS). A relational database organizes data in one or more data tables, where the data can be related to one another; these relationships help structure the data (Mawansyah et al., 2020).

5. CONCLUSION

In conclusion, Using the Web-Based Ordering Application for Black Turmeric Coffee also helps businesses manage inventory and analyze sales, all of which can be centralized. In addition, with the Web-Based Ordering Application for Black Turmeric Coffee customers can place orders easily. Lastly, with the Web-Based Ordering Application for Black Turmeric Coffee, customers, and businesses can form a relationship based on trust and loyalty to a product.

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ANALYSIS OF MACHINE LEARNING (ML) ALGORITHM ON SYSTEM INFORMATION AND EVENT MANAGEMENT (SIEM) LOGS

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ABSTRACT - Security Information and Event Management (SIEM) is one of the essential security measures for enhancing the network's cybersecurity. The SIEM system which is used by Security Operation Centre (SOC) analysts as the central location where all security notifications from various security technologies, such as firewalls, IPS/IDS, and Anti-Virus logs, are gathered and visualized. However, the increasing frequency of cybercrime incidents and a shortage of cybersecurity specialists highlight the need for more effective detection methods. The objective is to conduct a comparative analysis of multiple ML algorithms based on accuracy, F1 scores, recall, precision, computer resource utilization, and feature importance to determine the most effective algorithms for SIEM log analysis. Three algorithms, namely Random Forest, XGBoost, and Isolation Forest are utilized in the research. According to the results, Random Forest has the highest accuracy, precision, recall, and processing speed. XGBoost also performs admirably, with perfect accuracy, excellent precision, and recall, but at a slower rate. Isolation Forest is inferior in terms of precision, accuracy, and F1 score, as well as processing time. This research is hoped to contribute to the field of cybersecurity and can guide future research and the selection of ML algorithms for SIEM log analysis.

Keywords: Machine Learning, System Information and Event Management, Random Forest, XGBoost, Isolation Forest.

1. INTRODUCTION

Providing strong cybersecurity is essential in the quickly changing digital landscape of today. However, organizations face significant challenges as a result of the complexity and amount of security incidents that keep growing. To monitor and identify potential security issues, SIEM systems are necessary. However, the SIEM log live analysis can be tedious and require a lot of resources. SIEM alerts SOC analysts and offers contextual information to aid in the investigation of a security event or incident by using correlation and statistical models to identify occurrences that could be security incidents (Skendzic et al., 2022). AI-based anomaly detection can help overcome these challenges by automating the process of identifying anomalies in log data (Kumar et al., 2022). With ML algorithms applied to SIEM logs analysis, hidden patterns, anomalies and useful insights for threat detection and response can be identified.

2. METHODOLOGY

There are several essential phases in the process for the analysis of machine learning algorithms on SIEM logs. First, raw data is gathered, which includes the SIEM system's logs. In order to address missing values, outliers, and inconsistencies and maintain the quality and integrity of the information, the data is then put through a data cleaning procedure. Then, the dataset is divided into training and testing sets. The parameters of the machine learning algorithms, in particular Random Forest, XGBoost, and Isolation Forest, are adjusted throughout the training phase to maximize performance. The separate testing dataset is used to test the models after they have been trained to determine their accuracy and performance.

3. RESULTS AND DISCUSSION

Based on the result, Random Forest and XGBoost perform better than Isolation Forest while analyzing SIEM logs. Random Forest was able to create accurate positive predictions with few false positives, as evidenced by its remarkable accuracy of 99.99% and a high precision score of 0.9996. XGBoost demonstrated 100% accuracy and received a precision score of 1. These findings demonstrate the accuracy with which Random Forest and XGBoost can detect anomalies and security threats in SIEM logs. Contrarily, Isolation Forest displayed a lower accuracy of 64.79% as well as precision and recall scores of 0.6479. Although Isolation Forest may have specific uses, its limits in reliably detecting anomalies in SIEM logs are indicated by its lesser accuracy and precision. Additionally, compared to the other algorithms, Isolation Forest required much more CPU time and elapsed time, suggesting possible scaling issues.

Therefore, Random Forest or XGBoost should be considered as the preferred algorithms by organizations looking for effective SIEM log analysis.

4. NOVELTY OF RESEARCH

This research presents contributions in the analysis of machine learning algorithms on SIEM logs. It offers insights into the effectiveness of Random Forest, XGBoost, and Isolation Forest for anomaly detection and security analysis by studying their implementation in the analysis process. The study includes detailed performance indicators including accuracy, precision, recall, and F1 score as well as measures of resource utilization, like CPU and RAM consumption. The study makes use of machine learning to automate the procedure and strengthen cybersecurity defenses in order to overcome the difficulties of manual analysis. Overall, this research advances the field by presenting fresh viewpoints on SIEM log analysis, analyzing certain ML algorithms, utilizing extensive performance indicators, and highlighting the demand for effective and automated methods to deal with cybersecurity issues.

5. CONCLUSION

In summary, ML integration with SIEM systems has a tremendous potential to improve cybersecurity threat detection and response. However, issues like interpretability, model selection and data bias and quality are still a limitation for ML development. For the ML integration in SIEM systems to be as effective as possible, it is crucial to carefully weigh these advantages and difficulties, as well as to implement the right setup and conduct ongoing monitoring.

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MALWARE DATA COLLECTION USING CUCKOO SANDBOX

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ABSTRACT – As the threat landscape continues to evolve, the need for effective malware analysis and detection techniques becomes increasingly crucial. Cuckoo Sandbox is an open-source automated malware analysis system that allows for the execution of suspicious files and the collection of comprehensive data on their behaviour. Cuckoo Sandbox able to run malware samples for analysis, running them in a controlled environment, and monitoring their activities. Furthermore, the objectives of this project is to presents the diverse range of data collected by Cuckoo Sandbox during the analysis process. This includes system call traces, network traffic, registry modifications, file system changes, and screenshots, among other valuable information. The results of the analysis was successfully analysed and can be used for malware analyst and researcher. It emphasizes the significance of this rich dataset in understanding the behaviour and capabilities of malware. It highlighted the importance of robust data collection techniques in combating the ever-growing threat of malware in today's digital landscape.

Keywords: Data collection, Cuckoo Sandbox, behaviour

1. INTRODUCTION

The objective of this project is to gather malware data collection using Cuckoo Sandbox. This will involve collecting a large sample of dataset from various sites and files to gather as much as possible of malware behaviour. Once the dataset has been collected, Cuckoo Sandbox will be used to analyze the data and produce a information to show the behaviour of the data either malware or benign by predicting the score, out of 10. Moreover, the used of Cuckoo Sandbox also able to evaluate other performance metric to analyse the behaviour thoroughly. After that, the sample of unknown files either malicious or benign will be tested and analysed to create own sample of data that can be used by other researcher.

2. METHODOLOGY

This project will begin by do some literature review to gain a better understanding of the project goals and objectives. Relevant topics will be identified by researching various sources. Then, proceed to the project development where it need to install a VirtualBox to keep the host machine safe. Linux operating system will be used in this project which is Ubuntu 18.04. After that, the implementation of Cuckoo Sandbox inside the Ubuntu. After all the installation is done, the next step will be to prepare the data needed to do the analysing. Multiple sources such as Kaggle, VirusBay, Das Malwerk will be searched for gather information about malware behavioural. These data from multiple sources are using different type of files such as .exe, .csv, .zip, and other more. URL's also will be used in this project to do the analysis. Cuckoo Sandbox will run a hybrid analysis to gain information and metrics value needed. The final data will be compiled in CSV file format for further use.

3. RESULTS AND DISCUSSION

The collected data after the analysis is complete will be compiled in one file. It contained all the signatures, md5 hash value, sha256 hash value, score, file name, and file type. All the information is automatically gained from the Cuckoo Sandbox that has been configured. In this project, only 40 files and URL are being use to analysed and gather all the information to create a sample of dataset that can be used to other researcher and malware analyst.

4. NOVELTY OF RESEARCH / PRODUCT

Previous research on malware analysis and data collection has been done by a few researchers. One of the previous works was A Framework for Collecting and Analysis PE Malware Using Modern Honey Network by Muhamad Malik Matin & Rahardjo, in 2020. Their research is to identify malware PE file type formats and to develop a honeypot. There are 1222 malware has been collected during the research and 77% is PE file format and 23% is other files format. Next project is by Lu, Cai, and Tang in 2022 about Research on the Construction of Malware Variant Datasets and Their Detection Method. In this research shows that malware samples and API sequences are difficult to obtains. Their objectives was to enhance the ability of detection even under obfuscation and variants, and to create a dataset of obfuscated and unobfuscated malware variants. Last but not least, Mal-warehouse: A data collection as a service of mobile malware behavioural patterns by Kouliaridis, Barmpatsalou and Kambourakis. This research is to develop an open-source tool performing data collection-as-a-service for Android malware behavioral patterns.

5. CONCLUSION

In conclusion, malware data collection using Cuckoo Sandbox for this project was only a prototype to gain information, behaviour and signature of malware in different types files format. This research had its own limitations during the development and implementation process. There are several ideas and recommendations to improve this research project for future work.

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SMART MEDICINE INTAKE SYSTEM

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ABSTRACT - IoT contributes to the transformation of the current industry into an elegant industry distinguished by data-driven decision making and the promotion of a new generation filled with innovative and valuable services. A smart healthcare system that ensures rapid and safe health services for patients. Healthcare practices that take place in private homes and are not overseen by a healthcare professional can be challenging, especially for the sick person. As a result, it is critical to check their medicine consumption, especially when guardians are absent. The objectives for this project are to develop a smart medicine intake system that will remind a sick person to take medication on time and will automatically be refilling the pillbox and the outcome of the developed system can be evaluated by using an IR temperature sensor, an IR sensor supports the Blynk app for continuous monitoring of results. This smart pillbox is prepared by using Node MCU and also implemented IOT through Blynk app receive notifications. The major responsibility of making people consume medicine is resolved by using this smart pillbox setup. Future researchers are recommended adding more sensors and establishing ways to collect medicine input, therefore optimizing the system's performance, and fixing any possible vulnerabilities.

Keywords: IOT, Blynk, MLX90614, IR sensor, Node MCU, IR temperature sensor

1. INTRODUCTION

Healthcare practices that take place in private homes and are not overseen by a healthcare professional can be challenging, especially for the sick person. As a result, it is critical to check their medicine consumption, especially when guardians are absent (Nuqman Ahmad Fuad et al., 2022). It is critical to ensure that patients take the correct medication at the correct time. They should require more attention from their family members to be properly cared for. However, the reality is that it is common for sick persons who did not to be admitted to the ward to cause the intake of medicine to be insufficient because it is not monitored by the doctor. Usually, a sick person always takes carelessness about the timeliness of taking medicine, which causes severe pain and can lead to death because he does not follow what the doctor recommends (Xu et al., 2021).

2. METHODOLOGY

The Smart Medicine Intake System is divided into six stages which are planning, development, evaluation, analysis, and documentation. The IR sensor and IR temperature sensor results were tested using experimental data. Then, in various settings, many factors were used to evaluate the capabilities of the ESP8266 Wireless module connections. These performance and functionality tests were repeated several times to confirm that the prototype worked properly. This technique ensures a methodical approach to the development and documentation of the project.

3. RESULTS AND DISCUSSION

The testing process has revealed that the Smart Medicine Intake System functions effectively, with all components operating as intended. The research results focused on evaluating the functionality test, prototype system test, usability test and network performance test. The functionality and network testing techniques confirmed that the IoT components were used to their maximum potential.

4. NOVELTY OF RESEARCH / PRODUCT

This project presents a novel research/product that combines the Blynk app with a Smart Medicine Intake System. By integrating IoT technologies such as IR sensors, IR temperature modules, and wireless connection, the system provides real-time monitoring, remote access, and smart pillbox system. This allows for timely notifications to be sent to users by Blynk app, ensure that patients take the correct medication at the correct time and auto refilling medicine in the

pillbox when medicine runs out.

5. CONCLUSION

As the conclusion, the project has successfully completed, and the objectives of the project are also achieved. The system reduces carelessness and eases the burden of refilling pillboxes. The system helps sick people take their medicine on time and reduces the burden on caretakers. Future researchers should enhance monitoring and enhance security and privacy measures for better system.

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MENTAL HEALTH APPLICATION GUIDANCE AMONG STUDENTS IN UITM PERLIS USING ANDROID

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ABSTRACT- This research project aims to address the need for effective measurement of mental health through the development and evaluation of a mobile application. The objectives are two-fold: first, to create a comprehensive mobile application specifically designed for measuring mental health, encompassing indicators for both the presence and absence of mental illness. Second, to assess the effectiveness of mental health measurement using the developed application by employing the Weighted Sum Model (WSM), a well-established multi-criteria decision analysis approach. The WSM will be used to evaluate the level of mental health among students, considering various factors and selecting the best alternative. By combining the development of a mental health measurement mobile application and the application of the Weighted Sum Model, this research aims to advance mental health assessment tools and enhance understanding of mental well-being among students.

Keywords: mental health, mobile application, The Weighted Sum Model (WSM).

1. INTRODUCTION

The mental health issues among students, particularly in Malaysia, are prevalent and often go untreated due to negative views and low rates of help-seeking. According to Dr. Praveena Rajendra, one in every three Malaysians, or 29% of the population, suffers from mental health issues, and the figures remain unchanged. Lack of knowledge and understanding about mental health on college campuses acts as a significant barrier to receiving proper care. The Mental Health System is an evolving application that allows users to obtain an early diagnosis based on their symptoms, providing an opportunity for self-awareness before seeking professional help. Overall, raising mental health awareness and addressing barriers to seeking help are crucial in supporting the well-being of college students.

2. METHODOLOGY

The research used a mental health indicators approach that considers both the presence and absence of mental illness. The Weighted Sum Process, was employed to select the best alternative based on various considerations. The approach for measuring mental health is the opposite of the weighted sum model, where higher values indicate worse mental health for students. The sum-weighted technique was used to consolidate multiple goals into a single objective by assigning weights to each goal. However, determining the appropriate weights for each goal presents a challenge and is typically based on the relative importance of the objectives in the specific situation.

3. RESULTS AND DISCUSSION

In Figure 1, the network performance results are displayed. Render FPS represents the smoothness of the app's visuals, indicating the number of frames displayed per second. The CPU executes app instructions, while memory (typically RAM) stores data for multitasking. Network performance relates to internet connectivity, enabling features like real-time updates and data synchronization. These factors play a crucial role in determining the overall performance and user experience of mobile apps.

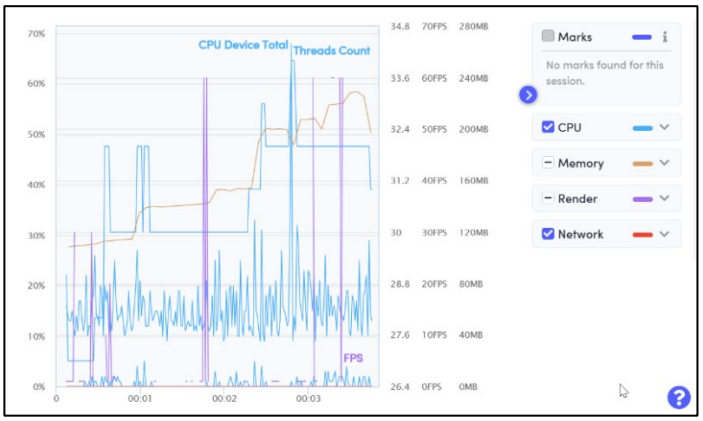

Figure 1 Network Performance

4. NOVELTY OF RESEARCH / PRODUCT

Companion, created in 2013 by psychologist Dr. Robin Hart and product designer Dan Bladon, is a mobile application for mental health. It was developed to help individuals cope with stress and anxiety through Cognitive Behavioral Therapy (CBT). Cove, another mobile app, was designed to enable people of all ages to express and capture their emotions using music. It can be used alongside talking therapies and counseling but is not a substitute for professional therapy and is not suitable for individuals experiencing severe distress or suicidal thoughts. However, Cove does not have plans for an Android version. WorryTree, founded and created by Louise in 2023, is an app specifically designed for individuals with Generalised Anxiety Disorder. It allows users to record and problem-solve their worries in real-time, addressing a gap Louise identified in existing apps. WorryTree was launched on Google Play.

5. CONCLUSION

The investigation suggests that a mobile application will be implemented for the mental health system due to the portability and convenience of mobile phones. The chosen platform for the native application is Android, as it holds a majority market share globally. This decision allows for better application development and builds upon existing related products. The approach for creating the mobile apps will be based on previous works and involve design and implementation.

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ANALYSIS OF ENTERPRISE NETWORK BY APPLYING MULTILAYER DEFENSE TOWARDS DOS ATTACK ON A SIMULATED NETWORK

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ABSTRACT- Due to the complexity of networking infrastructures, designing a corporate network security solution is a significant challenge. This study focuses on analyzing the efficiency of multilayer defense systems in reducing DoS assaults on corporate networks. The research was carried out by simulating a network environment with GNS3. The study intends to construct and install a simulated corporate network using GNS3, which closely resembles real-world network architecture. It then analyzes the enterprise network without having any defense configured and another one with multiple defenses deployed including firewalls, intrusion detection systems (IDS), and traffic shaping rules. Vital network performance parameters such as throughput, packet loss, and reaction time were continually monitored and analyzed throughout various assault scenarios to assess the impact of the defense measures on network operations. Finally, the findings were thoroughly examined in order to establish the efficacy of the multilayer defense mechanisms, allowing for a comparative comparison of their performance across various DoS assault scenarios.

Keywords: Enterprise Network, Multilayer Defense, GNS3, Network Performance, Snort

1. INTRODUCTION

The study aims to analyze the efficiency of the enterprise network under the DoS attack where multilayer defense were applied. The study also looked at the trade-offs between security measures and network performance parameters including throughput, latency, and resource utilization. This research is to examines the impact of various Denial of Service (DoS) attack scenarios on the enterprise network, taking into account different attack types which are SYN-Flood and ICMP Attack, traffic levels, and attack paths. GaO (2019) works on the research of the DoS attack using IDPS which shows that using only one defense is not enough in defending the network for a long time. This indicates that using more than one defense is necessary in order to tighten the security of the network. Therefore, in this study, applying the multilayer defense in the enterprise network towards DoS attack were analyzed.

2. METHODOLOGY

An experiment testbed was set up using GNS3((Wikipedia Contributors, 2022) to represent an enterprise network as shown figure 1. Three attack scenarios were conducted to represent the enterprise network under attacks without any defense, the enterprise network with one defense and the other one with more than one defense which will be measuring the packet drops, time and the throughput. The results gained from the simulation are then analyzed in order to measure the security performance.

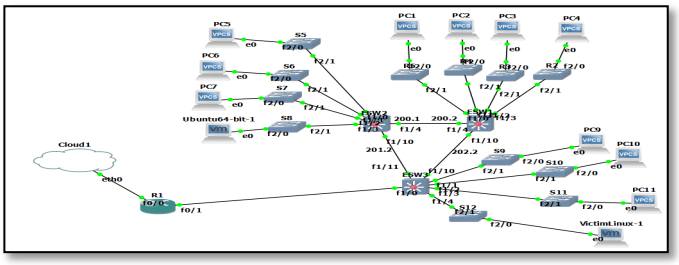

Figure 1. Enterprise Network

3. RESULTS AND DISCUSSION

The network performance is measured through the packet drop, throughput and traffic analyzation when the network was under ICMP and SYN-flooding attacks (see Figures 2 and 3). In Figure 2, the throughput shows the average numbered of 116 which indicates some traffics were still passed through, despite the network was under DoS attacks. It should be noted, however, that this figure is lower than the average throughput during normal network operation, suggesting a potential decline in network performance. Other than that, the average amount of packet drop during the assault was 162 which is quite a concern as it can result in delays, retransmissions, or complete loss of data, leading to disruptions in network communication. However, under the DoS assaults with the multilayer defense, there were no packet drops which means the defense was working out properly. Overall, the results of the analysis indicate that multilayer defense on the corporate network has optimal performance as the packet drops decreased, the CPU performs more efficiently and the throughput increases.

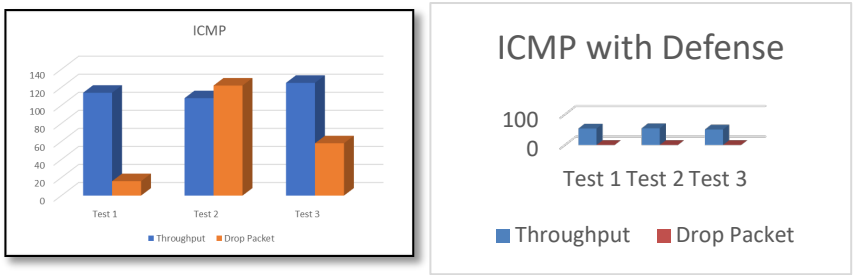

Figure 2. Analysis of Enterprise Network with and without defense (ICMP Attack)

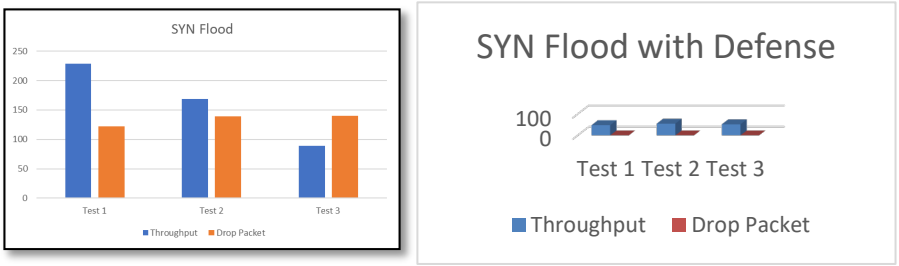

Figure 3. Analysis of Enterprise Network with and without defense (SYN-Flood Attack)

4. CONCLUSION

Enterprise network needs to tighten the security by applying multilayer defense as highlighted in this work. The network performance and reliability will be the key measures of keeping the corporate network on the highest level of performance. Besides, this study also demonstrates that enterprise network can utilize GNS3 to create an isolated network for analyzing the network under testing and also inhouse training of the network or security personnel.

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I-ISLAM: AN INTEGRATED MOSQUE INFORMATION AND ISLAMIC RESOURCES MOBILE APP

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ABSTRACT - The i-Islam mobile application was developed to address the challenges faced by individuals seeking up-to-date mosque information in the era of globalization. The objective of this project was to create a comprehensive Android application that serves as a one-stop solution for accessing mosque information, Islamic resources, and opportunities for charitable contributions. The Waterfall SDLC model was utilized for the project, providing a structured approach to system requirement analysis, design, and development processes. The research studies conducted in the field of donation and charity applications played a significant role in guiding the development process and improving the application's features and functionalities. i-Islam application seeks to provide a user-friendly platform for Android users to access mosque information, engage in spiritual activities, and contribute conveniently to charitable causes. These efforts aim to continually enhance the app's functionality, user experience, and impact within the community.

Keywords: i-Islam, Mobile Application, Mosque Information, Islamic Resources, Waterfall SDLC model

1. INTRODUCTION

In today's era of globalization, although information is easily accessible at our fingertips, many people still face challenges in obtaining up-to-date information about mosques in their area. This is often due to a lack of awareness about websites or mobile apps, such as Facebook, utilized by the mosques to reach out to the public. Additionally, the term "mobile application" has become universally recognized as software designed for use on smartphones and other mobile devices (Chmielarz, 2020). This trend also applies to non-charitable organizations that adopt similar approaches to engage with the public. Therefore, the objective of this project is to develop a comprehensive mobile application called i-Islam, which will serve as a one-stop solution for Android users seeking information about mosques in the Perlis area, Islamic resources, and opportunities for convenient contributions to charitable causes.

2. METHODOLOGY

The project was carried out using the Waterfall SDLC (System Development Life Cycle) model, chosen for its straightforward, efficient, and effective guidance in conducting various activities. The key phases of this methodology include system requirement and analysis, design, and development processes, all of which are crucial when developing a mobile application. Understanding the appropriate hardware and software, such as Android Studio, is essential in the development of Android applications.

3. RESULTS AND DISCUSSION

The development process included three types of testing: functionality testing, usability testing, and network performance testing. Figure 1 illustrates the results of network utilization, which helps assess the application's performance and offers recommendations for potential enhancements. The average download data transfer is 0.04 MB, indicating minimal network usage. Similarly, the average upload data transfer is 0 MB, indicating that the application does not extensively rely on network upload. Based on the network utilization findings, no improvements are necessary for this aspect, as the average values remain below 0.

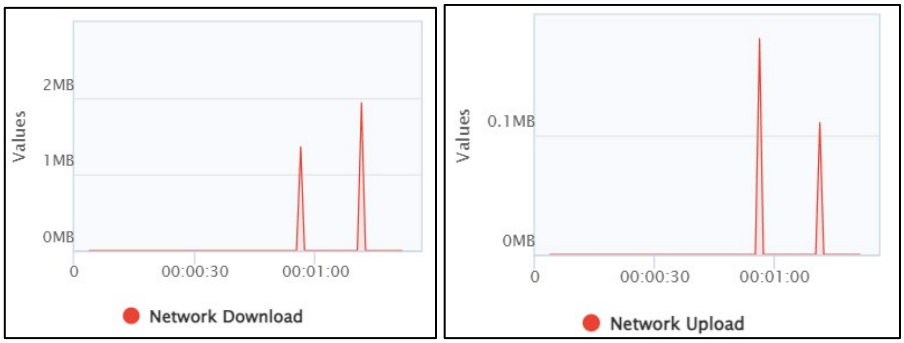

Figure 1. Network Utilization

4. NOVELTY OF RESEARCH / PRODUCT

#SadaqahMasjid is a mobile application that was developed in 2019 by the Brainy Bunch Foundation. Its main function is to facilitate online donations to mosques through online payment methods. However, there are some issues related to the availability and accuracy of mosque information within the application. Additionally, several research studies have highlighted the lack of promotion and awareness surrounding donation and charity applications, which results in limited support for causes around the world (Fathima, 2022). Previous research has also focused on the development process of Android-based donation systems, addressing the challenges of finding qualified nonprofit organizations and the resulting hindrances in making donations (Sai et al., 2022). These research studies are valuable in guiding the development process of this project and contributing to the creation of an improved product.

5. CONCLUSION

In conclusion, the i-Islam mobile application offers Android users a user-friendly platform to access mosque information, participate in spiritual activities, and contribute to charitable causes. Future developments may include expanding the app's coverage to include more mosques, incorporating interactive features to enhance user engagement, and refining the integration of donation processes. These advancements will further improve the app's functionality and provide a more comprehensive user experience.

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DETECTION OF BLACKHOLE ATTACK USING AODV ROUTING PROTOCOL IN VANET

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ABSTRACT - Vehicular ad-hoc network (VANET) is widely used in applications like highway automation, traffic management, and intelligent transportation systems due to its advantages over traditional communication systems. VANET enhances road safety by transmitting vehicle data to the Roadside Unit (RSU). However, VANET's decentralized architecture requires robust security measures to protect against attacks. Thus, this project is carried out to investigate and simulate a Blackhole attack using the Ad-hoc On-Demand Distance Vector (AODV) routing protocol in VANET and evaluate its impact using performance metrics. The metrics used are End-to-End Delay (EED), Packet Delivery Ratio (PDR), and throughput, simulated in NS-2. Two scenarios are examined: one compares performance with and without a Blackhole attack, while the other compares AODV and Destination Sequenced Distance Vector (DSDV) routing protocols. Results show that the Blackhole attack significantly affects the VANET environment, causing a delay of 175.05 ms with increasing nodes. By studying these aspects, improved security measures and protocols can be developed to safeguard VANET and ensure the reliability and safety of intelligent transportation systems.

Keywords: VANET, AODV, Blackhole attack

1. INTRODUCTION

The popularity of wireless connectivity has enabled the development of numerous internet-based apps and services, improving the quality of life. VANET is employed in various applications, such as traffic management and intelligent transportation systems, offering advantages like scalability and up-to-date information exchange. However, VANET is vulnerable to security threats like the Blackhole attack, which can cause data interruptions and manipulation. To protect against these attacks, suitable security measures and the AODV routing protocol are crucial. This project aims to investigate and simulate the Blackhole attack using the AODV routing protocol in VANET and evaluate its impact using performance metrics. The simulation will be conducted using Network Simulator (NS-2) version 2.35. Two scenarios will be simulated without and with the Blackhole attack, and performance metrics such as EED, PDR, and throughput will be measured. This project's significance lies in enhancing VANET security, understanding defenses against the Blackhole attack, and developing improved safety methods and protocols for intelligent transportation systems.

2. METHODOLOGY

The method includes data collection, planning, design, simulation, performance evaluation, and documentation. 20, 30, 40, 50, and 60 nodes are simulated within a 1000 x 1000 meter network area. Two scenarios are simulated: The first scenario compares network performance between without and with a Blackhole attack, while the second scenario compares the AODV and DSDV routing protocols. Experiments are conducted in each scenario to evaluate EED, PDR, and throughput. The simulation process comprises setting up the environment, configuring nodes and protocols, executing TCL scripts, analyzing network behavior, generating trace files and NAM visualizations, and evaluating performance metrics with AWK scripts. NS-2 and BonnMotion are helpful instruments for understanding VANET networks and researching the detection of Blackhole attacks. Microsoft Word is used for project documentation, facilitating accurate record-keeping and future reference. Overall, the methodology and simulation process contribute to a thorough evaluation of the behavior of VANET networks and the efficacy of detection mechanisms in the presence of Blackhole attacks.

3. RESULTS AND DISCUSSION

In a VANET, the presence of Blackhole attacks significantly degrades network performance. In the absence of Blackhole attacks, EED ranges from 8.65 ms to 63.08 ms. The PDR is also severely impacted, falling from 36.43 % to 10.01 % with the Blackhole attacks compared to a range of 36.43 % to 99.78 % without them. With Blackhole attacks, throughput ranges between 6.84 Kbps and 29.37 Kbps, whereas it ranges between 29.37 Kbps and 51.19 Kbps without. AODV consistently outperforms DSDV in terms of latency, PDR, and throughput. These results demonstrate the detrimental effect of Blackhole attacks on VANET performance and the efficacy of the AODV routing protocol in mitigating such attacks.

4. NOVELTY OF RESEARCH / PRODUCT

This study offers new insights into Blackhole attacks in VANETs and proposes a secure AODV routing algorithm to detect and mitigate these attacks (Kumar et al., 2021). By synthesizing existing knowledge and conducting an in-depth analysis, the research provides a comprehensive overview of the field (Bamhdi, 2020) and identifies research gaps. Incorporating performance metrics and simulation tools adds novelty to the methodology (Oberoi, 2020). In contrast, the research's practical implications contribute to developing more reliable and secure VANET systems (Fatemidokht & Kuchaki, 2020). This study makes a significant and novel contribution to VANETs and network security.

5. CONCLUSION

In conclusion, this project successfully investigated Blackhole attacks in VANET utilizing the AODV routing protocol. The evaluation of performance metrics revealed a substantial effect on network throughput, emphasizing the need for comprehensive security measures. Future research can concentrate on advancing detection techniques and bolstering VANET's resistance to Blackhole attacks.

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SMARTGUARD: IOT-BASED REAL-REALTIME INTRUSION DETECTION USING ACTIVE AND PASSIVE INFRARED SENSORS WITH ALERT NOTIFICATION VIA TELEGRAM APPLICATION

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ABSTRACT - The SmartGuard prototype is an innovative IoT-based real-time intrusion detection system designed to enhance home security using active and passive infrared sensors. This prototype utilizes the NodeMCU ESP8266 platform and leverages the Telegram application to deliver instant alert notifications to users. The primary objective of the project is to develop a reliable and efficient home security system that detects and notifies users about potential intrusions in real time. The functionality of the SmartGuard prototype is thoroughly evaluated through comprehensive testing methods, including functionality testing, network testing, and usability testing. Functionality testing focuses on assessing the prototype's ability to detect different objects accurately, while network testing analyses the system's performance regarding response time and reliability. Usability testing involves gathering user feedback to evaluate the ease of use, security features, and overall user experience. Results from the testing phase demonstrate the prototype's effectiveness in detecting intruders and promptly notifying users through the Telegram application. The prototype exhibits reliable functionality, with the ability to distinguish between humans, animals, and other objects, thereby minimizing false alarms. However, certain limitations are identified, including the susceptibility of the infrared sensors to motion and the limited detection range of the active infrared sensor. In conclusion, the SmartGuard prototype showcases the potential of IoT technology in revolutionizing home security systems. By leveraging active and passive infrared sensors and the Telegram application, this prototype offers users real-time intrusion detection and prompt notifications, contributing to an enhanced sense of security and peace of mind for homeowners.

Keywords: infrared sensor, NodeMCU, notification, home security, motion

1. INTRODUCTION

Malaysia is a multiracial country that promotes diversity and a peaceful environment among its people. This helps the nation to grow and develop in terms of its economy. Being a multiracial nation would increase the likelihood of internal conflicts between the various races, which might endanger the peace and security of the country (Zahirah et al., 2021). A city's reputation, along with its industry economics, habitation, and habitation rates, suffer from high burglaries. Because of this, crime index which used real-time data is used to view the current trends in crime and to ensure efficient and effective solution to negate it.

2. METHODOLOGY

For this project, the Waterfall model was used. There are six total phases for the creation of this prototype which are initiation, planning and development, experiment, analysis and, documentation. The methodology section provides a clear overview of the steps taken to develop the prototype and evaluate its functionality, network performance, and user experience. Network testing are conducted to assess the prototype's performance in terms of response time for alert notifications while usability testing was carried out through questionnaires administered to users. Overall, it demonstrates a systematic and comprehensive approach to ensure the prototype's effectiveness and suitability as a real-time intrusion detection with alert notification for home security.

3. RESULTS AND DISCUSSION

Four scenarios were conducted in three situations to evaluate the sensor's performance for network testing with varying obstacles and distances. From this in can be concluded that, the response time of the Telegram application to detect signals and send alert notifications to users was influenced by factors such as the condition of the sensor (dusty, reflective, or clean), distances between people and the IR sensor, and the presence of obstacles. The further the

distance, the longer the response time for the sensor to detect and send signals to the Telegram application. Additionally, the sensor functions optimally without obstructions or obstacles, enabling precise detection of intruders or individuals in its range. Another aspect considered in the analysis was the type of telecommunication used for the Telegram notification, which varied in each test. Finally, The SmartGuard prototype and Telegram Application were shown to help with their daily tasks regarding ease of use and security using the usability testing.

4. NOVELTY OF RESEARCH / PRODUCT

Previous research on home security systems has been done: Motion and Movement Detection for DIY Home Security Systems (Paputungan et al., 2019).There is also previous research that uses only a passive infrared sensor (PIR) to detect motion for its security system, which is Arduino Based Security System using Passive Infrared (PIR) Motion Sensor (Akinwumi et al., 2021).Other than that. Research also uses motion sensors to track animals, which is IoT Based on Remote Surveillance for Animal Tracking Near Railway Tracks (Rajan et al., 2023).This research helps a lot in understanding motion sensors for tracking animals. Finally, there are also research that uses other type of application to send alert notification.

5. CONCLUSION

In conclusion, the implementation of a smart home security system was suggested as a viable study subject in this project. This implementation's main goal was to improve network speed so that controlling smart home security may be done effortlessly and quickly. It was essential to offer the best internet access because the prototype depends on a Wi-Fi connection. Several ideas and recommendations exist to improve this research project for future work.

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PERFORMANCE ANALYSIS OF GREEDY PERIMETER STATELESS ROUTING (GPSR) IN MANET ENVIRONMENT USING OMNET++ FOR MULTIMEDIA DATA COMMUNICATION

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ABSTRACT - MANET has become one of the staple structures of wireless communications and multimedia in the modern era with increasing demand for its services and infrastructure-less nature thatmake every day work a whole lot easier and it uses its well-known and well-used routing protocol suchas GPSR. However, throughout the years, there is a lack of thorough research made on the basic aspectsand performance of GPSR. Even though there are a handful of research papers that has GPSR as the focus of research, however, the testing and experimentation were not too diverse in terms of network performance metrics measured and also the simulation scenarios. This problem leads to limited understanding of the GPSR protocol, thus also limiting the scientific study contribution of the protocol.This research simulated the performance analysis of GPSR in MANET environments, using a network simulator tool called OMNeT++. Simulation results of the GPSR protocol indicate that GPSR has remarkable performance in terms of its average jitter, average end-to-end delay, average throughput, which indicates a good performance when GPSR is routing multimedia data. Besides that, Packet Delivery Fraction (PDF) and also Normalized Routing Load (NRL) is also at optimal results when simulated in various MANET scenarios. For the future work, simulation of GPSR with additional MANET scenarios and network performance parameters can be carried out and different network simulator tool such as Ns-3 can be used in order to gain deeper understanding of the GPSR protocol and to validate or verify the findings of this research.

Keywords: MANET routing protocol, GPSR, OMNeT++

1. INTRODUCTION

The aim this research is reflectate the GPSR routing capabilities in a MANET environment by usingOMNeT++ network simulator tool and then compare the results of GPSR performance under various different scenarios that reflects the real-time implementation of the protocol in MANET. The scope ofthis research focused on the performance of GPSR protocol in MANET environment, and the simulationis carried out in OMNeT++. This research is also using the INET framework in OMNeT++ that allowsfor simulation of the GPSR protocol.

2. METHODOLOGY

The method that was used to carry out this research is a simulation model that represents an ad-hoc network with GPSR implementation approach. The simulation model is presented in the form of a network topology that consists of beacon frames to represent MANET devices. There is one source node, one destination node and 12 intermediary nodes that are wirelessly linked together in order to simulate wireless communication in MANET environments. The whole simulation of the GPSR protocol is carried out under several different simulation scenarios such as increasing packet size, transmission rate, transmission power and also simulation time. The results obtained from the simulation is then analysed in order to understand GPSR performances.

3. RESULTS AND DISCUSSION

Based on the results and analysis of the simulations of GPSR, as the packet size, transmission rate, transmission power and simulation time increases, performance of GPSR in terms of average throughput and Packet Delivery Fraction (PDF) increases except when simulated with 8192 bytes of packet size. Besides that, the average end-to-end delay and average network jitter also increases as thepacket size increases, but decreases and optimal when transmission rate,

transmission power and simulation time increased gradually. Lastly, the Normalized Routing Load (NRL) remained optimal aspacket size and transmission rate increases, and decreased when transmission power and simulation time are increased. Overall, results of the analysis indicate that GPSR has optimal performance as the packet size, transmission rate, transmission power and simulation time increases.

4. NOVELTY OF RESEARCH / PRODUCT

Throughout the years, there have been several research that conducted performance analysis on GPSR using OMNeT++, Ns-3 and Ns-2, measuring the PDF, NRL and throughput as number of nodes increases, such as (Abdulleh & Yussof, 2019; Chhabra & Barwar, 2022). There is also previous research on the performance of GPSR that measures the performance of the protocol in terms of PDF, NRL, throughput and packet loss rate using OMNeT++ as the transmission rate and Hello packet interval increases (Amaya et al, 2021). Last but not least, there is also research that analysed the performance of GPSR in terms of PDF, NRL throughput and jitter with distance between nodes and map size varied (Laanoui & Raghav, 2021).

5. CONCLUSION

To conclude the project entirely, it can be said that GPSR has remarkable performance when routing data in a MANET environment, especially in terms of average network jitter, throughput and end-to- end delay as the packet size, transmission rate, transmission power and also simulation time increases.

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SMART VENDING MACHINE INVENTORY MANAGEMENT SYSTEM

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ABSTRACT - The current state of vending machines poses inventory management issues as well as a lack of remote access to real-time information. Smart Vending Machine Inventory Management System is presented to address these difficulties, utilising technology such as Arduino, infrared sensors, WIFI, and GPS modules. Testing and evaluation demonstrate the accuracy, functionality, usability, and network performance of the system. The findings support the system's effectiveness, dependability, and user satisfaction. In the future, research could incorporate maintenance and problem detection systems, as well as apply data analytics capabilities for increased operational efficiency and revenue optimisation.

Keyword: Arduino, IoT, Infrared sensor, ESP8266 and Blynk

1. INTRODUCTION

Vending machines are self-service devices that dispense various goods without human assistance (Sibanda et al., 2020). They offer advantages such as reduced labor costs, flexibility in operation, and time-saving convenience. According to Ratnasri & Sharmilan (2021), the global market for vending machine is predicted it will reach US$146.6 Billion in 2027. vending machine can be categorized as IoT-based or non-IoT-based. However, there are issues with current vending machines, such as stock management, a lack of sales data, and restricted remote access (Wiyanti & Alim, 2020). These problems result in more labour being needed, less effective stocking, and lost time. The Smart Vending Machine Inventory Management System has been proposed as a solution to these issues. The system aim is to provide easy access to the vending machine stocks, location and condition so that the manager of the vending machine could manage it easier.

2. METHODOLOGY

The development process of the Smart Vending Machine Inventory Management System follows a structured methodology. It includes initiation, planning, development, evaluation, analysis, and documentation phases. The system incorporates hardware such as Arduino, infrared sensors, wireless and GPS modules. Evaluation involves functionality testing, notification testing, usability testing, and network performance testing. The analysis phase analyzes the results and provides recommendations. The documentation phase compiles the findings. This methodology ensures a systematic approach to the project's design, development, and documentation.

3. RESULT AND DISCUSSION

The functionality test of the infrared sensor showed accurate detection of obstacles within a 5 cm range, highlighting its effectiveness and limitations. The notifications test successfully triggered notifications according to the set conditions, indicating the proper functioning of the system. The usability test, conducted with 20 participants, yielded positive results, demonstrating the efficiency and user-friendliness of the system. The network performance test was deemed successful as the system performed well across different locations, with minimal impact on transfer rate and latency due to its lightweight data transfer. Overall, these tests confirm the effectiveness, reliability, and user satisfaction of the Smart Vending Machine Inventory Management System.

4. NOVELTY OF RESEARCH

The novelty of this research project is the development of a Smart Vending Machine Inventory Management System that overcomes the drawbacks of the existing vending machine systems. The system offers real-time monitoring, remote access, and effective inventory management by integrating IoT technologies including infrared sensors, GPS modules, and wireless connectivity. The vending machine gains cutting-edge capability thanks to the implementation of an infrared sensor for exact product detection and deduction from the inventory as well as the integration of GPS modules for accurate location tracking. With the help of this project, vending machine business will

be able to better manage their inventories, cut costs, and increase their overall productivity and profitability.

5. CONCLUSION

By utilizing IoT technology, the Smart Vending Machine Inventory Management System project was able to successfully address the issues that the current vending machine sector was facing. Through a prototype system, it offered real-time data on sales, inventory, and location tracking. The project boosted efficiency, decreased expenses, and eliminated the requirement for human presence. Vending machine management was made simple by the integration of GPS and wireless modules, and the Blynk application functioned as a hub for data gathering and analysis. The project met its goals, resolving issues in the sector and opening the door for upcoming advances.

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BLOCKCHAIN BASED E-VOTING USING HYPERLEDGER FABRIC

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ABSTRACT - This research focuses on the application of Hyperledger Fabric, a blockchain technology, in e-voting systems to enhance transparency and security. The study aims to design, build, and test a secure and transparent e-voting system that promotes trust and accountability in the voting process. By leveraging the features of Hyperledger Fabric, such as smart contracts and distributed ledger technology, the proposed system ensures the integrity and immutability of voting data. This abstract provides an overview of the system's architecture, security considerations, implementation details, and the potential impact of adopting blockchain-based e-voting. By employing the principles of transparency and decentralization, the solution addresses the challenges inherent in traditional voting systems. The research contributes valuable insights into the effective utilization of Hyperledger Fabric for e-voting, offering a promising avenue to enhance transparency, security, and efficiency in the voting process.

Keywords: blockchain-based e-voting, Hyperledger Fabric, transparency, security, voting systems, smart contracts.

1. INTRODUCTION

In Malaysia, a democratic nation, and within private institutions, there is an active pursuit to enhance the efficiency, reliability, and security of the voting process. Conventional voting systems face common challenges, including potential fraud and a lack of trust among participants. In light of these challenges, this research seeks to provide a comprehensive understanding of a blockchain-based e-voting system utilizing Hyperledger Fabric, with a particular focus on its application within private institutions. By harnessing the power of blockchain technology, this study aims to introduce a solution that fosters transparency, strengthens security, and ensures accountability in the voting processes of private institutions. Such a system instills confidence among participants, promotes fair decision-making, and advances the democratic principles within private institutional settings.

2. METHODOLOGY

The information gathering stage includes understanding voter needs, studying existing systems, and identifying key functionalities. During the planning stage, a comprehensive plan is formulated, specifying the project scope, goals, timeline, and available resources. The design and development stage focuses on constructing the system's architecture, user interface, and smart contracts to ensure transparency, security, and efficiency in the voting process. Implementation and testing involve coding, programming, and integration of components to create a functional prototype that aligns with defined requirements. Finally, the documentation stage ensures the comprehensive recording of the entire process, including system specifications, user manuals, and technical documentation, enabling future replication and maintenance of the prototype.

3. RESULTS AND DISCUSSION

The implementation of the blockchain for the e-voting system using Hyperledger Fabric is still in progress. However, the e-voting system has run smoothly without any technical glitches or issues. The e-voting system has been able to capture the total number of votes and the percentage of students from each faculty who have cast their votes. In addition, the final year project has also tested the security of the e-voting system by conducting a penetration testing using BurpSuite, which has revealed vulnerabilities such as SQL injection that could pose a threat to the integrity and confidentiality of votes. The result of the penetration testing highlights the need to implement defense mechanisms such as firewalls and intrusion detection systems to enhance the security of the e-voting system. This project demonstrates the potential for blockchain technology to revolutionize the voting process by providing a secure and transparent platform for casting and counting votes, while also exposing the potential vulnerabilities that need to be addressed to ensure the integrity of the system.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of the product developed for blockchain-based e-voting using Hyperledger Fabric builds upon the insights provided by previous research studies. Ruhi Tas and Omer (2020) examined the risks associated with online voting and the need for careful evaluation of voting options on the internet. Ahamed Ben Ayed (2017) highlighted the lack of total anonymity and integrity in the current e-voting system, emphasizing the potential of blockchain technology to address these issues. Javier and Paula (2021) emphasized the persistence of antiquated voting methods and explored the feasibility of a decentralized solution that can support both public and private environments. By incorporating the findings from these studies, the developed product leverages Hyperledger Fabric to provide a decentralized and transparent platform for secure and efficient e-voting. This approach ensures the integrity of the voting process, enhances transparency, and eliminates the reliance on trust by utilizing the capabilities of Hyperledger Fabric, thus advancing the field of electronic

5. CONCLUSION

In conclusion, the blockchain-based e-voting project using Hyperledger Fabric demonstrated the potential of this technology to address the limitations of traditional voting systems. By leveraging features such as smart contracts and distributed ledger technology, the project aimed to enhance transparency, security, and efficiency in the voting process. While challenges were encountered during development, the project contributed valuable insights and methodologies for future advancements in blockchain-based e-voting systems. This research has paved the way for further exploration and improvement, highlighting the importance of decentralized governance and public verifiability in creating a secure and trustworthy platform for elections. With continued research and development, blockchain-based e-voting using Hyperledger Fabric has the potential to revolutionize democratic processes and promote greater trust and confidence in electoral systems.

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IOT-BASED AIR QUALITY MONITORING ALERT SYSTEM IN KINDERGARTEN FOR CHILDREN WITH ASTHMA

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ABSTRACT - Air pollution has become the main concern in the world because it has increased rapidly nowadays. A lot of health issues are caused by the air pollution especially related to breathing such as asthma. Children are much more vulnerable to asthma than adults, especially in a crowded and closed place such as kindergarten. Pollutants in the air are also cannot be seen thus making it more difficult to avoid them. The aim of this research is to develop a prototype of IoT-Based Air Quality Monitoring Alert System to help teachers to monitor the air quality in the kindergarten thus reducing the risk of children getting asthma attacks. The prototype has been developed using NodeMCU ESP32, Adafruit IO, and Telegram. The sensors that have been used are SDS011 sensor for measuring particulate matter and DHT11 for measuring temperature and humidity. This research has tested the functionality of the prototype and tested the network in terms of response time to send the alert notifications. Through the result gained from this research, it was proven that the prototype can successfully monitor the air quality inside the classroom and send the alert notifications to the teachers via Telegram.

Keywords: IoT, NodeMCU ESP32, Adafruit IO, SDS011, DHT11

1. INTRODUCTION

According to previous research, there are already a lot of IoT-based air quality monitoring devices that have been developed. This research has implemented the air quality monitoring in kindergarten. The objective of this research is to develop a prototype of IoT-Based Air Quality Monitoring Alert System to help teachers to monitor the air quality in the kindergarten. Other than that, another objective is to evaluate the performance of the prototype using functionality testing, network testing, and Technology Acceptance Model (TAM).

2. METHODOLOGY

There are six phases in total of developing this prototype which are initiation, planning, design and development, experimentation, result analysis, and documentation phases. The experiment was conducted by powering up the prototype for seven hours per day for five days in kindergarten. Data were collected through Adafruit IO website. In network testing, there were eight scenarios involved in the network testing to find the response time for user to receive alert notifications via Telegram. The first three scenarios were set up to test the prototype different in environments while the other five scenarios were testing the impact of increasing distance between the prototype and mobile phone. Each of the scenarios has been tested three times to obtain average response time. A set of questionnaires was created and given to 15 respondents from several kindergartens in Kota Bharu, Kelantan. The questionnaire consists of two sections: Perceived Usefulness (PU) and Perceived Ease of Use (PEU).

3. RESULTS AND DISCUSSION

After running the experiments, all results obtained from the functionality testing, network testing, and TAM were evaluated.

3.1 Functionality Testing Result

The values of PM10, PM2.5, Temperature, and Humidity obtained are shown in Table 1. It is proven that the prototype was functioning well with the results stated in Adafruit IO website.

Table 1 Average result

Day	PM10 (µg/m^3)	PM2.5 (µg/m^3)	Temperature (°C)	Humidity (%)
Monday	11.29	7.00	34.86	65.57
Tuesday	11.57	6.29	33.71	68.57
Wednesday	13.14	8.29	32.00	77.43
Thursday	22.43	18.00	32.71	76.00
Friday	23.00	19.00	34.00	74.29

3.2 Network Testing Result

The average response time obtained from three scenarios that is High Humidity, High Temperature, and High AQI were 3.04, 3.11, and 3.03 seconds respectively. The capability of the prototype in sending alerts through Telegram was influenced by environments. On the other hand, the average response time for the distance between prototype and mobile phone which are 1 m, 2 m, 3 m, 4m, and 5 m were 2.94, 3.59, 4.06, 4.51, and 4.92 seconds respectively. This showed that response time was influenced by the distance between prototype and mobile phone. However, it does not give a significant impact to the performance since the response time is still in acceptable range to notify the user.

3.3 Technology Acceptance Model (TAM) Result

The result obtained from TAM concluded that the prototype was shown to help with respondents' daily tasks in terms of PU. The other section, PEU, shows that the respondents feel that the IoT-Based Air Quality Monitoring Alert System is an easy-to-use system.

4. NOVELTY OF RESEARCH / PRODUCT

There has been many research that developed air quality monitoring system using IoT but on larger scales and using different hardware and software. For example, research by Sai et al. (2019) was about developing a prototype using Arduino Uno, MQ135 and MQ7 sensors, and ThingSpeak platform for monitoring. Besides, Cieplak et al. (2019) developed a prototype to monitor the air quality in city of Lublin using Raspberry Pi Zero and the data was stored using Apache Cassandra database. Furthermore, Jo et al. (2020) developed a prototype using STM32F407IG from STMicroelectronics and Amazon Web Services for data analyzation, visualization, and presentation. Our research has developed a prototype that not only can monitor particulate matter, temperature, and humidity through Adafruit IO website, but also can give alerts to the user through the Telegram application.

5. CONCLUSION

In conclusion, this research has achieved its objectives and the air quality monitoring alert system has worked and has been successfully tested. This prototype eases out the teachers in kindergarten to monitor the air quality that can benefit children health and wellbeing.

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A PROTOTYPE OF IOT BASED NOISE POLLUTION DETECTION AND NOTIFICATION IN LIBRARY USING NOISE SENSOR AND BLYNK APPLICATION

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ABSTARCT - Noise pollution is the term used to describe the increase in ambient noise levels brought on by human activity. Humans may suffer immediate or delayed hearing damage due to acoustic overexposure. Libraries also affected by noise pollution as the source of noise pollution are mostly from external sources. Researches insisted that the recommended level of sound in a library should be around 40 decibels. The development of a prototype for an Internet of Things (IoT)-based noise pollution detection and notification system in a library environment is demonstrated in this research. The objectives of this project are to develop and implement a prototype that can use a sound sensor, a NodeMCU ESP8266, and the Blynk app to measure noise levels in a specific area and send real-time notifications to a mobile device and to evaluate the performance of the prototype, several tests were conducted, including functionality testing, network testing, and usability testing. The prototype was tested in various scenarios to prove its functionality and response time. The prototype had a positive review from majority of respondents that involved in usability testing. Other researches can implement an alternative means of measuring sound in order to read sound level accurately for future work. The results of the evaluation suggest that the prototype was successfully implemented, with accurate noise level measurements and consistent notice transmission. The prototype offers an efficient means of keeping track of noise pollution in libraries and other comparable settings, promoting a calm environment for learning and research.

Keywords: IoT, noise pollution detection, sound sensor, NodeMCU ESP8266, Blynk application

1. INTRODUCTION

Nowadays, noise pollution has occurred in various place caused by environment such as public events, building sites and automotive traffic (Fallis & Spachos, 2021). This project presents the development of a prototype for an Internet of Things (IoT) based noise pollution detection and notification system in a library environment. The objectives of this research are to develop a prototype that can measure the noise in an area and send notification to a mobile device using noise sensor, NodeMCU ESP8266 and Blynk Application, and to evaluate the performance of prototype using functionality test, network testing and usability testing.

2. METHODOLOGY

For this project, there are total of six phases for development of this prototype. The phases are information gathering, planning, design and development, experiment, analysis and documentation. The methodology section offers a comprehensive explanation of the methods taken to develop the prototype and assess its functionality, network performance, and user interface. A few scenarios were created to conduct functionality testing and network testing. As for usability testing, a questionnaire was created and shared to public community to give their opinion regarding this research.

3. RESULT AND DISCUSSION

There were 3 scenarios conducted during functionality testing and network testing to evaluate the performance and functionality of the prototype with various obstacles and distances. Based on the functionality tests, the sensor attached to the prototype was able to detect sound and send notification to mobile smartphone via Blynk application. Moreover, the optimal effect range for sound detecting and type of obstacles that can block sound detecting were able to be determined through this testing. As for network testing, the prototype was proven able to send notification to mobile smartphone through Blynk application in a short time. Last but not least, a majority of respondents that involved in usability testing has given a positive review to this research based on the questionnaire given to the respondents. It is proven that this prototype was able to monitor sound level and detects noise pollution inside library.

4. NOVELTY OF RESEARCH/PRODUCT

Previous research on noise detection system has been done by a few researches. One of the previous works was Automation of Noise Detection Using Internet of Things by Vanitha, C. N., Sridhar, K. L., & Dhivakar, R. in 2021. Their research used voice recognition board to detect voice of people speaking and have the person received a reminder email. Next, Meshkov, O., & Naumoski, A. has published their research in 2021 about Noise Pollution Measurement System-Implementation and Perspectives that aim to implementation of a noise measurement and monitoring system. Last but not least, there is also researches that created personal monitoring system provides free access with low price technology in order to display environmental variables corresponded with environmental pollutants and observes the standard of life in a particular ecological area (Shahriar Alam et al., 2018).

5. CONCLUSION

In conclusion, a Prototype of IoT Based Noise Pollution and Detection and Notification in Library Using Sound Sensor and Blynk Application was a prototype that can be use by librarians to monitor the sound level and detects noise pollution inside library. This research had its own limitations during the development process. There are several ideas and recommendations to improve this research project for future work.

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DETECTION OF WORMHOLE ATTACKS USING AODV ROUTING PROTOCOL IN VANET

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ABSTRACT - VANET (Vehicular Ad-Hoc Network) is a sort of wireless communication network intended exclusively for intelligent cars to interact and create a dynamic network that supports a variety of applications and services. The growing popularity of autonomous vehicles makes VANET vulnerable to cyber-attacks. The attacker could intercept, edit, inject, and control traffic messages used to direct road vehicles. They also allow for the modification of messages and the spread of misleading road information, resulting in traffic congestion and road risks. Therefore, the objective is to investigate and simulate wormhole attacks using AODV routing protocol. Furthermore, network performance parameters such as Packet Delivery Ratio, Throughput, and End to End Delay are simulated under two different scenarios using the NS2 simulation tool. The simulation parameter covers 1000 x 1000 meters geographical area, with an increasing number of nodes. The results reveal that Packet Delivery Ratio (PDR) provides a significant detection rate of Wormhole attacks with an average of 92.52% when compared to Throughput and End to End Delay as the number of cars that represent congestion level increases. Wormhole attacks, as a result, constitute a substantial danger to network security and can negatively impair network performance and operation. Wormhole attacks, in general, highlight the significance of maintaining robust network security and raising awareness about potential vulnerabilities.

Keywords: VANET, routing protocol, AODV, NS2

1. INTRODUCTION

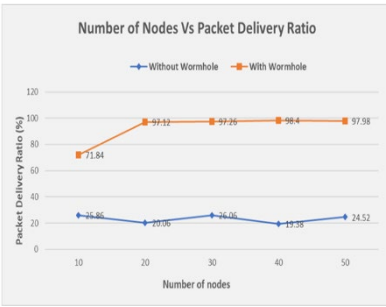
VANET stands for Vehicular Ad-Hoc Network. It is a type of wireless communication network specifically designed for vehicles on the move. VANETs enable vehicles to communicate with each other and with roadside infrastructure, creating a dynamic network that supports various applications and services. A vehicle network differs from a mobile ad hoc network in that a vehicular network node is free to join and exit the network at any time. The aim of this research is to investigate and simulate wormhole attacks using AODV routing protocol in a VANET environment by using NS2, a network simulator tool and then compare the results of the performance test under two different scenarios that reflects the real-time implementation of the protocol in VANET. The scope of this research focused on the performance of AODV routing protocol with the presence and absence of wormhole attacks in the VANET environment.

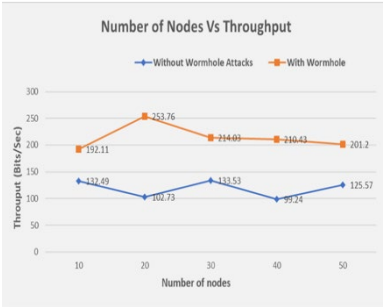
2. METHODOLOGY

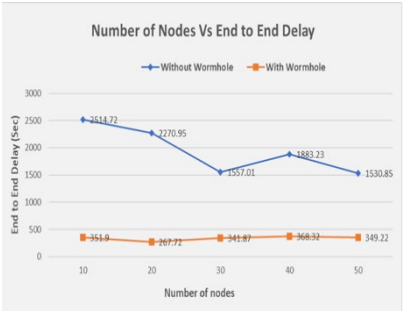
There are six phases in total of making this project successful which are information gathering, planning, design and development, experimentation and simulation, data collection and analysis, and documentation. The method that was used to carry out this research is a simulation model that represents an ad-hoc network with AODV routing protocol implementation approach and the presence and absence of wormhole attackers. The simulation model is presented in the form of a network topology that consists of beacon frames to represent VANET vehicles. There is one source node, one destination node and two malicious nodes that represent wormhole attacks are wirelessly linked together in order to simulate wireless communication in VANET environments. The whole simulation of this project is carried out under two different simulation scenarios which are increasing the number of nodes and simulation time. The results obtained from the simulation are then analyzed to understand the behavior of wormhole attacks in the network.

3. RESULTS AND DISCUSSION

Based on the results and analysis of the simulations in NS2, as the number of nodes and simulation time increases, network performance in terms of average Packet Delivery Ratio (PDR) shows a significant rate of Wormhole attacks with 92.52%. Besides that, the average Throughput also increases as the number of nodes increases but then continues to decrease after a certain number of nodes. However, End to End Delay remains lower even though the number of nodes increases. To conclude, results of the performance analysis indicate that Wormhole attacks pose a significant threat to network security and can have a huge impact on network performance and functionality.







4. NOVELTY OF RESEARCH / PRODUCT

Throughout the years, there have been several studies that conducted performance analysis on detecting Wormhole attacks using NS-2, measuring the PDR, Throughput and EED as the number of nodes increases, such as (Kumar et al., 2019). There is also previous research on Blackhole Attacks and the performance between secure AODV algorithm and existing AODV routing protocol that measures the performance of the protocol in terms of PDR, Throughput and EED rate using NS-2 as the number of nodes increases (Kumar et al., 2021). Other than that, there is also research that analyzed the performance of different protocols which are TCP and UDP in the VANET environment in terms of PDR and packet loss with number of nodes varied (Khalid et al., 2022). Finally, research by (Saini et al., 2018) conducted performance analysis on presence of wormhole attacks, measuring PDR, Throughput and EED under the scenario of increasing simulation time.

5. CONCLUSION

As a conclusion, wormhole attacks constitute a substantial danger to network security and can negatively impair network performance and operation. Wormhole attacks, in general, highlight the significance of maintaining robust network security and raising awareness about potential vulnerabilities.

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PERFORMANCE COMPARISON OF VPN TUNNELING ON GRE, IPSEC AND GRE OVER IPSEC USING GNS3

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ABSTRACT – Virtual Private Network (VPN) have become essential for secure communication over public networks. There are few protocols that can be implement in VPN, that establish a secured data communication. However, the continuous evolution of cybercriminal activities poses a significant threat to the security of sensitive data, necessitating the implementation of robust security mechanisms. Moreover, GRE is a tunneling protocol that only encapsulates packets within IP packets between network devices and does not have built-in security mechanisms. On the other hands, IPSec offers various security management capabilities and supports authentication and cryptographic key negotiation make the algorithm more complex. Besides, the performance of GRE and IPSec may degrade with an increase in the number of users and also when to scalable the network, it can leads to fragmentation issues that susceptible to certain network performance. This problem leads to the issues of network performance for both VPN protocol, thus limiting the potential used of GRE and IPSec protocol when implementing in network environment. This research simulated the performance comparison of VPN tunnelling on GRE, IPSec, and GRE over IPSec using GNS3. Simulation results of the GRE, IPSec, and GRE over IPSec VPN protocol indicates that these VPN protocol has remarkable performance in terms of its average throughput, average latency, and also average jitter in various VPN scenarios. For the future work, simulation of GRE-Based VPN tunnelling over IPSec with more additional VPN scenarios and network performance metrics can be carried out in order to gain deeper knowledges and understanding of the GRE, IPSec, and GRE over IPSec VPN protocol.

Keywords: VPN tunnelling protocol, GRE, IPSec, GRE over IPSec, GNS3

1. INTRODUCTION

The aim of this research is to simulate GRE, IPSec, and GRE over IPSec by using GNS3 network simulator tool and then compare the results of each GRE, IPSec, and GRE over IPSec performance under various different scenarios that reflects the real-time implementation of the VPN protocol. The scope of this research focused on the performance of GRE, IPSec, and GRE over IPSec protocol in network environment, and the simulation is carried out in GNS3. This research is also using Iperf-3 network monitoring tool in GNS3 that used together for simulation of each VPN tunnelling protocol.

2. METHODOLOGY

The method that was used to carry out this research is a simulation model that represents VPN network environment in between two building with different networks. The simulation model is presented in the form of a VPN network topology that consists of GRE, IPSec, and GRE over IPSec tunnelling. There is one source node, and one destination node in both buildings that are linked together in order to simulate GRE, IPSec, and GRE over IPSec VPN tunnelling protocol in VPN network environments. The whole simulation of GRE, IPSec, and GRE over IPSec is carried out under several different simulation scenarios such as MTU sizes, and encapsulation modes which are tunnel mode and transport mode. The results obtained from the simulation is then analysed in order to find the best solutions to maximize the network performance of GRE, IPsec, and GRE over IPSec tunnelling environments.

3. RESULTS AND DISCUSSION

Based on the results and analysis, there are three simulations which are GRE, IPSec, and GRE over IPSec VPN tunnelling. Firstly, for the GRE VPN performance, as the MTU size increases, performance of GRE VPN in terms of average network throughput increases and in terms of average network latency and average network jitter decreases when simulated with 1500 bytes. Secondly, for the IPSec VPN performance there will be two simulation which is in tunnel mode and transport mode. For the tunnel mode, as the MTU size increases, performance of IPSec tunnel mode in terms of average network throughput increased gradually together with average network latency and network jitter when set the maximum MTU size of 1500 bytes. For the transport mode, as the MTU size increases, performance of IPSec transport mode in terms of average network throughput decreases except when simulated with the minimum MTU size of 1000 bytes. However, the average network latency and average network jitter increases as the MTU size increases. Lastly, the GRE over IPSec performance, as the MTU size increases, performance of GRE over IPSec VPN in terms of average network throughput increases when simulated with 1500 bytes. Besides, the average network latency

and average network jitter decreases as the MTU size increased gradually. Overall, results of the analysis indicates that each of GRE, IPSec, and GRE over IPSec VPN tunnelling has optimal network performance according to the right MTU sizes and encapsulation mode.

4. NOVELTY OF RESEARCH / PRODUCT

Throughout the years, there have been several research that conducted performance analysis on GRE, IPSec, and GRE over IPSec using either GNS3, and packet tracer measuring the throughput, response time, jitter by measuring with Solar Winds such as (Ogudo., 2019; Uddin et al., 2021). There is also a previous research on the performance of GRE and IPSec that focusing on QoS VoIP and how both protocol effects the performance of network throughput, packet loss, and jitter using OPNET Moduler as a network simulation tool (Ubedilah et al., 2022). Other than that, there is also research that analysed the performance of VPN tunnelling protocol based on Application Service Requirements in terms of throughput, latency, and jitter that provided the good network performance for the application service requirements (Akter et al., 2022). Last but not least, research by Forbacha & Agwu (2023) implemented a secure Virtual Private Network over an open network (internet) measuring the throughput, bandwidth, and security implementation between multiple private networks connected to public network that is internet by implementing GRE and IPSec VPN protocol.

5. CONCLUSION

In the nutshell, it can be concluded that each of GRE, IPSec, and GRE over IPSec has remarkable performance towards the performance of the network throughput, network latency, and network jitter when the different network parameter being simulated in different scenarios.

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ANALYSIS OF THE FAKE WEBSITES USING ACTIVE URL IDENTIFYING METHOD

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ABSTRACT - In the modern era, the use of Internet has been increased a lot. The Internet made the world instant therefore anyone can access and get whatever they need. However, there are an existence of fraudulent website available on the Internet and nowadays fake websites has been one of a method in cyberattack to hijack. The main use of this fake website is to trick users into fraud or malicious attacks. Several websites require users to enter sensitive information for authentication process. However, some fake websites make use of this information for miserable purposes such as blackmailing, selling the data in the black market and more. Thus, this project is carried out to simulate on how the fake website can be done using BlackEye and analyse the variety links to determine which tools has a best accuracy to detect a fake website. Two scenarios are examined; one is to simulate on ow fake website can fraud victims, while the other hand is to compare which three main tools can detect on the fake websites with higher accuracy. By studying these aspects, improved security measures and protocols can be developed to ensure people browsing on the Internet without getting trapped into fake websites.

Keywords: Fake websites, BlackEye

1. INTRODUCTION

Website is a collection of web pages and the related content that can be identified by a common and familiar domain name. Every web pages has at least one web server. Server is a software or hardware device that accepts and responds the request that has been made by the users over the network. On the other hands, fake websites are unlicensed or unauthorized websites on the Internet. Scammer misused the namelessness of the Internet to hide their true identity and intentions behind multiple unrecognizable. These fake websites work in many ways such as promising big rewards in a financial exchange. Several websites require users to enter sensitive information for authentication process. To protect against these attack, suitable security measures can be done. This project aims to develop, simulate and analyse the fake websites using BlackEye and three main tools which are URLVoid, CheckPhish and ScamVoid. Two scenario will be done which are to simulate on how fake websites can make victims fall into it and secondly on how to analyse the fake website by using different tools. This project's significance lies on the ability to recognise and list every phoney website, protecting users' data and preventing them from being victims of fraud.

2. METHODOLOGY

The method includes information gathering, planning, design, simulation, performance evaluation and documentation. Two scenario are simulated; The first scenario is simulate on how fake websites can be done by using BlackEye while the second scenario is to trace on which three tools can have a better performance on accuracy by using 20 different links combining legitimate and fraudulent links. The simulation process comprises setting up the environment, configuring the BlackEye as the main tool to create the fake website and Hydra as a tool for penetration testing. Microsoft Word is used for project documentation, facilitating accurate record-keeping and future reference. Overall, The first scenario does not meet the objectives as the link that should be sent to the victim is cannot be produced because of uncertain issues while the second scenario runs smoothly as it give a good results.

3. RESULT AND DISCUSSION

Based on three tools that has been identified; URLVoid, CheckPhish and ScamVoid, they showed a different results of accuracy on detecting the fake websites by using the same 20 links combining from legitimate and fraudulent links respectively. For URLVoid and ScamVoid, it shows 0.7 of accuracy which are 14 links out 20 links can be detected correctly. While CheckPhish, it has 0.85 of accuracy which are 17 out of 20 links which are close to get 1.0 of accuracy.

Table 1 Comparison of URLVoid, CheckPhish and ScamVoid

OL	CURACY
LVoid	
eckPhish	5
mVoid	

4. NOVELTY OF RESEARCH / PRODUCT

A scanning tool that can trace fake websites can be a valuable asset in the fight against phishing attacks. Such a tool can be created by researchers with expertise in website design, network security, and programming. The tool would need to be able to scan websites for suspicious activity, such as hidden scripts or links to known phishing sites. It could also use machine learning algorithms to identify patterns and anomalies in website design and structure that are indicative of phishing attacks. By creating such a tool, researchers can help prevent cybercrime and protect individuals and organizations from the harm caused by phishing attacks.

5. CONCLUSION

In conclusion, this project is partially successfully as the simulation of fake websites cannot be finished even after several trial with different kind of configurations and tools. The analysis of fake websites is successfully investigated and the evaluation of performance metric revealed that CheckPhish has a better accuracy than URLVoid and ScamVoid. Future research can concentrate on advancing the tools by develop a scanning tool to detect and trace fake websites through links.

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SMART GARBAGE BIN MONITORING SYSTEM

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ABSTRACT - The increasing student population in our country has given rise to a corresponding increase in waste generation within educational institutions, including UiTM Perlis. This surge in waste poses a significant challenge, as inadequate waste management can lead to detrimental consequences, such as the emission of air pollutants that pose health risks. Additionally, the accumulation of overflowing garbage serves as a breeding ground for flies, which can transmit various diseases, including food poisoning, dysentery, and cholera. To address these waste management challenges in UiTM Perlis, this research proposes the implementation of a Smart Garbage Bin Monitoring System. The primary objective is to develop a sophisticated prototype system that incorporates humidity, ultrasonic, and GPS sensors to effectively monitor and locate garbage bins. With the aid of a mobile application called Blynk, users will have access to comprehensive data on garbage levels and bin locations. The functionality test, prototype system test, usability test, and network performance test conducted for this project have yielded positive results, indicating the system's efficacy. However, there is still potential for further enhancement and refinement. Future researchers are recommended to consider incorporating additional sensors and implementing mechanisms to gather user feedback, thereby optimizing the system's performance and addressing any potential shortcomings.

Keywords: Internet of Things, Arduino, Ultrasonic Sensor, Humidity Sensor, Blynk

1. INTRODUCTION

Over the past few years, the population of students in this country is increasing rapidly. Due to that, the amount of waste in the campus is also increasing. A Research that was conducted in University Putra Malaysia for three weeks regarding the analysis of municipal solid waste found that the average of waste in the cafe area only is 325.75 kg (Abd Hamid et al., 2018). Thus, waste management is very crucial and can lead to many consequences if it is not handled smartly. In Universiti Teknologi MARA (UiTM) Perlis, there is no cutting-edge, organized and systematic system to monitor and collect the garbage. Monitoring the garbage bin is crucial in order to maximize management, resources and cost (Thapar, 2022). It is also important because it can reduce workforce to deal with the collection of garbage. Therefore, the existing system is not systematic and will lead to many drawbacks. In this project, a smart garbage bin monitoring system will aid them minimize these problems and all the drawbacks from occurring.

2. METHODOLOGY

The Smart Garbage Bin Monitoring System comprises six stages: initiation, planning, development, evaluation, analysis, and documentation. Experimental data were gathered to test the readings of the ultrasonic sensor and humidity sensor. Following that, multiple variables were employed in various scenarios to assess the capabilities of the ESP8266 Wireless module, including different distances and types of connections. These performance and functionality tests were conducted multiple times to ensure the prototype's functionality.

3. RESULTS AND DISCUSSION

The testing process has revealed that the smart garbage bin monitoring system functions effectively, with all components operating as intended. The research results focused on evaluating the functionality test, system prototype test, usability test and network performance test. The IoT components were utilized to their fullest capacity, as demonstrated by the functionality and network testing procedures. Ultimately, following extensive testing, the prototype has proven to enhance farmers' job performance and operates successfully.

4. NOVELTY OF RESEARCH / PRODUCT

This project presents a novel research/product that combines the Blynk app with a smart garbage bin monitoring system. By integrating various sensors and network communication capabilities, the system provides real-time updates on the garbage bin's fill level. This allows for timely notifications to be sent to users, ensuring efficient waste management and preventing overflow issues. This project presents a novel research/product that combines the Blynk app with a smart garbage bin monitoring system. By integrating various sensors and network communication capabilities, the system provides real-time updates on the garbage bin's fill level. This allows for timely notifications to be sent to users, ensuring efficient waste management and preventing overflow issues.

5. CONCLUSION

As the conclusion, the project has successfully completed and the objectives of the project are also achieved. This technology improves air quality and also reduces health risks. It will also let the waste management municipalities to constantly monitor the garbage bin status. Future researchers should enhance monitoring by adding sensors for detailed garbage bin data and implement user feedback mechanisms.

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THE PERFORMANCE OF TEXT STEGANOGRAPHY BASED ON SYMBOL

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ABSTRACT - Data security has always been a priority in our lives. Humans have devised several methods for transferring data to one another while assuring that other individuals are unable to obtain this data which is data hiding. Steganography is the technique of concealing a private message in a non-secret message, where communication is essential, by concealing data in other data such as text, picture, audio, and video. Eventually, the data will be concealed from view or discovery, making it impossible for humans to notice that the file contains a hidden word. This study focuses on steganography, which is a technology that encrypts data inside text files, also known as cover files, to conceal the existence of sensitive information. The goal of this research is to elaborate text steganography using symbols as a hidden word. Then, explores the concept of text steganography, its significance in the field of information security, and its potential applications. Various methods of text steganography are discussed, including encoding and decoding techniques using Jupyter Notebook and Python language. Finally, the importance of text steganography in safeguarding sensitive information and the need for further research to enhance its effectiveness and robustness in an ever-evolving digital landscape.

Keywords: Data security, text steganography, data hiding, symbol text

1. INTRODUCTION

Steganography has piqued the interest of researchers as an effective auxiliary method to cryptography (Wang & Gao, 2019). Text steganography is a method of disguising a secret text message as a covering message within another text or constructing a cover message related with the initial secret message. There are several types of text steganography. Subsequently, the data will be hidden from being seen or found. It is also applicable to other forms of media such as text, speech, communication channels, and binary reports (Maheswari et al., 2022). Steganography and cryptography are two different techniques because cryptography only focuses on encrypting data not hiding. Since then, steganography has got a lot of attention nowadays. Data from nations or organizations that require confidentiality must be conveyed appropriately and securely to the right persons (Memis et al., 2022). People currently often utilize the Internet, which leads to cyberattacks in any technology. As a result, new methods for data privacy have emerged.

2. METHODOLOGY

There are six phases in methodology phases which are initiation, planning, development, evaluation, analysis and documentation. The method that was used to carry out this research is a system that can encode and decode text. This is a process of developing a text steganography system that can hide the text or we call it the data in a text cover file. All the software required, which are the Jupyter Notebook application and a Python language, used to develop the performance of text steganography based on symbols. The secret message to be concealed is chosen by the sender. This message can be any form of sensitive or confidential information. An encoding strategy is used to ensure that the concealed message stays intact and recoverable. This method specifies how the secret message is expressed within the cover text through the use of certain encoding rules or algorithms.

3. RESULTS AND DISCUSSION

When the system was built by encoding the concealed message inside the cover text file, it was tested with Hex Editor to compare two files. The cover text file (.txt), which contains the secret message and is the first step in the testing, is filled with varying numbers of symbols. The capacity technique, that calculates the file size with concealed symbols after encoding, is then used to calculate the performance. Figure 1 below shows Hex Editor is used to compare files.

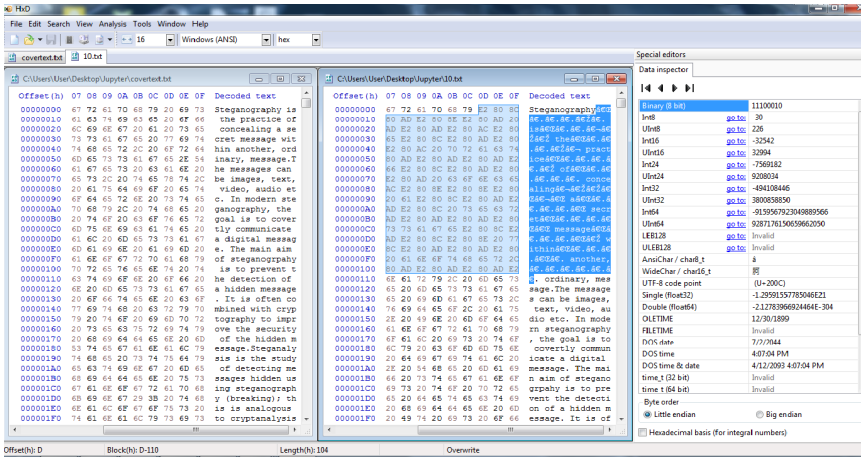

Figure 1 File comparison between cover text file and encoded text file.

The covertext.txt file (on the left) in Figure 1 above did not contain any hidden symbols. The 10.txt file, on the other hand, is encoded with ten secret symbols, as shown in the highlighted above.

4. NOVELTY OF RESEARCH/PRODUCT

Steganography using symbols in text can help a secret message stand out and be unique. It can increase security in which the secret communications are less likely to be discovered and decrypted by attackers who are skilled in symbol-based steganography techniques when special symbol sets and encoding techniques are used. A further degree of protection is added through the use of unique symbols and encoding techniques.

5. CONCLUSION

In conclusion, this study succeeds in creating a user-friendly graphic user interface and a symbol text steganography system. The capacity criterion measure, which compares the size of the original text file with the encoded text file, was successfully met as a consequence of this research.

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LORA TRACKING SYSTEM PROTOTYPE WITH GPS FUNCTIONALITY

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ABSTRACT - LoRa is a reliable modulation system for IoT, while GPS aids in navigation. In Malaysia, the great outdoors is growing more and more popular, but many people have learned the hard way that the wilderness can be cruel if they are not prepared. The project's objective is to create a LoRa Tracking System with GPS functionality and assess its performance. The process entails building a testbed that includes a LoRa32 transmitter and receiver, a GPS module, and a Blynk tracking device. Tests evaluate the performance of the network, hardware, and functionality. Results show that as distance increases, signal strength (RSSI) and signal noise ratio (SNR) decrease, and transmission time increases. Environmental variables and distance have an impact on signal intensity. In open places, the coverage range is often several km, while it is less in areas with high populations. Signal strength, accuracy, and coverage are all improved when GPS and LoRa are combined. In conclusion, this study creates and evaluates the LoRa Tracking System with GPS functionality. Results show signal behavior and the advantages of integrating GPS. Future work will focus on increasing coverage and accuracy. Future studies will focus on increasing the transmission range and accuracy of GPS algorithms.

Keywords: LoRa, GPS, RSSI, SNR, Tracking System

1. INTRODUCTION

LoRa32 is a device that utilizes the LoRa spread spectrum modulation system, offering long-range, low-power communication capabilities for IoT applications. GPS (Global Positioning System) is a satellite-based navigation system used to determine precise geographic positions on Earth. A tracking system combines the LoRa32 device with GPS functionality to enable accurate location tracking of objects or people. This combination allows for the development of efficient and reliable tracking solutions, making it suitable for applications such as asset tracking, security systems, and outdoor activities. The visualization of GPS data is visualized on Google map using Blynk cloud.

2. METHODOLOGY

The method that was used to carry out this research is a development of a prototype tracking system using LoRa32 and interfaced with GPS. The prototype consists of two LoRa32 modules. One LoRa32 module is the transmitter and another one LoRa32 module is receiver. The transmitter module will interface with GPS to gather GPS data from satellites. Then the GPS data will be transmitted to the LoRa32 receiver and stored in the LoRa32 receiver. The LoRa32 receiver then sends GPS data to Blynk cloud and visualize it on Google map. The results obtained are then evaluated to understand LoRa32 and GPS performances.

3. RESULTS AND DISCUSSION

Based on the results and evaluation of the LoRa tracking system prototype with GPS functionality, as the network performance, as the distance increases, the signal strength and the signal noise ratio decreases, however time taken for LoRa32 transmitter to transmit packet increased when the distance increased. The LoRa system's signal strength varies with distance and environment. In general, as the distance between the transmitter and receiver rises, the signal intensity drops. The surroundings, including the presence of structures, trees, and other obstructions, has an impact on the signal strength as well. In open places, the LoRa system's coverage range is often several kilometers, although it might be significantly smaller in populated areas. As the GPS receiver can be used to detect the location of the LoRa32 transmitter, which may assist to optimize the transmission power, the addition of GPS capabilities to the LoRa system can enhance the signal strength, signal noise ratio and coverage range.

4. NOVELTY OF RESEARCH / PRODUCT

Throughout the years, there have been several researches that conducted projects using LoRa and GPS, A Novel Smart Gas Stove with Gas Leakage Detection and Multistage Prevention System Using IoT LoRa Technology such as (Islam M et al, 2020). Other than that, Study of a bus location system with LoRa in Nonoichi city (Tasaka S et al, 2019). Lastly, research by Chitrakar P, Biradavolu Y, and Yellampalli S (2019) conducted GPS and LoRa module Based Safety Alert system.

5. CONCLUSION

To conclude the project entirely, it can be said that LoRa Tracking System with GPS functionality offers a low-cost, long-distance, and energy-efficient solution for real-time tracking and monitoring applications, enabling effective asset management, improved safety precautions, and increased operational efficiency. For the future works, The improvement of GPS localization algorithms accuracy. Enhance the coverage range that packet can be transmit from transmitter to receiver.

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REAL-TIME EMG DATA COLLECTION AND MONITORING SYSTEM USING ESP8266 AND EMG SENSOR DEVICE

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ABSTRACT- An EMG is a device for counting and recording very small electrical impulses that occur when muscles perform movements. In the EMG system, a wireless link will be used to facilitate the transmission of real-time medical information. To record EMG sensor readings, various network protocols are used to communicate. However, the previous technology could not help to see the condition of the muscles directly. Therefore, Players cannot avoid their muscle cramps because they lack effective equipment to monitor muscle health that can control their daily muscle rate. Players need to go to the hospital for muscle testing and take a long time for testing and recovery. Therefore, with the existence of IoT technology able to overcome the problem easily and effectively by only using the EMG sensor device and through the help of the ESP8622 WiFi Module. In the future of virtual consultation for remote medical care, IoT will be able to provide efficient data connection from multiple locations (Philip, N.Y.; Rodrigues, J.J.P.C.; Wang, H.; Fong, S.J.; Chen J, 2021).

Keywords: EMG Sensor, Esp8266, Arduino IDE, MySQL

1. INTRODUCTION

The aim of this research is to build a real-time EMG data collection and monitoring system using esp8266 and EMG sensor device and then compare the results of muscle performance under various different scenarios that indicate the player's muscle condition. The scope of this research focuses on sports players as it involves the arm on the radial and ulnar muscles. The scope of this study is focused on sports players because it involves the arm muscles. Athletes can view their muscle health rates via their mobile phones which will be uploaded to MySQL. This project also discusses the extent to which these IoT network technology issues can help in this research.

2. METHODOLOGY

The method used to conduct this study is to use the EMG Sensor device. The sensor's EMG readings are displayed in the form of a cloud-based table that is read through the NodeMcu. Arduino IDE is used to upload the source code to the NodeMCU to get the EMG sensor reading and there are two 9V battery supplies connected to the EMG sensor device for power supply. The system is run under several different scenarios such as reading EMG sensor readings before and after performing sports activities. The results obtained are then analyzed to understand the performance of the player's muscles when there is pressure on the muscles.

3. RESULT AND DISCUSSION

The EMG sensor test shows the detection of the pulse of the player's arm muscles. The notification test successfully triggers notifications according to the specified conditions, indicating that the system is working properly. The usability test, carried out with 3 sportsmen, yielded positive results, demonstrating the functionality of the system. The network performance test was considered successful as a well-performing system, with minimal impact on transfer rates and latency due to data transfer. Overall, this test confirms the effectiveness, reliability and user satisfaction of the real-time EMG data collection and monitoring system using esp8266 and EMG sensor device.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of this research project is the development of real-time EMG data collection and monitoring system using esp8266 and EMG sensor device that overcomes the weaknesses of the muscle monitoring system. The system offers effective real-time monitoring by integrating IoT Technologies including EMG sensor devices, ESP8266 Wifi Module and NodeMCU microcontrollers. Muscle monitoring system obtain advanced capabilities with the implementation of EMG sensors to measure muscle pressure on sports players. With the help of this project, the vending machine business will be better to monitor and control the occurrence of muscle stress while playing sports that can cause muscle defects and can increase player productivity.

5. CONCLUSION

By using IoT technology, the Muscle Monitoring system project has successfully addressed the issues faced by sports players to monitor the state of their muscle health. This system has been produced with the use of EMG sensor and ESP8266 WiFi Module as well as MySql data collection which serves as a hub for data collection and analysis. The project met its goals, resolved issues and opened up opportunities for further progress in the future.

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IMPLEMENTATION OF CLIENT-SERVER CONCEPT USING SOCKET PROGRAMMING IN E-ADUAN PORTAL IN UITM

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ABSTRACT - Implementation of client-server concept using socket programming in e-aduan portal in uitm. This project aims to implement a client-server using socket programming that enables real-time communication between students (clients) and lecturers (servers) through chat features. Software tools and languages used include Laragon for local development, Visual Studio Code for code editing, HTML/CSS for web page design, PHP for server-side scripting, and WebSocket for real-time two-way communication. The e-aduan portal offers features such as user registration, real-time messaging, notifications for lecturers, report history display and status reporting. Implementation includes database construction, home page design and server-side processing. Performance evaluation focuses on throughput and latency using tools such as Wireshark for network traffic analysis. The results show successful implementation, providing an efficient platform for report submission, communication and updates between students and lecturers. However, some limitations are identified, including scalability and optimization for larger user loads. The implementation of the client-server concept using socket programming on the e-aduan portal in uitm showcases its potential in facilitating effective communication and streamlining the education process.

Keywords: Client-server concept, socket programming, e-aduan portal, distributed system architecture, real-time communication.

1. INTRODUCTION

Online portals have now become common and numerous. Thus, efforts to manage the online Portal become more important so that every function on the Portal can run smoothly and steadily. But the significant challenge in the development of this Portal is to create high quality content. Hence, there is a need to design a system architecture that allows content creation to occur automatically, generating a fast workflow (Ting & Yen, 2021). System architecture such as WebSocket technology is a computer communications technology, which will be implemented to enable full-duplex communication over a single TCP connection. This ensures efficient and bidirectional communication between the clients and the server. This project aims to establish a communication mechanism between multiple clients and a server, enabling real-time messaging and collaboration. By utilizing socket programming, the project ensures efficient and reliable communication between the clients and the server.

2. METHODOLOGY

The methodology consists of five key phases such as initial planning, information gathering, design and development, testing and evaluation, and documentation. The initial planning phase involves defining the goals and objectives of the project, as well as creating a high-level plan for achieving them. During the information gathering phase, relevant information and data related to the e-aduan portal and its requirements are collected. The design and development phase focuses on establishing the unique features and functionality of the client-server application in the testing and evaluation phase, the client-server application is thoroughly tested to ensure its reliability and performance. Finally, the documentation phase involves documenting the entire implementation process, including the research activities, design decisions, development approach, testing results, and any lessons learned.

3. RESULTS AND DISCUSSION

The network performance of the implementation of socket programming on a website is evaluated using Wireshark. The system will analyze network performance based on latency and throughput. Latency refers to the time it takes for a request or data packet to travel from the client to the server from a specific source address to destination address. The information on the size of the data in bits and the average time taken to send the message (average sending time) in milliseconds have been recorded. For example, for a message size of 13 bits, the average sending time is $0.0407 \times 10^{-}$

[6]ms. Throughput is a metric that quantifies the amount of data transferred between the client and server over a specific period. The project seeks to understand how a packet length will affect the time it takes for packets to reach their destination. The information on the size of the data in bits, the average time taken to transmit the message in seconds, and the calculation of throughput in bits per second (bits/s) have been recorded. For example, for a message size of 13 bits, the time taken to transmit the message is 0.1405s, so the throughput of this size data is 320.99 bit/s. Similarly, the values are recorded for different message sizes. However, the system's performance can be further improved by expanding the size data.

4. NOVELTY OF RESEARCH / PRODUCT

This research brings novelty through the implementation of socket programming on websites. This is due to socket programming being one of the best methods in distributed computing that can improve a system's performance (Maata et al., 2018). The implementation of client server concept using socket programming will allow the chatting features more efficiency and effectiveness of the communication process. Its implementation will also allow the server to connect and exchange messages successfully and with security (Bhatt & Bindal, 2020).

5. CONCLUSION

In conclusion, this project has successfully implemented the client-server concept using socket programming in the e-aduan portal. The project also has enhanced the functionality and performance of the portal by establishing a distributed system architecture that enables seamless communication between clients and servers successfully. By employing socket programming and a distributed system architecture, the portal can handle multiple client requests simultaneously, enabling faster response times and improved overall performance. This can be accomplished by implementing appropriate socket management and error handling, as well as testing and evaluating the performance of the e-aduan portal in detail.

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LORA NETWORK TESTBED PERFORMANCE EVALUATION IN UITM PERLIS

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ABSTRACT - Wireless networks are crucial in today's connected world, where IoT devices are being implemented in many environments such as smart homes, smart offices, and smart cities. LoRa (Long Range) are designed for IoT communication where devices enable connection between remote end nodes and LPWAN for analytic applications. LoRa Technology offers a promising alternative, providing low-power with long-range wireless data transmission. For a LoRa Network to be deployed, a performance LoRa analysis needs to be executed in the campus in order to measure received signal strength (RSS) and signal-to-noise ratio (SNR) for its usefulness. The research objectives are to set up the LoRa testbed in both indoor and outdoor environments and analyze the network performance. The LoRa testbed consists of a gateway and a few nodes that were deployed around the campus. The results for the indoor environment on three floors show higher RSS on the first floor, indicating acceptable signal coverage with the range of SF7 to SF12, whereas in outdoor only 15% coverage compared to the overall buildings except plantation area in UiTM Perlis.

Keywords: LoRa, LPWAN, RSS, SNR.

1. INTRODUCTION

LoRa is a wireless communication technology that operates on unlicensed frequency bands, allowing for cost-effective deployment and flexible network setup. It employs a spread spectrum modulation technique, enabling reliable communication in challenging environments with interference and obstacles. The main advantages of LoRa are its long-range capability and low power consumption. These features make it well-suited for applications requiring extended connectivity, such as smart cities and smart homes.A typical LoRa network consists of three components: end nodes, gateways, and network servers. End nodes are devices that collect data and transmit it to gateways. Gateways act as intermediaries between end nodes and network servers, which manage the network, process data, and facilitate communication with external systems.

2. METHODOLOGY

The method involves a LoRa Network testbed that consists of a gateway and a few nodes that were deployed around the campus. Various tests and measurements were conducted to evaluate the network performance in both indoor and outdoor environments. Performance evaluation involved collecting data on key metrics such as signal strength (RSS), signal-to-noise ratio (SNR).

3. RESULTS AND DISCUSSION

The research results indicated that the LoRa network demonstrated reliable connectivity and robust signal strength across the campus. The network was able to provide good coverage, allowing for effective communication and connectivity within the campus premises. Furthermore, the analysis of the data revealed that the performance of the LoRa network varied in different scenarios as shown in Figure 1 below.

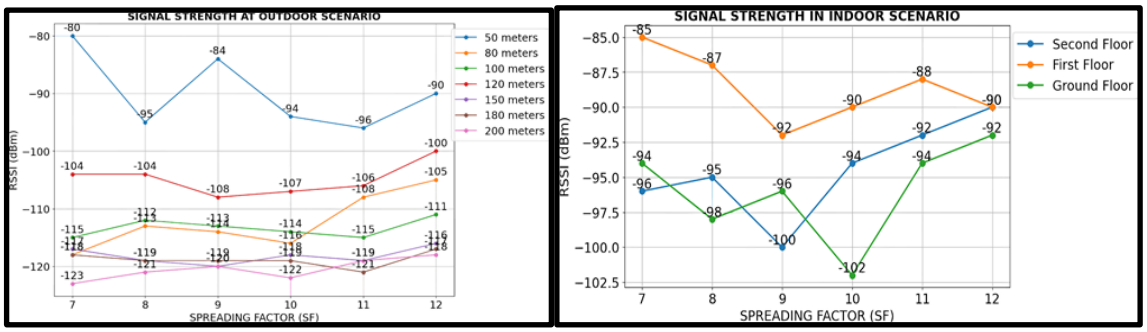

Figure 1 Signal Strength in Different Scenarios

4. NOVELTY OF RESEARCH / PRODUCT

This research is distinctive for its thorough evaluation of LoRa network performance in specific environments. Unlike previous studies that examined various applications, this research specifically focuses on how spreading factor selection affects coverage, packet loss, and signal strength. Santos et al. (2019) stressed the importance of choosing the right factor, while Muzammir et al. (2019) favored SF7 for better signal strength. Furthermore, Villiam et al. (2019) explored LoRa technology's robustness in dense urban areas and forests.

5. CONCLUSION

This research was to set up a LoRa Network testbed in UiTM Perlis that consists of a LoRa gateway and a few LoRa nodes. Next, the research has obtained new performance metrics such as RSS and SNR. The coverage areas that were covered by the LoRa Network is approximately 15% from the overall building areas. Nevertheless, the results for indoor coverage and outdoor with 200 meters radius are significant for any IoT devices implementation in UiTM Perlis Campus.

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SECURED CHAT-API WITH E2EE TECHNIQUES AND WEBSITE ANALYSIS USING PERFORMANCE MONITORING SOFTWARE

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ABSTRACT – Secured website chat has been a great approach to interact with potential new clients and provide users the assurance required to communicate through the business. A secure chat API using E2EE techniques and Telegram API ensures high level security and privacy. AES-256 encryption provides efficient and fast encryption and decryption processes, enabling smooth communication. Performance monitoring by Super Monitoring and Google extension ensures impressive results. THis secure chat API website provides a secure and efficient platform for private communication.

Keywords: E2EE**,** AES-256, RSA, SuperMonitoring, loading time, response time, recovery time

1. INTRODUCTION

This study enhanced the use of E2EE techniques in Telegram API. The developed website will be added with a chat feature that can be directly sent to the recipient through Telegram-API that has been invoked into group chat. The encrypted information transmitted through the website chat is stored inside a database, MySQL. Then, the information went through decryption and sent through the Telegram API towards the recipient. The algorithm used in the encryption is AES-256 and RSA which has the highest rank of secured algorithm. The reason for using two algorithms is to compare the analysis result at the end of the project testing. The implementation of AES-256 algorithms is the final security measurement will be installed in this website chat along with a URL filter attached to the chat feature to filter any malicious link attached by the sender.

2. METHODOLOGY

The methods involved in this study are collecting data from the client regarding the need of secured website chat and implementing E2EE techniques which are AES-256 algorithms to encrypt the data sent by the client. Script writing is in Visual Code studio and openssl installer is used to get the encryption key for both AES-256 and RSA algorithms. The analysis results are compared using performance monitoring software attached with the website's URL.

2.1 System Design

The system is simply built with an interface using HTML language with several information regarding the sender and sent through Telegram-API towards the recipient. The information transmitted is encrypted and stored in a MySQL database. Then, the information is decrypted with the encryption key and sent to the recipient Telegram account. The message sent by the sender will go through the URL filter if there is any URL detected attached to the message sent to ensure the recipient does not click on any malicious link.

3. RESULTS AND DISCUSSION

In this context, the result of loading time, response and recovery time based on different browser pages using monitoring software show that AES-256 algorithm implementation is better than RSA algorithm implementation due to less work on converting the keys for encryption and less scripting load when executed.

The results show the lab and field data retrieved from monitoring software called SuperMonitoring for two different implementations between RSA and AES-256 on website chat. Hence, the comparison between RSA and AES-256 in terms of loading, recovery, and response time are made according to the results report.

Table 1. Analysis result comparison for both algorithms

Components	AES-256	RSA
Average response time	Min. value: 0 min (number of events = 3) Max. value: 0 min (number of events = 9)	Min. value: 0 min (number of events = 1) Max. value: 0 min (number of events = 3)
Average loading time	Min. value: 3.53s Max. value: 9.89s	Min. value: 4.93 Max. value: 11.6s
Average recovery time (RTO) Uptime% - downtime%	28.544%	35.728%

The best number of events executed per 0 minute should be 0 minute per 15 events (Sharma, 2020), however, the nearest result obtained should be AES-256 algorithm average response time which is 0 minute 9 events.

4. NOVELTY OF RESEARCH / PRODUCT

Our research project focuses on developing a highly secured chat API using AES-256 encryption. This project aims to address the concerns of privacy and data security in online communication platforms. By implementing AES-256 encryption, which is widely regarded as one of the most secure encryption algorithms, we aim to provide users with a secure and private chat experience. This research project will contribute to the field by developing an efficient chat chat API that ensures end-to-end encryption, preventing unauthorized access to sensitive user data.

5. CONCLUSION

Overall, the project has achieved its objective of developing secured chat-API for developed website chat and exploring hybrid cryptography to increase security, expand database sizes to store more encrypted data, incorporating new features such as automatic generating of encryption keys.

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THREAT HUNTING USING SECURITY ONION IN VIRTUAL NETWORK

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ABSTRACT- This project focuses on applying threat hunting, a proactive cybersecurity strategy, within a simulated network and systems. The objectives are to actively look for and identify sophisticated threats or malicious behaviors that could have sneaked past traditional security measures. The project adheres to a methodical threat hunting framework that includes phases like planning and preparation, hypothesis creation, data collection, analysis and continuous improvement. This project was conducted using Security Onion tools such as Sguil and Kibana. As a result, the threat hunting project has shown its effectiveness in proactively identifying and reducing threats, lowering the network's risk exposure, and maintaining a strong cybersecurity defense against constantly changing threats. The outcome of this project is expected to improve threat hunting skills, enhance security posture, and reduce the time spent in the presence of attackers in order to proactively deter emerging threats.

Keywords: Threat Hunting, Security Onion, Sguil, Kibana

1. INTRODUCTION

The research project has two main objectives which are to analyze activities and traffic across the simulated network while also aiming to identify possible anomalies also discover yet-to-be-discovered malicious activity using Security Onion tools like Sguil and Kibana. The scope of the project involves utilizing Security Onion tools to analyze network-based artifacts, with a focus on threat hunting operations for simulated attacks such as malware server and reconnaissance attacks. To evaluate the system's effectiveness in detecting and mitigating these threats, the project employs techniques such as observing network activity, examining system logs, and utilizing data visualization tools. The outcome of this project is expected to improve threat hunting skills, enhance security posture, and reduce the time spent in the presence of attackers in order to proactively deter emerging threats.

2. METHODOLOGY

This project's methodology takes a multi-step approach to identifying and analyzing threats. The project begins by collecting relevant network logs and data from a variety of sources, including bro_conn, bro_files, snort, and others. For real-time monitoring and analysis, these logs are then given into the Sguil and Kibana platforms. The analysis concentrates on two distinct attack scenarios: malware server assaults and reconnaissance attacks. The project makes use of the Sguil platform's advanced alerting features to find and look into suspicious activity connected to certain attack types. The data visualization tool Kibana is also used, enabling in-depth investigation of network traffic patterns and the detection of possible threats.

3. RESULTS AND DISCUSSION

Results of the project include IOC match visualizations, connections to network components, and assessments of their effects on the organization. The comparison table of highlighting the key differences between Sguil and Kibana are shown in Table 1.

Table 1 Key differences between Sguil and Kibana

Key	Sguil	Kibana
Purpose	Network security monitoring and analysis	Data visualization and exploration
Functionality	Real-time alerting of network events	Visualize, search, and analyze data stored
Data Sources	Network sensors	Log files, databases
Alerting	Advanced alerting capabilities	Built-in alerting features
Network Focus	Primarily focused on network security analysis	Can analyze various data types beyond network security

4. NOVELTY OF PROJECT

Over the years, a number of studies have used different methods to perform threat hunting. The current project and the project described in the article "An Efficient Approach of Threat Hunting Using Memory Forensics" (Danish et al, 2020), differ in their focus, methodology, and tools used. The implementation of Sguil and Kibana forms a crucial part of the current project, enabling real-time monitoring, alerting, and analysis. On the other hand, the article's project focuses on implementing the isolation forest algorithm for cyber threat hunting within a specific environment.

5. CONCLUSION

In conclusion, the combined use of Sguil and Kibana in the project allows for the detection, analysis, and response to simulated attacks. Sguil assists in the identification of suspicious activities and investigation of attacks, while Kibana's visualization capabilities enable better understanding of network traffic patterns, log data, and IOCs for improved situational awareness and proactive defense.

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CHILD-CYBERCARE MOBILE APPLICATION FOR SECURED BROWSING

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ABSTRACT- Mobile phone use has skyrocketed worldwide over the past decade. Due to parental disconnection, youth internet addiction is rising. Internet addiction is more likely in children who feel unsupervised, have their privacy violated, or have poor parent-child relationships, according to research. Parental supervision, involvement, and meaningful connections reduce these risks and protect children from excessive internet use. To protect young children, especially those under 10, this project will create a mobile app. Parents can track their children's online activity, detect unwanted Keywords in Google searches, and receive pop-up alerts. The app's search history lets parents address concerns. SQLite manages keyword lists and search history efficiently. Usability testing and user feedback showed app effectiveness. Participating in their children's online activities teaches responsible digital behavior and creates a safe and supportive online environment.

Keywords: Unwanted Keywords detection, Parent, Child, Google Search, SQLite Database.

1. INTRODUCTION

Mobile phones enable instantaneous communication and online activities. Smartphones are introduced to children early, raising concerns about addiction and unhealthy use. Essential mobile apps are available in app stores. Children can learn on the Internet, but unsupervised use is dangerous. Age-appropriate, engaging content is needed for kids to enjoy the internet. Smartphone and internet dangers are underestimated by parents. Children need safe browsing to avoid viewing harmful content. This project will create a secure browsing mobile app for parents to monitor and detect unwanted Keywords in their children's online activity. Parents can look for inappropriate Keywords in their kids' search history.

2. METHODOLOGY

This project uses the seven-phase waterfall SDLC model. Planning used journal articles and Google Scholar. ACM Digital Library, ScienceDirect, and IEEE Xplore collected and analyzed project requirements. Canva, Lucidchart, and Diagram.net visualized system architecture, database design, and user interface layout during the design phase. The Android Studio emulator tested functionality, Apptim tested network performance, and Google Form tested usability and user acceptance. Java and Android Studio were used for development. The documentation phase recorded the project's results, while the maintenance phase used Android Studio to fix bugs.

3. RESULTS AND DISCUSSION

During the application development, functional testing yielded exceptional results, with a 100% success rate. Usability testing with 15 parent respondents resulted in an average satisfaction rating of 4.1 out of 5. User Acceptance Testing (UAT) with five experts provided an average rating of 3.6 out of 5 for design and user interface. Network performance testing demonstrated low average download and upload sizes of 0.19 MB and 0.01 MB, respectively. Figure 1 below indicates the comprehensive testing conducted during the development process.

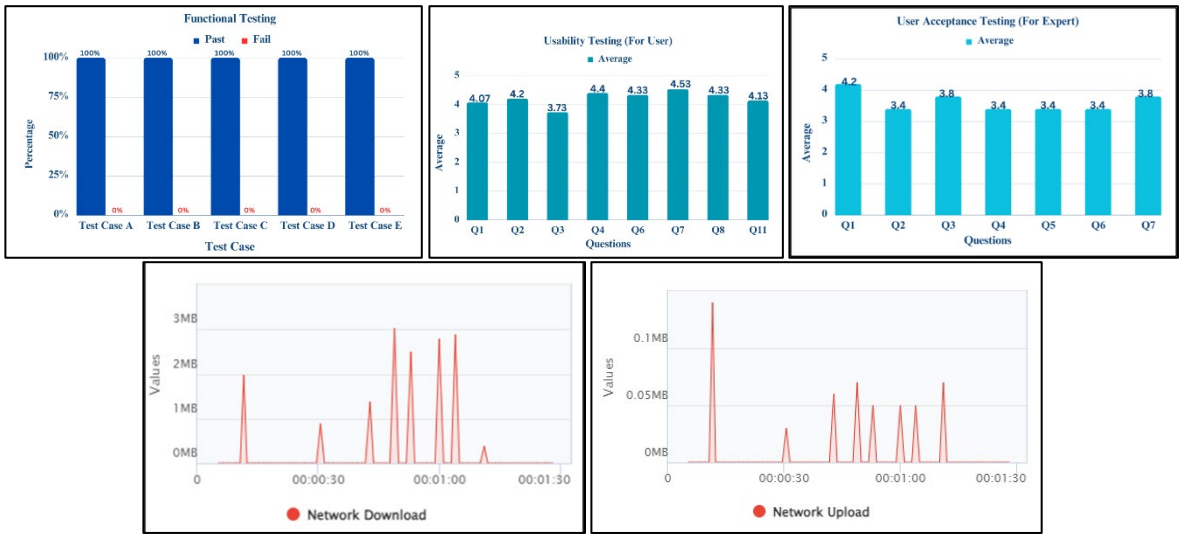

Figure 1 Functional, Usability, User Acceptance, Network Performance Testing

4. NOVELTY OF RESEARCH / PRODUCT

This project's novelty lies in focusing on the online safety of children under 10 years old, a group often neglected by existing parental control apps. The Child-CyberCare app offers unique features like keyword detection during Google searches within the app, promoting parental supervision. It empowers parents to be actively involved in their children's digital lives, fostering responsible online behavior. By addressing specific needs, it fills a gap in existing solutions for their safety and well-being.

5. CONCLUSION

The Child-CyberCare app ensures online safety for young children by enabling parental monitoring and keyword detection on Google Search. It underwent comprehensive testing and had a user-friendly interface. The app fills a crucial gap in parental control solutions for younger children, contributing to a safer digital environment. Future work may involve enhancing functionality and collaborating with educational institutions for responsible digital behavior.

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DOS ATTACKS DETECTION USING SNORT IN VIRTUALIZED ENVIRONMENT BY USING GNS3

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ABSTRACT - This project focuses on the detection of Denial of Service (DoS) attacks using Snort, an open-source intrusion detection system, within a virtualized environment created using GNS3, a network simulation platform. The primary objective is to set up an isolated network that simulates DoS attacks on Linux and Windows hosts, allowing for the analysis of host behavior under these attacks. This is achieved by consuming a stream of request records from multiple servers using an Intrusion Detection System (IDS). The project also aims to demonstrate the network behavior under DoS attacks with and without security measures in place. Through the implementation of Snort, GNS3, and Wireshark, the project evaluates the effectiveness of these tools in detecting and mitigating DoS attacks, while also monitoring performance metrics such as connectivity tests, CPU usage of the victim, and throughput and packet drop rates. The outcomes of this project contribute to enhancing network security and provide valuable insights into the detection and evaluation of DoS attacks in a virtualized network environment.

Keywords: DoS attacks, Snort, GNS3, Wireshark, Virtualized environment

1. INTRODUCTION

This research aims to set up an isolated network using GNS3 to simulate DoS attacks on Linux and Windows hosts. The project involves analyzing the behavior of the hosts under DoS attacks by using an IDS and a stream of request records from multiple servers. It also includes analyzing host behavior with and without security measures, demonstrating network behavior, and monitoring performance during DoS attacks. The project scope includes the use of three PCs, implementation of Hping3, Snort, and Wireshark, and the deployment of a firewall for prevention. By enhancing the security of personal computers through the implementation of an IDS, this project contributes to the understanding and mitigation of DoS attacks in a virtualized network environment.

2. METHODOLOGY

An isolated network was set up using GNS3, and three PCs were configured to simulate various roles, including attacker and victims. The project utilized Hping3 as the attacking tool, Snort as the Intrusion Detection System (IDS), and Wireshark to analyze and monitor network behavior across different operating systems for Windows and Ubuntu. Furthermore, the deployment of a firewall for prevention was discussed. Consequently, the testbed was successfully established and is now ready for use.

3. RESULTS AND DISCUSSION

The experimental results can be divided into two scenarios. The first scenario evaluates the performance of the Snort IDS in Windows and Ubuntu operating systems during TCP DoS attack without any additional defense mechanisms. The second scenario evaluates the performance of the Snort IDS in Windows and Ubuntu operating systems during UDP DoS attack without any additional defense mechanisms. The third scenario assesses the performance of the Snort IDS in Windows and Ubuntu with the presence of a firewall as a defense mechanism. The Wireshark results show the captured network traffic before and during the DoS attacks. The performance analysis of Snort focuses on throughput and dropped packet rates for TCP and UDP flooding attacks, comparing the performance between Windows and Ubuntu. As shown in Figure 1, Snort performs better under a TCP DoS attack in Ubuntu compared to Windows, achieving a higher packet capture rate per second, and Ubuntu exhibits a smaller drop packet rate compared to Windows. On the other hand, as depicted in Figure 2, Snort performs better under a UDP DoS attack in Windows, exhibiting a higher packet capture rate per second, and a lower number of dropped packets compared to Ubuntu. The findings demonstrate the effectiveness of Snort in different operating systems.

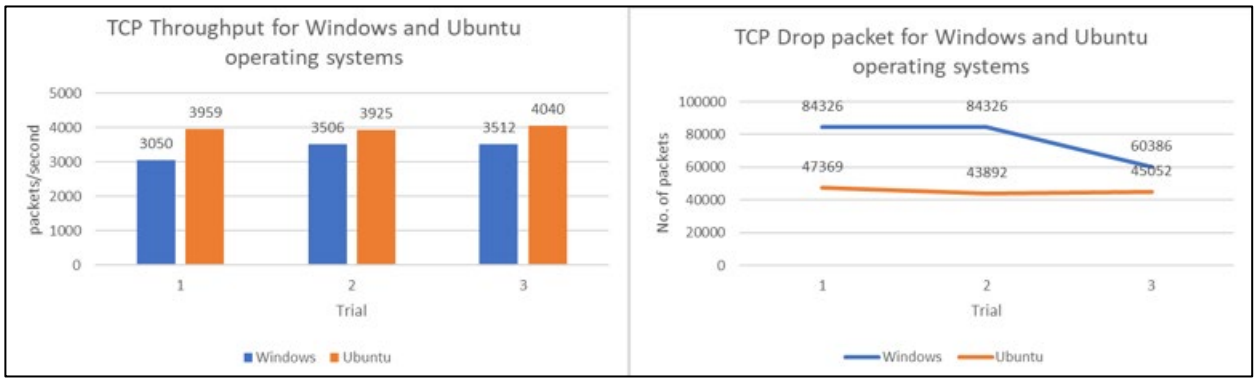

Figure 1. Throughput and Drop packet for TCP for both Windows and Ubuntu operating systems

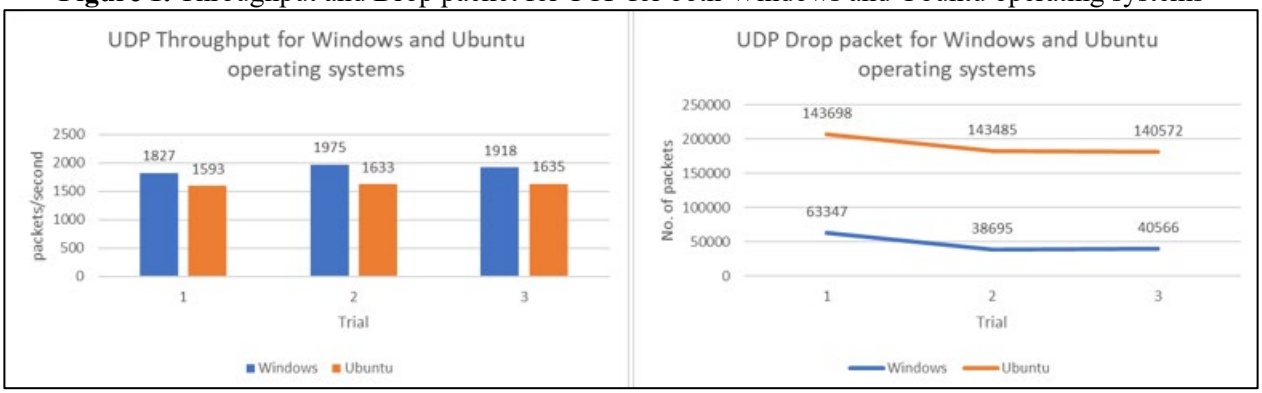

Figure 2. Throughput and Drop packet for UDP for both Windows and Ubuntu operating systems

In the third scenario, after implementing the firewall, no throughput and packets were dropped for Windows indicated that no attacks successfully penetrated the network. The packet drops and throughput for Ubuntu were lower, suggesting that the firewall successfully acted as a defense mechanism.

4. CONCLUSION

The conclusion section summarizes the key findings of the research. It reiterates the objective of the project to set up an isolated network for simulating DoS attacks and analyzing host behavior. The conclusion emphasizes the importance of implementing an IDS, analyzing network behavior, and monitoring performance during DoS attacks. The research contributes to the understanding and mitigation of DoS attacks in a virtualized network environment, ultimately enhancing network security.

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ANALYZING THE PERFORMANCE OF INTEGERS BASED TEXT STEGANOGRAPHY PROTOTYPE

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ABSTRACT – Information security is the technique of preventing digital data from being accessed by unauthorized parties, being corrupted, or being stolen at any point in its lifecycle. Information security can be divided into two categories; Cryptography and Information Hiding. There are two types of information hiding, which are watermarking and steganography. This research is focusing on steganography, which is a technique that involves encrypting data inside multimedia files, sometimes known as cover files, to hide the existence of sensitive information. The hidden information can only be accessed and retrieved by the intended receiver, who is aware that it is included in the cover file. Within a range of multimedia files, including music, video, and photos, the steganography approach can be applied. The objective of this research is to develop a text steganography based on integers. It is also to identify the amount of hidden space when using a text cover file. Other than that, the performance of the developed text steganography prototype will be evaluated by the end of the research.

Keywords: Steganography, Data Hiding, Text Steganography, Hidden Message, Cover Text File

1. INTRODUCTION

Steganography is a method of hiding sensitive information by encrypting it within multimedia files, like images, videos, or audio. Only the intended recipient, who knows where the hidden message is located, can access and extract the information. Text steganography specifically hides secret messages within cover texts using linguistic rules, structure, and other characters. There are two types: word-rule based and feature-based. Word-rule based approaches use line-shift coding to hide messages vertically within the text, calculating positions based on distances between texts. Feature-based approaches alter letter size, form, and placement to make them less noticeable within the text structure. The cover text containing the hidden message is called stego text and is sent to the recipient, who can extract the message without others knowing.

2. METHODOLOGY

The development of the integers based text steganography prototype involved the design and implementation of text steganography specific in hiding the integers. Jupyter Notebook was used with Python language to create the prototype by implementing encoding and decoding hidden messages into the cover text file. The data entered was embedded in the cover text file and by decoding the hidden data, the user can retrieve the hidden message. Other than that, GUI was used to create interfaces for the text steganography. The user can easily use the prototype to create a stego file and send the important data to another person. The stego file contains important messages to receive by the receiver securely with interruption from the intruder.

3. RESULTS

As the prototype has been developed, the testing was done by encoding the hidden message into the cover text file. The testing began by inserting different numbers of input (integers) into the cover text file (.txt) to analyze how many integers can be hidden and where the hidden message has been encoded in the cover text file. The figure 1 below shows the comparison of the original cover text file and the cover text file that have 10 numbers of integers. It displays two cover text files: the left one is the original file (37,000 bytes), while the right one contains an encoded message. The hidden message consists of 10 integers (260 bytes) placed at the beginning of the text. The message is encoded as unreadable words to prevent unauthorized access and data theft.

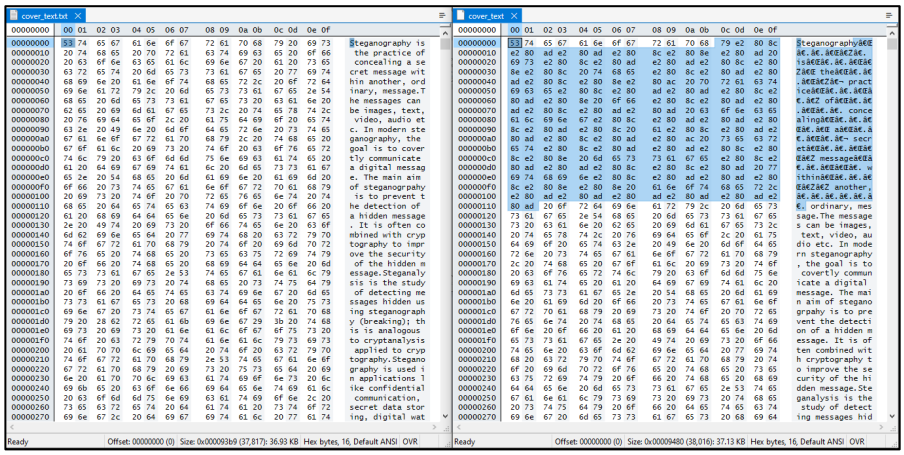

Figure 1. Comparison cover text file

4. NOVELTY OF RESEARCH / PRODUCT

As for the research on steganography, the text steganography that has been done was combining all the types of text. The integers based text steganography prototype was focused on embedding the integers into the cover text file. The performance of the prototype was analyzed to find the size of integers encoded into the text file. The capacity of the stego file and the hidden data was calculated. There is the difference of the size of the cover text file before and after embedding the hidden data which are without and with spacing between the digits.

5. CONCLUSION

What this study reveals is, the research of text steganography is a secure technique in transferring data from the sender to the receiver. With the hidden message that has been encoded, even when the attacker interrupts the transaction of the data, it cannot retrieve the important data. So that, the messages are well secured and the attacker would not be able to access and make alteration on the messages. The message will safely arrive to the receiver.

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ANALYZING THE PERFORMANCE OF ALPHABET BASED TEXT STEGANOGRAPHY PROTOTYPE

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ABSTRACT- Text steganography was a sophisticated technique used for covert communication, where information was concealed within seemingly innocuous text. This study aimed to introduce an alphabet-based text steganography prototype and conducted a comprehensive analysis of its performance. The objectives were twofold: firstly, to develop an advanced text steganography method that effectively utilized alphabets to hide sensitive information within innocuous text, and secondly, to evaluate the performance of the developed text steganography prototype in a thorough manner, with a focus on NST, embedding capacity, and robustness. Rigorous experimentation and analysis were conducted using diverse datasets and benchmarking tools. A wide range of text samples were gathered from different sources and genres to ensure representativeness and generalizability. The performance metrics, including NST, embedding capacity, and robustness, were quantitatively assessed to gain a comprehensive understanding of the prototype's capabilities and limitations. The outcomes of this study significantly contributed to the advancement of text steganography techniques, providing valuable insights for the development of secure and efficient covert communication systems. Future research could explore the integration of machine learning algorithms and advanced linguistic analysis techniques to further enhance the security and performance of alphabet-based text steganography. Overall, this study presented an alphabet-based text steganography prototype and provided a comprehensive evaluation of its performance, making a noteworthy contribution to the field of text steganography and enabling more effective covert communication methods.

Keywords: Text steganography, performance evaluation, NST, embedding capacity, robustness

1. INTRODUCTION

Text steganography played a critical role in ensuring information confidentiality in digital communication. The study addressed the challenges of limited text steganography options, linguistic complexity, and available empty space. The objective was to develop a prototype of alphabet-based text steganography that could securely hide information within text. The prototype employed embedding techniques to ensure the secrecy and integrity of the hidden data, utilizing alphabet characters as carriers. The performance of the prototype was evaluated through three analyses: NST, embedding capacity, and robustness.

2. METHODOLOGY

The alphabet-based text steganography prototype was developed through the design and implementation of a text steganography system. Different encryption algorithms were explored to safeguard the hidden information from unauthorized access or detection. The prototype utilized embedding techniques to conceal information within the text while preserving its readability and naturalness. The evaluation was conducted, assessing the NST, embedding capacity, and robustness of the prototype using predefined metrics.

3. RESULTS AND DISCUSSION

The performance of the developed text steganography prototype was evaluated by presenting and analyzing the evaluation findings. The NST was calculated to assess the effectiveness of the encryption technique and the system's vulnerability to different attacks. The embedding capacity, which determined the amount of hidden information that could be concealed without compromising readability, was estimated. Additionally, the prototype's resilience was evaluated by examining its resistance to various attacks and potential distortions.

3.1 TEXT ANALYSIS

The table and chart below show the text analysis for text input with and without space.

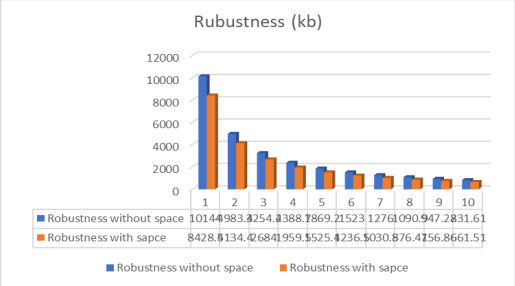

Figure 1: Comparison for Robustness

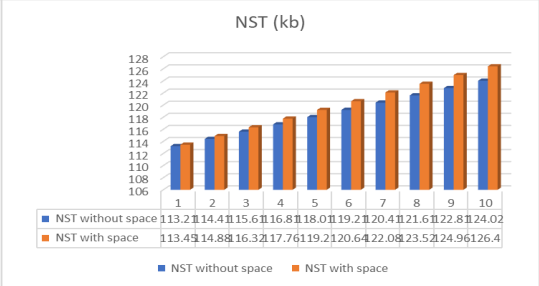

Figure 2: Comparison for Distribution of NST

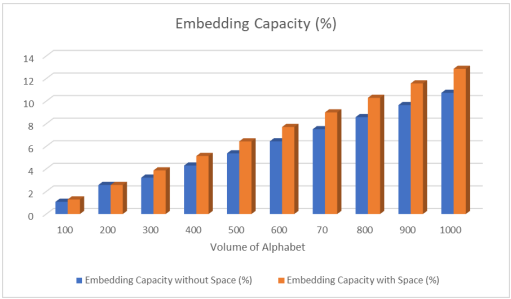

Figure 3: Comparison for Embedding Capacity

4. NOVELTY OF RESEARCH / PRODUCT

This project distinguished itself by focusing specifically on alphabet-based text steganography and utilizing .txt files as cover files. The performance analysis or metrics centered around three key aspects: NST, embedding capacity, and robustness.

5. CONCLUSION

In summary, the development and evaluation of the alphabet-based text steganography prototype provided valuable insights into its performance. The prototype demonstrated promising results in terms of NST, embedding capacity, and robustness. The findings from this research contributed to the progress of text steganography techniques, further improving secure communication in various domains.

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REMOTE MONITORING AND CONTROLLING OF LIGHTS USING IOT

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ABSTRACT - As technology advances and improves to benefit the environment, daily living has become significantly easier and more convenient. Our lives are becoming increasingly intertwined with the Internet of Things (IoT) as a result of the technological advancement. IoT is a network of physical objects embedded with sensors, software, and other technologies that connect to and exchange data with other devices and systems via the internet. Since humans are prone to forgetting things, it's tough to steer clear of this predicament. As a result, electricity is wasted and the problem of forgetting to turn off the lights is not addressed. The rising cost of electricity is a result of this predicament. Smart lighting is used to conserve energy. This study discusses about developing a prototype of smart lighting system using IoT. The system is supported by Blynk application and Arduino. A smart phone app will be used to monitor and manage all of a house or office's lights remotely.

Keywords: IoT, smart home, Blynk, Arduino, smart lighting system

1. INTRODUCTION

As technology advances and improves to benefit the environment, daily living has become becomes significantly easier and more convenient. Our lives are becoming increasingly intertwined with the Internet of Things (IoT) as a result of the technological advancement. This research aims to develop a prototype of remote monitoring and controlling of lights system which is smart lighting with the help of Arduino UNO, Arduino IDE and Blynk application as well as Blynk server. The objectives of the research are to develop a prototype of smart lighting system that able to control the lights remotely via smartphone using Arduino through Blynk application and to evaluate the functionality and network performance of the prototype. The research will be using ESP8266 WiFi module setup using Arduino Uno. The Blynk server will monitor and control the lighting system.

2. METHODOLOGY

There are 5 phases involved in developing the project which are initiation phase, planning phase, development phase, evaluation phase and documentation phase. The most critical and significant phase is development phase. This is where the prototype is developed. During this phase, hardware and software are acquired in order to develop the proposed prototype of smart lighting system. Then, the assembled prototype will be tested its functionality as a smart lighting system.

3. RESULT AND DISCUSSION

The prototype of a smart lighting system was successfully developed. The user can remotely control and monitor the lights using smart handphone through Blynk application. The functionality of the prototype also being tested to ensure that it can function well. The network performance of the prototype also is tested. There are several upgrades that can be done in order to improve the functionality of the prototype.

4. NOVELTY OF RESEARCH / PRODUCT

There are various of research has been done regarding smart lighting system especially in regards of smart home system. Previous research has been done to control LED through Internet based on NodeMCU with Blynk application (Asmawati et al., 2019). There is also a previous research regarding IoT smart lighting system for university classrooms (Montalbo & Enriquez, 2020). SOA and IoT principles to smart home lighting in a research by merging Raspberry Pi with Python programming, a web server (database) with PHP and Android programming with Java programming also had been done previously (Irawan et al., 2021).

5. CONCLUSION

The proposed prototype still lacking in various aspects and open to enhancement and improvement to make it a better system. The smart lighting system can be enhanced in order to create a more efficient and cost-saving environment.

Yet, the objectives of the research are successfully achieved.

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Extended Abstract for CS251

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WEB-BASED LEARNING FOR ADAB IN KELAS AL- QURAN DAN FARDU AIN (KAFA)

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ABSTRACT - Web-based Learning for Adab in Kelas Al-Quran dam Fardu Ain (KAFA) is anticipated to provide students and teachers with a simple internet-based learning platform. This technique may also be used to replace the outdated paper-based method. Web-based Learning for Adab in Kelas Al-Quran dam Fardu Ain (KAFA) will include interactive lectures, quizzes, and practice exams to assist students in preparing for the UPKK examination. The system will also offer a database of previous test questions and answers to acquaint students with the questions. Using Web-based Learning for Adab in Kelas Al-Quran dam Fardu Ain (KAFA) will also give teachers a novel method of instructing and engaging students.

Keywords: Kafa, web-based learning, outdated paper-based method, enhancing education

1. INTRODUCTION

KAFA, Kelas Fardu Ain, and Kifayah were established in 1990 by the Malaysian Islamic Development Department (JAKIM). KAFA education is set up for students aged 7 to 8 years old and a limited number of youngsters up to 12 years old. The class will run three (3) times weekly for almost three (3) hours daily. KAFA lessons are conducted by the KAFA curriculum developed by the Islamic Centre. In addition, several researchers have investigated the teaching and learning of KAFA to improve the learning system over time, for example, KAFA Classes in the Covid-19 pandemic phase (Yahaya, 2022). The researcher states that to strengthen the plan for virtual KAFA education by establishing an online learning policy to ensure that all parties play their assigned roles in achieving this goal.

2. METHODOLOGY

ADDIE model is a step-by-step framework used by interface designers, developers, and trainers to ensure systematic and regulated course development and learning. This method will be applied in this study because it has proven an effective due to its high-quality design, clear learning objectives, carefully structured content, controlled workloads for teachers and students, pertinent student activities, and assessment strongly linked to desired learning outcomes. Since it is methodically built with the theoretical basis of learning design, this methodology is applicable towards building a web-based with highlighting an interactive online learning. It is also a great management tool, enabling the creation and development of many courses to a consistent level.

3. RESULTS AND DISCUSSION

The primary objective of this study was to evaluate using usability and functionality of testing for the Web- based Learning for Adab in Kelas Al-Quran and Fardu Ain (KAFA) system to develop a form template used by teachers, school staff, and parents. In addition, an online questionnaire using google form method was conducted with the participation of 33 individuals. The majority of respondents, 33.3%, self-identified as teachers, according to the study's findings. They were followed by 33.3% of the participants who were school staff. In addition, 25.8% of respondents were students, while the remaining percentage represents individuals from various professions. Besides, the majority at respondents who answer the questionnaire at the age of 20 till 30 years old.

4. NOVELTY OF RESEARCH / PRODUCT

This project benefits students, teachers, school management, and parents. For the student, the learning process will be easier to understand each topic taught using visualization techniques. Students can achieve all the activities in KAFA, including lecture notes, tests, quizzes, exercises, examination results, and the level of their achievement or

performance during the period of study. For the teacher, this system can facilitate teachers' affairs in teaching and giving assessments because it is available in the system. Teachers can provide and prepare lesson planning such as lecture notes, tests, quizzes, exercises, as well as the attendant, scope of the study, for students, teachers, and KAFA management. These activities can ensure teachers improve their teaching methods to build effective teaching for students, the schools. Parents can monitor their children's education based on the syllabus, homework, tests, results, and performance. Furthermore, parents can get information regarding KAFA education as well.

5. CONCLUSION

In conclusion, the Web-based Learning for Adab in Kelas Al-Quran and Fardu Ain (KAFA) is developed using the earlier studies examined in the section on the literature review. This web-based resource can assist with various learning and teaching issues, including technological advancements and traditional teaching methods. After the project's conclusion, it was discovered that all objectives enumerated at an earlier stage of the project's development had been successfully attained.

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WEB-BASED APPLICATION FOR HARUMANIS IN UITM PERLIS

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ABSTRACT - This project aimed to develop a comprehensive web-based application for Harumanis mangoes at UiTM Perlis, focusing on providing information, facilitating online ordering, and enhancing the overall user experience. The research findings revealed a moderate level of awareness among students and staff regarding Harumanis mangoes, but a strong need for more information and a convenient platform for accessing such information and placing orders. The web application addressed these needs by offering a user-friendly interface, intuitive navigation, and features like order tracking and notifications. The discussion highlighted the potential of the web application in promoting Harumanis mangoes as an agro-tourism product in Perlis. The project utilized the Scrum framework for software development, emphasizing iterative and flexible approaches. The implementation of the web application successfully met the objectives by increasing awareness, providing convenient access to information, and enhancing the overall user experience. The project contributes to the accessibility and promotion of Harumanis mangoes, serving the UiTM Perlis community and mango enthusiasts alike.

Keywords: Harumanis, Web application, Online ordering

1. INTRODUCTION

The Harumanis Mango, also known as Magnifera Indica, is a highly sought-after fruit in Malaysia, particularly in the northern state of Perlis. It is a tropical fruit that thrives in hot and humid climates, and it is known for its sweet and fresh taste with a hint of acidity. The cultivation of Harumanis Mango in Perlis began in 1982 as part of a government-funded program, and it has since become an iconic agro-tourism product in the region. UiTM Perlis, one of the universities in Perlis, has also embraced the cultivation of Harumanis Mango on its campus, allowing students and staff to purchase the fruit directly (Uda, Gopinath, Hashim, Hakimi, Anuar , (2020). However, there is currently no website providing information about Harumanis at UiTM Perlis, leading to the need for a web-based application that offers details about the product, its origins, and the orchard. This application will also streamline the ordering process, replacing the existing Google form system. The proposed model will utilize the Laravel software development framework and PHP web application framework to create a database-driven website that caters to the needs of staff, students, and the management of Harumanis at UiTM Perlis, ultimately enhancing the accessibility and convenience of purchasing and ordering the Harumanis mango and its products.

2. METHODOLOGY

This study utilizes the Scrum framework as a research framework. Scrum is an agile and lightweight methodology widely used in software product development, as well as in other fields such as finance and research (Singhto & Phakdee, 2017). It emphasizes iterative and flexible approaches, with the development process organized into short, time-boxed intervals called sprints. During sprint planning, the product owner defines the sprint goal based on customer value, and the development team strategizes on how to achieve it. Daily Scrum meetings synchronize operations, and the sprint review showcases completed work. Sprint retrospective identifies process improvements. Scrum offers advantages such as fast-paced and cost-effective development, continuous feedback, and a focus on high-priority requirements. It is considered suitable for complex projects and individual productivity enhancement.

3. RESULTS AND DISCUSSION

The findings of this project indicate a moderate level of awareness among students and staff at UiTM Perlis regarding Harumanis mangoes, but a strong need for more information about the fruit and its cultivation. Participants expressed a desire for a convenient and accessible web application to access information and place orders online. The discussion highlights the significance of the web application in meeting these needs and improving the overall user experience. By offering a user-friendly interface, intuitive navigation, and features like order tracking and notifications, the web

application can enhance awareness, engagement, and convenience for Harumanis mango enthusiasts. Furthermore, the application has the potential to promote Harumanis mangoes as an agro-tourism product in Perlis, showcasing the orchard and its unique features. Developing a comprehensive web application that addresses these findings will effectively serve the UiTM Perlis community and contribute to the promotion and accessibility of Harumanis mangoes.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of the proposed Harumanis web application lies in its specific focus on providing information and facilitating online ordering and purchasing for Harumanis mangoes at UiTM Perlis. While there are existing websites and applications for various products and services, there is currently no dedicated platform for Harumanis mangoes at UiTM Perlis. The web application will serve as a centralized hub for all information related to Harumanis mangoes, including details about the product, its origins, the orchard, and any related activities. Additionally, the application will streamline the ordering process by replacing the current Google form system, allowing customers to easily check the status of their orders and providing the management with better order tracking capabilities. This specialized focus on Harumanis mangoes at UiTM Perlis distinguishes the web application from generic e-commerce platforms and enhances the accessibility and convenience of purchasing and ordering this specific product.

5. CONCLUSION

In conclusion, this project successfully developed a web-based application for Harumanis mangoes at UiTM Perlis. The application addressed the need for information and online ordering, improving the user experience and accessibility for students and staff. By promoting Harumanis mangoes and streamlining the ordering process, the project contributes to the promotion and enjoyment of this iconic fruit in Perlis.

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WATER pH LEVEL MONITORING USING MOBILE APPLICATION INTEGRATED WITH INTERNET OF THINGS USING pH SENSOR

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ABSTRACT - This study presents the development of a pH monitoring system integrated with a notification system using an Arduino microcontroller. The system is designed to measure the pH levels of a solution and send notifications to the user in the event of any deviation from the pre-set threshold. The system consists of a pH sensor, an Arduino ESP8266 microcontroller, and a notification system that sends alerts through telegram. The pH sensor is interfaced with the Arduino ESP 8266 microcontroller, which processes the sensor data and sends it to the database. The database then sends the appropriate notification to the user based on predefined rules or thresholds. The system is designed to be low- cost, easy to use, and customizable to meet the specific needs of the application. The system is suitable for monitoring pH levels in various agriculture, aquaculture, and many others. The system is designed to ensure real-time monitoring, data analysis, and control of the pH level; it is aimed to improve the efficiency and sustainability of the process being monitored. This project aims to incorporate the use of IoT and telegram applications to deliver the notification about the quality of water. By integrating both IoT and telegram applications, people with phones have easy access to all data about the quality of water.

Keywords: Monitoring, pH, Notification

1. INTRODUCTION

The integration of Arduino microcontrollers in pH level monitoring systems is a recent advancement in pH measurement technology. The main advantage of using an Arduino for pH monitoring system is its ability to connect with multiple sensors and other components, which enables the creation of flexible and personalized systems that can be adapted to the specific needs of the application. The Internet of Things (IoT) is a network of physically linked electronic devices that interact with one another and other devices in ways other than machine-to-machine (M2M) communication through the Internet. (S. A. Hamid, 2020). Due to its versatility and low cost, Arduino is a preferred choice for pH monitoring systems in various industries. Freshwater is the most valuable natural resource on the earth, yet it is also vulnerable to contamination, necessitating real-time monitoring. Freshwater resources may be monitored in real-time using a system powered by the Internet of Things (IoT). Moreover, both pH and alkalinity tests should always be performed on irrigation water. This is crucial because high alkalinity has a profound impact on the fertility and nutrient content of growth media. (Cox, D. 2017)

2. METHODOLOGY

This research used functionality testing to determine whether it worked well or not. In functionality testing, the pH sensor was tested three times by changing the different types of liquid whether they could send an alert by telegram. Meanwhile, the LCD screens were tested based on the functionality of the data displaying the status of pH level. Moreover, the system performance has been tested by using different types of telecommunications services.

3. RESULTS AND DISCUSSION

In the analysis, users will no longer have to manually check the pH level of water because they will be notified right away through the Telegram app if pH becomes too high or Too low, and the system will automatically notify the user if the pH is below 6 or above 10.

4. NOVELTY OF RESEARCH / PRODUCT

In the context of pH level monitoring, IoT devices can be deployed to measure and transmit pH data wirelessly. This integration of IoT technology into pH level monitoring adds a new dimension to traditional monitoring methods. By

continuously monitoring pH levels, it becomes possible to identify fluctuations, anomalies, or critical conditions that may require prompt action. The use of IoT devices for pH level monitoring offers a more automated and efficient approach compared to manual sampling and testing.

5. CONCLUSION

The objectives of this research were successfully achieved. Based on the result, the notification was sent immediately to the user when pH level is too High or Low, and the user can request the data for pH level through telegram application.

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DEVELOPMENT OF DIGITAL TICKET RESERVATION SYSTEM FOR RECREATIONAL PARK IN PERLIS USING WEB BASED APPLICATION

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ABSTRACT – This project aims to develop a web-based digital ticket reservation system for a recreational park in Perlis which is in Gua Kelam. The current manual ticketing process in Gua Kelam presents challenges such as long queues and limited accessibility. The system is developed to create a user-friendly interface where users are able to book their tickets online without the hassle of manually buying it at the counter. Following the System Development Life Cycle phases, the requirements, design, development, testing, and deployment of the system is analyzed to produce a well-functioning website, ready to be used by the general public. A survey was carried out during the testing phase of the system and the findings resulted to a majority of people opting for a digital ticket reservation system rather than a manual system. Through user feedback and evaluation, this project is intended to enhance ticketing operations, reduce waiting times, and improve the visitor experience. Successful implementation will support Gua Kelam in terms of management and provide a seamless journey for visitors.

Keywords: ticket reservation, digital ticket, booking system, Perlis recreational park

1. INTRODUCTION

Tourism has been one of Malaysia's source incomes for decades due to many beautiful places here that are worth the visit. However, ever since COVID-19 started, a lot of the tourist attraction places face challenges and had to shut down. Organizers and managers of tourism places have tried to boost their business back by promoting their places after the COVID-19 cases had decreased. The depreciation of the Malaysian ringgit has attracted more tourists, opening a new chance for the tourism sector to shine again. One of Malaysia's attraction places which is Gua Kelam in Perlis, is not excluded from this opportunity. Although people have started to visit Gua Kelam, a new problem arises. Gua Kelam only has a manual buying system to buy their ticket. Visitors have to pay at the counter on the day that they arrived, so this leads to a long queue and a time-consuming process. Due to this issue, the idea of a digital ticket reservation system comes into light as it can solve the problem. The website is developed using a web-based application and is accessible by the public, without the need to login every single time. Customers who want to book their tickets can simply fill in the form on the website and all the details will then be sent back to the customer for them to check on their booking details. After filling in the form and booking their ticket, a Quick-Response (QR) code will be displayed so that the customers can make their payment. QR codes are widely utilized in marketing and advertising campaigns as they are way easier to be spread around with information they want to lay out. (Kaspersky, 2020). Not only does this system is fast, but it also solves the long queue issue where people do not have to wait boringly in line. This system also helps the management of Gua Kelam to track the tickets bought online. It is a win-win situation for the both the visitors and staff of Gua Kelam.

2. METHODOLOGY

The methodology used to develop this project is the Software Development Methodology, also referred to as System Development Methodology, a framework used for organizing, scheduling, and managing the process of creating an information system no matter if it is web-based or mobile application. The phases in Software Development Methodology are requirement, design, development, testing, and deployment. The hardware requirement used for this project is a Dell laptop and the software requirements are Visual Studio Code as the software to write source codes, XAMPP as the local web server, PHP, CSS, MySQL database, and mail services for customers to check their booking details.

3. RESULTS AND DISCUSSION

According to the usability and functionality test, majority of the users have agreed that the digital ticket reservation system is an easy system to use, without any difficulties of trying to understand the flow of the system. The results showed that the website is pleasing to navigate around because of the user-friendly features, with intuitive navigation and clear instructions. Users were able to easily navigate through the system, select desired dates and time slots, and complete the reservation process without hassle. It also received positive feedback because it is a desired system where users do not have to manually buy tickets by queuing for a long time. Users reported quick response times and minimal delays throughout the reservation process, contributing to a smooth and efficient user experience. This aspect significantly improved the overall efficiency of ticket reservations system. Feedback from users indicated a high level of satisfaction with the digital ticket reservation system. The system's usability, efficiency, error handling, and customization features collectively contributed to an enhanced user experience. Users expressed their preference for using the digital reservation system over traditional manual ticketing processes, emphasizing the convenience, time-saving benefits, and seamless booking experience.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of this research lies in the development of the first-ever digital ticket reservation system specifically designed for purchasing Gua Kelam tickets. While digital ticket reservation systems are not entirely new to the tourism industry, this particular system caters to the unique needs and requirements of Gua Kelam, offering visitors a seamless and convenient way to reserve their tickets online. By implementing this innovative system, the administrative processes of ticket management can be streamlined, reducing manual efforts, and improving overall operational efficiency. Furthermore, the introduction of this digital solution to Gua Kelam opens new possibilities for future advancements in ticketing systems, setting a precedent for other attractions to adopt similar digital reservation technologies to enhance visitor experiences and optimize ticketing operations.

5. CONCLUSION

In conclusion, the digital ticket reservation system for Gua Kelam has been proven to be beneficial, not only to the visitors of Gua Kelam, but also to the management team of Gua Kelam. For future works, one of the main potential areas for improvement is creating a mobile application that further upgrades convenience and accessibility where users can make reservations directly from their smartphones.

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WEB-BASED UiTM BARBERSHOP MANAGEMENT SYSTEM

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Abstract - Web-based UiTM Barbershop System is a web-based application that seeks to optimize the operations of barbershops by providing barbers and proprietors with an intuitive framework for appointment scheduling and efficient administration. The waterfall is a sequential software development approach used to construct the project. To ensure the system's efficacy, functionality, and usability, a sample of 30 respondents participated in testing. This evaluation assessed the system's capabilities, performance, and user interface. The respondents' responses were analyzed to validate the system and make any necessary adjustments. Based on the received feedback, the project's objective was effectively met. Respondents deemed the Web- based UiTM Barbershop Management System genuine, functional, and usable. This demonstrates that the system can optimize barbershop operations and provide a convenient platform for patrons and barbers. By implementing the Barbershop Management System and adhering to the Waterfall methodology, the project demonstrates a systematic approach to software development, ensuring that the project objectives are met, and the final product is validated by user testing. This implementation's success paves the way for enhanced operations and increased barbershop administration efficiency.
Keywords: barbershop, appointment, web-based application

1. Introduction

This project intends to build a Web-based UiTM Barbershop Management System using PHP. The system will provide students, staff, and administrators with an expedient platform for managing barbershop operations. The project also includes evaluating the Web-Based UiTM Barbershop Management System through functionality and usability testing. This testing phase ensures the system is user-friendly, accurately performs its intended functions, and meets user requirements. The testing process's feedback will be collected and analyzed to determine which areas require enhancement or refinement.

2. Methodology

The researcher utilized the Waterfall Model as the project development methodology and developed this system using the System Development Life Cycle (SDLC). The technique included the System Planning, Analysis, Design, Implementation, Testing, Maintenance, and Documentation phases. During the initial system planning phase, it was necessary to conduct preliminary research, identify the project's problem, objectives, scope, and significance, and conduct a literature review based on journals and related works. The subsequent phase is system analysis, which identifies the necessary hardware and software for development. The subsequent step is to initiate the system design phase, characterized by creating the entity relationship diagram (ERD) used in database design to construct an overview of data structures. The system implementation phase follows: writing the program code, constructing the system interfaces using Sublime, and storing the data in MySQL using phpMyAdmin. User-focused usability and functionality evaluations are conducted during the testing phase. The documentation phase concluded with an evaluation of the project's results and a discussion of its faults.

3. Results and Discussion

This study's primary objective was to evaluate the Web-Based UiTM Barbershop Management System by evaluating its functionality and usability. Google Form was used to administer an online questionnaire to 30 individuals to collect data for evaluation purposes. The purpose of the questionnaire was to assess the opinions and experiences of the participants regarding the system's functionality and usability. The Likert scale, which ranges from 1 to 5, was used to measure responses, with options ranging from "strongly disagree" to "strongly agree." The outcome of functionality

and usability testing attained to achieve the objective.

4. Novelty of Research/Product

The Barbershop Management System provides online appointment scheduling, which provides consumers with a seamless and convenient booking experience. Customers can easily access the system from any internet-connected device and select their desired appointment time intervals. This saves consumers and barbers time and effort by eliminating the need for phone inquiries or walk-ins. A web-based system stores and backs up customer and appointment information in a secure manner. This substantially reduces the risk of data loss compared to manual or paper-based systems, protecting customer data and maintaining the confidentiality of sensitive information. Online appointment scheduling increases consumer satisfaction and loyalty due to its convenience. Customers can plan their visits and receive reminders and notifications promptly if they can readily reserve their preferred time slots. This streamlined process reduces wait times and enhances efficiency, resulting in a more satisfying consumer experience.

5. Conclusion

In conclusion, this system helps the user to make appointments more easier and business owners run their operations more efficiently. In addition, all the objectives of this project, which was to develop Web-Based UiTM Barbershop Management System using PHP and to evaluate Web-Based UiTM Barbershop Management System using functionality and usability testing was successfully completed and achieved.

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ARAU RENTAL HOUSE WEB BASED SYSTEM

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Abstract - The Rental House Web-based System is an innovative platform designed to streamline and enhance the process of renting residential properties. An overview of the features, advantages, and developments of web-based systems in the context of managing rental properties is provided in this abstract. The Rental House online-based System makes use of online technology to give landlords, property managers, students and tenants access to a comprehensive and user-friendly interface. The system has a number of features that are all accessed via a web browser, including property listings, tenant applications, lease administration, rental payments, and maintenance requests. Traditional paper-based processes are no longer necessary, which lowers administrative costs and increases productivity. In terms of managing rental properties, web-based technologies have advanced significantly in recent years. They enable stakeholders to be informed and engaged at all times by providing real-time access to property information, financial activities, and communication channels. Additionally, the system's built-in data analytics capabilities can give landlords and property managers useful insights, enabling data-driven decision-making and enhancing rental property performance.

Keywords: Rental House, Web-based system

1. Introduction

The Rental House Web-based System is a cutting-edge platform that leverages web technologies to transform the process of managing rental properties. Web-based systems have become a potent instrument for managing rental assets as a result of the increase of technology and the rising demand for practical and effective solutions. The latest in technology offers a user-friendly interface available through a web browser to landlords, property managers, and tenants, doing away with the need for challenging expensive physical help and improving many facets of the renting process. The Rental House Web-based System strives to optimise productivity, improve communication, and increase overall tenant satisfaction in the rental property market by utilising the possibilities of web-based systems.

2. Methodology

The development of the Arau Rental House Web-based System follows the Rapid Application Development (RAD) model, an iterative and collaborative approach to software development. To understand the needs of landlords, property managers, and tenants, the requirements are first gathered through classes, questionnaires, and interviews. The next step is the creation of a prototype, which is then given to users for feedback and quick adjustments. The development team enters the building phase after receiving approval for the prototype and gets the system in place using the proper frameworks and technologies. Functional testing, test of integration, and user acceptance testing are all carried out thoroughly. Through frequent meetings and feedback sessions, stakeholders are kept in the loop on collaboration and communication.

3. Result and Discussion

The Arau Rental House Web-based System's implementation has produced a number of significant benefits for managing rental properties. With features like automated tenant application processes, secure messaging, online rent payments, and addressing maintenance requests, this modern technology reduces property management operations. Landlords gain from more effective property marketing, simplified tenant screening, and prompt rent collection. On the other side, through online rent payments, direct contact with landlords, and quick resolution of maintenance concerns, tenants enjoy increased convenience. Overall, it has been shown that the Rental House Web-based System

is a useful tool for increasing operational effectiveness, tenant happiness, and overall performance in rental property management.

4. Novelty of Research/Product

A novel research direction in the field of Rental House Web-based Systems could be investigating the impact of rental rights policies on young people's intentions to rent or purchase properties, as explored by Li and Wen (2018). In the context of web-based systems, this study offers insights into the variables affecting rental market dynamics. Hu et al. (2018) also describe an integrated method for monitoring house rental prices using social media that includes machine-learning algorithms and hedonic modelling. This method being used in a web-based system could influence equitable housing laws. Additionally, the study by Boeing (2020) investigates how the online rental housing market is represented and how this may contribute to the maintenance of urban inequality. Even though it is not only concerned with web-based systems, this research offers more information on the digital dynamics of rental housing markets that can be taken into account while creating and examining the Rental House Web-based System. Researchers can examine the implications of policies governing rental rights by incorporating the findings from these studies, create pricing strategies that are informed by monitoring rental prices, and address issues of urban inequality within the Rental House Web-based System.

5. Conclusion

In conclusion, the Arau Rental House Web-based System emerges as a significant advancement in the field of rental house management. This modern platform optimises various aspects of managing rental properties, which is advantageous for landlords, property managers, and tenants. It does this by utilising web technologies and the Rapid Application Development (RAD) approach. Features of the system include automatic tenant applications, online rent payments, secure messaging, and processing of maintenance requests all improve operational effectiveness, communication, and overall tenant satisfaction. The RAD model promotes successful cooperation and communication throughout the development process by ensuring continuous improvement, frequent public input, and the incorporation of changing requirements. The Arau Rental House Web-based System represents a valuable tool in the rental property industry, transforming traditional property management practices and enhancing efficiency, convenience, and stakeholder satisfaction. Future developments in this subject could further modernise rental property management, solve housing inequalities, and advance just housing laws.

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IMAGE STEGANOGRAPHY WEB APPLICATION

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ABSTRACT - This study for a final year project with the title Image Steganography Web Application presented in this abstract offers a user-friendly interface for securely embedding and extracting secret information within digital images. The application utilizes an advanced steganographic algorithm, which is Randomized Least Significant Bit (RLSB), to ensure robust data concealment while maintaining the visual integrity of the cover image. Users can upload their desired image, select the preferred steganographic algorithm, and encode the hidden data for added security. The web application supports encoding and decoding images for concealing data in images. To evaluate its performance, extensive testing was conducted, including embedding and extracting data using different image formats. The results demonstrated the application's effectiveness in hiding information while preserving image quality. The web application proved to be a versatile and practical tool with applications in various fields such as cryptography and digital forensics. In conclusion, the Image Steganography Web Application provides a convenient and secure solution for individuals and organizations needing to transmit sensitive data covertly within images, ensuring data privacy and integrity in an intuitive and user-friendly manner.

Keywords: Image Steganography, Web Application, RLSB (Randomized Least Significant Bit)

1. INTRODUCTION

Image steganography plays a crucial role in various real-life situations where secure communication is vital. For example, in the field of journalism, journalists may employ steganographic techniques to transmit sensitive information or evidence while protecting their sources. In the field of cybersecurity, steganography can be used to hide encryption keys or confidential data within images, making it harder for malicious actors to detect and intercept them. Additionally, law enforcement agencies can utilize steganography to embed watermarks or hidden identification markers in digital images for copyright protection or forensic purposes. Image steganography offers a powerful tool for covert communication and secure information exchange in a wide range of practical scenarios.

2. METHODOLOGY

The Image Steganography Web Application is developed using the Waterfall Model of the Software Development Life Cycle (SDLC). This model follows a sequential approach, starting with requirements gathering, followed by system design, development, testing, deployment, and maintenance. Each phase is completed before moving to the next, ensuring a structured and comprehensive development process for the web application. By adhering to the Waterfall Model, the application undergoes thorough planning, design, and testing to meet the specified requirements and ensure a successful and well-organized development journey.

3. RESULTS AND DISCUSSION

The Image Steganography Web Application was tested using the RLSB (Random Least Significant Bit) algorithm for embedding hidden data within cover images. The performance was evaluated based on metrics such as embedding capacity, visual quality, and robustness against detection. The results demonstrated that the RLSB algorithm effectively concealed data within the cover images while preserving visual quality. It provided a reasonable embedding capacity, allowing for a moderate amount of hidden data to be stored. The algorithm also exhibited good resistance against detection techniques, making it challenging for unauthorized users to detect the presence of hidden information.

4. NOVELTY OF RESEARCH / PRODUCT

In recent research, the focus of image steganography has shifted towards developing innovative methods that offer enhanced robustness against steganalysis and enable the concealment of larger amounts of data (Das et al., n.d.). Some noteworthy approaches that have been proposed include deep learning-based steganography, which utilizes deep learning techniques to embed secret data in images in a manner that is challenging to detect (Pevný & Fridrich, 2008). Spread spectrum steganography is another novel method that spreads the secret data across a wider range of pixels within the image, thereby increasing the difficulty of detection. Transform domain steganography, on the other hand, embeds the secret data in the transform domain of the image, further complicating its detection (Subramanian et al., 2021).

5. CONCLUSION

In conclusion, the Image Steganography Web Application offers a user-friendly interface for securely embedding and extracting hidden data within images. With advanced steganographic algorithms and options for concealing data, it ensures privacy and data integrity, making it a valuable tool for secure information transmission.

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WEB-BASED WATER SUPPLY COMPLAINT MANAGEMENT SYSTEM

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Abstract - The proposed Web-Based Public Water Supply Complaint Management System developed using the latest Laravel framework intends to use modern digital technologies to improve the reporting and resolution of public water-related issues. It is designed to replace the traditional, manual process of submitting complaint through visiting water departments and fill in paper form. The System Development Life Cycle's Waterfall approach is used in the development phase. This project's main goal is to create and build a public complaint web application to improve overall water service delivery, enhance public involvement, and optimise complaint processing by utilising present web technology while increasing effectiveness and easiness for reporting and resolving water-related issues. The functionality and usability of the application will be thoroughly tested to ensure it meets the needs of the users.

Keywords: Laravel, water, public, complaint, web application.

1. Introduction

The Web-Based Water Supply Public Complaint Management System is a thorough platform created to simplify and enhance the process of responding to public complaints about water supply services. The app has been tested for functionality and usability and is intended for use by every citizen who encountered problems with water supply. By using Laravel, a platform that manages public complaints about water supply services in an effective and reliable approach is delivered to users. Overall, the web application will provide a thorough solution to effectively manage and address public complaints regarding water supply services.

2. Methodology

The Web-Based Water Supply Complaint Management system was designed using Laravel employing the Waterfall process, which is a sequential linear approach to the System Development Life Cycle (SDLC). Planning, analysis, design, implementation, testing, and documentation are the specific steps that the procedure follows. In the planning phase, project background, problem statements, objectives, project scope, and significance were identified. The next phase is analysis, where writings related to project were reviewed and determining research methodology. The design phase involves designing user interface, sitemap, and ERD. User interface and database administration were carefully designed and implemented using the Laravel framework in implementation phase. Functionality and usability testing were done to get feedback from 30 users. Lastly, the final phase is documentation of all information gathered during the development process.

3. Result and Discussion

It was critical to test the system to make sure it adhered to the specifications and was simple for end users to use. To get user input on the entire user experience, usability testing was done. Most users said the application was simple to use and user-friendly. Functionality testing was also done to make sure that all the web application's form, buttons, and pages functioned as planned. Nonetheless, some recommendations for improvement were also discovered during testing. Overall, the web application was capable of carrying out all its specified tasks.

4. Novelty of Research/Product

By combining web-based technology, the Laravel framework, and user complaint management concepts, the creation of the Water Supply Public Complaint Management System introduces a revolutionary approach to managing water supply concerns. It incorporates best practices from software development life cycle models (Akinsola et al., 2020) and makes use of SQL databases to improve data handling. The system incorporates safe techniques for authorization and authentication and employs the Waterfall SDLC methodology for efficient design and development. Additionally, it addresses the importance of water quality and sanitation concerns (Faulkner et al., 2021). Overall, this research contributes to the topic by providing a thorough and specific solution for handling water supply complaints using an innovative combination of technologies and methodologies.

5. Conclusion

In conclusion, the Water Supply Public Complaint Management System provides a creative and effective method for handling public complaints about water supply services. It was created using the Laravel framework and incorporates a variety of technological developments. The system offers an organised platform for users to efficiently report and address water supply issues by using web-based technologies, secure authentication procedures, SQL databases, and following to best practises in software development. By addressing the requirements of users, incorporating latest technologies, and boosting the overall management of water supply complaints, this project contributes to fix water issues and raises the quality and dependability of water supply services for the benefit of the public.

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SEARCH ENGINE OPTIMIZATION (SEO) TECHNIQUES FOR YUSFIZA SATAY TEMBAM WEBSITE MARKETING

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ABSTRACT – This abstract provides an overview of Yusfiza Satay Tembam Website Marketing project development. This project aims to address the need for an online marketing strategy using SEO techniques to improve website visibility, attract relevant traffic, and increase brand awareness and sales. It emphasizes the significance of SEO in improving search engine rankings and user satisfaction. This project involves the development of a user- friendly website using HTML, CSS, Visual Studio Code, Laragon, Composer, Node.js, and SQLyog. It follows the Agile methodology, which emphasizes flexibility, rapid iteration, and customer involvement throughout the development process. The different phases of the software development life cycle (SDLC) are outlined, including planning, data collection and analysis, designing, development, testing, and adjustment. The planning phase involves identifying project requirements and obtaining approval from supervisors and subject coordinators. The data collection and analysis phase focuses on gathering research materials and identifying user requirements. The designing phase includes creating diagrams such as mind maps, ERDs, use case diagrams, and DFDs to understand the website's structure. The development phase involves implementing SEO techniques, and the testing phase ensures functionality and user acceptance. The adjustment phase allows for identifying and fixing issues to improve the website. Overall, the project aims to deliver a high-quality website marketing solution by following the Agile methodology, meeting user requirements, and achieving better search engine rankings, customer satisfaction, and increased sales.

Keywords: SEO, website marketing, marketing strategy.

1. INTRODUCTION

Website marketing is crucial for driving relevant traffic to a website, and search engine optimization (SEO) techniques play a vital role in improving website visibility. This is because Internet marketing makes use of the potential of digital commerce to sell and promote goods (Bala & Deepak Verma, 2018). The project aims to develop an online website marketing strategy using SEO techniques, focusing on Google as the primary search engine. The problem statement highlights the negative impact of not having an official website page, resulting in decreased brand awareness, customer satisfaction, and sales. The objectives include developing a user-friendly website and evaluating user acceptance. The scope encompasses all users interested in purchasing the company's products, and the web application will be developed using HTML, CSS, Visual Studio Code, Laragon, Composer, Node.js, and SQLyog. The significance of the project lies in achieving higher search engine rankings, improving customer satisfaction, and gathering valuable data and insights about customers. This summary provides an overview of the introduction, outlining the project's background, problem, objectives, scope, and significance..

2. METHODOLOGY

The methodology section discusses the research approach and the software development life cycle (SDLC). The SDLC is a multi-step process that includes initialization, analysis, design, implementation, maintenance, and disposal. For this project, the Agile model will be implemented due to its flexibility and rapid iteration. The Agile model aligns with the need for continuous adaptation and optimization in website marketing development, particularly when using SEO techniques. The Agile model allows for the integration of SEO practices throughout the development process, resulting in a more holistic approach to optimization (Radack, 2009; Al-Saqqa et al., 2020).

3. RESULTS AND DISCUSSION

The implementation of the Agile model in the development of Satay Tembam Yusfiza Website Marketing proved to be effective in achieving the project objectives. The Agile methodology's flexibility and rapid iteration allowed for continuous adaptation and optimization of the website. SEO techniques such as meta tags, keyword research, and

website structure were seamlessly integrated into the development process, resulting in improved search engine rankings and increased visibility. This holistic approach to optimization contributed to higher levels of customer engagement, satisfaction, and ultimately, increased sales (Al-Saqqa et al., 2020). The successful implementation of the Agile model in website marketing development shows its suitability for projects that require flexibility and rapid changes, providing a valuable framework for future web development endeavors.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of the Yusfiza Satay Tembam Website Marketing project lies in its integration of SEO techniques within the Agile development methodology. While website marketing and SEO are well- established practices, the project's focus on developing a user-friendly website using SEO techniques sets it apart. The incorporation of meta tags, keyword research, and website structure throughout the development process ensures that the website is optimized for search engine rankings and visibility. According to (Ullah et al., 2018), the competitiveness of the Internet is growing, and enterprises who use SEO will have a significant edge in terms of sales and traffic. This approach contributes to improved customer engagement, satisfaction, and increased sales. By combining the principles of Agile development with SEO techniques, the project offers a unique and effective solution for enhancing website marketing strategies.

5. CONCLUSION

In conclusion, the Yusfiza Satay Tembam Website Marketing project successfully utilized SEO techniques within an Agile development methodology. The integration of SEO practices, such as meta tags and keyword research, improved search engine rankings and customer engagement. The user-friendly website developed using HTML, CSS, and other tools met user requirements and enhanced the overall website marketing strategy. This project offers valuable insights for effectively combining SEO techniques with Agile development for successful website marketing.

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NASI LEMAK CALORIE COUNTER WITH DEEP NEURAL NETWORK

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ABSTRACT - This report presents the development of a Nasi Lemak Calorie Counter system using a deep learning approach. The objective of the project is to accurately detect and estimate the calorie content of various components in Nasi Lemak, a popular Malaysian dish. The methodology involves data collection, model training using a single-shot multibox detector (SSD) architecture, and integrating the trained model into a user-friendly interface. The system achieves accurate object detection and estimates calorie content based on the detected components. The performance of the system is evaluated using precision, recall, and mean Average Precision (mAP) metrics. The results show promising performance, with an overall mAP score of 32.27% across different components. The system's limitations are identified, including the need for a larger dataset and further optimization for real-time usage. Future directions include dataset expansion, integration of additional dishes, and enhancing real-time performance. The Nasi Lemak Calorie Counter system provides a valuable tool for individuals to monitor their calorie intake accurately and make informed dietary decisions.

Keywords: Nasi Lemak, calorie estimation, object detection, deep learning, single-shot multibox detector, mean Average Precision (mAP)

1. INTRODUCTION

The objective of this project is to develop a Nasi Lemak Calorie Counter system using deep learning techniques. Nasi Lemak is a popular Malaysian dish with various components, and accurately estimating its calorie content can be challenging. The system utilizes a deep learning model based on the single-shot multibox detector (SSD) architecture to detect and localize different components, such as rice, chicken, anchovies, peanuts, sambal, and cucumber. The trained model is integrated into a user-friendly interface, allowing users to capture images of Nasi Lemak and obtain calorie estimates for each component. The project aims to provide individuals with a convenient tool for monitoring their calorie intake and making informed dietary choices.

2. METHODOLOGY

The methodology consists of several key steps. Firstly, a diverse dataset of annotated Nasi Lemak images is collected and preprocessed. The SSD model is then trained using this dataset, optimizing for object detection and localization. The training process involves multiple iterations, adjusting hyperparameters, and fine-tuning the model to achieve optimal performance. The trained model is integrated into a graphical user interface (GUI), enabling users to capture images and obtain real-time predictions of the Nasi Lemak components. The calorie estimation is based on the average calorie values obtained from the Malaysian Food Composition Database.

3. RESULTS AND DISCUSSION

The performance of the Nasi Lemak Calorie Counter system is evaluated using precision, recall, and mean Average Precision (mAP) metrics. The system achieves promising results, with an overall mAP score of 32.27% across different components. The individual component mAP scores range from 15.74% for kacang to 59.33% for telur. These scores indicate the system's capability to accurately detect and estimate the calorie content of Nasi Lemak components. However, the system's performance can be further improved by expanding the dataset and optimizing for real-time usage.

4. NOVELTY OF RESEARCH / PRODUCT

This research brings novelty through the development of a Nasi Lemak Calorie Counter system that combines object detection and calorie estimation using deep learning techniques. The integration of deep learning algorithms, such as the single-shot multibox detector (SSD), enables accurate detection and localization of Nasi Lemak components in images (Liu et al., 2016). The system incorporates the Malaysian Food Composition Database for precise calorie estimation, setting it apart from generic food tracking applications (Malaysian Food Composition Database). By focusing specifically on Nasi Lemak, a popular Malaysian dish, this research addresses the unique challenges posed by its diverse components and variations. The comprehensive tool provides a user-friendly interface and empowers individuals to make informed dietary decisions (Liu et al., 2016). This research contributes to the fields of computer vision and nutrition tracking, offering a novel solution tailored to the Malaysian culinary landscape.

5. CONCLUSION

The Nasi Lemak Calorie Counter system demonstrates the effectiveness of deep learning techniques in accurately detecting and estimating the calorie content of Nasi Lemak components. It provides a user-friendly tool for individuals to monitor their calorie intake and make informed dietary choices. The system's performance can be enhanced by addressing limitations such as dataset size and real-time optimization. Future directions include dataset expansion, integration of additional dishes, and further improvement of real-time performance. The Nasi Lemak Calorie Counter system contributes to the field of computer vision and offers a valuable solution for individuals seeking to maintain a healthy and balanced diet.

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DEVELOPMENT OF BLOOD BANK AND INFORMATION SYSTEM USING WEB-BASED APPLICATION

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ABSTRACT - The title of this research and system is "Development of Blood Bank and Information System Using Web Based Application". This research is aimed to design web applications involving blood bank centers, blood donor books and information related, to develop web-based applications for blood centers information of donors also give notifications for certain important messages and to evaluate the blood bank centers and information system via user testing and user acceptance test. This web application targets donors to donate more blood with help of this web application. Methodology that has been used in this study is the Waterfall Model which consists of planning, designing, implementation, testing and maintenance. For testing evaluation, usability test and user acceptance test (UAT) are used for data collection. Usability testing will focus on navigation, clarity of instructions, visual design, information organization, and overall user satisfaction. Meanwhile, the user acceptance test (UAT) is focusing on user validation, making sure the product meets their needs for usability and expectations. Based on data, ages 18 to more than 36 years old, almost all the respondents agree and think this web application is easy for them to use and help them to donate more blood.

Keywords: Donate, blood, test, donors

1. INTRODUCTION

As blood is so important to humans, there must be people who need blood for emergencies. Emergency blood is used from blood donation. Blood donations are essential as 1 bag= 350ml can save 3 lives. Donors also can receive many benefits if they regularly donate their blood. For example, it can lower the risk of heart attack and high blood pressure. About 328 million people currently live in the United States. About 6.8 million people donate blood in the United States each year. Each year, this equates to approximately 13.6 million units of whole blood collected for donation in the United States. The Red Cross donates about 40% of our country's blood and blood cell components to donors. Your blood donation will be used for patients who need surgery, cancer treatment, and blood transfusions for blood loss from trauma. This project will focus on reaching donors or other users to know more about blood donation, flow of donation and any important info about blood. This project also will help hospitals as suppliers to stock blood which is blood banks.

2. METHODOLOGY

Methodology that was used in this study is the Waterfall Model. In testing phase which will be conducted using usability test and user acceptance test (UAT). For usability testing, data were collected from respondents which consisted of donors as user and admin from educated fields in Medicine, nursing and related fields. Respondents need to explore the system first. After testing the system, respondents will be provided with a link to the Google Form questionnaire. The questionnaire only takes 5-8 minutes to answer.

3. RESULTS AND DISCUSSION

All respondents were satisfied with the system's utility, information quality, and interface quality, according to the findings and analyses; chapter five results serve as support for this claim. The system's overall goals, which included designing web applications involving blood bank centers, blood donor books, and information-related matters, developing web-based applications for blood centers that collect donor information and send notifications for certain urgent messages, and assessing blood bank centers and information systems through user testing and user acceptance tests, were nevertheless achieved. Based on the suggestions made by respondents, the system still needs improvement and further capabilities for future use.

4. NOVELTY OF RESEARCH / PRODUCT

This study reveals several unexpected elements. First, it emphasizes the crucial role that blood donation plays in saving lives during emergencies, highlighting the significance of satisfying people's blood requirements in urgent situations. Second, it highlights the advantages to health that regular blood donors might experience, including a lower risk of heart attacks and high blood pressure. By highlighting the benefits that both donors and recipients receive reciprocally, this viewpoint gives the research a distinctive dimension. The goal of the project is to enhance blood bank facilities and technology systems through user and acceptability testing. The research attempts to discover areas for development by gathering input and evaluating usability, encouraging continual improvement and a user-centric approach. In outcome, this study offers innovation through its emphasis on the significance of blood donation, investigation of health advantages, usage of a web-based application, implementation of the Waterfall Model, and commitment to user testing and approval.

5. CONCLUSION

To conclude, blood donation, information and related messages can be reached through this web application. Not only is it beneficial towards recipients, but donors will also gain the benefits from donating blood. Along with the growth of this web application, the hospital and Pusat Darah Negara will have sufficient blood supply for emergency cases.

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WEB-BASED INVENTORY MANAGEMENT SYSTEM FOR FOOD AND BEVERAGES INDUSTRY WITH NOTIFICATION FEATURES

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ABSTRACT - This study addresses the lack of management information regarding sales and inventory in the food and beverage sector. Currently, many shops and restaurants still rely on outdated methods for inventory and sales management. To overcome this challenge, a web-based inventory management system tailored specifically for the food and beverage industry has been developed. This system allows food and beverage businesses to effectively track and manage perishable goods by monitoring expiration dates, setting reorder points, and accessing inventory levels remotely. Moreover, it enables companies to manage multiple locations, track suppliers and deliveries, and generate sales and inventory movement data. Implementing this technology can enhance sales, reduce food waste, and improve inventory management efficiency. The study focuses on stock and sales management in the food and beverage industry, utilizing information from relevant books, journals, and articles on web-based development for this sector. Through analysis, the research identifies crucial factors for designing a successful web-based inventory system, such as utilizing server-side scripting languages and databases for stock and sales management. Additionally, the study highlights the practicality of incorporating notification functionalities into the web-based system. Overall, the research aims to contribute to the growth of the food and beverage industry and provides insights into the strategic design approach for effective web-based inventory systems.

Keywords: web-based, inventory, System Development Life Cycle (SDLC), notification

1. INTRODUCTION

The food and beverage industry are a vast and constantly evolving sector, encompassing various products and specialized equipment. Effective inventory management within this industry can be challenging due to the need to track stock levels, monitor sales, and manage resources. Inefficient manual methods of inventory management, such as using pen and paper or relying on WhatsApp groups, often lead to errors, miscalculations, and delays. To address these issues, the Web Based Inventory System for the Food and Beverage Industry has been developed. This web application aims to automate and streamline inventory processes, providing a user-friendly interface accessible to both staff and shop owners. By digitizing purchase data, tracking suppliers and recipes, and facilitating bookkeeping, this system helps reduce food waste, save costs, and improve overall efficiency. Features like real-time stock updates, sales notifications, and production data management enhance decision-making and enable effective resource planning. By transitioning to a web- based inventory system, businesses in the food and beverage industry can optimize operations, maximize profits, and ultimately enhance customer satisfaction

2. METHODOLOGY

The project methodology for the Web Based Inventory System for the Food and Beverage (F&B) Industry involves the use of the Waterfall Model System Development Life Cycle (SDLC) to guide the planning, analysis, design, implementation, testing, and documentation phases of the project. The SDLC is a well- established approach used in the software industry to ensure the development of high-quality software that meets customer expectations within the specified timeframe and budget. This methodology emphasizes a systematic and structured approach to software development, aiming to enhance the overall development process and deliver a superior product. By following the SDLC, the project team will adhere to a well-defined framework, enabling them to effectively gather data, design the application, interface with local hosts, and implement the desired functionalities. The methodology ensures that the project progresses in a logical and organized manner, leading to the successful development of the Web Based Inventory System for the F&B Industry.

3. RESULTS AND DISCUSSION

The functionality testing for the final year project involved conducting a questionnaire survey among food and beverage workers, with most of them being students. The survey results indicated a clear demand for a system inventory to aid in the efficient management of stock in their stalls and restaurants. Additionally, the participants expressed a strong desire for the Telegram notification feature, which would provide convenient notifications when stock items run out. The functionality test results were highly successful, with all functions in the system performing exceptionally well. This indicates that the system meets the requirements and expectations of the food and beverage industry workers. The positive outcomes of the functionality test validate the effectiveness and reliability of the developed system, affirming its ability to streamline stock management processes and meet the needs of food and beverage establishments. By addressing the participants' requirements and ensuring seamless functionality, this project contributes to enhancing operational efficiency and inventory management practices in the industry.

4. NOVELTY OF RESEARCH / PRODUCT

The novel feature of the inventory system developed for this final year project is its advanced notification capabilities, which differentiate it from existing systems in the market. What sets this system apart is not only its ability to generate real-time notifications when stock levels reach a predefined threshold but also the underlying technology used for its development. Unlike other inventory systems, this project utilizes Laravel MVC, a modern and highly efficient framework. By leveraging Laravel's Model-View-Controller architecture, the system achieves a robust and scalable structure, ensuring seamless integration of inventory management functionalities. This innovative approach enhances the system's performance, reliability, and maintainability. The Laravel MVC framework provides a solid foundation for the system, offering flexibility in terms of customization and extension. With its elegant syntax and comprehensive set of tools, Laravel simplifies the development process, making it more efficient and productive. By incorporating this cutting-edge technology, the inventory system gains a competitive edge, delivering a user-friendly interface and seamless functionality. The advanced notification capabilities, coupled with the use of Laravel MVC, revolutionize inventory management in the food and beverage industry, enabling real-time alerts, efficient stock monitoring, improved decision-making, reduced errors, and enhanced operational efficiency.

5. CONCLUSION

In conclusion, the objective of developing an inventory management system for the food and beverage industry, integrated with the Telegram notification feature, has been successfully accomplished. The system effectively addresses the industry's inventory management challenges by providing real-time notifications through Telegram. The functionality test results demonstrate that all features of the system perform exceptionally well, ensuring efficient stock management and communication processes. By achieving these objectives, the developed system significantly improves operational efficiency. The successful integration of Telegram as a notification facilitating timely actions for restocking and replenishment. Overall, the project's outcomes affirm the value and effectiveness of the inventory management system in meeting the specific needs of the food and beverage industry, contributing to improved inventory control, and streamlined operations.

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LEARNING SCIENCE THROUGH GAMIFICATION FOR SECONDARY SCHOOL STUDENTS

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ABSTRACT - The goal of this final year project is to determine whether gamification can be used to effectively teach secondary school students about force and pressure in science. The goal is to increase students' interest in and enthusiasm for learning science while also enhancing their comprehension and memory of the subject. The methodology used in this project is the Waterfall model, including the planning, analysis, design, implementation, testing and documentation phases. A secondary school has created and implemented a gamified learning environment where pupils are urged to actively engage in interactive and game-like activities. The cloud database used to store the data produced by these activities is Firebase. In order to obtain points, badges, and a position on a rank, participants in the activities must watch films and complete exercises. The instructor can keep an eye on the student's development and performance.

Keywords: Firebase, science, gamification.

1. INTRODUCTION

The goal of the final year project is to assist secondary school students in their study of force and pressure in science class. This system used gamification components like points, ranks, and badges to help students concentrate and stay motivated while they were learning. It can also assist teachers in keeping track of their students' progress. Overall, this project can improve learning process quality and effectiveness.

2. METHODOLOGY

The successful development of a web-based system will be accomplished using a waterfall methodology. Usability testing is being utilised in this project to evaluate how well the Learning Science System functions. There were 16 respondents, which is secondary school students and teachers. To make sure that respondents are aware of how the system works, comprehensive instructions and explanations will be given. The respondents' device was used for the usability assessment. The system was open for respondents to explore for 20 minutes. Respondents are required to complete the Google Forms survey on their own devices after investigating and testing the technology.

3. RESULT AND DISCUSSION

The Usability testing involved a total of 16 individuals. Personal data about the respondents, including name and gender, were gathered in the survey's initial stage. The question then divided into four categories, including perceived utility, perceived simplicity of use, and interface design. In conclusion, the fact that almost all criteria had high mean ratings indicates that consumers intended to utilise this web-based service.

4. NOVELTY OF RESEARCH/PRODUCT

This research project provides a novel strategy to engage and encourage secondary school students in science education by integrating gamification approaches in a web-based learning environment. By combining interactive and game-like aspects into the learning process, it seeks to close the gap between traditional classroom instruction and the digital era. Additionally, the emphasis on force and pressure as scientific ideas gives the research a unique perspective. The study examines a key feature of physics education by focusing on these particular topics and explores

how gamification can improve students' comprehension and recall of these difficult concepts. This study has the potential to aid in the creation of efficient methods for gamifying the instruction of difficult scientific concepts.

5. CONCLUSION

Overall, all of the goals were met, and the Learning Science With Gamification Web Based project was produced effectively and according to schedule. This web-based system was also effectively constructed in accordance with user requirements. The user will utilise this web-based tool since it helps students concentrate better when they are learning.

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MANGO GENERATIVE ADVERSARIAL NETWORK

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ABSTRACT - This research aims to achieve the objectives of formulating a deep generative adversarial network (GAN) for translating sketches to "Sala" mango images and vice versa, developing a web application for sketch-to-image transformation, and evaluating the quality of the generated images. The methodology involves data collection, preprocessing, and augmentation, followed by the implementation of an image-to-image conditional GAN. The Fréchet Inception Distance (FID) metric is utilized to assess image quality. The findings demonstrate the successful translation of sketches to high- quality "Sala" mango images, with the web application providing a user-friendly interface for convenient transformation. The low FID scores indicate the close resemblance of the generated images to the ground truth, highlighting the effectiveness of the GAN model. This research contributes to the advancement of image generation techniques and provides a valuable tool for transforming sketches into realistic mango images, enhancing the field of generative adversarial networks and mango imagery.

Keywords: Deep generative adversarial network, sketch-to-image translation, "Sala" mango images, image quality evaluation, web application.

1. INTRODUCTION

The objective of this research is to develop a deep generative adversarial network (GAN) for translating sketches to "Mangga Sala" images, focusing on improving color, shape, and details. By achieving this objective, we aim to create realistic and visually appealing mango images from simple sketches. The development of a GAN model specifically designed for "Mangga Sala" mangoes will enable researchers and practitioners to accurately represent the unique characteristics of these mangoes. This will enhance visualization and analysis, benefiting fields such as agriculture, botany, and graphic design. Additionally, we aim to create a user-friendly web application that simplifies the process of transforming sketches into high- quality mango images. This will make the technology more accessible and allow a wider range of users to generate customized mango visuals. By meeting these objectives, this research contributes to the advancement of computer vision and image generation, offering a valuable tool for mango representation. The outcomes of this work hold potential for various applications, bridging the gap between sketches and realistic "Mangga Sala" mango images.

2. METHODOLOGY

The methodology for this project involved several key steps. Firstly, the problem of dataset imbalance in generative adversarial networks was addressed. The focus was on developing a deep generative adversarial network to translate sketches to "Mangga Sala" images. The methodology encompassed data understanding, data preparation, modeling, evaluation metrics, and deployment. Data understanding involved describing and exploring the dataset, while data preparation included collecting the "Mangga Sala" mango image dataset and performing necessary pre-processing steps. The modeling phase implemented an image-to-image conditional GAN model with generator and discriminator networks. Evaluation metrics, such as the Fréchet Inception Distance (FID), were used to assess the quality of generated images. Lastly, a web application was developed for easy deployment and user interaction. The methodology provided a systematic approach to address the research objectives and paved the way for generating high-quality "Mangga Sala" mango images through the use of deep generative adversarial networks

3. RESULTS AND DISCUSSION

The results of this project demonstrated the successful implementation of a deep generative adversarial network (GAN) for translating sketches to "Mangga Sala" images. The GAN model was able to generate realistic mango images based on input sketches, capturing the color, shape, and details of the mangoes. The developed web application provided a user-friendly interface for transforming sketches into high-resolution mango images. The evaluation of the

generated images using the Fréchet Inception Distance (FID) metric showed promising results. The FID scores indicated that the generated images closely resembled the ground truth images, indicating the effectiveness of the GAN model in producing high-quality results. The discussion revolved around the strengths and limitations of the GAN model and the web application. The strengths included the ability to customize mango characteristics such as color, shape, and defects through sketch modifications. The web application provided convenience and accessibility for users to transform sketches into mango images. However, some limitations were identified, such as the need for a diverse and larger dataset to further improve the model's performance and generate a wider range of mango variations.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of this project lies in leveraging deep neural networks and generative adversarial networks (GANs) to achieve significant advancements in image processing tasks. Deep neural networks have shown promising results in various image processing tasks, including style transfer, restoration, coloring, and more (Gatys et al., 2016). The rapid development of deep learning, especially the emergence of GANs, has led to remarkable progress in image generation (Isola et al., 2016). GANs aim to model the distribution of natural images by generating samples that closely resemble real images (Radford et al., 2015). By incorporating these techniques, this project aims to harness the power of deep learning and GANs to enhance image processing capabilities and generate realistic and high-quality images.

5. CONCLUSION

In conclusion, this project successfully implemented a deep generative adversarial network (GAN) for translating sketches to Sala mango images, resulting in realistic representations of mangoes with customizable features. The low Fréchet Inception Distance (FID) score validates the high quality and similarity of the generated images to the ground truth. The development of a user-friendly web application enhances the convenience and accessibility of the transformation process. For future work can focus on expanding the dataset to include a wider variety of mango variations, exploring advanced GAN architectures to further improve image quality, and incorporating additional features such as texture and ripeness.

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EARLY WARNING SYSTEM FOR RAPID FLOOD AT RECREATIONAL AREA SITES USING LORA NETWORK

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ABSTRACT - Flood is one of the major disasters that affects many people each year in numerous places throughout the world. This flood disaster can occur anywhere, but the recreation area is the most dangerous. Therefore, an IoT early warning system for flood detection utilising the Arduino technology is suggested as a possible fix. The system is made up of a few sensors, including temperature, humidity, water flow sensor and ultrasonic ones. This research aims to develop a system that can contribute to collect data which will be used as an attribute to monitor and detect the water flow activity such as the water level and water velocity. Then to notify the potential occurrence of rapid flood. To implement this system, a System Development Life Cycle (SDLC) has been used as the methodology. Testing has been conducted by using method field testing at Puncak Janing Waterfall to evaluate the functionality of all sensors. All the data that has been taken is saved in the firebase database. The connection also used ESP32, where the coding was written and compiled using Arduino IDE software. This project has successfully achieved its objective where water level and water velocity can be monitored and stored in a firebase.

Keywords: IoT**,** Rapid flood, LoRa, water velocity, water level

1. INTRODUCTION

Flooding is one of the major causes of death in the world. Floods are a major threat to human life. One of the technologies that may be employed to reduce flood-related fatalities is the flood monitoring system, particularly in places along the rural areas and near the rivers. The purpose of this article is to demonstrate the usefulness of Internet of Things technology in the context of smart cities, with the end goal of enhancing disaster response and early warning systems. This article addresses the design, implementation, and test outcomes of a LoRa-based early flood related parameter monitoring and detection system and its avoidance utilizing the Arduino project are presented as solutions to the described problem. The proposed system will offer a straightforward monitoring interface, enough flood data, and short-term water level and water velocity forecasting in the future. The system's functionality and network performance utilizing an ultrasonic sensor, LoRa technology, and Arduino board are tested in a real-world setting. The positive results obtained from the on-site testing validate the effectiveness of the proposed sensor and network system. It indicates that the system is capable of accurately detecting and monitoring flood conditions, providing timely and reliable data for early warning purposes.

2. METHODOLOGY

The methodology may be characterized as a set of phases that were utilized to explain and discuss the project development process. More detail was included in the methodology section on the actions taken to carry out the project's objectives. Multiple phases of the project, including information collecting, project analysis requirements, project planning, system development, and project documentation, were employed as a System Development Life Cycle (SDLC).

3. RESULTS AND DISCUSSION

Field testing has been conducted. The water level indicates the height or depth of the water surface at a specific point in the system. The researcher analyses the chart that the water level gradually decreases from 400 cm 8:00 AM to 320 cm. The values show a consistent downward trend, indicating an increase in the water level over time. This means that the water level continuously rises to the ultrasonic sensor. This is because of the occurrence of rain.

4. NOVELTY OF RESEARCH / PRODUCT

Waterfalls, unlike river, do not have distinct banks or gauges against which water levels may be measured. Additionally, the dynamic nature of waterfalls means that their flow can fluctuate dramatically within short periods of time, further complicating the establishment of benchmarks. Waterfalls are equipped with gauges and water level stations strategically placed along their course. These measures of water level are commonly in centimetres or feet. To properly detect water levels, they use sensors, float-based equipment, or staff gauges. Gauges are frequently linked to data recording systems, allowing for real-time monitoring and analysis. Waterfalls have flood stage indicators that determine water level thresholds. These indicators are based on historical data as well as local knowledge of waterfall behaviour. When water levels exceed these levels, there is a substantial risk of flooding. Flood stage indicators provide critical alerts to communities and disaster management authorities, allowing them to take proper action.

5. CONCLUSION

In conclusion, the on-site findings validate the effectiveness of the proposed sensor and network system for flood monitoring. The system accurately detects and monitors flood conditions, providing valuable data for early warning purposes. This project contributes to the research field by offering a reliable solution for flood monitoring, with potential applications in public safety. Future work can focus on scalability, integrating additional sensors, and enhancing data analysis for better decision-making.

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DEVELOPMENT OF EARLY WARNING SYSTEM FOR FLOOD AT RECREATIONAL SITES USING ANDROID MOBILE APPLICATION

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ABSTRACT - Sudden floods that happen in recreational areas can cause harm towards tourists and residents near these bodies of water. This is all due to the lack of an early warning system that can notify unsuspecting visitors about this harmful incident. To solve this problem, an early warning system for flood at recreational sites was developed for Android phones. It will notify the user if a flood is predicted to happen. The methodology used is the Agile Methodology. A User Acceptance Test has been conducted to 15 respondents to test the functionality and usability. Overall, the application received positive feedback. Hence, the objective has been successfully fulfilled.

Keywords*:* Mobile application, android, early warning system, flood

1. INTRODUCTION

The objective of this project is to develop a mobile application that can display data about the water velocity and water level of a body of water in the recreational area and prior actions that can be taken during or before a flood happens. Secondly, to test and analyze a mobile application that can notify the users in case a flood is bound to happen at the recreational area. The project's scope is that the target users for this application is for visitors of Puncak Janing Waterfall. A pop-up notification will appear on the user's phone if a flood is predicted to happen at the recreational area. The water level and water velocity will be represented as line charts so that the users can compare these data in previous dates as well as the current ones. The mobile application will also allow users to post warning messages about floods that will happen in that area via Twitter application. Lastly, the mobile application will also focus on displaying understandable graphical methods and information regarding prior actions that can be taken before and during flood.

2. METHODOLOGY

The Agile Model is chosen as the framework for the project development. This project development comprises 6 phases namely Requirements phase, Design phase, Development phase, Testing phase, Deployment phase and lastly Review phase. In the Requirements phase, requirements of the mobile application will be verified after referring to previous works regarding mobile applications and comments from the stakeholders. Next, in the Design phase, the interface system and content that will be developed in this project is designed. In the Development phase, the mobile application will be developed according to the requirements decided before. Then, in the Testing phase, a Quality Assurance (QA) test will be conducted to justify the features and solve any of the problems encountered during this phase. Afterwards, the Deployment phase is when a running application is deployed. Lastly, during the Review phase, reviews from clients and stakeholders are collected to decide the requirements for later iterations.

3. RESULTS AND DISCUSSION

User Acceptability Test is carried out with 15 respondents chosen randomly. The questionnaire is split into usability testing, functionality testing as well as information on the respondents. The response given for the user usability testing questionnaire was based on ranking. The application had been tested prior to ensure it was functioning properly before letting the respondents test it. Most respondents answered strongly agreed and agreed for the easiness of using the application. The results also proves that both objectives have been achieved successfully in terms of data display and notification pop-up. Although the application received positive feedback, it still has its limitations.

4. NOVELTY OF RESEARCH / PRODUCT

The significance of this project is to provide an early warning system for floods to tourists of recreational areas. The project will also be beneficial as it will be accessible to most Malaysians. As the mobile application is developed for the Android operating system, the mobile application can be used by most Malaysian mobile phone users. One of the benefits of this project is that visitors of the recreational areas can always be aware and be prepared in case a flood is bound to happen. This is because water levels and water velocity of the body of water in the recreational area can be monitored live through users' mobile phones. Another benefit of this project is the user's awareness of preparations and early actions that needed to be taken during a flood can also be increased through graphical info presentation. Fuady, R., & Mutalib, A. A. (2018) published a report which stated that information presented through visual media is efficient as students love studying illustrated or animated texts. Another benefit of this project is that information of a flood occurring in the recreational place can be circulated faster as users can post about the flood via Twitter post.

5. CONCLUSION

In conclusion, this project has effectively accomplished all its goals. Early Warning System for Flood was practical and accessible from any location if there was an internet connection. It makes flood prediction easier.

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DEVELOPMENT OF UITM ARAU STUDENT FORUM USING WEB- BASED APPLICATION

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ABSTRACT - Technology changed work, entertainment, and communication. A Pew Internet poll found that most adults in 11 countries utilised at least one of seven social networking or messaging apps, with Facebook and WhatsApp being the most popular (Silver et al., 2019). This highlights how individuals communicate with technology and how important digital communication is today. A UiTM Arau student forum is proposed to let students get closer among the community when communicating with each other and share one's interests. While students interact with each other, they also can report any inappropriate behaviour of other students in the system so that admin can block them, while taking other suitable measures. Agile Methodology was employed in this project as it is better suited for projects that need to modify often since it is more flexible than other traditional approaches (Chaudari & Joshi, 2021). Then the system is evaluated using Usability and Functionality Testing by 17 respondents from UiTM Arau and the results are then used to improve the system.

Keywords: Web application, forum

1. INTRODUCTION

An online forum is a web site designed and focused to interact, by allowing participants to propose an issue for discussion and then begin posting, commenting, voting, and seeing the posts of other participants on that matter (Chiu & Hew, 2018). Some internet forums are centred on a specific topic, such as book and movie recommendations or technology discussions. The objective of this project is to develop a web application for the student forum for the UiTM Arau community and evaluate the usability and functionality of this forum. This project's main scope is that students can join any forums that suit their interests. Only administrators can create a new forum, but students can make suggestions through the web if they want a new forum category.

2. METHODOLOGY

During the requirements phase, a questionnaire was completed by 28 UiTM Arau students, asking them about their own experiences in using college chat groups. In the development phase, the code was created and edited in Visual Studio Code, and the web application was built and managed locally using Laragon. The npm modules for using Bootstrap were installed after creating a new Laravel application. PhpMyAdmin was used to manage databases for the system. In the test phase, few users evaluated the system and gave feedback so that any errors or flaws can be rectified right away.

3. RESULTS AND DISCUSSION

At the end of the project, two interfaces were successfully developed, which is admin and user interface. Admin can manage users and forum categories using the create, read, update, and delete (CRUD) system. Moreover, admin also can block certain users who display inappropriate behaviour when using the forum. While users can join any forum they want and interact with members of the forum. Based on the Usability Functionality Testing that has been made, most students mentioned that they will highly consider using the system due to its functions.

4. NOVELTY OF RESEARCH / PRODUCT

There are currently three forum categories available, which are K3 Reports and Complaints, Arau Marketplace, and Australia Info. In these forums, students can interact and see what others are thinking about. With the help of the system, students can stay aware of any issues concerning their residence. Furthermore, this system encourages those

looking for side income while attending university. Those who value time and convenience can also benefit from this system.

5. CONCLUSION

In conclusion, this project met all its objectives by developing a UiTM Arau Student Forum using Web- Based Application. A student forum will make students interact with each other more, while still staying up to date with college info.

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WEB BASED FOR SKIN CARE GUIDE AND PURCHASE

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ABSTRACT - This study for a final year with the title Web Based for Skin Care Guide and Purchase. This research aims to design and develop a web-based system for guide about skincare and product suggestions. This web-based system has the ability to allow user get information about skin care. The information consists of skin types of detail so users will know their skin types. The next page will bring user to the guide page where it requires a determination from the user first about their skin types. After choosing their skin type, user will proceed to the next page, which has a skin care guide depending on their skin. In that page also includes product recommendations so user can be ready to purchase on a Online Shopping Website. The methodology for this study used the Waterfall Model that consists of five phases which is analysis, design, implementation, testing and documentation. In order to evaluate the study, functionality testing and user experience test have been conducted. Every feature in this web system has been tested using functionality testing. Then, proceed to the second testing and user respondent have been successful which is Testing Survey. This testing goals to impress users by focusing on attractiveness, efficiency, reliability, stimulation, and novelty. Finally, this research and development achieved the goals of creating, developing, and assessing a web-based skin care guide and purchase.

Keywords: Online shopping website, testing survey, skin care, waterfall model

1. INTRODUCTION

Skincare plays an important role in overall health and appearance for face. According to Margaux Reese in 2022, the skin serves as a barrier to internal systems that are critical to one's health and well-being. To achieve the healthy skin, there too many skin care products which people tend to choose the wrong skin care product that will make their skin worst. The way to solve this problem there is need to develop a web-based system that have a combination of guide website with online shopping website. The first objective is to design both content of guide and purchase in one website. Next, to develop a website that provides guidance on skin care and suggested product purchases. The final objective is to evaluate the enjoyment on buying online product after getting guidance about skincare.

2. METHODOLOGY

The methodology that used in this project is Waterfall Model. Requirement analysis is the first phase in waterfall model which related to understanding what needs to be designed and what its function, purpose, and so on. Design phase to helps in specifying hardware and system requirements and helps in defining overall system architecture. Implementation phase is the process of developing the system based on database and interface. The system will be tested then needs to go through constant software testing to find out if there are any flaws or errors. Last of the phase is the maintenance that measurement of the system effectiveness then evaluates potential enhancements.

3. RESULTS AND DISCUSSION

There are many comments and recommendations regarding this web-based system in the most recent depiction of users who have used it. Testing Survey, which has 20 questions and obtained more than 30 responses, was used. According to the results of this poll, most of the users agree like to see the features in a web based that contain user-friendly interface, reliable and simple to follow the guide, have true information, fast and efficient online shopping website. From the survey, most of users would prefer a web-based skin care guide and purchase because they have interested the combination of guide websites with online shopping websites. At the end of survey, the question was about agreement with development of a Web Based Skin Care Guide and Purchase and all users agreed with the development of this project.

4. NOVELTY OF RESEARCH / PRODUCT

The World Wide Web, the first web browser, was invented in 1990, and it is the second major proponent of online shopping. This web-based system is a guide website with online shopping that includes identification of skin concerns. User can determine their skin types before getting a guide. Then, it will lead to online shopping sites that have skin care product recommendation. Online shopping allows user to shop quickly and conveniently while also exposing them to as many products as the can handle (V.C.G Author, 2019). As reported by (Angelica L., 2020) overall, a web-based application has a user-friendly interface unlike mobile- based applications, these applications do not require installation. Users do not need to install additional software to use web-based apps, and developers do not need to create multiple versions of the same application for different operating systems. Web-based system convenient for user use by clicking on their device so they acquire guidance and purchase things in a straightforward manner.

5. CONCLUSION

To be conclude, this study was conducted with the goal of creating a web-based system for skin care guide and purchase. By evaluate user's skin type, this website can determine the best guide based on user's choice. Furthermore, this web-based system will provide recommend products and will be ready to buy.

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A BIOMETRIC FACE RECOGNITION FOR WEB-BASED ATM VERIFICATION SYSTEM

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ABSTRACT - ATMs are essential financial services capable of users access to cash, transfers, and bill payments. The increasing demand for secure and efficient authentication mechanisms in ATM-based systems demands the creation of new technologies to improve user verification. This study aims to construct a biometric face recognition system incorporated into a web-based ATM verification system. The objectives are to identify the features of ATM based system using face recognition, to develop a model for a biometric face recognition for web-based ATM verification system and to evaluate the functionality and usability of the system. Methodology used is the Waterfall model built through the laravel framework, PHP, CSS, and MySQL. The recommended biometric face recognition technology increased consumer security and convenience through a web-based ATM verification system. It reduces the risks of unauthorized access and fraud by eliminating traditional PIN-based and fingerprint authentication. The model was tested using User Acceptance Testing (UAT) involving 20 respondents, and convinced the proposed model contributes the functionality of biometric face recognition and ease of use the website. The outcome of this the model can be used by the user to gain the security level through the face biometric recognition technology.

Keywords: ATM, biometric, face recognition, laravel, User Acceptance Testing

1. INTRODUCTION

ATMs are essential financial services that provide users with the ability to check their balance, withdraw cash, or transfer funds. These self-service machines are often installed in various parts of the country and offer various services such as balance transfers, check deposits, and bill payments. Biometric systems, such as fingerprints and iris recognition, are used to identify individuals in various industries (Ghaffar, Allam, Mansour & Alsoud, 2008). In financial services, biometric fingerprints were introduced to withdraw money, but they have higher recognition issues compared to PINs. Face recognition has been introduced (Ovsiannikov, 2022) as a more secure and user-friendly alternative to fingerprints and PINs. Face recognition is faster-unlocking and does not require memorizing codes and passwords, making it more user-friendly. This project proposes a web-based application for an ATM verification system using biometric facial recognition to prevent hacking incidents and incorrect reading of fingerprints. The purpose of introducing face recognition to ATM systems is to improve the security of transactions and make them more popular among the younger generation, who want access to all systems.

2. METHODOLOGY

The Waterfall model was used to build this A Biometric Face Recognition for Web-based ATM Verification System, a sequential linear approach to the System Development Life Cycle (SDLC) (Hoory & Bottorf, 2021). The steps are as follows: initialization, planning, designing, programming, testing, and documentation is the initial step in this project's development. The process begins with a requirements analysis to identify the needs of ATM users in there was a thorough testing phase in which data was collected via surveys and functional testing to ensure that the application met the requirements and operated effectively.

3. RESULTS AND DISCUSSION

During the testing phases, 23 respondents completed the questionnaire, and their responses were collected and analyzed. While based on the evaluation testing through User Acceptance Test (UAT), about 69.6% of the respondents prefer the convenience of a web-based system with biometric face recognition. Next, 21.7 % were open to the web-based system but had concerns, and 8.7 % of respondents needed more information to decide whether to allow the user to access their system bank account from any internet-connected device. 4.3 % did not agree with developing A

Biometric Face Recognition for Web Based ATM Verification System. However, 95.75% with the development of this research.

4. NOVELTY OF RESEARCH / PRODUCT

This research introduces a novel approach by integrating biometric face recognition technology into a web-based ATM verification system. Utilizing the Laravel framework adds to the novelty, providing a robust and flexible platform for development. Comprehensive evaluation and testing ensure the system's performance and reliability in real-world scenarios. The enhanced security and convenience biometric face recognition offers in ATM transactions significantly contribute to the banking sector. This research presents an innovative solution that improves user verification, reduces fraud, and fosters a safer banking environment.

5. CONCLUSION

To conclude, this study developed a secure and convenient biometric face recognition system for web-based ATM verification. Overall, this research offers a novel solution that improves user verification, reduces fraud, and fosters a safer banking environment.

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IMPLEMENTING PLANNER EDUCATION WEB-BASED SYSTEM

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ABSTRACT - A web-based education system using the Laravel framework assists the university community efficiently. The user can create the schedule for a class, and Create, Read, Update, and Delete (CRUD) operations are performed within the lists shown in the radio button in the services section on the navigation bar. Besides, there is other information, for instance, the list of current courses and the teams. The upcoming event is also displayed to notify the user. A few templates are used in this project. The goals of this project are to design a planner of an education system for the computer science community in UiTM Perlis Branch, to develop a web-based system built by the deviser with Laravel, and to evaluate the web-based using User Acceptance Testing (UAT). Appropriate development approaches use the Agile Model, which acts as a guideline in the development of a web-based with 6 phases. Overall, Laravel's templates increase the organization, maintainability, and developer productivity of the code by offering an organized and efficient method to develop user interfaces. The development involved numerous software. To identify whether end-user requirements are met for acceptability, UAT is conducted. The results will be displayed on the results page after the study is completed.

Keywords: Education, planner, schedule, Laravel

1. INTRODUCTION

The scheduler system is part of the framework to create the schedule for the students and lecturers in the computer science community at UiTM Perlis Branch efficiently. A scheduler is something that creates a plan for the activity that needs to be performed. A maneuverer is a person skilled in maneuvering and a person who makes plans for a system. To give an illustration, a student or lecturer will update the system to get the schedule for a class. The list of groups, lecturers, subjects, places, and the schedule will be shown in the menu in the radio button for the student to select the class. The table of the schedule will be shown after the user selects the groups, lecturer, subjects, and places. The user can add a new element to each list to create another list which will be shown in the row column. The goals of this project are to design a planner of an education system for the computer science community in UiTM Perlis Branch, to develop a web-based system built by the deviser with Laravel, and to evaluate the web-based using User Acceptance Test (UAT).

2. METHODOLOGY

All methodology that has been used in the work must be stated clearly and subtitles should be used when necessary. The Agile Model technique, which divides the project development process into different phases such as requirements, design, development, testing, deployment, and review is the initial step in this project's development. In the Requirements phase, the articles were studied from the library to write the documentation. Diagrams.net was used in the design phase. The development involved the software which are Composer, Laragon, Node.js, SQLyog Community, and Visual Studio Code. UAT was performed in the testing phase. In the deployment phase, numerous templates were used. The plagiarism checker is used to check the thesis in the review phase.

3. RESULTS AND DISCUSSION

UAT in which the participants were given a set of questionnaires asking them to rate 16 questions on a scale of 1 to 5, including questions about the respondent's background and user feedback on using the web-based system, was implemented to review the responses of 36 participants. The Technology Acceptance Model (TAM) has different sections, which are the Attitude of Using (ATT), Perceived Ease of User (PEOU), and Perceived Usefulness (PU) categories are used to determine the outcome and analysis. 1 of the 36 participants was an expert reviewer. For the category involved, 97.2% show that they are students. The expert review represents 2.8% and he is a software engineer.

4. NOVELTY OF RESEARCH / PRODUCT

This project contains a planner for education web-based which implements the schedule and additional information for students or lecturers. Known for being reliable and simple to grasp, Laravel is an open-source PHP framework. The design pattern used is model-view-controller. Laravel provides developers with a built- in library of tools that minimizes the amount of code they must accomplish.

5. CONCLUSION

In summary, web-based planner education assists the university community in providing current information and creating a schedule. The project's objectives have all been met successfully. With this system, it can benefit the students and lecturers efficiently and effectively.

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INTERACTIVE GAMIFIED WEB-BASED APPLICATION FOR ADHD CHILDREN

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ABSTRACT - The web-based application, was created especially for kids with attention deficit hyperactivity disorder (ADHD), is described in this study. This web application makes use of gamification to create a dynamic and interesting learning environment. It seeks to improve cognitive abilities in children with ADHD by combining game features. Children and parents may access and use the platform from a variety of devices. The application has a number of features, such as an interactive game part, a helpful resource, and a section devoted to information on ADHD. An agile methodology was applied to this project. The phrase "agile methodology" describes a method of creating software that is based on the idea of iterative development. This gamified web application effectiveness will be assessed based on user acceptance test and functionality, assuring ongoing development and optimisation for ADHD kids.

Keywords: Web-based application, ADHD, Gamification, Agile Methodology

1. INTRODUCTION

ADHD is a neurodevelopmental disorder characterized by issues with attention, impulse control, and hyperactivity (CDC,2022). Traditional learning environments can be difficult for children with ADHD, needing creative solutions to help them succeed in school and in life. This study provides a web-based interactive game application created with children with ADHD in mind. It seeks to deliver an interesting and customized learning experience that develops focus, attention, and the development of cognitive skills by utilizing the power of gamification (Moore,2016). Due to the application's web-based design, it is accessible and flexible, allowing kids to use it on a variety of devices. This study intends to meet the particular needs of children with ADHD and contribute to their academic and social success by using a user-centered design approach and using parts of the agile methodology.

2. METHODOLOGY

User acceptance testing and functionality testing are included in the creation of the interactive, gamified web application for ADHD children in addition to the user-centered design approach and agile methodology. Children with ADHD, their parents, and experts in the field are involved in user acceptability testing to evaluate the application's usability, performance, and general user satisfaction. This feedback-driven methodology enables small updates and guarantees that the web application satisfies the unique requirements and tastes of its intended users. Functionality assessment involves putting the application's multiple features and functionalities to the test to make sure they work as intended and accomplish the goals. The development team may better understand any problems, flaws, or usability concerns by thoroughly testing and evaluating the web application. This will improve the application's overall quality, usability, and beneficial effects on ADHD children's educational experiences.

3. RESULT AND DISCUSSION

ADHD children and their parents actively participated in the user acceptance test and functionality test of the gamified web-based application for ADHD children. The findings and discussions revealed positive review and general satisfaction with the application, engagement, and effectiveness of the web application in addressing the learning needs of ADHD children. The gamified aspects were considered motivating and helpful for sustaining attention and focus by ADHD children and their parents. The website's capacity to provide an engaging and encouraging environment for children with ADHD was successfully demonstrated by the user acceptance test and functionality testing, which also showed that it had the potential to improve the educational experience of kids with ADHD.

4. NOVELTY OF RESEARCH / PRODUCT

The unique aspect of this research is how it combines an enjoyable, gamified technique with a web application made especially for children with ADHD. The possibility of internet-based therapies in psychological problems has been recognized by previous research (Ritterband et al., 2003). However, a web-based tool for ADHD instruction that specifically combines gamification, user-centered design, and agile methodology is an important milestone in the field. This study expands on the growing interest in novel methods for treating ADHD and is consistent with the potential presented in earlier research (Ritterband et al., 2003). By including these components, the application seeks to improve cognitive skill development, engagement, and attention in children with ADHD while also providing a fresh and effective approach to meeting their educational demands.

5. CONCLUSION

In conclusion, the web-based interactive gamified application for ADHD kids shown in this study offers a promising approach to addressing the particular educational requirements of kids with ADHD. It offers an interesting and personalized learning experience by incorporating gamification aspects, user- centered design, and agile methodology. The system attempts to improve children with ADHD's attention, focus, and cognitive abilities through ongoing feedback, cooperation, and iterative improvement. The combination of these methods is a new development in education and has the potential to improve the educational experiences of children with ADHD.

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DEVELOPMENT OF EARLY WARNING SYSTEM FOR FLOOD AT RECREATIONAL SITE USING WEB-BASED APPLICATION

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ABSTRACT - The development of Early Warning System (EWS) focuses on providing information and early warning, if necessary, to the public about the condition of the river and if there is a predicted flood at the recreational area. This project is an extension from an Internet of Things (IoT) project in which a data retrieved from IoT device is stored in a real-time database to be integrated into the web application. The purpose of this project is to develop a web-based application that allows users to view updates about the intensity level of the possibility of a flood at the recreational area and to test and analyze the Early Warning System web application and its usability in displaying accurate information for users. The significance of this project is to provide convenience for recreational area visitors and most importantly, to help avoid casualties. By studying the records of the 25 respondents that has participated in the usability and functionality test, it is obvious that the majority of them are satisfied with the system and are likely to use the application, when necessary, in the future.

Keywords: early warning system, flood, recreational area, Internet of Things (IoT)

1. INTRODUCTION

The problem arises when the visitors visit the recreation site only to be disappointed that it is not suitable for them to stay there due to the rises of the water level that could be dangerous to stay. This is because they do not have access to information about the water level beforehand. In the context of flood, it was written that the lack of an Early Warning System and delayed rescue efforts play a part in causing the death toll of 54 people in 2022 which is the highest death toll in the flood history in Malaysia (Syed Ahmad Idid, 2022). This project highlights the function of the web site to provide information from IOT device. The scope of this project involves the recreation area in Padang Terap, Kedah. The target users are the visitors of the recreational area. There is also a notification mechanism using pop-up alert notifications appearing on the web application page to alert the users if the area is not safe to stay. These messages vary according to the indicators or the threshold that has been determined. There is also a navigational structure that uses hyperlink to bring the users to the Twitter web and generate the pre-written tweet that has been customized with specific hashtag, #infoPadangTerap. Users can use the hashtag to share any information about the area and also read through the hashtag to stay updated. Twitter was acknowledged as a useful social media as it was used as an information sharing tool actively during the Great East Japan Earthquake that has occurred on March 11, 2011(Hadjadj-Aoul et al., 2019). The EWS system focuses on the data representation as to satisfy the objective highlighted in the project. EWS represents the data through graph and table. Furthermore, there is also a page that provides additional info such as the guideline on what the visitors should and should not do.

2. METHODOLOGY

The Early Warning System (EWS) is developed using System Development Life Cycle (SDLC) framework. The method involves planning, analysis, design and development, implementation, and testing phase (Yadav, 2019). The requirements to build the system includes Visual Studio Code as the source code editor writing PHP, HTML, and CSS language, SQLyog and Firebase Realtime Database for database where SQLyog keeps system administrators' data and Firebase on the other hand, retrieve data from IOT device and keep them in real-time and also Laragon as the local web server in addition to the hardware requirements which is the device used to build the system.

3. RESULTS AND DISCUSSION

Based on the two tests, a usability and functionality test that has been conducted, 18 participants took part in the test. The purpose of the two tests is to evaluate the performance, functionality, and user experience of the system. It helps in identifying any issues or usability problems that may exist, so that improvements can be made to ensure better user

experience. There are two roles involved in the testing which is the public user and admin since there are two different interfaces for different roles. According to the finding analysis, for the question about if the users are satisfied with the system that uses linear scale as the method, 88.9% of the total respondents went with scale 5 which means strongly agree and the remaining 11.1% chose scale 4 that indicates agree. For the admin interface, 100% of the total respondents which is 25 respondents are totally satisfied with the interface. For the public user interface, 2 out of 15 respondents were satisfied meanwhile another 13 of the respondents are totally satisfied with the interface. To include other questions, none of the respondents valued the system with the scale 2 and below. Therefore, it could be concluded that there is no major issue with the web application that needs to be addressed and fixed.

4. NOVELTY OF RESEARCH / PRODUCT

In this project, Early Warning System (EWS) serves as a warning system specifically for the visitors of Puncak Janing Waterfall, Yan, Kedah. Unlike the 'Public Infobanjir' official website which provides early predictions for every river in Malaysia, this project focuses solely on providing information about the condition of the environment at the recreational area in Puncak Janing Waterfall and providing notifications in the form of pop-up alert messages on the web page. The system retrieves data such as water level, humidity and temperature according to timestamps from an IoT device that has been placed at the recreational area. This ensures that accurate reading or information can be noted. Additionally, the readings of the river stated in the official website are not equivalent to the readings at the recreational area. Hence, the system that is centered around the recreational area was built to help visitors plan their day at the recreational area.

5. CONCLUSION

In conclusion, the development of the Early Warning System (EWS) for flood at Recreational Site using a web-based application is proven to be relevant. The respondents, or the possible visitors, have acknowledged that the existence of the system is needed to fulfill the objective of the project. Future works that could be done to improve the relevancy of the EWS web application system include implementing a forum section on the website so that users can communicate with each other without having to go on Twitter.

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GROCERIES WEB-BASED RECOMMENDATION SYSTEM WITH EMAIL NOTIFICATION

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ABSTRACT - The title of this study is "Groceries Web-Based Recommendation System with Email Notification". This research aims to develop a recommendation web-based system for the groceries industry and evaluate its effectiveness through user acceptance and functionality testing. This study utilizes Agile Model as its methodology. The methodology consists of five phases which are System Planning, System Designing, System Development, System Testing and System Publish. The development of the recommendation system will involve the integration of advanced algorithms and machine learning techniques to analyze large datasets of customer transactions, product information, and user feedback. By leveraging these techniques, the system will be able to generate accurate and relevant recommendations tailored to each individual user's preferences. To evaluate the system, both user acceptance and functionality testing will be conducted. Functionality testing will focus on assessing the system's performance in terms of accuracy, efficiency, and reliability. It will involve measuring the system's ability to provide appropriate recommendations based on user inputs. The findings from this research will contribute to the field of grocery retail by providing insights into the effectiveness of recommendation systems in enhancing the shopping experience. Ultimately, the development and evaluation of a recommendation web-based system for groceries will enable retailers to personalize the shopping experience, improve customer satisfaction, and drive business growth in the highly competitive grocery industry.

Keywords: Recommendation, Groceries, Agile Model, shopping.

1. INTRODUCTION

The grocery industry is an important aspect of our daily lives since it provides us with the food and other supplies we require. With the introduction of e-commerce and online shopping, consumers now have instant access to an immense variety of products and brands. However, an abundance of options can frequently lead to decision overload and make it difficult for individuals to navigate through the tremendous array of available possibilities. The use of recommendation algorithms in the context of the supermarket industry has huge potential (Cheng, 2019). Grocery industries may give their consumers personalized product recommendations by utilizing the power of data and analytics, which will streamline the shopping process and raise customer happiness. This ultimately promotes corporate expansion by increasing customer loyalty.

2. METHODOLOGY

The approach that will be used for this research will consist of two primary components where the first will be the creation of a web-based recommendation system for grocery stores, and the second will be the assessment of the usefulness of this system through user acceptance and functionality testing. The results of this study will give grocery retailers valuable information that will help them use recommendation systems to make customers happier, grow their businesses, and stay competitive in the ever-changing grocery market.

3. RESULTS AND DISCUSSION

The findings of this study show how effective the built web-based recommendation system for the grocery sector is. High levels of satisfaction and adoption readiness were found during user acceptance testing, showing the system's usability and potential to improve the shopping experience. Functionality testing showed that the system's recommendations were precise and necessary, closely comparing with users' preferences and buying habits. These results demonstrate the important role that recommendation systems play in enhancing consumer satisfaction, engagement, and loyalty in the grocery sector, and they offer helpful guidance for grocery enterprise looking to put such systems in place and enhance their business growth.

4. NOVELTY OF RESEARCH / PRODUCT

The interesting thing about this research is that it builds and tests a web-based recommendation system for supermarkets. Recommendation systems have been used in a lot of different areas, but they haven't been used much in the food industry yet (Bellini et al., 2022). This research fills a gap in the existing literature by looking at the unique challenges and opportunities in the grocery industry, such as the need for personalized recommendations based on user preference. This study helps to move the field forward by creating and testing a new grocery recommendation system. It also gives valuable information to grocery stores that want to improve the shopping experience and increase customer satisfaction.

5. CONCLUSION

In conclusion, this study was able to create and evaluate a web-based recommendation system for the grocery industry that gives personalized product suggestions based on what the user likes. The results showed that the method improved customer satisfaction. Also, it would be helpful for grocery stores to find out how the suggestion system affects customer loyalty and business growth.

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WEB BASED STUDENT TRAINING SYSTEM WITH SKILLSET RECOMMENDATION

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ABSTRACT - This project aims to develop a web-based student training system with skillset recommendation to address employers' concerns about the lack of skills among graduates. Many university graduates struggle to meet job requirements or lack awareness of the skills needed for their desired careers. The project's objectives are to identify requirements and techniques for an effective system and create a web application that fulfills these needs. The waterfall model is chosen for the project's development, consisting of five phases: requirement, design, implementation, testing, and maintenance. Functionality testing and User Acceptance Testing (UAT) are conducted to evaluate the system's usability and functionality. The web-based student training system successfully meets all criteria and accomplishes the project's goals of providing skillset recommendations to students. By utilizing this system, students can receive personalized skill recommendations and enhance their employability. The project's outcome contributes to closing the skills gap and helping students succeed in their careers. The web application effectively achieves its purpose and provides valuable guidance to students seeking skill development opportunities.

Keywords: Student training system, Skillset recommendation, Employers' concerns, Web application, Skills gap.

1. INTRODUCTION

In response to the need for graduate employability in an evolving labor market, this project presents a web- based training management system that aims to equip students with 21st-century skills. Employers have expressed concerns about the lack of critical thinking and communication skills among graduates, necessitating a shift in skill requirements (Yahya & Ramli, 2019). The proposed system allows students to explore career options and receive personalized skill recommendations. Through the web application, students can access information about required skills for their desired careers, bridging the gap between their qualifications and employers' needs. By developing this training management system, higher education institutions can fulfill their responsibility of producing employable graduates who contribute to long-term economic growth and labor force development.

2. METHODOLOGY

During the testing phase, functionality testing and User Acceptance Test (UAT) were conducted to assess the web application's user engagement and the effectiveness of its features. A group of students from UiTM Arau were selected as testers to evaluate the performance and usability of the web application. The testing process began with the registration process, where testers registered and created their user accounts. Each tester then spent approximately 10 to 15 minutes exploring the system and its functionalities. Following the testing, the developer conducted a questionnaire session with the testers to gather feedback on the functionality and usability of the web application. This comprehensive testing approach allowed for an evaluation of how well the system performed and how easily it could be used by the intended users.

3. RESULTS AND DISCUSSION

The collected data and feedback from the selected students revealed that most respondents expressed confidence in using the web application. This positive response indicates that the system is effective in providing personalized skill recommendations and improving students' employability. The project's outcomes are valuable in addressing the skills gap and supporting students' career success. However, it is important to note that some respondents provided suggestions for improvement and offered feedback for future enhancements of the system. These suggestions can be used to further refine and enhance the functionality and user experience of the web application. Considering this feedback will help in continuously improving the system and ensuring it meets the evolving needs of students and

employers. Overall, the project has demonstrated its effectiveness in addressing the skills gap and providing valuable guidance to students. With the incorporation of suggested improvements, the web application can continue to empower students and contribute to their long-term career development.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of the proposed web-based training management system lies in its ability to address the pressing issue of graduate employability by providing personalized skill recommendations to students. Unlike traditional approaches, this system leverages the Fourth Industrial Revolution (IR 4.0) to equip graduates with 21st-century skills required in the ever-changing workforce. By integrating functionality testing and User Acceptance Test (UAT), the system ensures its acceptability, usability, and effectiveness in engaging users. The inclusion of a diverse group of ten students from UiTM Arau as testers adds to the novelty of the system, as it incorporates real-world user feedback to enhance the application's features and usability. The positive response from the majority of respondents highlights the system's efficacy in boosting student confidence and employability. Furthermore, the system's focus on personalized skill recommendations contributes to closing the skills gap and supporting students' long-term career success. By providing students with tailored guidance on the skills needed for their desired careers, the web application empowers them to make informed decisions and bridge the gap between their qualifications and employers' requirements. Overall, the combination of IR
4.0 technologies, user testing, and personalized skill recommendations sets this web-based training management system apart, offering a novel and comprehensive solution to the challenges of graduate employability and skills development.

5. CONCLUSION

In conclusion, the proposed web-based training management system represents an innovative solution to the issue of graduate employability and skills development. With functionality testing and UAT, the system ensures effectiveness and user engagement. Positive feedback confirms personalized skill recommendations and improved employability. The outcomes address the skills gap, allowing students to explore careers, receive tailored recommendations, and acquire in-demand skills. By bridging qualifications and industry needs, the system empowers students and contributes to economic growth. Continuous refinement based on user feedback promises significant impact on career success and job market needs.

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WEB-BASED BICYCLE RENTAL SYSTEM WITH NOTIFICATION FEATURES

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ABSTRACT - One of the significant factors of the existence and growth of cities is transportation. The aim of this study to design and develop a bicycle rental system to make it easier and more effective for users and leasing businesses to complete bicycle rentals. The Software Development Life Cycle (SDLC) is a clearly laid out and organized series of steps used in software engineering to create a variety of software products. Waterfall model is one of the System Development Life Cycle (SDLC) method of the strategies for systematic and sequential software development, covering environmental analysis, application design, coding, testing and application maintenance to keep an application up and running. An online renting system were created to allows customers to rent at any time. It can also help reduce the number of missed or double-booked rentals. Various electronic payment methods, such as credit cards, debit cards, digital wallets, and online bank transfers, were introduced. The user receives a message or alarm via Telegram notification. Overall, this system was developed to maintain thorough records of both the bicycle and the customers. This approach will make the process more effective and ensure the security of bicycle rentals. It is also the finest technique to improve management standards and lessen time pressures.

Keywords: web-based, rental, Telegram notification

1. INTRODUCTION

Bicycles have played a significant part in transportation strategies in recent years due to their advantages for the environment and human health (Abidin et al., 2018). Cycling does not pollute the environment or release fumes, making it the most ecologically friendly mode of transportation. In this scenario, it is essential to develop more environmentally friendly modes of transportation, such as public transit, bicycles, and foot traffic to create a sustainable transportation system that strives for energy independence. As of right now, there is no manual that students may use as a resource when looking for bicycle rental in UiTM. The idea behind the bicycle rental system was to establish a modest system of rentals so that students could pick up bicycles on campus and ride them anywhere and whenever they pleased (Kiefer et. al., 2016). Therefore, this project will develop a system that can ease the business owner and users. This system will be implemented by using notification features so it will remind the users from time to time to return the bicycle.

2. METHODOLOGY

A waterfall model will be used to create a complete and successful web-based system. Waterfall model is one of the System Development Life Cycle (SDLC) method of the strategies for systematic and sequential software development, covering environmental analysis, application design, coding, testing and application maintenance to keep an application up and running. Software Development Life Cycle (SDLC) is described and defined using a variety of methods, stages and tools (Alexandra Florea et al., 2019). The development process itself is divided into several stages including the following: Planning, Analysis, Design, Implementation, Testing and Documentation.

3. RESULTS AND DISCUSSION

In conclusion, users have successfully evaluated each list that has to be checked to see whether it is functioning effectively or not. Users appreciated the convenience of being able to check bicycle availability, make reservations, and receive notifications about rental confirmations and updates through the web interface.

4. NOVELTY OF RESEARCH / PRODUCT

With the web-based bicycle rental system, there is a lot of benefits of the implementation include transport flexibility, reductions to vehicle emissions, health benefits, reduced congestion and fuel consumption, and financial savings for

individuals. Furthermore, the system allows flexibility and convenience for students in the UiTM Arau, who can automate the free rental bikes service by using the web-based rental system. Being a public service, bikes removal and return is very fast. With no need of doing proceed in desk with the service works continuously and does not depend on office hours or the availability of an operator.

5. CONCLUSION

In conclusion, web-based bicycle rental system with notification features will make the process more effective and ensure the security of bicycle rentals. This method makes it simpler for UiTM to rent bicycles and manage their income while assisting students in rapidly accessing bicycle information through all rental bicycle records and information online at any time using the campus bicycle rental system.

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WEB-BASED TODDLER'S DEVELOPMENT MILESTONE SYSTEM WITH TELEGRAM NOTIFICATION

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ABSTRACT - Due to work duties, parents often struggle to track their children's progress effectively. To assist them, a Web-Based Toddler's Development Milestone System with Telegram Notification has been proposed and developed to allow childcare workers to record developmental milestones of toddlers aged two and three years old and send notification to parents via Telegram. The project objectives include developing the system and evaluating its usability and functionality through user acceptance and functionality testing. Employing an agile methodology, a flexible and iterative approach to the system development is ensured. The system enables teachers to update students' milestones and automatically notifies parents via Telegram when a new milestone is achieved. Evaluation conducted using usability and functionality testing among 16 childcare workers has resulted in proving that this system simplifies the process of tracking and monitoring developmental milestones. With this web-based tool and Telegram integration, parents can stay actively involved in their toddler's progress, even with busy work schedules.

Keywords: parents, toddlers, developmental milestones, Telegram, notification

1. INTRODUCTION

The Web-Based Toddler's Development Milestone System with Telegram Notification helps encounter the challenges faced by parents in monitoring their children's developmental milestones. With work duties hindering parental involvement and the potential negligence towards their children's early childhood development (Monteiro et al., 2017), selecting the appropriate tracking tools is often challenging. The objectives of this study are to develop a web-based system that records developmental milestones for toddlers aged 2 to 3 years and notifies parents via Telegram. The system is evaluated through user acceptance and functionality testing using an agile methodology. The scope of the system includes tracking milestones across motor, communication/language, social/emotional, and cognitive development domains. It will feature automated notifications to parents when milestones are achieved, benefiting a childcare center in Perlis, Malaysia. This research aims to empowers parents in promoting active engagement in their child's development, as well as providing valuable information to experts, aiding in early identification of delays and appropriate interventions (Ben-Sassons et al., 2022).

2. METHODOLOGY

The Agile methodology was selected to help propel this project due to the many qualities and significant perks it offers to software development. Trivedi (2021) stated that part of the success of the Agile methodology lies in its emphasis on breaking down projects into smaller, more manageable pieces, or iterations, which in turn enhances and perfects the development, collaboration, and testing phases. In the planning phase, information and resources are gathered to define the problem statement, scope, project objectives, and requirements. The design phase focuses on specifying the technical details of the system, including system designs, databases, sketches, and system interfaces. During development, the logical information is transformed into machine-executable form, ensuring proper functioning and interface integration with system components. The testing phase is crucial, as it involves evaluating system performance and ensuring that all requirements are met before launching the application. Usability and functionality testing are employed by gathering 16 participants to guarantee a successful and efficient system.

3. RESULTS AND DISCUSSION

The Web-Based Toddler's Development Milestones System with Telegram Notification was evaluated through usability and functionality testing with a total of 16 participants, all of whom were childcare workers aged between 18 to 35 years old. The findings revealed that the majority of participants (15 out of 16) found the system to be very comfortable to use, indicating its user-friendly nature. Regarding the quickness in mistake recovery, two participants

rated 3 on a scale of 1 to 5, while five participants rated 4, and the remaining nine participants rated 5. This suggests that the system generally allows for efficient error correction and recovery, although a small proportion of participants experienced some difficulties. Notably, 12 participants found the telegram notification feature of the toddler milestone system to be highly effective, demonstrating its value in providing timely updates and alerts. In conclusion, the questionnaire responses indicate that the Web-Based Toddler's Development Milestones System with Telegram Notification is perceived positively by the participants, as they found it comfortable to use, effective in mistake recovery, and highly satisfactory overall. The system's user-friendly interface and the functionality of the telegram notifications were particularly appreciated. These findings validate the system's usability and functionality, emphasizing its potential to support childcare workers in monitoring and tracking toddler milestones effectively.

4. NOVELTY OF RESEARCH / PRODUCT

The Web-Based Toddler's Development Milestone System with Telegram notification integrates technology, specifically the use of a web-based platform and Telegram messaging, by enabling childcare workers to record and update children's milestones within the system. When a milestone is updated or achieved, parents receive instant notifications through Telegram. This seamless integration between childcare providers and parents through a web-based platform and Telegram messaging enhances communication and ensures that parents are promptly informed of their child's developmental progress. By utilizing modern communication channels and automating milestone notifications, the project offers an innovative approach to addressing the challenges faced by parents in staying actively engaged in their toddler's early development, even in the face of busy work schedules and potential negligence.

5. CONCLUSION

In conclusion, the Web-Based Toddler's Development Milestone System with Telegram Notification successfully achieved all objectives, providing a user-friendly tool for parents to track and monitor their children's milestones. The system effectively addressed the challenges faced by parents, empowering them to actively engage in their child's early development with the assistance of childcare workers.

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IN-CAR CHILD ABANDONMENT DETECTION

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ABSTRACT - This abstract presents a method for child detection in car interiors using a Single-Shot Detector (SSD). The objective is to automatically identify the presence of a child within a car for enhanced safety and welfare. The SSD framework, a state-of-the-art object detection algorithm, is trained on a dataset containing annotated images of car interiors with and without children. The model learns to recognize and localize the specific features associated with a child's presence. Images or video frames of the car interior are processed by the trained SSD model to detect and localize child instances accurately. The system offers real-time detection, accurate localization, and potential integration with existing car monitoring systems or applications. Evaluation involves benchmarking performance on various car interior images and assessing detection accuracy. The proposed system aims to contribute to child safety by preventing incidents associated with leaving children unattended in vehicles. It provides a robust and reliable solution for automatically detecting child presence in cars, mitigating risks like vehicular heatstroke, and promoting child welfare.

Keywords: Single-Shot Detector (SSD), child detection

1. INTRODUCTION

The objectives of this study are to develop a deep learning model using Single-Shot Detector (SSD) for detecting children and adults in a car, and to evaluate the performance of the developed model. The aim is to create an effective and accurate system that can identify the presence of children and adults in car seats, thereby addressing the issue of child abandonment in vehicles. The model will be trained and tested using appropriate datasets, and its performance will be assessed based on detection accuracy and reliability. Object recognition, a deep learning and post-processing technique, is essential for this project. Object recognition models can be designed to detect and recognize multiple objects, making them adaptable for different applications. This includes identifying human features in images and videos, which has become feasible with advancements in deep learning and one-shot learning approaches.

2. METHODOLOGY

The study's approach consists of three main phases. In the first phase, training pictures were obtained to simulate child abandonment in a car, considering different scenarios such as backgrounds, lighting conditions, and passenger groups. The second phase involved using a deep learning identification model based on the MobileNetV2 architecture and implementing a custom Single-Shot Detector (SSD) using Keras Sequential Model. This model can detect objects in images through a single encounter with a convolutional network, preserving spatial configuration and extracting semantic meaning. The final phase focused on creating a model for detecting in-car child abandonment using the MobileNetV2 model on a dataset prepared using TensorFlow object identification. The MobileNetV2 model was chosen for its efficiency and suitability for resource-constrained systems.

3. RESULTS AND DISCUSSION

The results that can be obtained from the system encompass various aspects of its performance. Firstly, the detection accuracy of the system can be measured, indicating how well it can correctly identify and classify children and adults in car seats. Precision and recall metrics will further provide insights into the system's ability to minimize false positives and false negatives. Evaluating the system's performance across different scenarios, including varying lighting conditions, backgrounds, and passenger postures, will help identify any limitations or challenges. Additionally, assessing the system's real-time processing speed will determine its efficiency in handling live video feeds from the webcam. Comparative analysis with existing methods or models for occupant detection can highlight the system's strengths and areas for improvement. Overall, these results will contribute to understanding the effectiveness, accuracy, and practical applicability of the system in enhancing child safety in vehicles.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of incorporating Single-Shot Detector (SSD) and MobileNetV2 in this study lies in the specific advantages for child detection in cars. The use of SSD brings efficiency and accuracy to the system by enabling real-time object detection in a single pass, making it ideal for promptly identifying children in car seats. This real-time capability is crucial for preventing child abandonment incidents. Additionally, the choice of MobileNetV2 as the neural network architecture introduces novelty by offering a lightweight and efficient model that maintains high accuracy. MobileNetV2's suitability for resource-constrained systems ensures that the developed model can be implemented in practical scenarios, such as in-car detection systems, without compromising detection performance. Overall, the combination of SSD and MobileNetV2 enhances the research's novelty by providing a real-time, accurate, and efficient solution for detecting children in car seats, thereby contributing to child safety and addressing the issue of child abandonment.

5. CONCLUSION

In conclusion, the research focuses on developing a deep learning model using SSD and MobileNetV2 to detect children in car seats, addressing the issue of child abandonment. The novelty lies in their real-time capabilities, efficiency, and suitability for resource-constrained systems. The study emphasizes comprehensive datasets, practical implementation, and evaluation metrics. The outcomes have the potential to enhance child safety by providing an effective and efficient system to prevent child abandonment incidents.

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UiTM ARAU DEVELOPING WEB BASED SUPERBIKE'S WORKSHOP RESERVATION SYSTEM EXTENDED ABSTRACT

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Abstract - This web-based system will allow users to easily reserve a spot at a superbike workshop. Users will be able to select the workshop they want to reserve a spot at, the date and time of the service, and the type of service they need. A confirmation email containing all of the reservation information will subsequently be generated by the system. The system will be created to be effective and user-friendly. This system will be a valuable resource for superbike owners. It will make it simple to locate workshops, book a seat, and keep tabs on the progress of reservations. Users will experience less time and bother as a result, and it will be made possible for them to service their superbikes whenever necessary.

Keywords: Laravel, user-friendly, efficient, reserve a spot, email notification

1. INTRODUCTION

Every superbike's owner is always wondering about where to repair and service their beloved screaming machine when it is due their service time. But, not all the workshops are available and have time to accept their motorcycle. This is where a web-based superbike workshop reservation system comes in.. The objective is to create a user-friendly platform that offers convenience and ease of use for motorcycle enthusiasts booking workshops that have the available time for the services. Users will be able to quickly reserve a space at a superbike workshop using this approach. Users may choose the workshop they wish to secure a space at, the service's day and time, and the kind of service they require. A confirmation email containing all of the reservation information will subsequently be generated by the system. The system will be developed using Laravel, a popular PHP framework. Laravel is a powerful and versatile framework that is well-suited for developing web applications. It is also easy to learn and use, making it a good choice for developers of all levels of experience.

2. METHODOLOGY

Waterfall Model was used to gather the information in developing this website, which consist of planning, analysis, design, implementation, testing and documentation. By using Laravel and PhpMyAdmin as the database, the development of this project has run smoothly. 20 respondents were given questionnaires with usability testing questions in order to evaluate this project and according to the result, the feature in the website is operating well but still needs some improvement.

3. RESULTS AND DISCUSSION

The results of the study showed that the web-based superbike workshop reservation system was effective in helping users to reserve a spot at a workshop. Users were able to quickly and easily identify the workshop they were seeking for and reserve a space with only a few clicks because of the system's simplicity of use and efficiency. Users may always know when their service was planned because of the system's ability to track the progress of bookings. This feature proved to be highly convenient for users booking spots in the workshops. Overall, the results from the survey demonstrated that the website successfully met its objectives of enhancing convenience, accessibility, and user experience for motorcycle enthusiasts booking the workshop services. Discussion and feedback from respondents can provide valuable insights for further improvement and optimization of the website. Ongoing monitoring and evaluation of the website's performance and user engagement will enable continuous enhancements to ensure the website remains effective and user- friendly in meeting the evolving needs of motorcycle enthusiasts.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of this research lies in the development of a web-based superbike workshop reservation system that is both user-friendly and efficient. The user-friendliness of previous web-based workshop reservation systems has received less attention than efficiency. Most web-based workshop reservation systems are designed to be efficient, but they often sacrifice user-friendliness in the process. This can make it difficult for users to find the information they need or to complete the reservation process. (Smith, 2022). The system developed in this research is designed to be both user-friendly and efficient. The user interface is designed to be simple and easy to understand, and the reservation process is streamlined to make it as quick and easy as possible.

5. CONCLUSION

In conclusion, this extended abstract has presented the research on the development of a web-based superbike workshop reservation system using Laravel. The system is designed to be both user-friendly and efficient, and it is likely to be adopted by users and to be effective in helping them to reserve a spot at a workshop. Users are also inclined to accept the system because it was created with their requirements in mind. The reservation process has been optimized to make it as quick and simple as possible, and the user interface is created to be straightforward and simple to grasp. The system also offers a number of features that customers are likely to find useful, such as the option to see workshop availability at various times and leave workshop feedback. Overall, the web-based superbike workshop reservation system created in this research is an original and cutting-edge technology that is likely to be embraced by users and useful in assisting them in reserving a space at a workshop.

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DEVELOPMENT OF STAFF RESIDENCE KOLEJ (SRK) REPORTING SYSTEM USING LARAVEL MVC IN UITM PERLIS

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ABSTRACT - Staff Resident College (SRK) is a key position at a residential college or university, particularly at UiTM Perlis. It consists of academic staff and university administrators. The management of university student affairs appoints SRK to help college administration and resident students. The management allocates each SRK with a private residence in the college. Google forms and WhatsApp are the contemporary techniques that SRK employs to manage student information. The current approaches are unreliable since SRK must continuously update the student's condition. Managing a bigger number of residents will need a substantial amount of time and effort. Two objectives of this study include to design and develop a functional SRK Reporting System for UiTM Perlis and to evaluate the SRK Reporting System using functionality and usability test. The system is developed following the waterfall model of SDLC using Laravel MVC as an evolving framework to create a website connected to a MySQL database. As developed, the system was tested with usability and functionality tests by the SRKs and students. From the survey distributed, it was found that the website functioned successfully to replace the previous method to lodge reports.

Keywords: Laravel MVC, MySQL, SRK Reporting System, Reporting System, Waterfall

1. INTRODUCTION

UiTM Perlis has 30 SRKs who are organized into 5 groups which are Group A, Group B, Group C, Group D and Group E. The fact that SRK must maintain certain student information and guarantee student safety simplifies their task. A similar problem was raised in a study by Samanekar et al. (2018) where the author stated that most academic institutes are reliant with manual processes and paperwork to submit reports, managing attendance and admissions hence a new student management system was proposed for his institute. On the contrary, Google Forms and WhatsApp are two of the contemporary techniques that SRK employs to manage student information. Staff Resident College Report Management System, a web application, will be created to address this issue. This web application is built with Laravel as it is emerging as a new tool for software development to enhance their creativity. Laravel is poised to become a game changer for web development in 2023 (Babirli, 2023). According to Ahmad Nizar & Othman (2020) from UTHM, they proposed a similar solution which uses PHP and MySQL to deliver a new system for managing residents in their hostel. Laravel itself uses PHP language plus various simple syntax as a back-end development tool.

2. METHODOLOGY

Methodology that is used in this project is Waterfall Model of Software Development Life Cycle (SDLC). Design phase is the earlier phase which includes the design of the data flow of the system, design of the database and design The user interface. By using the design that has been created, implementation will be conducted to complete this project. Implementation phases include the development of user interface, develop system and creation of database. Testing has been conducted by using method functionality testing and user experience test to evaluate the satisfaction of the user during use website application.

2.1 Laravel MVC

The MVC (Model View Controller) architectural pattern is used by the PHP (Hypertext pre-processor) framework Laravel to isolate the presentation layer from the application functionality (Md Sakib, 2019). In accordance with the MVC principle, Laravel divides the application logic into three distinct components which are Model responsibility, View responsibility and Controller responsibility. In developing the web, Laravel will be implemented because of its robust and future scalability for further use. The application's functionalities will be constructed using Laravel components.

3. RESULTS AND DISCUSSION

Two methods of testing relevant to this study are functionality testing and usability testing. The specific tests will be distributed to three classes of population in UiTM Perlis. 10 students, 10 SRKs would be the target respondents for the survey. From the survey distributed, users agree that the new system proposed successfully to replace the existing reporting system which was 95.2% of the respondents. Figure 1 shows the relevance of the new system proposed.

4. NOVELTY OF RESEARCH / PRODUCT

The system proposed would be the first to implement Laravel MVC framework as a back-end development platform. Workload of management staff and SRKs can be reduced since the system will systematically conquer the manual process of acquiring residents' reports compared to the previous method. The future goal of the project is also to be implemented into the official website of the university. As compared to the related work done by Rahman et al., (2017) where through the application developed by the author, students can also calculate their CGPA through CGPA calculator and student's attendance, UiTM has already developed a more functional web application that does so much more than the author. Hence the website can be more complete if there would be a SRK reporting system attached to the website itself to be accessed by the staff and students.

5. CONCLUSION

Overall, all the objectives were achieved, and the Development of Staff Residence Kolej (SRK) Reporting System Using Laravel MVC in UiTM Perlis was successfully developed in accordance with the plan. This web application also has been successfully developed according to the users need which is an easy application to book the SRK reports. For further development, the system would be better if a mobile application would be developed in conjunction with the reporting system for mobility.

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APPLICATION OF SMOTE TECHNIQUE FOR IMBALANCED BREAST CANCER DATA SET

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ABSTRACT - Categorization data sets that have uneven class compositions are said to be unbalanced datasets. When a decision system is built to find a rare but significant occurrence, there are often substantial imbalances in real- world domains. The synthetic minority oversampling approach, or SMOTE, is one of the oversampling techniques most frequently employed to address the imbalance issue. By duplicating and adding more minority class samples at random, it seeks to balance the distribution of classes. SMOTE produces fresh minority instances by combining minority examples that already exist. Successful minority case prediction may be hampered by an unbalanced class distribution. This might have a significant impact on industries like medicine. Positive examples that are rare but substantial may be misclassified due to the overwhelming prevalence of the dominant class (negative cases). The data was collected from the UCI website which is Breast Cancer Data set. The algorithm chosen is J48, Random Forest and Logistic based on a little research about the best algorithm in another article The aim of this study is to apply SMOTE technique to an imbalanced breast cancer data set. By using WEKA as a tool with a different percentage of imbalance ratio to get the accurate output. Then, to validate the performance of those algorithms chosen by using Friedman Test with Hommel's Post-Hoc procedure analysis.

Keywords: Breast cancer, SMOTE technique, imbalanced class, Random Forest

1. INTRODUCTION

An essential component of data preparation is balancing the training data. The topic of imbalance has recently received more attention Chawla, N. V. et al., (2002). The safety of a model's training might be put in danger by data imbalance, which happens when classes in a data set are not distributed equally. Breast cancer is the second greatest cause of mortality among women globally, according to Mohammed, S. A., et al., (2020). For some real-world, world-class datasets, including breast cancer databases, balancing datasets is essential. With the SMOTE technique, we will approach the minority class in the imbalanced ratio of breast cancer data sets, which is the objective of this work. According to another study by Ha, T.M., & Bunke, H. (1997), this strategy was influenced by a method that has been successful in handwritten character identification. By applying certain techniques to actual data, they produced extra training data.

2. METHODOLOGY

The Waikato Environment for Knowledge Analysis (WEKA) was used to discretize the original data. The method begins with the preparation of the data which is collected in the UCI website with a CSV file. Next, apply SMOTE on the filter to begin the pre-processing data and change the percentage filter on SMOTE until you get the 40, 45 and 50 percent of Imbalanced Ratio. Then, set the percentage split to 70% before choosing algorithms for classifiers such as J48, Random Forest and Logistic. The result from the classifiers is the percentage of those algorithms chosen to find the most accurate algorithm for balancing the breast cancer data set.

3. RESULTS AND DISCUSSION

According to the Pre-Process Data table conclusion, Random Forest outperforms J48 and the logistic algorithm, the most accurate percentage for balancing was shown by Random Forest algorithm. As a result of the conclusion reached, Random Forest is substantially more accurate in making predictions.

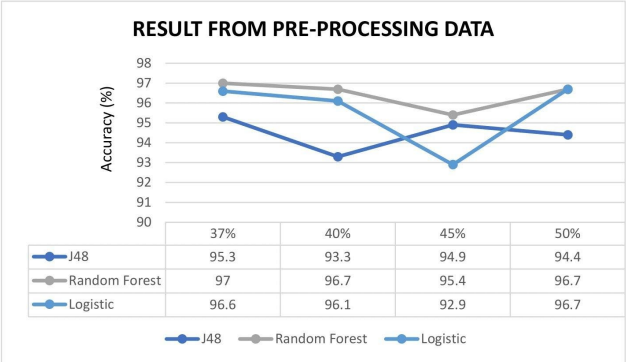

Figure 1. Graph for result from Pre-Processing data

3.1 Friedman Test with Hommel's Post-Hoc Procedure

Table 1. Result for Friedman Test with adjusted P-Hommel

Algorithm	FM. Test	Average rank	Adjusted P_{Hommel}
RF (control)	6 P-value =0.049	1.5	-
Logistic		1.5	1
J48		3	0.06779

Hommel's Procedure may discover minor variations between two procedures. After using Hommel's Procedure, Random Forest algorithm shows no adjusted P_{Hommel} and shows that Logistic algorithm and J48 algorithm has a significant difference.

4. NOVELTY OF RESEARCH / PRODUCT

The purpose of this paper is to solve the problem statement which is biased classifiers for majority class. It is advisable to replicate the same methodology on various classifiers and diverse datasets in order to obtain a well-balanced data set. These algorithms have frequently been utilised in conjunction with SMOTE due to their high efficiency, adaptability, and comprehensibility.

5. CONCLUSION

In conclusion, this study investigated which imbalanced ratio to be used and it is 40%,45% and 50% for computing the algorithm. As a result, Random Forest gets the highest classifiers percentage among other algorithms chosen.

Proven in validation the performance via Friedman Test which is Random Forest does not have a adjusted P_{Hommel} in the result.

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RANKING THE KEY FACTORS INFLUENCING THE ACCEPTANCE OF DIGITAL PAYMENT AMONG LOCAL RETAILER USING FUZZY ANALYTICAL HIERARCHY PROCESS (FAHP)

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ABSTRACT - The pandemic has spurred a widespread adoption of digital payments, with an increasing number of people preferring this mode of financial transactions. Despite the growing popularity of digital payments, some retailers have yet to address this shift in consumer behavior. This study ranks key factors influencing acceptance among local retailers, providing valuable insights for adapting to the increasing demand for digital payment options. Using Fuzzy Analytical Hierarchy Process (FAHP), the study identifies knowledge, intention to use, compatibility, and accessibility as crucial factors. Knowledge emerges as the most important, followed by intention to use, compatibility, and accessibility. These findings enable the government to develop targeted strategies to enhance retailers' understanding, promote usage, ensure compatibility, and improve accessibility, fostering an efficient retail landscape.

Keywords: Digital payment acceptance, fuzzy analytical hierarchy process.

1. INTRODUCTION

In today's rapidly evolving digital landscape, digital payment methods have emerged as a convenient and efficient alternative to traditional cash transactions. Digital payment refers to the electronic transfer of funds or value between parties using various technological platforms and devices (Sahayaselvi, 2017). With the increasing popularity of smartphones, online shopping, and contactless payments, local retailers are recognizing the importance of embracing digital payment solutions to cater to the changing preferences of their customers.

Understanding the factors influencing digital payment acceptance is vital for local retailers' integration into their business operations. To address this, we employ FAHP, an innovative decision-making methodology that accounts for uncertainties and imprecisions in factor evaluation. By applying FAHP, we identify and rank the key factors impacting digital payment acceptance, providing valuable insights to optimize strategies and drive widespread adoption among retailers.

By utilizing the capabilities of FAHP, the outcomes will empower local retailers with valuable insights to make well-informed choices, effectively allocate resources, and gain a deeper understanding of the driving factors behind the adoption of digital payment methods, thereby fostering growth and long-term viability in today's digitally-driven marketplace (Chattopadhyay et al., 2013).

2. METHODOLOGY

Fuzzy theory is applied to address real-world phenomena that exhibit instability, allowing for the representation of sets, numbers, and real-world phenomena using fuzzy techniques. FAHP, a modern approach within the Analytical Hierarchy Process (AHP), utilizes fuzzy concepts to construct combined comparison matrices by employing triangular fuzzy numbers for pairwise comparisons. The degree investigation method is utilized to determine the synthetic degree value of the pairwise comparison in FAHP (Fam et al., 2022).

There are 6 steps in ranking the criteria using the FAHP method. The steps are:

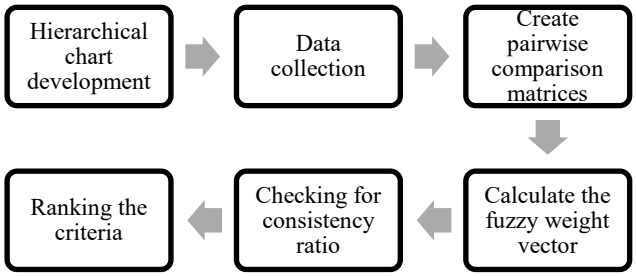

Figure 1. Fuzzy analytical hierarchy process steps

3. RESULTS AND DISCUSSION

The ranking of the criteria stated in Table 1 were ranked in descending order of importance.

Table 1. Ranking of criteria.

RANK	CRITERIA	FUZZY WEIGHT
1	CRITERIA 1	0.2501
2	CRITERIA 2	0.2500
3	CRITERIA 3	0.2500
4	CRITERIA 4	0.2500

With a fuzzy weight of 0.2501, Criteria 1 emerges as the most significant factor, highlighting the importance of knowledge of digital payment in driving its acceptance among local retailers. As the awareness and understanding of digital payment systems grow, there is a clear indication that acceptance and usage will continue to increase. The customers' technical competence and familiarity with cashless transactions can significantly influence the adoption of digital payment methods.

4. NOVELTY OF RESEARCH / PRODUCT

The utilization of Fuzzy Analytical Hierarchy Process (FAHP) to rank the key factors influencing the acceptance of digital payment among local retailers. This approach allows us to capture the inherent uncertainties and imprecisions associated with evaluating these factors, providing a more comprehensive and accurate assessment of their relative importance. By employing FAHP, our research contributes to the existing body of knowledge by offering a unique and innovative methodology for understanding and prioritizing the factors that drive digital payment acceptance in the context of local retailers.

5. CONCLUSION

In conclusion, Fuzzy Analytical Hierarchy Process (FAHP) successfully ranked the key factors influencing the acceptance of digital payment among local retailers. Among these factors, knowledge about digital payment emerged as the highest-ranking factor, emphasizing its crucial role in driving acceptance. This finding highlights the importance of enhancing retailers' understanding and awareness of digital payment systems to promote their successful adoption and integration into business operations.

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SUPPLIER SELECTION CRITERIA IN UiTM ARAU CAFETERIA USING FUZZY AHP METHOD

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ABSTRACT - Supplier selection is the procedure of determining with which prospective supplier that an organization should conduct business. In this study, the most preferred supplier selection criteria were chosen using the Fuzzy AHP method. The research aim is to determine the criteria when selecting the supplier, identify sub-criteria that impact in selecting the supplier and investigate the best criteria in UiTM Arau. In this study, three decision-makers examine three criteria and six sub-criteria to determine the supplier selection criteria. The criteria are quality of product, delivery service, and performance history. At the same time, the sub-criteria are warranties and claim policies, reputation in industry, time and cost, packaging ability, communication system and technical capabilities. The data is collected through the distribution of a questionnaire to experts in the area of study. The obtained data was calculated using a formula and Microsoft Excel. Quality of Product is the most preferred criteria, with a weight of 0.7123. Delivery Service is the second-best criteria, with a score of 0.1821, while Performance History is the lowest-ranked criteria in supplier selection, with a score of 0.1056. According to the statistics, Quality of Product is the best criteria, outperforming Delivery Service and Performance History.

Keywords: Fuzzy AHP, supplier selection, criteria.

1. INTRODUCTION

There are many challenges faced by the buyer to select the best supplier. The cafeteria managers in UiTM Arau cafeteria also are not able to identify the main criteria to select their supplier. In this research, Fuzzy AHP methods are used to solve the model. By using this method, the most preferred criteria in supplier selection criteria can be decided. Fuzzy AHP method can identify the importance of sub-criteria in selecting the supplier and will be utilized in ranking the criteria and sub-criteria. This method depends on the opinions of experts in the field. AHP combined with fuzzy logic also known as Fuzzy AHP, is widely used to handle uncertainty and fuzziness to help decision makers solve difficult challenges with several competing criteria (Kubler et al., 2016). The purpose of this research is to determine the most preferred criteria in supplier selection criteria using Fuzzy AHP method.

2. METHODOLOGY

The purpose of our study is to use fuzzy AHP to identify the most important criteria for selecting supplier in the UiTM cafeteria. The data used in this research will be collected from three specialists who were managers at the UiTM Arau cafeteria. They were selected as decision-makers for this study. Decision making is harder when limitations are imprecise, vague, uncertain and fuzzy in nature. Multi criteria decision making (MCDM) approaches such as Fuzzy AHP method are used to handle real-world issues with several competing constraints. Fuzzy AHP is an appropriate strategy for decision-making difficulties, and it assists in achieving more accurate findings while researching and reviewing supplier selection criteria. The best-scoring option is presented as a referral to the decision-maker.

3. RESULTS AND DISCUSSION

Based on the results, Fuzzy AHP method can offer an accurate way to solve the model by comparing the results. This study concludes that Quality of Product is the most influential supplier selection criteria with a normalised score of 0.7123. Delivery Service comes in second place, with a normalised score of 0.1821. Finally, with a normalised score of 0.1056, Performance History is the lowest ranked of the three criteria studied. Based on this research, the results of this study shows that Fuzzy TOPSIS is a good method for ranking alternatives based on several criteria.

4. NOVELTY OF RESEARCH

Fuzzy Analytical Hierarchy Process (FAHP) is used to rank the most important criteria influencing the supplier selection criteria. This method enables the customer to achieve more accurate findings while researching and reviewing supplier selection criteria, resulting in a more detailed and precise evaluation of each of the criteria. Through the use of Fuzzy AHP, this study improves the current study by providing a novel approach to identifying and ranking the criteria that influence the selection supplier.

5. CONCLUSION

In conclusion, Fuzzy AHP was able to precisely rank the most important criteria affecting supplier selection criteria in UiTM Arau cafeteria. Among them, Quality of Product showed up as the most important factor in determining the supplier selection criteria. Therefore, we can say that Quality of Product is the best criteria for choosing supplier in UiTM Arau cafeteria, even better than Delivery Service and Performance History.

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ANALYZING THE FACTORS TO BE A SUCCESSFUL ATHLETE BY USING FUZZY AHP METHOD

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ABSTRACT - Sports are an important aspect of a good society. They also could strengthen social ties and unite a diverse community. Furthermore, both the government and private sector have made efforts to promote sports by contributing resources such as funding, manpower, and time. Therefore, it is necessary to determine which factors should be given primary focus in order to use them more efficiently and optimally. There are numerous important factors in sports, such as discipline, fitness, rules, psychology, nutrition, and others. Among these factors, it is necessary to identify which ones deserve prioritization. However, this study is important in determining the main factor that should be focused on becoming a successful athlete. This study seeks to identify the main factors and sub factors of being successful athlete. Hence, this study also to rank factor and sub-factors to be a successful athlete using Fuzzy AHP method.

Keywords: Fuzzy AHP, successful athlete, sport.

1. INTRODUCTION

The study's main goal is to select effective ways to be successful athletes using the Fuzzy AHP method. A successful athlete is determined by their performance in sports competitions. Other specific objectives are to identify the main factors and sub-factors of being a successful athlete, to rank the main factors using Fuzzy AHP method and rank the sub-factors using the Fuzzy AHP method. Four main factors that athlete should consider to be successful which is the factors are discipline, facilities, talent, and psychology. Hence, the analyzing of this study will be based on sub-factors of each factor.

2. METHODOLOGY

The study would conduct a survey for analyzing the factors to be a successful athlete. Two experts are represented which is lecturer from faculty sport recreation that have experience and achievement in sports. They were given questionnaires by interviewer. In this study, Fuzzy AHP will select effective ways to select the factors to be a successful athlete. Analytic Hierarchy Process (AHP) is a decision support method developed to complete problems by breaking the solution problems, grouping them, and arranging them into a hierarchical structure. This method uses a comparison of criteria paired with a measurement scale that has been determined to obtain priority criteria. The Fuzzy AHP approach converts the AHP scale into a fuzzy triangle scale that can be accessed first (Ayhan, 2013).

3. RESULTS AND DISCUSSION

Based on ranking the main factors, facilities are the main factor to be a successful athlete decisions by using a fuzzy AHP method with a normalized weight of 0.8441. The next factor is the discipline, with a normalized weight of 0.0910, followed by talent, with a normalized weight of 0.0648, and psychology, with a normalized weight of 0.0001. Based on ranking the sub-factors coaching has the most important sub-factor to be a successful athlete, with a normalized weight of 0.4617, followed by sport facilities, equipment, rules, physical, attitude, time-management, fitness, skill, goal setting, motivation, mental rehab with a normalized weight of 0.2189, 0.1635, 0.0446, 0.0397, 0.0253, 0.0211, 0.0186, 0.0065, 0.0001, 0.00003, 0.000007, respectively. From these results, the highest value is the most important factor that should consider to focus first. Based on this research, Fuzzy AHP is a good method for ranking the factors.

4. NOVELTY OF RESEARCH / PRODUCT

First, according to (Pan, 2008) researched a Fuzzy AHP approach for selecting the suitable bridge construction method. For highway projects to be successful, it is essential to select an appropriate bridge construction technology. The owner or project contractor typically must identify important decision criteria and analyze their relative weights in order to decide the most preferred alternative in such a decision-making problem. As a solution, the selection problem can be solved using Fuzzy AHP, a commonly utilized multi-criteria decision-making technique. This paper shows how Fuzzy AHP was used in a selection to choose the most appropriate bridge construction method based on a set of criteria. The analytic hierarchy process (AHP) is a powerful method that can be used to solve complex decision problems. Any complex problem can be decomposed into several sub-problems using AHP in terms of hierarchical levels, where each level represents a set of criteria or attributes relative to each sub-problem.

5. CONCLUSION

As a result, this study aims to identify the main factors to be a successful athlete decision using the fuzzy AHP method by selecting certain factors, which are discipline, facilities, talent, and psychology. The study also aims to rank the main factor and sub-factor to be successful athlete decisions using fuzzy AHP. The fuzzy AHP method, which combines fuzzy theory and AHP, successfully achieved the study's objectives, specifically identifying and ranking the main factors and sub-factors to be a successful athlete. According to the findings of this study, the most important factors are facilities, followed by discipline, talent, and psychology. For the sub-factor the most important sub-factors are coaching. Followed by sports facilities, equipment, rules, physical, attitude, time-management, fitness, skill, goal setting, motivation, and mental rehab.

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COMPARATIVE ANALYSIS OF TAYLOR SERIES AND RUNGE-KUTTA FEHLBERG METHODS IN SOLVING THE LOTKA-VOLTERRA COMPETITIVE MODEL

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ABSTRACT - This research mainly focuses on the comparisons between numerical methods, such as Taylor Series and Runge-Kutta Fehlberg (RKF) methods with the exact solution. The advantage of these methods is that they can reliably and precisely solve the non-linearity of the model. Based on the results, both methods offer an accurate way to solve the model by comparing the results. RKF proves to be the most accurate approximation method for solving the Lotka-Volterra competitive model when compared to the exact solution than Taylor Series method by using software *Mathematica 13.2* programming. This research will use data of two species, *Paramecium Caudatum* and *Stylonychia Pustulata* from Gause's experiment. Both species undergo intraspecific interaction and their population is increasing day by day until a level where they remain constant. For *P. Caudatum*, the population sizes are increasing day by day until day 16^{th}, which is at 202 cells. Meanwhile for *S. Pustulata* the population sizes are increasing day by day until day 8^{th}, which is at 41 cells. The equilibrium and stability analysis are performed to give critical insights into the long-term behaviour of the system and indicate how the system responds to perturbations, respectively. For mixed population, when the value of both species' carrying capacities is lower than the value of other species carrying capacity divided by the competition coefficient, the two species are able to coexist in this stable equilibrium. Meanwhile, when the value of both species' carrying capacities is lower than the value of other species carrying capacity divided by the competition coefficient, one of the species will undergo competitive exclusion which eventually outcompete the other species that leads to an unstable equilibrium or the extinction of the weaker species. By understanding the behavior of competition and survival, the research's outcomes shed light on the population behavior of these species and have far-reaching implications in the fields of ecology, conservation, and environmental management.

Keywords: Lotka-Volterra competitive model, RKF, Taylor Series, stability.

1. INTRODUCTION

There are several numerical methods that can be used to solve the Lotka-Volterra competitive model. In this research, numerical methods, such as Taylor Series and Runge-Kutta Fehlberg methods are used to solve the model. By using these numerical methods, the competition on intraspecific interaction can be observed for both species. Interspecific interaction will be observed using the Lotka-Volterra competitive model and their stability will be studied to determine if they can coexist or will they undergo competitive exclusion. The RKF method prove to be a reliable and appropriate method for solving population models of linear and nonlinear differential equations than Laplace Adomian Decomposition Method (LADM) (Paul et al., 2016). The purpose of this research is to compare the numerical methods, such as Taylor Series and RKF methods with the exact solution of the Lotka-Volterra competitive model.

2. METHODOLOGY

The data used in this research is from Gause's experiment on two species which are *Stylonychia Pustulata* and *Paramecium Caudatum*. The logistic equation of both species is used to find the exact solution and will be compared to numerical methods, such as Taylor Series and Runge-Kutta Fehlberg methods. The Taylor series is a mathematical tool for representing a function as an infinite sum of terms, with each term derived by differentiating the function at a specified point. It provides a way to approximate a function using its derivatives at a given point. The RKF method is a numerical method used for solving ordinary differential equations (ODEs). A more accurate numerical approximation of the ODE solution can be obtained by iteratively applying the RKF method with smaller step sizes.

3. RESULTS AND DISCUSSION

Based on the results, both methods offer accurate ways to solve the model by comparing the results. RKF proves to be the most accurate method when compared to the exact solution than the Taylor Series method on solving the model. For intraspecific interaction, *P. Caudatum* and *S. Pustulata* population are increasing day by day until they remain constant at day 16th, which is at 202 cells and at day 8th, which is at 41 cells respectively. For interspecific interaction, the results show that *P. Caudatum* are a strong competitive species that driven out the weak species, *S. Pustulata* to the extinction. There are several cases of stability and equilibrium which are either species 1 or 2 wins, coexistence of both species and competitive exclusion. Based on the interspecific interaction, the species undergo the competitive exclusion since one of the species extinct which is *S. Pustulata*.

4. NOVELTY OF RESEARCH/PRODUCT

The research compares two numerical methods for solving the Lotka-Volterra competitive model, namely the Taylor Series and the RKF methods. This comparative analysis provides insights into the positive and negative aspects of each method, allowing researchers to choose the best methods for similar ecological modeling scenarios. The research utilizes data acquired from an experiment conducted in 1934 by Gause involving the species *Paramecium Caudatum* and *Stylonychia Pustulata*. The application of real-world data gives a great opportunity to evaluate numerical methods against established experimental outcomes, enhancing reliability of the results and their practical utility. This research examines the dynamics and effects of both intraspecific and interspecific interactions using the LotkaVolterra competitive model. Hence, this research examines into the stability and equilibrium of the Lotka-Volterra competitive model, whether the populations of both species remain constant over time or undergo competitive exclusion, in which one species outcompetes and eliminates the other.

5. CONCLUSION

In conclusion, RKF method has proved to be more effective than the Taylor Series method for approximation when compared to the exact solution. The data obtained through Gause's experiment for *P. Caudatum* and *S. Pustulata* are used to study the intraspecific and interspecific interaction. For intraspecific interaction, both species' populations exhibit growth until reaching a stable equilibrium, where their population sizes remain constant. However, in mixed populations, *P. Caudatum* consistently outnumbers *S. Pustulata*. The research proves that there are stable equilibrium points, which represent a balanced coexistence, where the populations of both species remain constant over time. There is also a situation called competitive exclusion, which one species outcompetes the other, resulting the extinction of the weaker species. In the future, researchers could use others available numerical methods, such as Multistep Method and Boundary Value Method to make a comparison and solve the model.

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RANKING MOTORCYCLE BRAND USING FUZZY TOPSIS

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ABSTRACT - Motorcycle have become a crucial mode of transportation, with various manufacturers offering a wide range of options. In this study, the most preferred motorcycle brand was chosen using the Fuzzy TOPSIS method. The aim is to determine the most preferable motorcycle brand in Pokok Sena, Kedah and to compare the result with previous study. In this study, three decision-makers determined the motorcycle brand according to these following criteria by Ngantung. (2013); price, safety, efficiency, design, performance, and durability. The data were collected through the distribution of a questionnaire to experts in the area of study. The obtained data were calculated using a formula and Microsoft Excel. The results show that Yamaha is ranked first among the three brands, closely followed by Honda, and Modenas. The CC values obtained for Yamaha, Honda, and Modenas are 0.2869, 0.2852, and 0.1447 respectively. The marginal difference of 0.017 in CC values between Yamaha and Honda suggests a highly competitive scenario between the two brands. By providing a comprehensive assessment of motorcycle brands, this research contributes to enhancing the understanding of buyer choices and supports the development of an effective decision-making framework in the context of motorcycle purchases.

Keywords: Fuzzy TOPSIS, ranking motorcycle brands.

1. INTRODUCTION

Motorcycle is one of the importance needs of modern life in term of transportation. However, selecting the best motorcycle is not easy. In this research, the best motorcycle brand using the Fuzzy TOPSIS method. The decision-making process when purchasing a motorcycle can be challenging due to various criteria, such as price, safety, efficiency, design, performance, and durability. The study aims to rank the motorcycle brands Yamaha, Honda, and Modenas based on these criteria. Data will be collected through questionnaires distributed to motorcycle sellers in Pokok Sena, Kedah, which has a high population and demand for motorcycles. The findings of this study will provide valuable information to potential buyers in Pokok Sena and assist motorcycle sellers in identifying brands with high potential and demand. Additionally, other researchers can use this study as a reference for employing the Fuzzy TOPSIS method to rank alternative options.

2. METHODOLOGY

Data will be collected through questionnaires distributed to experts in Pokok Sena to rank motorcycle brands using the Fuzzy TOPSIS method. The experts will evaluate the brands based on criteria such as price, safety, efficiency, design, performance, and durability. The collected data will be analyzed using the steps of the Fuzzy TOPSIS method, which involve aggregating fuzzy ratings, calculating the fuzzy decision matrix, normalizing the decision matrix, determining the weighted normalized fuzzy decision matrix, finding the FPIS and FNIS, calculating the distances from FNIS and FPIS for each alternative, determining the closeness coefficient, and ranking the alternatives. The results will be compared with a previous study.

3. RESULTS AND DISCUSSION

Based on the results, Yamaha being ranked first with a CC value of 0.2869, followed closely by Honda with a CC value of 0.2852, and Modenas ranked third with a CC value of 0.1447. This outcome aligns with the findings of a previous study by Walone, (2016), confirming that the Fuzzy TOPSIS method effectively determines alternatives based on the given criteria. It is worth noting that the difference in CC values between Yamaha and Honda is only 0.017, indicating a close competition between the two brands.

4. NOVELTY OF RESEARCH/PRODUCT

There some research about Fuzzy TOPSIS. The research by Kore et al. (2017) stated that Fuzzy TOPSIS can be use to rank the alternative given by its criteria. This research uses Fuzzy TOPSIS to rank 3 motorcycle brands which are Yamaha, Honda, and Modenas. The criteria are price, safety, efficiency, design, performance, and durability. There also step in conducting Fuzzy TOPSIS to rank the alternative.

5. CONCLUSION

In conclusion, the study demonstrates the usefulness of the Fuzzy TOPSIS method in assisting buyers in making informed decisions when choosing a motorcycle brand, and it highlights the importance of considering multiple criteria to find the best fit for individual preferences and needs. The result shows that Yamaha was ranked number 1 for both method of Fuzzy TOPSIS and Fuzzy AHP.

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TRANSSHIPMENT DEMAND IN VEHICLE ROUTING PROBLEM USING GENETIC ALGORITHM

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ABSTRACT – The Transshipment Demand in Vehicle Routing Problem (VRPTD) is a problem that involves transferring items between retailers due to shortages at retail stores and availability at another retail store. Strategically transferring items between retailers minimizes lost sales by ensuring item availability which leads to increasing customer satisfaction. In this study, the VRPTD considered real world scenarios involving valuable bulk items. The objective is to minimize the transportation cost while efficiently meeting customer demand by finding the best delivery routes that fulfill both regular and transshipment demand. A metaheuristic method, Genetic Algorithm (GA) was proposed for the problem. Three main genetic operators employed are Stochastic Universal Sampling (SUS) is used for selection, a modified Edge Recombination Operator (ERO) as the crossover operator and two different swap strategies in mutation operator. The control parameters: population size and maximum generation were determined through a small-scale experiment. GA was run for 10 independent runs, and the results obtained were compared with previous literature. The best sequence found has slightly higher distance with a running time of less than 3 minutes. In conclusion, this study successfully developed GA for solving VRPTD with near-optimal solutions with difference of not more than 10% when compared to the previous literature.

Keywords: Vehicle Routing Problem, transshipment demand, Genetic Algorithm

1. INTRODUCTION

The Vehicle Routing Problem (VRP) is a problem that involves finding an optimal design of routes traveled by a fleet of vehicles to serve a set of customers (Toth & Vigo, 2014). This study focuses on one of the VRP variants, which is VRPTD. As VRP itself is NP-hard, thus VRPTD falls in the same category. The VRPTD is a complex optimization problem in network distribution for retailers. The objective of VRPTD is to minimize the distance traveled by the delivery vehicles while meeting the regular and transshipment demand requirements. For retail companies dealing with seasonal and limited-edition items, transshipment demand ensures that retailers fulfill orders from other retailers to prevent lost profits due to delayed deliveries. Additionally, optimizing delivery routes considering transshipment demands enables the implementation of same-day delivery services, leading to enhanced customer satisfaction and loyalty.

This study used benchmark dataset that mimics a real-world problem. The undirected network graph consists of 20 nodes, with one depot and 19 retailers. Two homogeneous vehicles are available at depot to deliver items from depot to the retailers. At the same time, will visit pickup customers to pick up items for delivery to the delivery customer. To ensure feasibility, pickup customer must be visited before the delivery customer. The dataset and mathematical formulation for the VRP with Transshipment Demand (VRPTD) are adapted from Leelertkij et al. (2021).

2. METHODOLOGY

This study proposed a metaheuristic method, Genetic Algorithm (GA), which known for its the ability to find near-optimal solutions for NP-hard problems. GA employs evolutionary processes such as selection, crossover, and mutation as the operators to converge towards a near-optimal solution. The GA was coded in MATLAB Software R2022a version. The SUS is employed in the selection operator, and a modified Edge Recombination Operator in the crossover operator. The modification is done to ensure that transshipment demands are fulfilled. The mutation operator implemented is swap. Note that previous literature implemented Threshold Accepting and Neighborhood Search to solve VRPTD.

3. RESULTS AND DISCUSSION

As metaheuristic found near-optimal solution, hence the GA was executed independently 10 runs and the average results were recorded. Small-scale experiments were done with various combinations of population size and maximum number of generations. From the experiment, it is decided that population size and maximum number of generations was set at 300.

GA achieved feasible results in an average time of 209.11 seconds, which is slightly longer than 3 minutes. Out of the 10 runs the minimum running time is 175.77 seconds, the longest time is 245.27 seconds. The GA was able to find the best sequence with the best distance optimality range of less than 10%, when compared to the findings of Leelertkij et al. (2021). On average, GA performed well for VRPTD with standard deviation not more than 25, which showed the ability of GA in finding consistent solutions.

4. NOVELTY OF RESEARCH / PRODUCT

This study proposes the use of Genetic Algorithm (GA) to solve the VRPTD. This study introduced the designed of the GA to adapt transshipment demands, specifically, SUS for selection operator, ERO for crossover and two type of swap strategies for mutation. The developed GA successfully achieved feasible shortest distance. By applying this approach, the study offers valuable insights into efficiently solving complex real-world distribution problems.

5. CONCLUSION

In this study, the Transshipment Demand with Vehicle Routing Problem (VRPTD) was solved by Genetic Algorithm (GA). The performance of the GA was tested using a benchmark dataset. The GA successfully obtained optimal delivery route sequences to fulfill regular and transshipment demands within the same routes using two homogeneous vehicles. The total distance for the best sequence was slightly higher of 48.95 units compare to the literature. The approach proved and achieved near-optimal solutions within a 10% optimality range. Future research directions for VRPTD include incorporating delivery time windows to address real-worlds constraints. Additionally, exploring the transshipment facilities, where retailers can be served directly or indirectly through selected facilities can provide further insights.

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ANALYSING THE TRANSMISSION OF TUBERCULOSIS IN MALAYSIA USING SIR MODEL

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ABSTRACT - Tuberculosis (TB) is a substantial infectious disease in Malaysia, contributing significantly to morbidity and mortality rates. The lack of awareness regarding the signs and symptoms of TB is one of the causes of the late diagnosis of TB in the population. In Malaysia, the level of awareness about TB is still low. The purpose of the study is to analyses the dynamics of TB transmission using SIR Model and analyze the pattern of TB cases in Malaysia. Ministry of Health Malaysia data on TB cases and fatalities from 2003 to 2021, with a focus on the states of Selangor and Sabah, were collected. The results demonstrated that the number of susceptible individuals in Malaysia decreased swiftly, reaching a threshold of 10,000 in 160 days. The peak infection period lasted between 90 and 120 days, then gradually decreased. Throughout 2021, there was a constant increase in the number of recovered individuals. In Selangor and Sabah, similar patterns were observed. These results emphasize the significance of prompt interventions to reduce the number of susceptible individuals and control the spread of tuberculosis. Future research should be considered to include an exposed (E) group in the model, knowing the SEIR model. Overall, this study contributes to a better comprehension of the dynamics of TB in Malaysia.

Keywords: Tuberculosis disease, SIR Model

1. INTRODUCTION

Tuberculosis (TB) poses a danger to global public health and is one of the world's major infectious causes of death. According to World Health Organization (WHO), TB is one of the top 10 causes of death worldwide, accounting for the deaths of over 1.4 million people annually. In Malaysia, TB is the main cause of death from a single infectious illness (mortality rates ranging from 4.8 to 6.2 cases per 100,000 people); from 2012 to 2016, TB ranked above HIV/AIDS, dengue fever, and malaria. The lack of awareness regarding the signs and symptoms of tuberculosis is one of the causes of the late diagnosis of TB in the population. In Malaysia, the level of awareness about TB is still low. Even though the Malaysia Ministry of Health has organized awareness programmers such as World TB Day, which is on 24 March every year, Malaysian still lack awareness about this disease (Mokhtar et al., n.d.).

2. METHODOLOGY

The data was obtained from the original sources, which were from the website of the Ministry of Health of Malaysia. The yearly data was collected from 2003 to 2020. The SIR model with demography, with only takes into consideration the death rate and the birth rate during the trial time. (Widyaningsih et al. 2018) say that the birth rate and death rate must be the same for the population size to stay the same over time The number of susceptible groups, is raised by the birth rate while it is diminished by the mortality rate and the number of infected individuals who have had intimate contact with the patients. Following that, the disease's transmission rate may increase the number of affected persons, but the disease's mortality rate and recovery rate may drop. Finally, the recovery rate increases the number of recovered people while decreasing the death rates.

3. RESULTS AND DISCUSSION

Based on the SIR model with demography, the number of vulnerable persons in Malaysia rapidly reduced, reaching 10,000 within 160 days. The number of those infected rose between 90 and 120 days, showing the peak infection period for tuberculosis. Throughout 2021, the number of recovered persons increased steadily. A similar pattern was discovered in Malaysia when using the SIR model without demography. The number of vulnerable people peaked early and subsequently declined, reaching 10,000 within 160 days. The number of sick people peaked between 90 and 120 days, then declined gradually. The number of recovered persons climbed gradually and peaked towards the end of 2021.

The same patterns were seen with both models in the particular examples of Sabah and Selangor. Within 240 to 260 days, the number of vulnerable people had fallen to 10,000. The number of sick people peaked between 180 and 260 days and then steadily fell. Throughout 2021, the number of people who have been rehabilitated increased.

4. NOVELTY OF RESEARCH

This research aims to enhance tuberculosis (TB) control in Malaysia by integrating social network analysis (SNA) with the classical SIR (Susceptible-Infectious-Recovered) model. Using Ministry of Health Malaysia data from 2003 to 2021, the study focuses on Selangor and Sabah states. Social networks will be constructed based on contact patterns and demographic information of TB patients. Network analysis techniques will identify influential individuals and communities within the TB transmission network. The SIR model, incorporating network information, will simulate TB spread and evaluate intervention strategies. Integrating social networks into the SIR model provides a realistic representation of TB transmission dynamics, capturing the interplay between epidemiological factors and social connections. This research will offer novel insights into TB transmission in Malaysia, informing targeted interventions for policymakers and healthcare providers. By reducing susceptibility, minimizing transmission, and improving public health outcomes, this approach contributes to evidence-based strategies for TB control.

5. CONCLUSION

In conclusion the SIR model study gives useful insights into the patterns and dynamics of tuberculosis transmission in Malaysia, Selangor, and Sabah. These findings can help policymakers and healthcare providers devise effective methods to lower the prevalence of tuberculosis and enhance public health outcomes.

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ALIGNED MAGNETOHYDRODYNAMIC MIXED CONVECTION FLOW OF CASSON HYBRID NANOFLUID OVER A VERTICAL PLATE WITH NEWTONIAN HEATING

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ABSTRACT - This study focused on investigating mixed convection flow of a Casson hybrid nanofluid over a vertical plate with Newtonian heating, under the influence of aligned magnetohydrodynamics. The Cassson hybrid nanofluid consisted of Copper and Alumina nanoparticles dispersed in Blood, serving as the base fluid. Mathematical models in partial differential equations were formulated to describe the fluid flow and heat transfer, and these equations were then transformed into ordinary differential equations using similarity transformation. The resulting equations were solved numerically using the Range-Kutta fourth-order method in Maple, considering various physical parameters such as the aligned angle of magnetic field, interaction of magnetic field, Casson parameter, mixed convection parameter, nanoparticle volume fraction parameter, Newtonian heating parameter, and nanoparticle shape factor towards the effect on fluid velocity, temperature, skin friction coefficient, and Nusselt number. Among the nanoparticle shapes considered, it was observed that blade-shaped nanoparticles had the highest values of skin friction coefficient and Nusselt number. The velocity profiles experience a positive enhancement when parameters α, M, β_c, λ, and ω are increased. On the other hand, temperature profile decreases as a result of the negative impact of parameters α, M, β_c, and λ.

Keywords: Magnetohydrodynamic, mixed convection, casson hybrid nanofluids, vertical plate, newtonian heating

1. INTRODUCTION

Heat transfer refers to the transmission of heat between surfaces with different temperatures, primarily through convection, where fluid movement plays a significant role. Hybrid nanofluid, which combines various nanoparticles with cutting fluid, is a recent development in clean machining and is expected to have a significant impact on machinability. Magnetohydrodynamics (MHD) is a research field that combines electromagnetic and fluid mechanics to study the movement of electrically conducting fluids. Newtonian heating is commonly used in various industries, including petroleum, solar radiation, heat exchangers, and heat transfer around fins. This study specifically focused on Casson hybrid nanofluids, as they have shown to be more effective than regular nanofluids in enhancing heat transfer rates. Additionally, the research investigated the interaction between hybrid nanofluids and magnetic fields to understand how it further improves heat transfer.

2. METHODOLOGY

The study of heat transfer could not have been done using experimentation or observation alone as it was an abstract concept that required a mathematical model to explain it. Therefore, this study was conducted by utilizing the mathematical model for fluid dynamics, which was expressed in terms of partial different governing equations. The governing equations needed to be in the form of ODEs to enable their numerical solution. Thus, similarity transformation method is employed to PDEs in order to the ODEs. Runge-Kutta fourth order method in the MAPLE software had been applied to ODEs numerically solved the problem to various physical parameter towards.

3. RESULTS AND DISCUSSION

The outcomes of this study were acquired by implementing the non-dimensional governing equation in Maple software using the Runge-Kutta fourth order method. By doing so, velocity and temperature profiles were generated to examine the influence of various parameters, including the inclination angle of the magnetic field, the interaction of the magnetic field, Casson parameter, mixed convection parameter, nanoparticle volume fraction parameter, conjugate heat transfer parameter, and nanoparticle shape factor. Furthermore, numerical results were obtained for the

skin friction coefficient and Nusselt number to investigate the enhancement of heat transfer. These results contribute to the analysis and understanding of the heat transport characteristics and demonstrate the impact of different parameters on the flow and heat transfer behavior in the system under investigation

4. NOVELTY OF RESEARCH / PRODUCT

This study proposes the use Runge-Kutta fourth-order method in Maple software to investigated the behavior of Casson hybrid nanofluids towards various parameters such as the aligned angle of magnet field parameter, the interaction of magnet field parameter, Casson parameter, mixed convection parameter, nanoparticle volume fraction parameter, conjugate heat transfer parameter and nanoparticle shape factor. This study could have aided the inventor or developer in the development of a new technology that utilized the concept of heat transfer. With the data obtained, the inventor would have been able to design a device that effectively transmitted heat and was suitable for the intended purpose of the produced gadget. This solution would have been the optimal choice for them as it could have reduced expenses while also conserving energy.

5. CONCLUSION

In this study, the aligned MHD mixed convection flow of Casson hybrid nanofluid over a vertical plate with Newtonian heating was solved Runge-Kutta fourth-order method in Maple software. The outcomes of the analysis are presented as graphical and tabulated data, including velocity and temperature profiles, skin friction coefficient and Nusselt number for six different physical condition parameters. Among the nanoparticle shapes considered, it was observed that blade-shaped nanoparticles had the highest values of skin friction coefficient and Nusselt number. The velocity profiles experience a positive enhancement when parameters α, M, β_c, λ, and ω and are increased, resulting in an increase in their values. Conversely, velocity profiles are negatively affected by parameter ϕ, causing them to decrease. On the other hand, temperature profile decreases as a result of the negative impact of parameters α, M, β_c, and λ. However, temperature profile shows a positive improvement due to the favorable influence of parameters ϕ and ω.

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IMPACT OF COVID-19 ON TAKAFUL OPERATORS IN MALAYSIA

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ABSTRACT - This study aims to analysis the impact of COVID-19 on all 16 takaful operators that available in Malaysia. There are two types of takaful operator in Malaysia, which is Family Takaful and General Takaful. Both of these takaful have the own target in the market. All the data for this research are acquired from the official website of the company Since COVID-19 arrive on Malaysia on March 2020, there are a lot of death due to the virus breakout. The family members who died during the pandemic will claim the insurance, but too many claims made can significantly affect the takaful company. Therefore, this study will rank all the takaful operators before the pandemic occurs and during the pandemic. This study uses Data Envelopment Analysis by testing two different models which is Charnes, Cooper and Rhodes (CCR) model and Banker, Charnes, and Cooper (BCC) model. Two of these models are use in this study to ensure that results of the ranking analysis are more accurate and precise. Moreover, these models employ the input-oriented model function to maximise the efficiency. The input variables for this research are commission and management expenses while the output variables are income and contribution. The decision-making unit (DMU) is the name of the takaful operator. Based on the research, BCC-I model is better than CCR-I model due to significant improvement in ranking, occupying a position that is more convincing and reliable. The result show that only four takaful operator that maintain efficiency level from 2019 until 2022 based on CCR-I model while there are six takaful operators that maintain efficiency level from 2019 until 2022.

Keywords: Data envelopment analysis (DEA), takaful operator, ranking, efficiency, COVID-19

1. INTRODUCTION

Takaful is an Islamic insurance where members contribute money into a pool of system to guarantee each other against loss or damage. Takaful is based on sharia or Islamic religious law, which explains how individuals are responsible to cooperate and protect one another. In 2020, there many deaths due to COVID-19 pandemic and most of the takaful and insurance company are seriously affected where many claim have been made by the family members or the beneficiaries. The aim of this study is to rank the all takaful operator in Malaysia before the pandemic COVID-19 and during the COVID-19.

2. METHODOLOGY

This study has been conducted at local takaful companies in Malaysia. The secondary data sources derived entirely based on the annual report of the takaful companies respectively for the year 2019, 2020 2021 and 2022. A total of 44 companies were identified from Licensed Insurance Companies & Takaful Operators list. However, this study focuses only 16 takaful companies in Malaysia. The collected data analyzed using DEA software "Learning Version" (DEA-Solver-LV version 8) to evaluate the operating efficiency of Malaysia insurers. The first step in DEA is a determination of the DMU, which is the takaful company. Next step is to identify variable (input and output) and selecting a model. There are two variables for input and two output variables also applying the CCR model (Cranes, Cooper, Rhodes) input-orientation and BCC model (Banker, Charnes and Cooper) that aims to minimize using a set of data. Then, the collected data analyzed using DEA-Solver-LV version 8 to get the results.

3. RESULTS AND DISCUSSION

Two takaful operator were excluded from total of 18 takaful company because of missing information which are Swiss Re and Munich Re. Data were collected from the annual report of the companies' website. Table 1 shows ranking of takaful operators based on CCR-I model. There are only four takaful operators that reach the efficiency score of 1 over the period of 2019 until 2022 while other takaful operator do not maintain their efficiency score over the covered period.

Table 1. Efficiency score and ranks for CCR-I model

		2019		2020		2021		2022	
No.	DMU	Score	Rank	Score	Rank	Score	Rank	Score	Rank
1	AIA PUBLIC TAKAFUL BHD	1	1	1	1	1	1	1	1
2	AMMETLIFE TAKAFUL BHD	0.7065	9	0.6397	8	0.779	6	0.7688	7
3	ETIQA FAMILY TAKAFUL BHD	1	1	1	1	1	1	1	1
4	ETIQA GENERAL TAKAFUL BHD	0.753	7	0.8204	5	0.765	7	0.7813	6
5	FWD TAKAFUL BHD	1	1	0.6094	10	0.4258	16	0.7242	9
6	GREAT EASTERN TAKAFUL BHD	0.7287	8	0.4741	14	0.552	13	0.7612	8
7	HONG LEONG MSIG TAKAFUL BHD	0.6055	12	0.5774	11	0.5294	14	0.6729	10
8	MALAYSIAN RE	1	1	1	1	1	1	1	1
9	PRUDENTIAL BSN TAKAFUL BHD	0.6432	11	0.6163	9	0.601	10	0.6326	12
10	SUN LIFE MALAYSIA TAKAFUL BHD	0.699	10	0.7473	6	0.9156	5	1	1
11	SYARIKAT TAKAFUL MALAYSIA KELUARGA BHD	1	1	1	1	1	1	1	1
12	SYARIKAT TAKAFUL MALAYSIA AM BHD	0.5134	15	0.466	15	0.5636	12	0.5456	14
13	TAKAFUL IKHLAS FAMILY BHD	0.5311	14	0.535	13	0.6155	9	0.5801	13
14	TAKAFUL IKHLAS GENERAL BHD	0.4193	16	0.4048	16	0.4547	15	0.4707	16
15	ZURICH TAKAFUL MALAYSIA BHD	0.5859	13	0.5409	12	0.5699	11	0.5426	15
16	ZURICH GENERAL TAKAFUL MALAYSIA BHD	0.7924	6	0.6488	7	0.6687	8	0.669	11

4. NOVELTY OF RESEARCH / PRODUCT

There are several research that measure the efficiency of insurance or takaful companies. According to the study conducted by Coskun et al., (2021), the technical efficiency, overall technical efficiency, and pure technical efficiency are calculated and compared per year. The result show that the overall average efficiency scores of takaful company are considerably high also the input decreases in deficit state and output have been declining over the period. Another study by Yassin et al., (2018), uses output-oriented CCR model that involves 24 local insurance company for the period 2014-2015. The result show that DEA model allows integration of the performance for the insurance company and provides management overall performance evaluation.

5. CONCLUSION

In conclusion, this study helps all the takaful operator to make any adjustment toward their funding on order to reach the efficiency level. Furthermore, customer can now buy takaful plan according from the takaful operator that are proven to be efficiency throughout the covered period.

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SELECTION OF ZAKAH APPLICANTS BY USING FUZZY TECHNIQUE OF ORDER PREFERENCE FOR SIMILARITY TO IDEAL SOLUTION (TOPSIS) METHOD

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ABSTRACT – The Unit Zakat, Sedekah, and Wakaf (ZAWAF) Perlis in Malaysia provided zakah assistance to students. However, due to the limited funds and the large number of applications, not all applicants can receive assistance. To ensure fairness and eliminate ambiguity, this study aimed to select the entitled applicants among 383 applicants from various backgrounds at UiTM Perlis. Fuzzy Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method was employed for decision-making. Four criteria were considered for ranking the applicants: family income, number of dependents, number of disability or sick dependents, and amount of loan scholarship received per semester. The study identified the three most entitled applicants to receive zakah: S157, S190, and S222, with a closeness coefficient of 0.8569. Conversely, S262 was the least entitled applicant, with a closeness coefficient of 0.0360. The findings of this study have significant implications for various stakeholders, including ZAWAF Perlis, the entitled applicants, and zakah institutions in Malaysia. ZAWAF Perlis can use these findings to allocate zakah funds more effectively. The entitled students can use financial assistance to support their education and well-being. Moreover, other zakah institutions in Malaysia can adopt the TOPSIS method to improve selection processes and allocate funds more efficiently.

Keywords: Applicants, criteria, decision-making, ranking, TOPSIS

1. INTRODUCTION

The Fuzzy Technique of Order Preference for Similarity to Ideal Solution (TOPSIS) method is used to solve multi-criteria decision-making problems when there is uncertainty. During the selection process of zakah applicants, ZAWAF Perlis relied on manual selection methods. However, it is important to note that this approach may introduce elements of unfairness and ambiguity. Additionally, limited funds and a high number of applications further complicated the selection process for ZAWAF Perlis. In this study, the Fuzzy TOPSIS method was applied to prioritize and rank four criteria, allowing for the identification of the most entitled zakah applicants among students at UiTM Perlis.

This study demonstrates the effectiveness of the fuzzy TOPSIS in ranking zakah applicants, contradicting a previous study by Iswara et al. (2018) that used fuzzy AHP. However, both studies considered the same two criteria namely number of dependents and family income, in selecting zakah applicants.

2. METHODOLOGY

This study introduced the utilization of the Fuzzy TOPSIS method for the selection of zakah applicants. To apply this method effectively, two decision-makers were chosen from the group of interviewers involved in the selection process. They were responsible for evaluating the significance of each criterion and sub-criterion used in the evaluation. Furthermore, the data collected from ZAWAF Perlis was employed to gather information about the zakah applicants. Microsoft Excel was utilized to analyze the collected data from ZAWAF, which facilitates the selection process of zakah applicants.

3. RESULTS AND DISCUSSION

After considering the evaluations of the decision-makers regarding the significance of each criterion and sub-criterion, it was determined that the first crucial criterion is family income, followed by the number of disability or sick dependents, the amount of loan scholarships received per semester, and the number of dependents, respectively. On the other hand, the ranking of applicants is obtained based on the relative closeness coefficient value. The applicants' rankings were arranged in descending order, with S157, S190, and S222 achieving the highest relative closeness

coefficient value of 0.8569. This indicates that these three applicants should be given priority in receiving zakah assistance. Conversely, S262 is the least likely candidate to receive zakah, as this applicant obtained the lowest relative closeness coefficient value of 0.0360.

4. NOVELTY OF RESEARCH

Zakah serves as a significant income source and has the potential to serve as a means of financing targeted initiatives that enhance the social, political, and economic conditions within Muslim communities. Various organizations have been established to efficiently manage these funds and provide assistance to those in need. ZAWAF Perlis, established with the objective of supporting financially struggling UiTM students, is one such organization. To ensure that deserving individuals receive zakah, it is crucial to implement a selection process that gives priority to entitled applicants. Consequently, the purpose of this study was to employ the Fuzzy Technique of Order Preference for Similarity to Ideal Solution (TOPSIS) to select zakah applicants by ranking both the applicants and the evaluation criteria used to assess them.

5. CONCLUSION

The research conducted in this study demonstrates the utilization of the Fuzzy TOPSIS method for selecting zakah applicants. The data collected from ZAWAF Perlis was employed to assess and prioritize student applicants. The application of the fuzzy TOPSIS method successfully ensured a fair and unambiguous selection process for zakah recipients. The study effectively achieved its objectives of ranking the four evaluation criteria utilized by ZAWAF Perlis and ranking the 393 applicants. For future research, it is recommended to explore the use of Fuzzy Logic, particularly in constructing a Fuzzy Rule-Based System for selecting zakah applicants, as this method can handle the ranking of numerous alternatives. Furthermore, this study can be utilized to compare the proposed method with other Multiple Criteria Decision Analysis (MCDA) methods such as Analytic Hierarchy Process (AHP), as well as outranking methods like ELECTRE III and PROMETHEE II, in subsequent research endeavors.

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FACTORS INFLUENCING STUDENTS' ACADEMIC PERFORMANCE DURING ONLINE CLASSES CASE STUDY AT UITM ARAU, PERLIS.

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ABSTRACT - Online Distance Learning was introduced since 2020 because the origin of the COVID-19 outbreak in Malaysia can be traced back to the first case arriving on Malaysian shores on January 25. 2020, when a passenger from China tested positive for the virus. Because of that, students need to adapt with a sudden new type of learning from home. The changes related to the pandemic has afrected the educational context including student itself. The purpose of this study are to determine the relationship and factors influencing students' academic performance (CGPA). Multiple Linear Regression (MLR) and Pearsons' Corrletion Analysis was used in this study.The sample of 52 UiTM Arau, Perlis students' from two programme diploma CS143 and degree CS248 College of Computing, Informatics and Mathematics was selected using stratified sampling. The sources of primary data by using online survey form was employed to collect the data. The independent variables for factors influencing students' performance in this study were daily sleeping hours, daily study hours. subject taken, credit hour taken, study environment and study lifestyle. The results of this study shows that the study environment statistically significant influencing to students academic performance (CGPA) with p-value 0.033. Besides, study environment (r=-0.336, p-value = 0.007 and credit hour taken (r=-0.240 , p-value=0.043) significantly has weak negative relationship with CGPA Meanwhile, others factors showed no significant relationship with CGPA with p-value > 0.05.

Keywords: Students' academic performance, online distance learning, multiple linear regression

1. INTRODUCTION

An excellent academic performance does need a lot of effort and hard work. It does depend on the student themselves. Undoubtedly, every student will achieve a different level of academic performance. Besides, the changes related to the COVID-19 outbreak have also affected the educational context. This study aims to identify the significant factor that influences students' academic performance. Secondly, to examine the relationship between daily sleeping hours, daily study hours, subject taken, credit hour taken, environment, and lifestyle that affect students' academic performance. Another objective of this study is to determine the regression model for the significant factor influencing students' academic performance.

2. METHODOLOGY

For this study, data was collected using an online survey, Google Form. Selected students will be given a link of the questionnaire to be filled in a group WhatsApp. In order to find the significant factors influencing students' academic performance, Multiple Linear Regression was used. Stepwise method in Multiple Linear Regression was applied in this study.

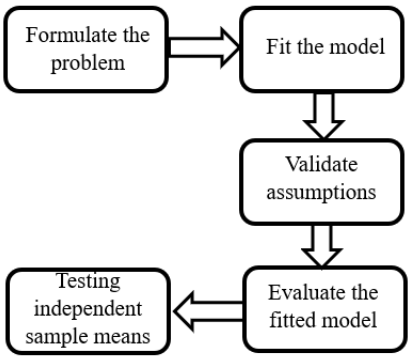

Figure 1. Steps in Multiple Linear Regression.

3. RESULTS AND DISCUSSION

Model		Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	5.950	1.135		5.243	0.000
	Sleeping hour per day	0.041	0.039	0.142	1.040	0.304
	Study hour per day	-0.003	0.021	-0.020	-0.148	0.883
	Subject taken	-0.077	0.044	-0.230	-1.733	0.090
	Credit hour taken	-0.089	0.054	-0.218	-1.667	0.102
	Study Environment	-0.131	0.059	-0.332	-2.216	0.032
	Study Lifestyle	-0.039	0.072	-0.081	-0.537	0.594

Coefficients

a. Dependent Variable: CGPA for current semester.

Table 1. Coeffiecient of Independent Variable.

The findings of this study obtained that the variable "Study Environment" is considered statistically significant because the value of the coefficient is -0.131, with p-value of 0.032. Since p-value is less than alpha, 0.05; it can conclude that "Study environment" was a significant factor influencing students' academic performance during Online Distance Learning.

4. NOVELTY OF RESEARCH / PRODUCT

Multiple Linear Regression is used to identify the significant factor that influences students' academic performance. Besides, Multiple Linear Regression also can determine the regression model for the significant factor influencing students' academic performance. Through the use of this method, this study manage to improve the current study.

5. CONCLUSION

In conclusion, this study manages to obtain a factor that influencing students' achievement during Online Distance Learning (ODL). However, variables "Subject taken" and "Credit hour take have p-values close to the significance threshold which is 0.090 and 0.102 respectively.

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SELECTION MOTORCYCLE BRANDS IN KOTA BHARU USING FUZZY ANALYTIC HIERARCHY PROCESS

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ABSTRACT - In Kota Bharu, motorcycles have gained popularity as a means of transportation since they provide residents with convenient and economical mobility. This study attempts to help purchasers rank motorcycle companies and establish their criteria for buying using the fuzzy AHP. Primary data was gathered using questionnaire surveys and customer knowledge interviews. The study concentrated on Yamaha, Honda, Suzuki, and Modenas as the leading motorcycle brands. Surveys were created using criteria taken from current research, including financials, features, and promotions. According to the study, Honda motorcycles were favoured over Suzuki, Yamaha, and Modena models. Based on four factors—financials, features, promotion, and motorbike type—the FAHP technique was used to assess the performance of several motorcycle brand names. Priority was given to financial factors, features, motorbike type, and promotion was given the least importance. Based on their needs, lifestyle, and financial limitations, purchasers in Kota Bharu can use the study's systematic methodology to make informed motorbike purchases. The research advances our knowledge of consumer preferences and can help motorcycle dealers create robust brand positioning strategies. The FAHP methodology can also be used to enhance decision-making and product or service ranking.

Keywords: Fuzzy analytical hierarchy process, motorcycles, purchasing decisions, customer behaviours

1. INTRODUCTION

Scooters, motorbikes, and mopeds are popular types of transportation on two-wheels worldwide. Despite the country's hot temperature and frequent rain, motorbikes are still popular modes of transportation in Malaysia. A motorcycle with an engine capacity of 125 cubic centimetres or less uses less fuel and is more economical for extended travel. Motorcycles also create fewer carbon emissions and require less frequent repairs and maintenance than automobiles (Holyoak & Bray, 2015). Motorcycles are a realistic answer in congested cities with limited parking and excessive traffic. They may be easily parked in approved areas, and their flexibility lets riders handle traffic better (Hussain et al., 2005). In many developing cities, alternative forms of transportation cannot compete with the level of accessibility that is provided by motorcycles. Their wages are sufficient to cover the ever-increasing cost of living, enabling them to save and invest their money carefully. As a result, customers looking for motorcycles will need to consider the amount of money they have available seriously. Some people searching for motorcycles are seeking an affordable alternative. However, they have high criteria for the pleasing and build quality of the bike they buy, even if the price is modest. In this Fuzzy Analytic Hierarchy Process analysis, motorcycle brands are evaluated according to customer preferences, priorities, and financial limitations.

2. METHODOLOGY

Fuzzy AHP is a decision support method created to address problems by preparing a questionnaire. In this study, the questionnaire is given to two motorcycle-buying experts. The questionnaire result was computed using the fuzzy AHP method, and the pairwise comparison matrix was constructed. The consistency ratio was then computed, and if the result was less than or equal to 0.10, the pair comparison matrix was modified. If not, the pairwise comparison matrix is converted to fuzzy numbers to generate the triangular fuzzy number. The criteria were ranked after calculating the fuzzy geometric mean, fuzzy weight, and normalized weight.

3. RESULTS AND DISCUSSION

According to the normalised weight, Honda is the best motorcycle brand over Suzuki, Yamaha, and Modenas for daily commuting or work. The findings show that when buying a motorcycle, consumers are more affected by price. This study demonstrates the importance of considering finances, features, promotions, and motorbike kinds when deciding which motorcycle manufacturers to buy in Kota Bharu.

4. NOVELTY OF RESEARCH / PRODUCT

The AHP method, which has been extensively researched and modified throughout time, is thought to have been introduced by Saaty (2008) in his work "Decision Making with the Analytic Hierarchy Process." Based on previous work by Zadeh (1996), this study identified and analyzed a unique dynamic mechanism. Dweiri and Al-Oqla (2006) used the AHP model to choose the best material for the study's keys. The method was chosen by the researchers partly because it allows for reliable measurement of paired comparisons of options, which aids in minimizing decision-makers' inconsistent behaviour.

5. CONCLUSION

In this study, four criteria; financial, promotion, features, and motorbike type; are evaluated by fuzzy AHP decision-making while evaluating motorcycle brands. According to this report, price is more important to Kota Bharu motorcycle consumers than features. Financial weighs in at 0.5920 the most. Then came the 0.2439-weighted features. The category of motorcycles came in third with 0.1157 weight. The promotion has the least weight (0.0484). In terms of motorcycle transportation, Honda comes in first (0.3881). Suzuki came in second place with a 0.3029. With 0.2615 and 0.0415 points, Yamaha and Modenas are third and fourth, respectively.

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ENHANCING THE ZAKAT FINANCIAL ASSISTANCE MODEL USING POLYTOMOUS LOGISTIC REGRESSION: A CASE STUDY AT UITM PERLIS BRANCH DURING THE COVID-19 PANDEMIC

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ABSTRACT - Zakat, Sedekah, and Wakaf Unit (ZAWAF) of UiTM Perlis Branch has modified its zakat application process to an efficient online system during COVID-19. However, the unit faces challenges in accurately ensuring appropriate zakat assistance is provided. Therefore, this study conducted Polytomous Logistic Regression to determine the appropriated amount for eligible student who received zakat by using SPSS software. The research methodology involves collecting zakat application data from UiTM campuses in Arau over a period of four semesters, from March 2020 to October 2021. In addition to the family size, gender, state, faculty, programme, semester, CGPA, student status, and other factors, the study expands the analysis by including variables of household income groups (B40, M40, T20). The data splitting for test 2 (2semesters training set and 2 semesters test set) was chosen as the best fit model considering a few statistical analyses. The result shows Mother's income, Household size, Faculty, Semester, Zakat receiver, and Head's family income were statistically significant with an overall percentage correct accuracy of 71.2%.

Keywords: Polytomous logistic regression, zakat, income classification, zakat amount

1. INTRODUCTION

This study addresses the challenges faced by the Zakat, Sedekah, and Wakaf Unit (ZAWAF) of UiTM Perlis Branch in distributing zakat financial assistance to students during the COVID-19 pandemic. They have transitioned to an online application process but face problems in reviewing applications and determining the appropriate amount of assistance. To overcome this, the study aims to develop a new zakat financial assistance model using polytomous logistic regression. The model will integrate student profiles and parent household income classes to identify eligible students and predict the amount of zakat assistance. This will ensure a more efficient and accurate assessment process, allowing eligible students to receive timely and adequate support. By considering the specific circumstances and economic impact of the pandemic, the model aims to facilitate fair and effective distribution of zakat assistance among UiTM Perlis Branch students.

2. METHODOLOGY

This study aims to develop a polytomous logistic regression model to determine the amount of zakat assistance received by eligible students. The study consists of five stages: data acquisition, data preparation and processing, model development, model evaluation, and model application. The data used in the study were obtained from the Unit Zakat, Sedekah, and Wakaf (ZAWAF) UiTM Cawangan Perlis, including 16 variables such as amount of zakat, gender, state, faculty, program, semester, CGPA, and others. The data were processed and cleaned, and the relationship between variables was examined using statistical tests. A polytomous logistic regression model was then developed to predict the amount of zakat assistance. The model will be evaluated based on various statistical criteria such as goodness of fit, likelihood ratio test, pseudo R-squared, specificity, sensitivity, accuracy, AIC, and BIC. Finally, the model will be applied to predict the zakat application for the upcoming semester.

3. RESULTS AND DISCUSSION

Based on the test set, the best-fit model produced a specificity value of 81.28% and an overall percentage accuracy of 71.4%. This model can effectively predict the eligibility and amount of zakat assistance for the next semester. The polytomous logistic regression model with six significant independent variables was used, and the outcomes of RM100, RM200, RM300, and RM0 (representing not qualified) were predicted, with RM400 as the reference category.The model's quality was evaluated using a confusion matrix (classification table), which showed that the

model correctly classified the amount of zakat assistance for eligible students with 71.2% accuracy. This level of accuracy can be considered satisfactory.

4. NOVELTY OF RESEARCH / PRODUCT

Previous studies have mainly utilized binary logistic regression to determine eligibility or factors related to zakat recipients, this study expands the analysis by incorporating multinomial logistic regression to predict the appropriate amount of zakat assistance. For example, Fuadah Johari et al. (2015) used binary logistic regression to determine zakat distribution towards new converts, while Ahmad Fahme and Mohd Faisol (2018) examined income levels of zakat applicants in Kelantan. In contrast, the use of multinomial logistic regression in zakat distribution is relatively unexplored. Ahmad Najim et al. (2022) applied multinomial logistic regression to predict air quality levels, achieving an accuracy of 84%. Mohammad M. Faqe Hussein (2022) used multinomial logistic regression to analyze car accident types and achieved a 67% accuracy in classification. Mazanec et al. (2023) utilized multinomial logistic regression to analyze travel behavior during the COVID-19 pandemic, achieving an accuracy of nearly 70% in predicting modes of transport. Furthermore, the study incorporates various independent variables, including family size, gender, state, faculty, program, semester, CGPA, student status, household income groups (B40, M40, T20), as well as other factors. This expanded analysis adds depth and complexity to the study, allowing for a more accurate determination of zakat assistance based on multiple factors.

5. CONCLUSION

In conclusion, this study developed a polytomous logistic regression model to predict the appropriate amount of zakat assistance for eligible students. Significant variables such as mother's income, household size, faculty, semester, zakat receiver status, and head's family income influenced the zakat assistance. The selected best-fit model achieved a 71.2% overall accuracy in predicting the assistance amounts. Implementing this model and an online system can enhance the accuracy and efficiency of zakat distribution. Future research can expand the model and conduct longitudinal studies to improve the effectiveness of zakat assistance for eligible students.

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NUMERICAL SOLUTION OF LOTKA-VOLTERRA COMPETITIVE MODEL BY USING EULER AND FOURTH ORDER RUNGE-KUTTA METHODS

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ABSTRACT - This study compares the Euler and Fourth order Runge-Kutta numerical methods for solving the Lotka-Volterra Competitive model. The objective of the study is to analyze the competitive interactions that occurred between lions *Panthera leo* and leopards *P. pardus* in the Sabi Sand Game Reserve, South Africa. Numerical approximation tests evaluate the reliability and precision of both methods applied to the logistic equation. The findings indicate that the RK method provides a superior approximation, outperforming the Euler method. Graphical representation of the numerical approximations in Wolfram Mathematica 12.1 confirms the close alignment between the RK method with exact values. The study also explores the impact of carrying capacity on the dynamics of interspecies competition. Carrying capacity refers to the maximum population size that a species can sustain indefinitely, considering factors like food, habitat, water, and others. The results demonstrate that a larger carrying capacity corresponds to a greater ability for a species to thrive and survive in competitive environments. Moreover, this study showcases the practical application of numerical approximation as a predictive tool for understanding species interactions. By using data simulation to emulate real-world scenarios, researchers can accurately predict the outcomes of interspecific competition without the need for prolonged experiments.

Keywords: Numerical method, competitive hunter model, euler method, runge-kutta method, dynamic behavior

1. INTRODUCTION

The Lotka-Volterra Competitive model is used to study the population dynamics of species competing for common resources. The main objective of this study is to compare the exact solutions using Euler and RK methods in solving the Lotka-Volterra Competitive model. Furthermore, the impact of carrying capacity on the dynamic behavior of species competition, equilibrium and stability based on initial conditions of two species will be analyzed. This study examines competitive interaction between two top predators, lions *Panthera leo* and leopards *P. pardus* to determine if lions, as the dominant competitor, would limit the distribution and abundance of leopards. This study offers insights into competition dynamics, the theory of exclusion, and coexistence possibilities between lions and leopards.

2. METHODOLOGY

The logistic equation for the population of lions and leopards was tested using numerical approximation methods, specifically the Euler and Runge-Kutta methods. The Euler method and RK method were applied to plot orbits for the Competitive Hunters model, and the resulting simulation results were compared with the exact orbit. Numerical approximation tests were conducted to evaluate the reliability and precision of the Euler and RK methods in solving the Lotka-Volterra Competitive model. Therefore, the numerical approximations were rendered graphically using Wolfram Mathematica 12.1 programming to see which method was closest to the exact values.

3. RESULTS AND DISCUSSION

The results obtained from the numerical approximation test, applying both the Euler and RK methods to the logistic equation of lions *Panthera leo* and leopards *P. pardus* shows that RK method is a more effective for solving Lotka-Volterra Competitive model compared to Euler method. Therefore, by attaining appropriate carrying capacity using curve fitting procedure shows that the distribution and abundance of leopards were not significantly affected by the lions, the dominant predator at least in our study area. Additionally, by conducting equilibrium and stability testing by observing four outcomes whether species 1 winning, species 2 winning, the existence of an unstable equilibrium, or the coexistence of both species. The study found that the equilibrium and stability of any competition interaction were relying on the initial conditions and initial numbers of the competing population sample.

4. NOVELTY OF RESEARCH / PRODUCT

There have been numerous studies investigating the comparison of numerical techniques in solving mathematical biology problems. For example, research from Paul et al., (2016) utilized numerical methods to approximate solutions for nonlinear ordinary differential equation systems, including models for insect populations and one-species Lotka-Volterra models. Building upon this research, our study focuses specifically on the dynamics of wildlife population interactions between two different species, applying the Lotka-Volterra Competitive model.

5. CONCLUSION

In conclusion, this study compared the Euler and RK methods for solving the Lotka-Volterra Competitive model. The results showed that the RK method provided a more accurate approximation of the numerical methods. The estimation of carrying capacity revealed the importance of resource availability in species competition. Future research should explore the effects of additional factors and incorporate multiple step of numerical methods to enhance the accuracy of numerical approximations and further our understanding of species interactions in competitive environments.

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EVALUATION OF ONLINE FOOD DELIVERY APPLICATIONS AMONG UiTM PERLIS STUDENTS USING FUZZY ELECTRE

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ABSTRACT - Recent technological advancements have led to the widespread accessibility of online food delivery platforms, driven by the growing demand for fast and convenient meals. However, consumers often face challenges in choosing the best online food delivery application due to the numerous criteria that need to be considered. This study aims to identify the most important criterion for selecting online food delivery applications and rank the most preferable online food delivery applications. The focus is on comparing Foodpanda and Grabfood as alternative to be ranked in this study based on specific criteria such as food prices, delivery costs, available promotions, and user-friendliness of the applications. The finding shows that the most importance criteria is price of the food followed by delivery cost and the least importance in choosing online food delivery applications is user-friendliness of the applications. The study's results indicate that Grabfood is the most preferred online food delivery application, thereby both objectives were achieved. The findings obtained showed that the fuzzy ELECTRE successfully overcomes confusion in choosing the best online food delivery. The study's findings benefit to many stakeholders, and this enables them to focus their efforts on the most popular online food delivery applications.

Keywords: Online food delivery applications, Fuzzy ELECTRE, ranking, UiTM Perlis students

1. INTRODUCTION

The rising availability of online food delivery platforms creates a dilemma for students in choosing the most preferred online food delivery applications that meet their satisfaction. Moreover, consumers encounter difficulties in choosing and comparing the best applications as numerous criteria need to be taken into consideration. In addition, online food delivery application advertisements can influence and mislead consumers with discounts and promotional codes However, the terms and conditions accompanying these offers are often poorly disclosed in the ads, causing confusion and misunderstanding among consumers. This study aims to determine the most important criterion for choosing online food delivery applications and to rank online food delivery applications among UiTM Perlis students.

2. METHODOLOGY

The data was collected by distributing a questionnaire to 219 students from UiTM Perlis. This study focus on ranking two alternatives (Foodpanda and Grabfood) of online delivery applications among UiTM Perlis students based on specific criteria which are price of the food, delivery cost, promotion available, and applications user-friendliness. Data for this study was collected by asking the respondents to rate the importance of criteria for choosing online food delivery application and the performance of alternatives based on criteria by using linguistic variables. This study is analyzed by using the method of Fuzzy Elimination and Choice Expressing Reality (ELECTRE) which consists of 15 steps. The ELECTRE method was introduced in Europe by three French scholars (Benayoun, Roy and Sussmann) in 1966 (Hu et al., 2018). The ranking of online food delivery applications was chosen based on outrank the most of other alternatives with the highest rank in the last step.

3. RESULTS AND DISCUSSION

The finding shows that the most importance criteria is price of the food since it has the highest fuzzy weight of criteria for choosing online food delivery applications followed by delivery cost with the second highest weight. The criterion that has the lowest weight is user-friendliness of the applications. Thus, user-friendliness of the applications is the least important criterion for choosing online food delivery applications. According to Fuzzy ELECTRE results, Grabfood ranking as the most preferred online food delivery applications among UiTM Perlis students over Foodpanda based on specified criteria.

4. NOVELTY OF RESEARCH / PRODUCT

Fuzzy ELECTRE was used in this study because it provides transparent results that can be easily interpreted by decision-makers (Zardari et al., 2015). Fuzzy ELECTRE allows each criterion can be assessed using its own specific measurement scale or unit (Vahdani et al., 2013). By following the approach of ranking online food delivery applications using Fuzzy ELECTRE, students can focus their attention on the top-ranked platforms instead of getting overwhelmed by a vast number of available applications. Ranking online food delivery applications provides students a clear information the most suitable applications that align with their satisfaction. This information will help students in identifying applications that offer quick and convenient meal options since students often have busy schedule.

5. CONCLUSION

This study proves that Fuzzy ELECTRE is a good method to rank online food delivery applications since it can handle the subjectivity and ambiguity inherent in human thoughts. For future research, we should widen the scope of this study conduct the study from different geographical locations to analyze the differences in rankings of online food delivery applications. A future study might be comparing the ranking of online food delivery applications between Universiti Teknologi MARA (UiTM) Perlis students and Universiti Malaysia Perlis (UniMAP) students.

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MINIMIZATION TRAFFIC CONGESTION WITH SMART TRAFFIC LIGHT BY USING FUZZY LOGIC

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ABSTRACT - Traffic congestion is a pervasive problem with significant negative social, economic and environmental impacts. This study aims to reduce traffic congestion on Raja Ashman Shah Road in Ipoh by implementing an intelligent fuzzy logic traffic light system. The system aims to reduce waiting times and improve traffic flow by automatically adjusting green light durations based on real-time traffic conditions. Data on the number of vehicles and queue lengths during peak hours were collected to compare congestion levels before and after the intervention. The results of this study demonstrate the effectiveness of deploying an intelligent traffic light system with fuzzy logic in minimizing traffic congestion and reducing waiting times. By dynamically adjusting green light duration based on real-time traffic conditions, the system optimized traffic flow and improved overall congestion. A comparison of congestion levels before and after the introduction showed a significant reduction in congestion and an improvement in traffic flow. The adaptability of the intelligent traffic light system makes better use of road capacity, reducing waiting times and minimizing congestion. As a result, we found a significant reduction in waiting time compared to the previous static system. The results highlight the effectiveness of intelligent traffic light systems based on fuzzy logic in minimizing congestion and optimizing traffic flow. This study will provide valuable information to improve the transportation system and improve the quality of life for road users in Ipoh.

Keywords: Fuzzy logic, Ipoh, traffic congestion, minimize, smart traffic light

1. INTRODUCTION

Traffic congestion has significant negative effects on society, the economy, and the environment. Hence, this study aims to minimize traffic congestion in Ipoh, Malaysia, specifically in Jalan Raja Ashman Shah, by implementing intelligent traffic light systems using fuzzy logic. The study's objectives are to develop an optimal traffic light control design and compare traffic congestion before and after implementing the study. The research location was chosen based on its proximity to Ipoh General Hospital, where congestion is worst during peak hours. The number of vehicles and queue length during peak hours, was collected through observations. The findings of this study have significant implications as they can help reduce queue times and minimize stress for Ipoh road users. The efficient management of traffic congestion would ensure timely arrival, particularly for working citizens, and enhance overall productivity. By addressing the issue of traffic congestion, this study contributes to improving the quality of life and transportation efficiency in Ipoh.

2. METHODOLOGY

Primary data was collected in this study, which are number of vehicle and length of queue from observations during the peak hours. Then, Fuzzy Logic method was used to solve this problem. MATLAB software was used to develop this study. There are 5 steps in this study. The first step is defining the linguistic variable for input and output. In this study linguistic variable from Hartanti et al. (2019) was used. Then, membership function and fuzzy rules based will be create. Next, fuzzy tools in MATLAB is implement to build the system. Lastly, compared the results with data from observations. In this study, the problem will define base from the variables to simulate a smart traffic light that can adapt base from situation.

3. RESULTS AND DISCUSSION

By analyzing the number of vehicles and the length of the queue, the system optimizes the green light duration to facilitate a smoother flow of traffic and reduce congestion. his adjustment allows more vehicles to cross the intersection in each cycle, clearing the queue faster and minimizing time spent in traffic. The use of fuzzy logic methodology further enhances the system's adaptability, as green light durations can now vary based on real-life

conditions, providing improved efficiency and reducing congestion during peak hours.

4. NOVELTY OF RESEARCH / PRODUCT

There were several studies that have been conducted on traffic congestion. One of the works presented by these researchers revolves on studying the exposure to traffic congestion during road trips by utilizing the Global Positioning System (GPS) trajectory of taxis and Point-of-Interest (POI) datasets based in Wuhan, China (Kan et al., 2022) . Next, the aim of Aid et al. (2019) in this study is to employ an Artificial Neural Networks (ANN) traffic congestion prediction mechanism which controls or minimizes congestion resulting in a smooth traffic flow. The aim of Hartanti et al.(2019) is to create a simulator that optimizes traffic time management by using Fuzzy Logic.

5. CONCLUSION

The study successfully achieved its objectives by implementing smart traffic lights at the Jalan Raja Ashman Shah intersection. This led to reduced traffic congestion and waiting times, improving vehicle flow. The system allowed more vehicles to pass through per cycle, effectively clearing queues faster and reducing traffic jams. The results demonstrate the potential benefits of adopting fuzzy logic-based smart traffic light systems to optimize green light duration and minimize traffic-related issues.

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FACTORS CONTRIBUTING TO LONG COVID OUTCOMES USING ARTIFICIAL NEURAL NETWORK (ANN)

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ABSTRACT - Background: The COVID-19 pandemic has resulted in a significant number of individuals experiencing long-term symptoms, known as long COVID. Understanding the factors contributing to long COVID outcomes is crucial for effective management and intervention. Objective: This study aimed to identify and rank the factors contributing to long COVID outcomes, develop an Artificial Neural Network (ANN) model, and evaluate its performance in predicting long COVID outcomes. Method: Data from a cross-sectional study by Moy et al. (2022) were used, including variables such as gender, age, BMI, smoking status, comorbidities, and severity of acute COVID-19. The Multilayer Perceptron (MLP) model in IBM SPSS Statistics 27 was employed for data analysis and ANN model development. Findings: Age, smoking status, severity of acute COVID-19, and heart disease emerged as significant factors associated with long COVID outcomes. The developed MLP model achieved an accuracy of 81.3% in predicting long COVID outcomes, with an area under the curve (AUC) of 0.753. Conclusion: This study provides valuable insights into the factors contributing to long COVID outcomes. Age, smoking status, and severity of acute COVID-19 were identified as key predictors of long-term effects. The developed ANN model offers a useful tool for healthcare professionals and policymakers in understanding and addressing the challenges of long COVID. Further research is needed to explore additional variables and validate the findings in diverse populations.

Keywords: Long COVID, factors, Artificial Neural Network, Multilayer Perceptron

1. INTRODUCTION

The study aims to identify the factors contributing to long COVID outcomes using an artificial neural network (ANN) approach. The objectives are to determine the main factors, develop a predictive model, and evaluate the performance of the model in predicting long COVID outcomes. The study focuses on variables such as demographic characteristics, pre-existing health conditions, and severity of the acute COVID-19 infection. The data used is obtained from a research paper by Moy et al. (2022). Limitations include the reliance on self-reported data and the retrospective nature of the study. Despite these limitations, the study is significant as it can provide valuable insights for healthcare resource allocation, inform public health measures and policies, and guide interventions to improve the quality of life for individuals with long COVID. Overall, the study has the potential to contribute to the understanding and management of long COVID and ultimately improve the health and well-being of those affected

2. METHODOLOGY

This section provides an overview of the data collection process, data description, method of data analysis, and the artificial neural network (ANN) used in the study. The data, obtained from the Plus One website, consists of variables related to factors contributing to long COVID. The ANN approach, specifically the MLP model in IBM SPSS Statistics 27, was employed to analyze the data and develop a predictive model. The model's architecture, activation functions, and training method were specified. Evaluation metrics, including accuracy, precision, recall, and the AUC of the ROC curve, were used to assess the model's performance. The findings of the study will enhance our understanding of long COVID and guide future research and interventions.

3. RESULTS AND DISCUSSION

In this chapter, the findings obtained using the SPSS software are discussed, focusing on data partition, neural network design, model evaluation, and the importance of independent variables. The data partition was performed, with 65.8% of cases assigned to training and 34.2% to testing the ANN models. The neural network design consisted of an input layer with 31 nodes representing various factors, one hidden layer with 4 nodes, and an output layer with 2 nodes for the long COVID outcome. The model's performance was evaluated using metrics such as accuracy, percent incorrect

predictions, and the sum of squares error. Sensitivity analysis was conducted to identify significant input factors for long COVID prediction. The model's evaluation included classification matrices, calculated indicators (accuracy, positive/negative predictive values, recall, specificity, and F1 score), and the area under the curve (AUC) analysis. A predicted versus observed chart was used to assess the model's predictions. The importance of independent variables was analyzed, with age, smoking status, severity of acute COVID-19, and heart disease identified as important factors for predicting long COVID outcomes. These findings provide insights into the predictive performance and variable importance of the ANN model in understanding and addressing long COVID.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of this research lies in its application of an Artificial Neural Network (ANN) approach to analyze and rank factors contributing to long COVID outcomes. While previous studies have explored the impact of various factors on long COVID, the use of ANN in this context is a novel approach. Additionally, the study provides insights into the relative importance of different factors, such as age, smoking status, and disease severity, which can inform future research and interventions. By utilizing ANN and conducting sensitivity analysis, this research contributes to the originality and advancement of knowledge in understanding long COVID.

5. CONCLUSION

In conclusion, this study utilized an Artificial Neural Network (ANN) approach to identify and rank factors contributing to long COVID outcomes. Age, smoking status, severity of acute COVID-19, and heart disease were found to be significant factors. The ANN model showed promising performance in predicting long COVID outcomes, and recommendations were made for future research to expand the dataset, include additional variables, and conduct intervention studies for improving long COVID outcomes.

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RANKING RUNNING SHOES BY USING FUZZY TOPSIS

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ABSTRACT - Running is a popular physical activity that offers numerous health benefits and is enjoyed by all ages of people and fitness. However, choosing proper and suitable running shoes is crucial and not easy because there are many criteria that need to be considered and human's feelings and perception is ambiguous. This research aims to rank or select running shoes based on several criteria that need to be considered. The criteria considered in this study were six criteria namely stability, durability, comfort, motion control, flexibility, and design. Other than that, this study also aims to compare fuzzy multicriteria decision making ranking with runner's original ranking. This study presented a fuzzy multi-criteria decision making (MCDM) method which is fuzzy Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) and an experienced runner has been chosen as a decision maker in this study. Based on the results of this study, Zoomfly is the best running shoes compared to 3 others which are Phantom, Aerobounce, and Ultraboost that are top one in the ranking according to the decision maker. The result of this study also showed the similarity in fuzzy TOPSIS running shoes ranking with runner's original running shoes ranking. This study proved that Fuzzy TOPSIS is a good method for ranking alternatives hence can help runners to make a better decision and compare which brand are preferable in running shoes.

Keywords: Fuzzy TOPSIS, decision making, running shoes

1. INTRODUCTION

It is important for runners to make informed decisions based on their own needs and characteristics in order to choose the best running shoes for themselves. The purpose of this study is to help runners choosing their suitable running shoes. This study was collected data from a decision maker who is runner that has experienced with running since childhood. There are six criteria that runners should considered when selecting running shoe which are stability, durability, comfort, flexibility, motion control, and design. The specific objective for this study is to rank running shoes by using Fuzzy TOPSIS and to compare fuzzy multicriteria decision making ranking with runner's original ranking.

2. METHODOLOGY

The data was collected by decision maker who has many experienced in running. This study will using Fuzzy Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) as a method. Fuzzy TOPSIS offers a solution for decision-makers when dealing with real-world data, which are typically multi-attribute and entail a complicated decision-making process. The Fuzzy Positive Ideal Solution (FPIS), which is chosen as the best option in the TOPSIS technique, is one which is both the closest to and the furthest from the Fuzzy Negative Ideal Solution (FNIS). FPIS comprises the optimal performance values for each alternative, whereas FNIS comprises unfavorable performance values. In order to determine the closeness coefficient for each alternative, we need to identify the distance from each alternative and the FPIS and FNIS. The alternative that has the highest closeness coefficient will be number one ranking of running shoes for decision maker.

3. RESULTS AND DISCUSSION

There are two result that we can conclude for this study. The first result shown that, A3 (Zoomfly) has the highest closeness coefficient value which is 0.420. Thus, A3 (Zoomfly) is the most preferred running shoes by Imran. Other than that, this study also aimed to compare fuzzy multicriteria decision making ranking with runner's original ranking. From this, it shows that fuzzy TOPSIS ranking is the same as Imran's ranking for all running shoes. This shows that Fuzzy TOPSIS result is aligned with Imran's perception about his running shoes. Based on this research, the results of this study shows that Fuzzy TOPSIS is a good method for ranking alternatives based on several criteria.

4. NOVELTY OF RESEARCH / PRODUCT

There have been a few research that have using fuzzy TOPSIS. According to the paper by (Aziz et al.,2021), this paper presented fuzzy TOPSIS to rank the best online shopping website. The findings showed that, fuzzy TOPSIS provides flexibility in decision-making as it allows for the inclusion of both quantitative and qualitative criteria. This study benefits runners by allowing them to identify the best running shoes for them. Aside from that, this study benefits brands because each brand's specialty must make runners choose their favourite sport shoes. By applying this approach, the researcher has proved that Fuzzy TOPSIS method has its vital role in reducing the selection.

5. CONCLUSION

Fuzzy TOPSIS is an effective method for ranking the selection of running shoes. Selecting the right running shoes is a crucial task due to the various criteria involved and the subjective nature of individual preferences. For future researcher, one of the improvements that can suggested is researcher can add another decision maker, adding more criteria and alternative. For example, researcher can add more brands and another model for shoe selection. A future study could focus on comparing the outcomes of two runners in selecting the optimal running shoes from different brands. Utilizing Fuzzy TOPSIS, which has been identified as the most effective method for ranking running shoes, would be preferable for this comparison.

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ANALYZING INFLUENCIAL FACTORS FOR PREFERABLE COURIER SERVICES IN MALAYSIA BY USING FUZZY ANALYTIC HIERARCHY PROCESS (FAHP)

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ABSTRACT - This study addresses the problem of understanding users' preferences for courier services in Malaysia. With the increasing reliance on online shopping and package delivery, it is crucial to identify the key factors that shape users' decision-making process when selecting a courier service. To tackle this problem, the Fuzzy Analytical Hierarchy Process (FAHP) method is employed. The study aims to determine the relative importance of criteria such as responsiveness, reliability, empathy, assurance, and tangibility along with their corresponding sub-criteria. A group of experts defines these criteria and sub-criteria, and a questionnaire is distributed to gather data on customer preferences. Using the FAHP technique, the study constructed a hierarchy tree, created a fuzzy pairwise comparison matrix, and calculated criterion and sub-criteria weights. The findings highlight the importance of responsiveness, particularly easy contact with courier companies, as the primary criterion. Enhancing services based on these insights can help users select suitable courier services while improving competitiveness in the industry.

Keywords: Courier services, fuzzy analytical hierarchy process, online shopping, customer preferences.

1. INTRODUCTION

In the modern age of digitalization, courier services have gained paramount significance as online shopping and package delivery continue to witness extraordinary growth. In order to thrive in this fiercely competitive market, it is essential for courier service providers to gain a thorough understanding of the factors that impact users' choices when it comes to selecting their services. This research study focuses on examining user preferences for courier services in Malaysia with the objective of identifying the primary criteria and sub-criteria that shape their decision-making process. By employing the Fuzzy Analytical Hierarchy Process (FAHP) methodology, this study offers invaluable insights that can assist service providers in improving their offerings and meeting the expectations of their customers.

2. METHODOLOGY

The Fuzzy Analytical Hierarchy Process (FAHP) methodology is employed to analyze user preferences for courier services. A group of experts in the field of courier services is engaged to define the criteria and sub-criteria for evaluation. A questionnaire is distributed to these experts to gather their opinions and ratings. The collected data is then analyzed using Microsoft Excel software. The Fuzzy AHP method involves constructing a hierarchy tree, creating a fuzzy pairwise comparison matrix, checking for consistency, determining the geometric mean fuzzy, calculating the fuzzy weight of each criterion, and averaging and normalizing the weights. The same process will be repeated to identify the final weights and ranking of the sub-criteria with respect to each criterion. The process provides insights into the relative importance of each criterion and sub-criterion based on the experts' evaluations.

3. RESULTS AND DISCUSSION

The outcomes of the study indicate that the primary factor influencing users' choice of courier services is responsiveness, particularly the convenience of contacting the courier company. Factors such as reliability, empathy, assurance, and tangibility also play significant roles but to a lesser extent. The results provide valuable insights for courier service companies to improve their communication channels, ensure timely and efficient service, and enhance customer satisfaction. By understanding the relative importance of each criterion and sub-criterion, service providers can tailor their offerings to meet customer expectations and gain a competitive edge in the market.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of this research lies in the application of the Fuzzy Analytic Hierarchy Process (FAHP) to analyze factors for the most preferable courier services. While previous studies have examined customer satisfaction and service quality in the courier industry, this research goes a step further by utilizing the FAHP method, which combines a methodology that combines the Analytic Hierarchy Process (AHP) and fuzzy set theory, allowing for the consideration of uncertainties and imprecisions inherent in decision-making processes (Bhatt et al., 2021). Focusing on criteria such as responsiveness, reliability, empathy, assurance, and tangibility, the research offers valuable insights for courier service providers to tailor their services and strategies accordingly (Valaei, Rezaei, & Shahijan, 2016). Additionally, the incorporation of fuzzy set theory, expert evaluations, and specific criteria analysis sets this research apart from others in the field (Büyüközkan et al., 2011). Overall, this study brings a fresh perspective and innovative methodology to the study of customer preferences and decision-making in the courier industry.

5. CONCLUSION

In conclusion, this study highlights the significance of understanding user preferences for courier services in Malaysia. The application of the FAHP methodology provides insights into the relative importance of different criteria and sub-criteria. The findings emphasize the crucial role of responsiveness, specifically easy contact with the courier company, in users' selection of courier services. By considering these insights, courier service companies can improve their communication channels, enhance service quality, and ultimately increase customer satisfaction. Future research can explore the integration of different decision-making techniques alongside fuzzy AHP to further enhance the decision-making process in this domain.

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FUZZY TOPSIS & FUZZY AHP IN SELECTING SUPPLIER FOR KOREAN RESTAURANT

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ABSTRACT - The growing popularity of Korean cuisine in Malaysia has led to the rise of Korean eateries, posing a challenge for Muslim consumers in finding Halal Korean food options. This study focuses on the problem of sourcing Halal ingredients for Korean eateries, with Mr. Dakgalbi, a Halal Korean restaurant in Aman Central, Kedah, as the research subject. The objective is to utilize the Fuzzy TOPSIS and Fuzzy AHP methodologies to determine the best supplier for Halal Korean ingredients, particularly addressing the difficulty in finding Halal kimchi supplies. Through comparing the outcomes of these methodologies and establishing supplier selection criteria, Supplier 1 (S1) consistently emerges as the preferred supplier based on factors including price, shipment, system, and relationship. The findings demonstrate the reliability and usefulness of these methodologies in evaluating suppliers for Korean eateries, emphasizing the importance of supplier selection in ensuring the availability of high-quality Halal ingredients and meeting customer needs. Restaurant managers can benefit from the study's insights to make informed decisions, streamline supplier selection processes, reduce expenses, and enhance operational efficiency. Future research can further expand on the scope and criteria to gain a comprehensive understanding of supplier selection practices in the fast-growing Halal Korean restaurant industry.

Keywords: Halal korean food, supplier selection, Fuzzy TOPSIS, Fuzzy AHP, restaurant management

1. INTRODUCTION

The success of a restaurant business relies heavily on selecting the best suppliers to ensure the highest quality food and services. Supplier selection involves assessing providers' skills and their potential for forming cooperative partnerships. In today's dynamic market, where customer demands are constantly evolving, choosing competent suppliers is crucial for ensuring the availability of high-quality ingredients that meet stringent regulations. However, supplier selection is a complex decision-making process influenced by various factors. To address this complexity, fuzzy set theory, along with methodologies like Fuzzy AHP and Fuzzy TOPSIS, offers effective tools to manage uncertainty and evaluate suppliers based on qualitative and quantitative criteria. This research aims to evaluate and compare the efficacy of these methodologies for supplier selection, considering factors such as the number of alternatives, adaptability, computational complexity, and suitability for group decision-making. By providing valuable insights into supplier selection, this study aims to assist restaurant owners in making informed decisions that enhance customer satisfaction and overall business success.

2. METHODOLOGY

This study involves the participation of restaurant managers as decision makers. The decision-making process is facilitated using questionnaires specifically designed for the Fuzzy TOPSIS and Fuzzy AHP methodologies. The questionnaire for Fuzzy TOPSIS is designed to capture the decision maker's preferences for the evaluated alternatives, while the questionnaire for Fuzzy AHP aims to assess the relative importance of the criteria. The restaurant manager is responsible for providing ratings and comparisons based on their expertise and knowledge of the Korean restaurant industry. The collected data from the questionnaires are then utilized to determine the weights of the criteria and rank the alternatives. The Fuzzy TOPSIS methodology is applied to calculate the closeness coefficients of the alternatives, while the Fuzzy AHP methodology is used to establish the relative weights of the criteria.

3. RESULTS AND DISCUSSION

The results of this study in the restaurant industry align with the findings of (Manivel & Ranganathan, 2019), indicating consistent supplier rankings using the Fuzzy AHP and Fuzzy TOPSIS methodologies. Both methodologies consistently ranked Supplier 1 (S1) higher than S2 and S3, based on criteria such as price, shipment, system, and

relationship. These findings reinforce the effectiveness and dependability of these methodologies in supplier selection across industries. The comparison between studies underscores the broader applicability of these techniques, emphasizing their potential in diverse sectors. Overall, the Fuzzy AHP and Fuzzy TOPSIS methodologies provide decision makers with reliable tools to optimize supplier selection processes and enhance overall business performance.

4. NOVELTY OF RESEARCH / PRODUCT

Supplier selection plays a crucial role in the success of restaurant businesses, ensuring the procurement of high-quality supplies at the right price and quantity. Previous research emphasizes the importance of assessing suppliers' skills and their potential for cooperative partnerships (Shyur & Shih, 2006; Ha et al., 2011). This study contributes to the existing literature by evaluating and comparing two popular methodologies, Fuzzy AHP and Fuzzy TOPSIS, for supplier selection. It addresses the limitations of traditional approaches by incorporating fuzzy set theory to handle uncertain criteria (Chai et al., 2013).

5. CONCLUSION

This research used Fuzzy AHP and Fuzzy TOPSIS methods to identify the preferred supplier for Halal Korean restaurants in Malaysia, with Supplier 1 consistently ranking highest. The study emphasizes the importance of supplier selection in ensuring high-quality ingredients and customer satisfaction. It highlights the need for balancing costs, quality improvement, and customer service in the restaurant industry. Overall, the findings provide valuable insights for restaurant owners to make informed decisions and enhance business success.

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EVALUATION OF CLASSIFICATION ALGORITHMS WITH SOLUTION TO CLASS IMBALANCE PROBLEM ON ZAKAT DISTRIBUTION DATASET

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ABSTRACT - Class imbalance is one of the most serious and significant issues in data mining classification studies. In recent years, there has been a lot of interest in the problem of imbalance in a variety of real-world applications, such as fraud detection, medical diagnosis, and text classification. Similarly, the Zakat distribution UiTM Perlis dataset was utilized for the evaluation class imbalance dataset. The study aims to evaluate the performance of resampling technique, Synthetic Over-Sampling Technique (SMOTE) and to identify the best classifiers for class imbalanced Zakat datasets by comparing the classifiers performance. A sampling-based approach is proposed in this study to solve the imbalance dataset of Zakat distribution in UiTM Perlis. The evaluation is based on various metrics, which include accuracy, precision, recall, F-measure, and the ROC area. The algorithms that are considered in the study include Logistic Regression, Decision Tree (C.4.5), and Random Forest. The results indicate that Random Forest consistently performs well across all evaluation metrics after SMOTE has been implemented. It attains the highest levels of accuracy, precision, recall, F-measure, and ROC area. In conclusion, this research highlights the effectiveness of SMOTE in addressing class imbalance in the distribution of Zakat.

Keywords: Data mining, imbalance dataset, SMOTE, zakat, evaluation classification

1. INTRODUCTION

The zakat distribution dataset at UiTM Perlis shows an imbalance problem exist. The lack of true positive detections has a substantial impact on prediction performance. It implies that the algorithm is not properly capturing or detecting the patterns and properties of positive events. As a result, the algorithm's capacity to anticipate and categorize positive cases in future data may be damaged. Furthermore, it is essential to evaluate the effectiveness of applying the Synthetic Minority Over-Sampling Technique (SMOTE) in addressing the class imbalance problem in zakat distribution. A comparative classify algorithms analysis of sampling methods was conducted. The study outcome on evaluating four classification algorithms for predicting zakat distribution in UiTM Perlis event outcomes.

2. METHODOLOGY

The methodology focuses on addressing the class imbalance problem in the zakat distribution dataset using various techniques. The study utilizes resampling techniques, specifically the Synthetic Minority Over-Sampling Techniques (SMOTE), to improve the balance of class distribution. However, WEKA software was used for the evaluation of various classification algorithms. Weka is a machine learning tool that is written in Java. It provides us with the facility to artificially balance class imbalanced datasets by applying sampling filters in the pre-processing tab (Verma, 2019). The dataset consists of variables such as gender, semester, cumulative grade point average (CGPA), head family's income, mother's income, household size, and zakat receiver. Four classification algorithms, namely logistic regression, decision tree, and random forest are employed to build predictive models. Performance evaluation metrics including accuracy, precision, recall, f-measure, and ROC area are used to assess the model's performance. The results and findings of the evaluation provide insights for selecting the most suitable algorithm for the study.

3. RESULTS AND DISCUSSION

The confusion matrices successfully demonstrated an improvement in detecting the "Not eligible" class, as indicated by the increase in true positive (TP) values for minority class, following the application of SMOTE (Synthetic Minority Over-sampling Technique) to address the class imbalance in the dataset. The updated minority class has 237 members, compared to the actual minority class's 68 members. The instances of the majority class now make up 89% of the dataset, while the minority class only makes up 11%. Based on the supplied data, SMOTE has in this case increased the number of instances in the minority class. This may help to reduce the bias towards the majority class

and increase the representation of the minority class in the dataset. It is possible to draw the conclusion that Random Forest is the best method for the specific scenario when SMOTE is used. It exhibits excellent classification performance as well as successful management of class imbalance. Random Forest consistently demonstrated the highest performance across a variety of evaluation criteria, including accuracy, precision, recall, F-measure, and ROC area. It attains the highest levels of accuracy (95.1181%), precision (0.857), recall (0.676), F-measure (0.756), and ROC area (0.951). Finally, the observed increase in true positive values indicates that SMOTE's implementation has significantly improved the model's ability to detect instances that fall under the "Not eligible" class.

4. NOVELTY OF RESEARCH / PRODUCT

There are many methods available to address the issue of class imbalance in dataset. However, this study introduces an approach by selected various classification algorithms, including Logistic Regression, Decision Tree, and Random Forest, to tackle the class imbalance problem in the specific context of zakat distribution data. Additionally, the study incorporates Synthetic Minority Over-Sampling (SMOTE) to enhance the representation of the minority class and improve classification performance.

5. CONCLUSION

In conclusion, this research highlights the effectiveness of SMOTE in addressing class imbalance in the distribution of zakat. Hence, the results identify Random Forest as the optimal algorithm for the given scenario and provide recommendations for future research to enhance classification performance and investigate additional evaluation techniques.

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IMPROVE FORECAST ACCURACY BY USING REPEATED TIME SERIES CROSS VALIDATION (RTS-CV): A CASE STUDY OF DIGI SHARE PRICE

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ABSTRACT - Forecasting is the entire process of creating the essential techniques to produce future values that can then be utilised as inputs suited to the aims and objectives of the company (Alias, L. 2011). Based on data from prior experience, forecasters can make precise choices for the near future. The goal of this study is to make predictions about the share price of Digi Telecommunications Sdn. Bhd. (DIGI) on the stock market. Azlan Abdul Aziz (2021) acted as the representative for this approach. Given that there are many instances of erroneous predicting, this strategy is an improvement over the prior one. Inaccurate predictions of future values will result in poor decision-making and, even worse, might cause investors and stockholders to become fearful. The models that produce the lowest error measures were collected and compared to decide the most excellent predictions for this study. The next step is to distinguish the most excellent performance from the five models utilized in this consideration. This study was conducted to predict Digi's share price on a daily, weekly, and monthly basis for data high and low only from May 9, 2006 to May 2, 2023. Outcomes for univariate time-series investigation models, such as the Naive, Mean, Single Exponential Smoothing (SES), Holt's, and ARIMA models, were analyzed. Five sets of data splits (high and low) were used for each model to ensure the accuracy of the predicted values. Moreover, the smallest error for instance RMSE, MAE, MAPE, and MASE, are vital in deciding the demonstrative execution, with lower values showing more productive prescient model.

Keywords: Improve forecast accuracy, Repeated Time Series Cross Validation (RTS-CV), share price, digi telecommunications, R Studio

1. INTRODUCTION

In achieving the desired accuracy, time-series forecasting has become a binding domain and developing a forecasting framework with a high level of accuracy is one of the most challenging tasks in the field. In this study, the focus is on predicting the stock market's share price of Digi Telecommunications Sdn. Bhd. (DIGI). Accurate forecasting is important to investors, especially to domestic and international investors. Poor forecast value estimates lead to losses to investors, especially to major shareholders of the companies listed on Bursa Malaysia. Among the popular criteria that can be used to measure the performance of the models stated is to see the lowest error measurement value. Apart from the use of the correct model and criteria, another method that can be used in producing accurate forecasts is to use the Repeated Time Series Cross-Validation. Then, five time-series models, Naïve, Mean, SES (Single Exponential Smoothing), Holt's and ARIMA, were analysed into the R Studio software. However, the "winning" model or set of data splits is chosen based on the model that produces the smallest error measure in the evaluation part (M.A. Lazim, 2011).

2. METHODOLOGY

This method is represented by Azlan Abdul Aziz (2021). It is a better version of the previous method, since there is numerous false forecasting. Inaccurate forecasts of future values will lead to incorrect decision-making and even worse, may induce fear among investors and shareholders. The process began with data cleaning. Data cleaning is to make certain the data is free from missing values or outliers that can affect the accuracy of the forecast value. Each stage was conducted until the best model to predict short-term forecast of DIGI daily share price could be determined. The forecast values were compared to the actual data to see how well the model performs on unseen data and how accurate it is.

3. RESULTS AND DISCUSSION

Table 1. Forecast and accuracy of Digi's share price on a daily basis in data high and low

	DAILY(HIGH)	MEAN 90	ACTUAL DATA	ACCURACY MEAN 90 (%)
1	4/4/2022	3.9	3.98	97.673
2	5/4/2022	3.9	3.96	98.167
3	6/4/2022	3.9	3.89	99.933
4	7/4/2022	3.9	3.94	98.665
5	8/4/2022	3.9	3.95	98.415

	DAILY(LOW)	MEAN 90	ACTUAL DATA	ACCURACY MEAN 90 (%)
1	4/4/2022	3.8	3.9	98.033
2	5/4/2022	3.8	3.88	98.538
3	6/4/2022	3.8	3.84	99.565
4	7/4/2022	3.8	3.85	99.306
5	8/4/2022	3.8	3.87	98.793

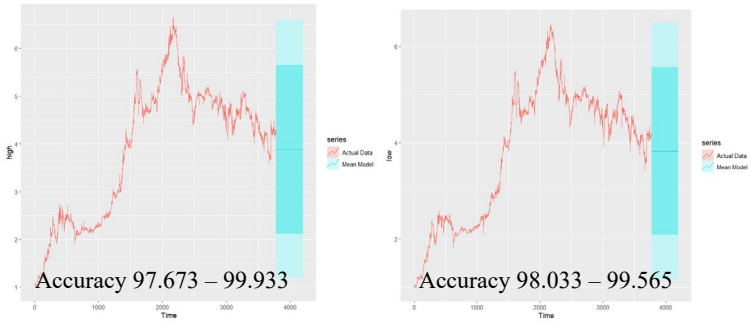

Table 1 shows the forecast and accuracy of the five-step ahead of Digi's share price on a daily basis in data high and low generated by the Mean Model. After comparing it with actual data obtained from Yahoo Finance, the forecast accuracy is between 97.673 percent to 99.933 percent for data high. Meanwhile, for data low, the five-step ahead of Digi's share price on a daily basis forecast accuracy is between 98.033 percent to 99.565 percent.

4. NOVELTY OF RESEARCH / PRODUCT

Time series cross-validation offers a novel and effective approach to improve forecast accuracy by considering the temporal dependencies inherent in time series data. Unlike traditional cross-validation methods, time series cross-validation techniques leverage the sequential nature of the data to create train-test splits that reflect real-world forecasting scenarios. By implementing rolling window cross-validation or recursive multi-step forecasting, models can be evaluated across different time periods, capturing evolving patterns and dynamics. Additionally, using time series-specific splitting techniques such as time series split or sliding window validation ensures that the temporal order is preserved during model evaluation. This enables a more accurate assessment of the model's ability to forecast into the future. Furthermore, incorporating specialized time series evaluation metrics and leveraging cross-validation for ensembling and model selection allows for more informed decision-making. This iterative process of model diagnostics and refinement, facilitated by time series cross-validation, leads to enhanced forecast accuracy and a deeper understanding of the data's temporal patterns. Overall, the application of time series cross-validation provides a valuable and innovative framework for improving forecasting performance.

5. CONCLUSION

Analysis and results were generated for univariate time-series analysis models and five sets of data splits (high and low) were used for each model to ensure the accuracy of the predicted values. Future studies should use long-term datasets with larger sample sizes, use cross-validation techniques to address data splits, and compare the performance and accuracy of predictive models.

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THE CUSPIDAL CURVE FROM THE INTERSECTION OF BISECTOR

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ABSTRACT - Bezier curves, especially quartic Bezier curves, are used in the study to help create cuspidal curves. The goal is to design a cuspidal curve and calculate the control points of the quartic Bezier curve using the bisector of a triangle. To construct cuspidal curves, a novel technique is presented that blends quartic Bezier curves with the intersection of angle bisectors. Mathematical computations and geometric transformations are used to precisely calculate the sites of bisector crossings and create the related quartic Bezier curves. Control points on the triangle are defined using the intersection of angle bisectors, and the control points necessary to create the quartic Bezier curve are determined. By presenting a unique approach to creating cuspidal curves using quartic Bezier curves and angle bisector intersections, this paper contributes significantly to curve theory and singularity analysis. The discoveries provide to a better knowledge of the evolution and characteristics of cuspidal curves, as well as significant insights for applications in computer graphics, industrial design, and robotics.

Keywords: Cuspidal curve, quartic bezier curve, intersection of bisector, mathematical computations, geometric properties.

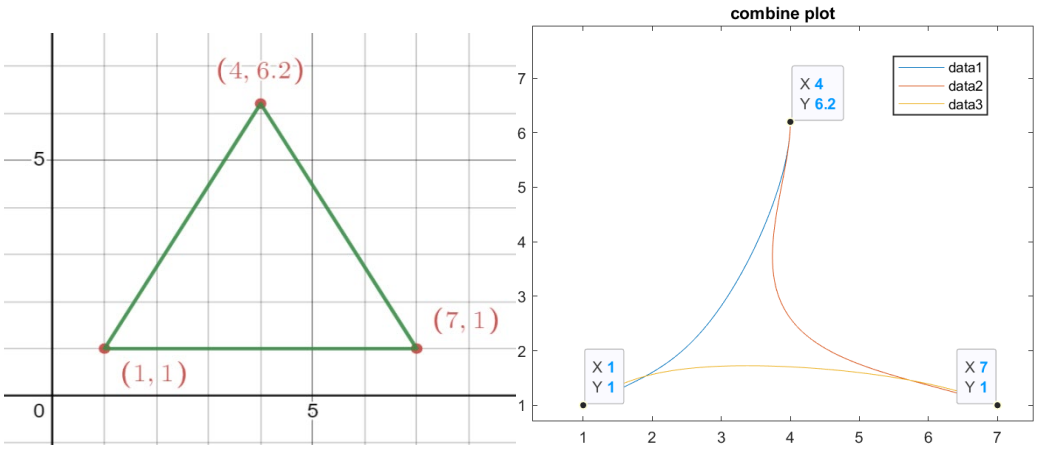
1. INTRODUCTION

The study introduces a novel approach to determining control points using the bisectors of a triangle and constructing cuspidal curves using quartic Bezier curves. Mathematical computations and geometric transformations are utilized to accurately locate bisector intersections and construct the corresponding quartic Bezier curves. The process begins with defining the control points on the triangle based on the intersection of angle bisectors, followed by determining the control points required for constructing the quartic Bezier curve.

2. METHODOLOGY

The study focuses on using intersection of angle bisector to determine the control points. The equilateral triangle is being used as the based for for angle bisector and resulted in three isosceles triangles. The triangle has been completed with five control points by using intersection of angle bisector and by using midpoint equation. The curve formed will be resulted from the five control points and when combined all three curves, a cuspidal curve is formed.

3. RESULTS AND DISCUSSION



Three curves of quartic Bezier curve formed a cuspidal curve after being combined together. The three control points (1,1), (4,6.2) and (7,1) are also the vertices oh the triangle.

4. NOVELTY OF RESEARCH

Quartic Bezier curve has been studied by Dube & Sharma (2013) with aim to construct quartic Bezier curve with shape parameters. Next, research by Besele & Catoiu (2018) about bisecting the parameter of triangle and stated that lines of bisecting area will have atleast one point that passes through those lines. Lastly, a study by Wang et al. (2011) is about cubic Bezier curve, which the authors use two curves with conditions to analyze if both curves are coincident.

5. CONCLUSION

The study gave a new viewpoint on control point identification for cuspidal curve design by introducing a novel technique for establishing control points by using the bisectors of a triangle. The study suggested a novel approach for creating cuspidal curves by combining quartic Bezier curves with the intersection of angle bisectors.

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FEASIBLE FEATURES OF BREAST CANCER RECURRENCE (BCR) PATIENTS USING MACHINE LEARNING ALGORITHMS

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ABSTRACT – Cancer is a disease in which cells in the body grow out of control and is consistently named for the parts of the body where it starts from the breast. BCR is breast cancer that returns after initial treatment and may occur within months or years. This study aims to identify the feasible feature in predicting BCR using four machine learning algorithms. The study utilized 10377 secondary data from the official statistic of the Ministry of Health and Medical Education and the Iran Cancer Research Center. Naïve Bayes (NB), Random Forest (RF), Gradient Boosted Tree (GBT), and Logistic Regression (LR) were utilized by using RapidMiner to obtain a good classifier's performance to be evaluated to determine the best model that can accurately predict the BCR, and the significant risk factors of BCR using the best model. The results show that the best model with the highest accuracy is GBT, with a ratio of 51%, and the most essential feature of this algorithm is radiotherapy.

Keywords: Breast cancer recurrence, machine learning algorithm, accuracy, RapidMiner

1. INTRODUCTION

According to World Health Organization, in 2020, there were 2.3 million women diagnosed with breast cancer and 685,000 deaths worldwide. This study aims to identify the feasible features that predict breast cancer recurrence (BCR) in Iran patients. Secondly, to predict the BCR and to identify the best model with the highest accuracy by incorporating the Naïve Bayes, Random Forest, Gradient Boosted Tree, and Logistic Regression using RapidMiner. This study can instill consciousness in the masses on the dire risk of BCR so women can take preventative measures to avoid spreading cancer.

2. METHODOLOGY

Data was retrieved from PLOS ONE and was acquired from official statistics of the Ministry of Health and Medical Education and the Iran Cancer Research Center, which consists of 10377 records of patients with BCR. The data consist of 15 features relating to BCR. The data mining approach was utilized in this study by undergoing the training and testing phase, the percentage of training is 70%, and testing is 30%. We evaluated the performance of Naïve Bayes, Random Forest, Gradient Boosted Tree, and Logistic Regression using RapidMiner. These will be considered on the accuracy, precision, recall, sensitivity, specificity, and F – measure.

3. RESULTS AND DISCUSSION

The best model with the highest accuracy is the Gradient Boosted Tree with a ratio of 51%; regardless of the attribute weights, *radiotherapy* has been selected as the feasible feature by all algorithms. Whereas *Chemotherapy, Estrogen Receptor Value, LN involvement rate,* and *result of biopsy of pathology* have been selected by three algorithms. Any algorithms do not select *Progesterone Receptor Value* and *tumor size*. However, this observation differs from the original dataset curators Mosayebi et al. (2020), whereby the best model is C5.0 with an accuracy of 81.90%, and the most crucial feature is the *Her2 value*.

4. NOVELTY OF RESEARCH / PRODUCT

Several studies and research projects have investigated and studied the best algorithm for predicting the probability of breast cancer recurrence. Lu et al. (2018) utilized machine learning techniques to examine predictive indicators for breast cancer recurrence using Wisconsin Prognostic Breast Cancer data, similar to Gracia – Murillas et al. (2012) and Rana et al. (2015), but the only difference is the machine learning algorithm which is Gradient Boosted Tree, Naïve Bayes, Random Forest, and Logistic Regression. However, this researcher does not include the most significant

features from the best algorithm model. This study used breast cancer recurrence data from official statistics of the Ministry of Health and Medical Education and the Iran Cancer Research Center. It used Naïve Bayes, Random Forest, Gradient Boosted Tree, and Logistic Regression to determine the best model with the highest accuracy and the most significant feature from the best algorithm.

5. CONCLUSION

In a nutshell, all the objectives are achieved in this study. The study benefits women who have completed breast cancer treatment, providing valuable information about the risk factors associated with BCR and serving as an essential resource for raising awareness among women.

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OPTIMIZATION ON COST FOR SOLID WASTE COLLECTION

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ABSTRACT – This study tries to determine the ideal cost for a private company's waste collection that occurs once a month and acknowledges the use of goal programming to determine the optimal cost. This study uses goal programming to reduce the cost of rubbish collection for a private Malaysian company. E-Idaman Kangar Sdn Bhd manages solid waste management in Perlis. The goal programming model was created with Lingo software version 18.0 and minimizes five cost categories for each route: labor cost, collection cost, vehicle cost, consumable cost, and financial statement of operation. The results of the study show that the company's collection expenses are at their optimal state. The cost of each vehicle included in the collection activity is optimized, and the total spending can still be reduced by RM3, which is a decrease of 0.01%. This shows that the company is already achieving collection in an ideal manner. The paper concludes by discussing the implications of the study for other private waste collection companies in Malaysia. The goal programming model developed in this study can be used by other companies to optimize their waste collection costs.
Keywords: Optimization, cost, solid waste collection, waste management, goal programming method

1. INTRODUCTION

The word "solid waste" refers to undesired items generated by commercial, industrial, and household operations (Prajakta et al., 2015). The rapid population growth and industrialization in Malaysia have led to a significant increase in solid waste generation. According to Waste to Energy for A Sustainable Future (2021), Malaysia's population has reached 32.8 million, indicating a quickly rising state with a tremendous amount of solid garbage being created. The current waste management system is inefficient and insufficient, which has negative consequences for public health and the environment. Waste collection is the most expensive component of waste management systems. The cost of waste collection includes both direct and indirect expenditures. All direct expenses incurred in an area's solid waste management are included in the term "direct costs." (Sakawi, 2011). Proper and effective waste management is essential to maintain a good environment, health, and economic stability in Malaysia. The goal programming model was used to minimize the total cost of waste collection while meeting certain constraints.

2. METHODOLOGY

Data were collected from a private waste collection company, E-Idaman Sdn Bhd in Kangar. A total of five cost that are carried out for collection per month were collected which are labor cost, collection cost, vehicle cost, consumable cost, and the financial statement of operation for each route. There are two routes included in the data set which are Beseri, Kangar to Jalan Santan which consists of three different vehicles where two basic vehicle and one included with an arm roll. These data are formulated into Goal Programming equations and were solved using Lingo software version 18.0. There are five goals that are required to meet, and the constraints were included in the formulation.

3. RESULTS AND DISCUSSION

According to the results, the ideal solution of 3 is the total cost that can be reduced when compared to the initial total cost of 92511.17. This represents a cost reduction of 0.01%. This means that in a month, a total of RM3 can be saved. This may also be seen in each of the vehicle costs, including labor, collection, vehicle, and consumable costs, where there is no reduction from the goal programming method. As a result, the goal programming method can be used to accomplish cost optimization. The solid waste collection company can obtain cost optimization for each route and vehicle based on the Lingo software output.

3.1 Data Analysis

Before putting the model through the Lingo software, a goal programming code was created. The code has five objective functions that were created based on the five goals to be acquired from each vehicle. Based on the Lingo software coding, the variables v1, v2, and v3 were exposed to the decision variables x_1, x_2 and x_3, respectively, where:

x_1 = Beseri route
x_2 = Kangar to Jalan Santan route
x_3 = Kangar to Jalan Santan route + arm roll

4. NOVELTY OF RESEARCH / PRODUCT

There is a numerous number of articles that focuses on waste management. To be exact, few research are using goal programming method but not necessarily on waste collection. Waste management is a huge environmental issue that has been a main concern around the world as the cost of waste management is expensive. Waste management includes the resources used in waste management planning, implementation, and management, such as storage, collection, transportation, and disposal. Not much research on local waste collection has been made where this study focus on the smallest state in Malaysia, Perlis Indera Kayangan. E – Idaman Sdn. Bhd. Kangar, a private company conducts the waste management in Northern Malaysia including Perlis. Goal programming is a multi-objective optimization technique that can be used to optimize numerous objectives, such as reducing garbage collection costs. The study focuses on the local area that can help with creating a better decision making towards waste management for any waste collection company.

5. CONCLUSION

In conclusion, the implementation of goal programming method to achieve the optimal cost for solid waste collection is met. The results of the study show that the goal programming model can reduce the total cost of solid waste collection by 0.01% which means that the company can save RM3 by implementing the model. The study also concludes that goal programming is not a perfect solution, and there may be circumstances where it is not possible to achieve all goals simultaneously. However, the model is a valuable tool for optimizing the cost of solid waste collection, and it can help to improve the financial and budget planning for E-Idaman Sdn. Bhd and can be used as reference for future research with a much bigger and complex dataset.

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ANALYZING THE VIRALITY OF DIETARY SUPPLEMENT ON FACEBOOK USING SEIR MODEL

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ABSTRACT - Facebook's usage has increased to the point that it had become a crucial marketing tool for businesses. With the growth of online marketing, it was essential for sellers to understand the viral marketing ideas that complemented their products. In this study, the Susceptible Exposed Infected Recovered (SEIR) model was used to assess the virality of nutritional supplements on Facebook. The model considered variables including the total number of followers, users who saw and shared the post, followers who reached the post, and people who followed the marketing page but did not view or share the content. From 15 May 2022 to 19 June 2022, information was gathered from Rabella's "Rabella Kota Bharu" Facebook account. The account administrator regularly used two post kinds, namely Photos and Videos, to improve user interaction. The analysis of the most popular posts of each genre showed that Photos had the largest reproduction number on June 6, 2022, which also happened to be a public holiday honoring the Yang di-Pertuan Agong's birthday. This study was essential for marketers who wanted to learn how users responded to various post formats and make content more accessible to customers.

Keywords: Viral marketing, facebook, dietary supplement, SEIR model

1. INTRODUCTION

Nowadays, social media has become a prominent platform for networking, sharing content, and online access. Among the various social media platforms, Facebook stands out with its vast user base of over 2.9 billion active users, making it a popular choice for both social and business interactions (Tracy, 2022). This case study aims to examine the viral potential of promotional posts for a dietary supplement product on Facebook. The use of dietary supplement for weight loss has gained significant popularity as individuals seek effective solutions for combating the obesity related concerns (Saper et al., 2004). With over 1.9 billion overweight adults and 650 million classified as obese worldwide, the associated health risks, including heart disease, diabetes, and high blood pressure, have become pressing issues (Mayo Clinic, 2021). In this context, products like Rabella offer potential solution for weight reduction, appealing to individuals striving for a slimmer physique. Therefore, by using SEIR model it can provide accurate predictive information to help to increase customer interest in the brand's dietary supplements. By analyzing viewer reactions to different posting formats, such as photos and videos, marketers can create engaging and informative content that resonates with their target audience. The findings of this study will provide valuable insights for marketers, enabling them to enhance their online marketing strategies and improve their overall marketing skills.

2. METHODOLOGY

The data for this study was collected using the Insights feature of the Rabella Kota Bharu Facebook account between 15 May 2022 and 19 June 2022. The collected data included gender, age range, and locations information of the reached uses as generated by the Insight feature. Furthermore, the study recorded the number of followers, the number of users who received the marketing information, the number of followers who were reached by the post and shared it, and the number of users who followed the marketing page but neither viewed nor shared the information. The model used was the SEIR model, which is based on the epidemiological model. Since viral marketing spreads similarly to pandemic infections, this study investigated how viral marketing spread, specifically for Rabella products via Facebook.

3. RESULTS AND DISCUSSION

The data are obtained from a Facebook business account in Insight feature, from 15 May 2022 and 19 June 2022. The target market was focused on Facebook users, especially their followers. The total number of followers on Facebook until 19 June 2022 was 4521. During the time frame mentioned, 18 postings were made, with two types of posting

gaining the greatest attention from followers. The two types of posting that the admin of Rabella's Facebook account frequently used and gained customer interaction were Photo and Video. Among 18 posting, four with the highest total number of reaches were taken to analyze in this study.

4. NOVELTY OF RESEARCH / PRODUCT

The novelty of this study lies in its application of the SEIR (Susceptible, Exposed, Infected, Recovered) model to analyze the virality of dietary supplement marketing on Facebook. While the SEIR model is traditionally used in epidemiology to study disease transmission, adapting it to the realm of marketing provides a unique framework to understand the spread and impact of promotional campaigns. By employing this model, we can uncover the underlying factors that drive the success or failure of dietary supplement marketing campaigns on social media, enabling marketers to make informed decisions and optimize their strategies for maximum reach and engagement.

5. CONCLUSION

In conclusion, the application of the SEIR (Susceptible, Exposed, Infected, Recovered) model to analyze the virality of dietary supplement marketing on Facebook has provided valuable insights into the dynamics of information propagation in this domain. By utilizing this model, we have gained a deeper understanding of the factors influencing the success of marketing campaigns and the potential drivers of their viral spread. This research serves as a foundation for marketers to develop more effective strategies for promoting dietary supplements on social media platforms, ultimately enhancing their reach and impact in a highly competitive market.

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RAINFALL PREDICTION BY USING MACHINE LEARNING APPROACH

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ABSTRACT- This study utilized machine learning to forecast rainfall levels and identify influential atmospheric elements. Python software was employed to analyze historical rainfall data, focusing on 16 selected attributes. The study aimed to predict rainfall amounts and determine the features that influence rainfall the most. Its significance lies in optimizing agricultural practices, enhancing preparedness for heavy rains, and supporting infrastructure planning, sustainable agriculture, and economic resilience. MLR algorithms were utilized and evaluated using the dataset. The data underwent preprocessing to handle missing values and create an organized dataset suitable for model building. The rainfall dataset was divided into a training set (70%) and a testing set (30%). The resulting model's predictive performance for rainfall was assessed by calculating the R-squared value. RFE was employed to select the most relevant two features, ranking them based on relevance and eliminating less important ones. The model developed using RFE demonstrated a reasonably good fit to the testing data, achieving an R-squared value of 0.1316. The RMSE indicated an average difference of around 0.11385 units between predicted and actual values. The errors between predicted and actual values were reasonably minimal, with a MSE of 0.01919 and a MAE of 0.07436. The model accounted for approximately 13% of the variation in rainfall. To conclude, the general aims of this study, where the factors that influence most rainfall have been found, by comparing the model and the Recursive Features Selection (RFE) process. The specific objectives of this study were fully addressed as the MSE and MAE value is low.

Keywords: Machine learning (ML), Multiple Linear Regression (MLR), Recursive Features Selection (RFE), Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), Mean squared Error (MSE).

1. INTRODUCTION

In any country, especially one in the equatorial climate region, which lacks seasons, rainfall is a common meteorological occurrence (BBC, 2022). Rainwater may restore the soil, according to Selase et al. (2015), it is also necessary for vegetation, it provides a habitat for fish, and it fills reservoirs that hold drinking water. In a previous study, Dar (2017) employed a mathematical strategy known as multiple linear regression. This method allows for the running of several independent variables and the evaluation of the model's accuracy when the MSE, RMSE are, and high value of r squared. Including that, the goal of machine learning (ML), is to connect every relevant information point in order to draw highly precise judgements and ultimately alter the behavior of the model. Based on climatic variables like temperature, humidity, and pressure, rainfall can be anticipated. Thus, in this research study ML approach and MLR were used with more attributes.

2. METHODOLOGY

The dataset for this study will be obtained from Kaggle.com. This secondary data collection consists of 366 records with 18 attributes from the rainfall dataset. Phyton software will be used to assess historical rainfall data. MinTemp, MaxTemp, Evaporation, Sunshine, WindGustSpeed, WindSpeed9am, WindSpeed3pm, Humidity9am, Humidity3pm, Pressure9am, Pressure3pm, Cloud9am, Cloud3pm, Temp9am, Temp3pm, Rainfall, RainToday, and RainTomorrow are all included in this dataset. The prediction accuracy will be calculated using all of these attributes except for RainToday, and RainTomorrow. Machine Learning approach was use in this study by conducting several processes which are data collection, identify dependent variables and independent variables, data preparation, data preprocessing, data describe, build regression model which is Multiple Linear Regression Model, evaluation and deployment process. Recursive Features Elimination was also used in this study to select 2 features related to amount of rainfall.

3. RESULTS AND DISCUSSION

The value observed is the MAE, MSE and RMSE and adjusted R Squared. As 2 features were requested for ranking the relevant variables affecting amount of Rainfall, then the system generate it for closer observation. The features

given were 'Humidity9am', and 'Pressure9am'. Based on the machine learning methodology, the R2 value obtained for the test data is 0.1316, exhibiting a high degree of similarity to the R2 value observed for the RFE method. The difference between RMSE of training dataset and RMSE of testing dataset is just 0.0371 units, it can be concluded that the model we have developed is the most optimal in terms of fitting the data. The mean squared error (MSE) value of 0.01919 and mean absolute error (MAE) value of 0.07436 suggest that the discrepancies between the predicted and actual values are relatively minimal. The R-squared score of the MLR model is approximately 0.1316. This implies that the model explains approximately 13% of the variability observed in the target variable.

4. NOVELTY OF RESEARCH / PRODUCT

The World Health Organisation (2022) records that from 1998 to 2017, floods caused injury to over 2 billion people worldwide. Excessive rainfall may also have an effect on the agriculture system. Due to this issue, the desire to prevent unpredictable, heavy rainfall has increased. It is an honor to learn to analyse and solve problems by using Phyton software. The experience of frustration to get a good model for rainfall prediction gave full relief once realize this small step is a part of polishing my skill and knowledge.

5. CONCLUSION

To conclude, the general aims of this study, where the factors that influence most rainfall have been found which are 'Humidity9am', and 'Pressure9am' features by comparing the model and the Recursive Features Selection (RFE) process. The specific objectives of this study were fully addressed as the MSE and MAE value is low, the smaller the value implies higher accuracy of the regression model which means that all expected values matched with the prediction values.

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