Universiti Teknologi MARA
Cawangan Melaka

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volume 1

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Progress in Computing and Mathematics Journal
College of Computing, Informatics, and Mathematics
Universiti Teknologi MARA Cawangan Melaka, Kampus Jasin
77300, Merlimau, Melaka Bandaraya Bersejarah

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EDITORS

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PREFACE

Welcome to the inaugural volume of the **Progress in Computing and Mathematics Journal (PCMJ)**, a publication proudly presented by the College of Computing, Informatics, and Mathematics at UiTM Cawangan Melaka.

This journal represents a significant step in our commitment to fostering a vibrant research culture, initially providing a crucial platform for our undergraduate students to showcase their intellectual curiosity, dedication to scholarly pursuit, and potential to contribute to the broader academic discourse in the fields of computing and mathematics. However, we envision PCMJ evolving into a beacon for researchers both nationally and internationally. We aspire to cultivate a space where groundbreaking research and innovative ideas converge, fostering collaboration and intellectual exchange among established scholars and emerging talents alike.

The manuscripts featured in this first volume, predominantly authored by our undergraduate students, are a testament to the hard work and dedication of these budding researchers, as well as the guidance and support provided by their faculty mentors. They cover a diverse range of topics, reflecting the breadth and depth of research interests within our college, and set the stage for the high-quality scholarship we aim to attract in future volumes.

As editors, we are honored to have played a role in bringing this journal to fruition. We extend our sincere gratitude to all the authors, reviewers, and members of the editorial board for their invaluable contributions. We also acknowledge the unwavering support of the college administration in making this initiative possible.

We hope that PCMJ will inspire future generations of students and researchers to embrace research and innovation, to push the boundaries of knowledge, and to make their mark on the world of computing and mathematics.

Editors
Progress in Computing and Mathematics Journal (PCMJ)
College of Computing, Informatics, and Mathematics
UiTM Cawangan Melaka

TABLE OF CONTENTS

LIST OF EDITORS ..... **iii**

PREFACE ..... **iv**

TABLE OF CONTENTS ..... **v**

SIMPLIFIED DRONE GAME FOR INITIAL REMEDIAL INTERVENTION FOR DYSPRAXIA AMONG KIDS 1

DEVELOPMENT OF STORAGE BOX WITH AUTOMATED AND REMOTE LOCK CONTROL SYSTEM IN WLAN ENVIRONMENT 16

COMPARATIVE ANALYSIS OF PASSWORD CRACKING TOOLS 29

SPORT FACILITIES FINDER USING GEOLOCATION 50

READ EASY AR: INTERACTIVE STORYBOOK FOR SLOW LEARNER 60

MATHMINDSET: GAME-BASED LEARNING TO REDUCE MATH ANXIETY 87

NETWORK PERFORMANCE ANALYSIS ON DIFFERENT ISP USING ONLINE CLASS PLATFORM ON DIFFERENT DEVICES 101

CIVIC HEROES; ENHANCING CIVIC AWARENESS THROUGH GAME-BASED LEARNING 115

ENHANCING COMMUNITY SQL INJECTION RULE IN INTRUSION DETECTION SYSTEM USING SNORT WITH EMAIL NOTIFICATIONS 124

LEARNING ABOUT MALAYSIA THROUGH GAME 138

STUDENT CHATROOM WITH PROFANITY FILTERING 150

ARCHITECTURE BBUILD AND DESIGN BUILDING THROUGH VIRTUAL REALITY 162

VEHICLE ACCIDENT ALERT SYSTEM USING GPS AND GSM 174

MARINE ODYSSEY: A NON-IMMERSIVE VIRTUAL REALITY GAME FOR MARINE LITTER AWARENESS 187

GAME BASED LEARNING FOR FIRE SAFETY AWARENESS AMONG PRIMARY SCHOOL CHILDREN 207

SIMULATING FLOOD DISASTER USING AUGMENTED REALITY APPLICATION 220

CRITICAL THINKER: VISUAL NOVEL GAME FOR BUILDING CRITICALTHINKING SKILLS 231

POPULAR MONSTER: 239

FIGURE SPRINTER: EDUCATIONAL ENDLESS RUNNING GAME TO LEARN 2D AND 3D SHAPE 252

AR MYDREAMHOUSE: AUGMENTED REALITY FOR CUSTOMISING HOUSE 265

RENTAL BIKE SERVICES WITH REAL TIME CHAT ASSISTANCE 308

IDOBI: IOT INTEGRATED SELF-SERVICE WASHING MACHINE RESERVATION SYSTEM WITH CODE BASED BOOKING TOKEN 321

TRADITIONAL POETRY OF UPPER SECONDARY STUDENTS VIA MOBILE APPLICATION 332

A MOBILE TECH HELPER RECOMMENDATIONS APPLICATION USING GEOLOCATION WITH AUTOMATED WHATSAPP MESSENGER..... 347

TURN-BASED ROLE-PLAYING GAME BASED ON MUSIC THEORY 370

FADTRACK: DEVELOPMENT OF VEHICLE TRACKING SYSTEM USING GPS 384

MENTALCARE: GAME-BASED LEARNING ON MENTAL HEALTH AWARENESS 397

HALAL INTEGRITY INSPECTOR:..... 411

MOBILE APPLICATION FOR REAL TIME BABY SIGN LANGUAGE RECOGNITION USING YOLOV8..... 434

TRAVEL TIME CONTEXT-BASED RECOMMENDATION SYSTEM USING CONTENT-BASED FILTERING 448

DETECTION SYSTEM OF DISEASE FROM TOMATO LEAF USING CONVOLUTIONAL NEURAL NETWORK 460

VIRTUAL REALITY (VR) FOR TEACHING AND LEARNING HUMAN ANATOMY IN SECONDARY SCHOOL..... 471

LEARNING KEDAH'S DIALECT VIA GAME-BASED LEARNING 490

AUTOMATED FACIAL PARALYSIS DETECTION USING DEEP LEARNING 504

ENHANCING CRIMINAL IDENTIFICATION: SVM-BASED FACE RECOGNITION WITH VGG ARCHITECTURE..... 517

WEB BASED PERSONALIZED UNIVERSITY TIMETABLE FOR UITM STUDENTS USING GENETIC ALGORITHM..... 528

SMART IQRA' 2 MOBILE LEARNING APPLICATION 545

ANIMAL EXPLORER: A WALK IN THE JUNGLE..... 557

FOOD RECOMMENDATION SYSTEM FOR TYPE 2 DIABETES MELLITUS USING CONTENT-BASED FILTERING 569

WEB-BASED PERSONAL STUDY HELPER BASED ON LESSON PLAN USING GAMIFICATION 580

DIETARY SUPPLEMENT OF COLLABORATIVE RECOMMENDATION SYSTEM FOR ATHLETE AND FITNESS ENTHUSIAST..... 596

AUTOMATED HELMET AND PLATES NUMBER DETECTION USING DEEP LEARNING 611

VIRTUAL REALITY IN MATHEMATICAL LEARNING FOR SECONDARY SCHOOL..... 622

VIRTUAL REALITY (VR) IN CHEMISTRY LEARNING FOR SECONDARY SCHOOLS STUDENTS 634

GOLD PRICE PREDICTION USING LONG SHORT-TERM MEMORY APPROACH 651

ARTQUEST: A VIRTUAL REALITY ESCAPE ROOM FOR LEARNING ART HISTORY LESSONS..... 664

FIRE SURVIVAL: A FIRE SAFETY GAME USING GAME- BASED LEARNING..... 675

ANIMALAR: AN INTERACTIVE TOOL IN LEARNING EDUCATIONAL ANIMAL KINGDOM THROUGH AUGMENTED REALITY 690

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STUDENT CHATROOM WITH PROFANITY FILTERING

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Abstract

Amidst the challenges of the modern era, face a rapid growth of technological development especially among social media development. With the extensive usage of social media, a new problem arises in the society which is profanity. To address this imperative, the project titled "Student Chatroom with Profanity Filtering" introduces a mobile chatroom application for students equipped with profanity filtering. The application's core objective is to minimalize the usage of profanity among the students as well as providing an anonymous platform for students to convey their message. The usability of this game will also be taken into consideration as it will prove this project's success. The filtering of this application achieved with the usage of Natural Language Processing (NLP) model, which aims to filter profanity usage in the project among the university students and implementing Waterfall methodology in the development process. Leveraging the System Usability Scale for testing, Student Chatroom with Profanity Filtering aspires to be a valuable tool in fostering a good behaviour that are needed in social interacting among the society. The results show a percentage of 61.67%. To improve the project, future work needed in enhancement for filtering for further effectiveness in profanity filtering.

Keywords: Profanity filtering, NLP, Waterfall methodology, Students, Anonymous,

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INTRODUCTION

Profanity filtering is a crucial tool in social media platforms to block offensive words and maintain a positive online environment. A study by Cachola et al., (2018) shows that the use of swear words does not only take place in face-to-face communication, but it also occurs on social media. leading to cyberbullying and negative feelings for recipients. To combat this, Natural Language Processing (NLP) is used in this project to implement profanity filtering. NLP algorithms analyse language patterns and context to detect offensive content, avoiding false positives and enhancing online interactions. This project, Student Chatroom with Profanity Filtering, provides a friendly environment for students to express messages without fear of cyberbullying. The application also offers an anonymous chatting room, allowing students to express their messages without fear of being recognized. Overall, implementing NLP-based filters can help create a more respectful and inclusive digital space for users.

LITERATURE REVIEW

Profanity is the use of vulgar, insulting, or degrading language, often seen as taboo or socially undesirable. It has been applied to albums containing violence and sex lyrics since 1990 in the United States to protect children (Chin et al., 2018). Different cultures and groups have different views on what constitutes profanity, which can have a distinct effect depending on the context. It is essential to recognize alternative ways to convey strong emotions without resorting to profanity. Censorship and content filters can be used to maintain linguistic norms and promote inclusive environments. Respectful communication is essential for fruitful interactions and mutual understanding between individuals and groups.

Profanity filtering in android application

Profanity filtering is a system used in Android applications to remove objectionable language from user-generated content. It ensures that content adheres to language or community standards, promoting liberalism without breaking cultural norms (Razali et al., 2021). Using linguistic analysis, pattern matching, and machine learning, these systems scrutinize text from comments, emails, or user-generated content. If a match is found, the material is blocked or flagged, prohibiting users from viewing, or posting it on social media.

Implementing profanity filtering can be challenging, as it requires balancing incorrect data removal with preventing false positives or censoring. If a word has additional, more neutral interpretations, it might be difficult to determine what should be obscured. such as r*tarded or retarded (Nozza & Hovy, 2022)

Natural language processing in android application

Natural Language Processing (NLP) in Android applications integrates language understanding and processing capabilities into mobile apps, enabling them to analyse, interpret, and respond to user inputs in natural language. However, research on foul language detection using trained CNNs has shown inaccurate detection and high computational costs (Wazir et al., 2022). Pre-processing is necessary to make data machine-readable, filtering out meaningless data like stop words. NLP techniques use machine learning algorithms and linguistic models to understand and extract meaning from user input. Voice assistants in Android devices heavily rely on NLP to convert spoken language into text and understand user intent. NLP may be thought of as a process that involves morphological analysis, syntactic analysis, semantic analysis, and pragmatic analysis to derive outcomes (Kim et al., 2022).

METHODOLOGY

The Waterfall methodology, a well-defined and predictable approach, is suitable for a project focusing on NLP-based profanity detection. When the waterfall approach was first launched, it was well-liked by business organisations and programmers who worked on several significant software projects (Ahmed & Chukwu Ogbu, 2021)It incorporates the application development model into the traditional life cycle and does not require certificates or specialized training for project managers or staff (Lucidchart, 2019). The small team size, clear requirements, and absence of ongoing change make it the best choice for this project. The sequential structure allows for extensive testing and validation at each step, making it useful for profanity detection. The waterfall approach achieves progress gradually and downhill, making it suitable for projects with constant needs. Figure 1.0 below shows waterfall methodology.

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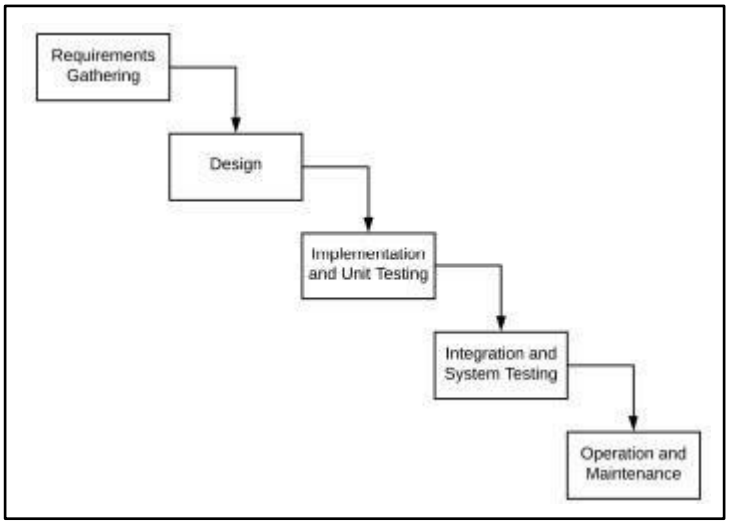

Figure 1 Waterfall Methodology
(Apar Garg, 2021)

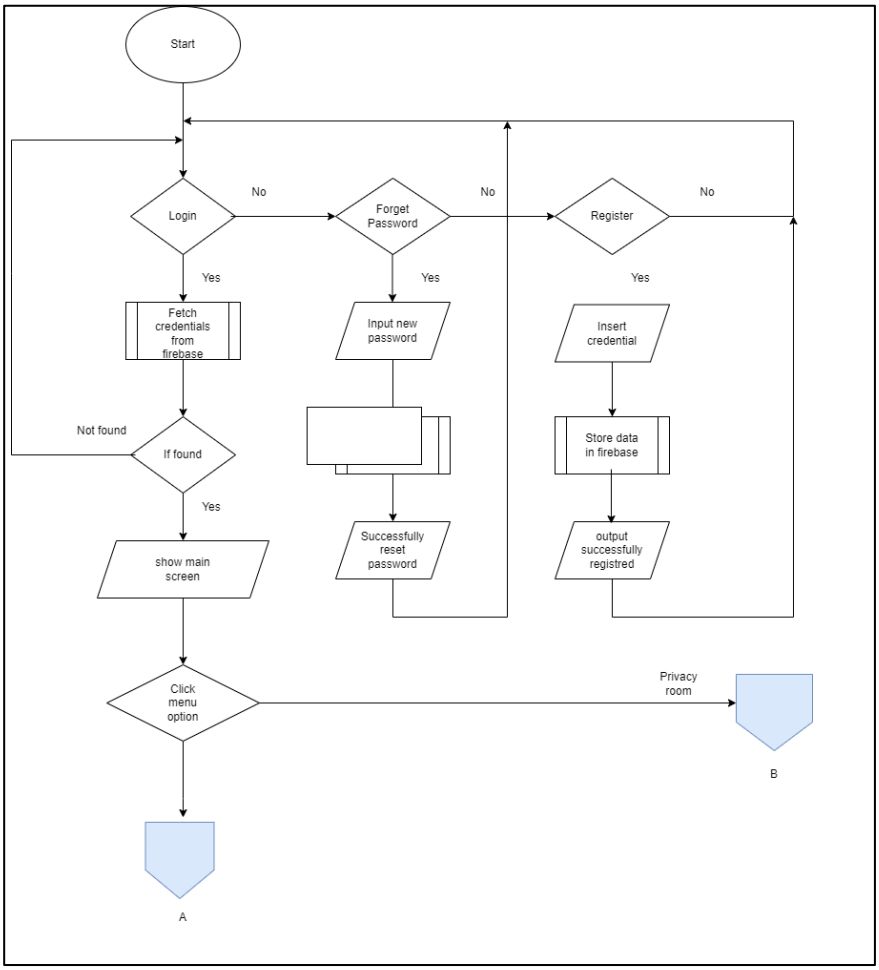

Figure 2 First part of flowchart.

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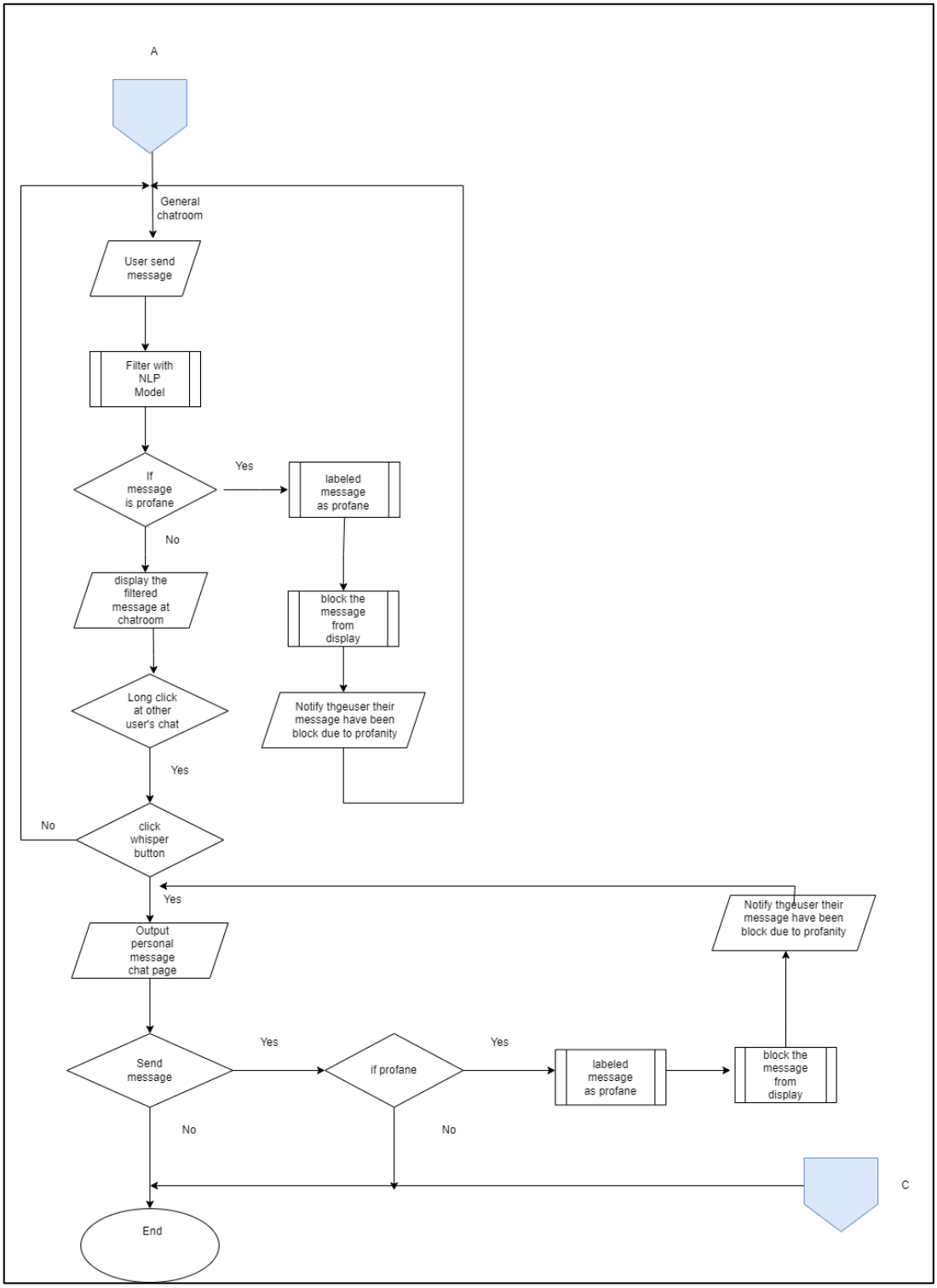

Figure 3 Second part of flowchart.

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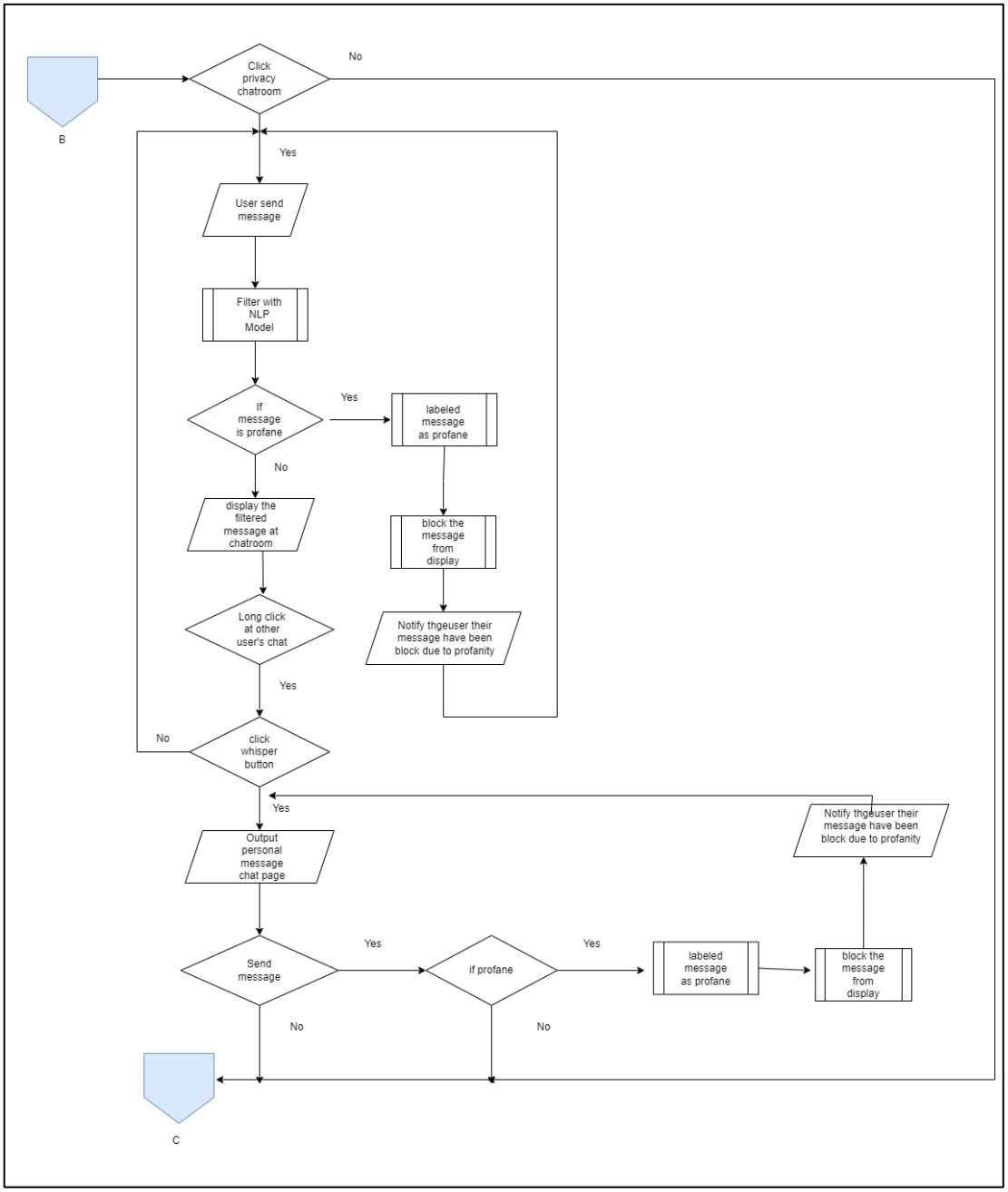

Figure 4 Third part of flowchart.

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RESULT AND DISCUSSION

Functionality testing, also known as functional testing, is a crucial phase in the software testing process where each function of the software application is tested by feeding it input and examining the output. In the model-based testing, the functionality of the existing applications is tested by the external behaviour of the system so basically this technique comes in black-box testing (Mburu & Ndia, 2022). This type of testing ensures that the software system is working as per the requirements and specifications provided. Functionality testing is primarily concerned with the user interface, APIs, databases, security, client/server applications, and the functionality of the software. The main goal is to check whether the system is functionally perfect. Below shows the features that available in Student Chatroom with Profanity Filtering.

System Testing is a level of testing that validates the complete and fully integrated software product (Hamilton, 2024). The system testing will mainly about testing the mobile application among the target user as explain in Chapter 3 which is student UiTM Jasin. The process of testing the application will be targeting the usability of the Profanity Filtering Student Chatroom among the users. As for that, System Usability Scale (SUS) will be hand out to the target users to evaluate overall usability of the application. Table 5.3 below show the System Usability Scale (SUS) Questionnaire that are being used. For a reliable result between 8–12 test persons are required as per state by (Knudsen, 2021).

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SUS Questionnaire Findings

In System Usability Scale (SUS), each answer has a value from 1 to 5. In Guerci's (2020) estimation, the odd items (1, 3, 5, 7 and 9) on the SUS questionnaire require a deduction of 1 from the total score. Meanwhile, the even items (2, 4, 6, 8, and 10) deduct the score from 5. It is necessary to total the points for each item for each respondent, multiply that total by 2.5. The average is determined upon obtaining the entire score for every respondent. Afterward, the average will be graded accordingly. Table 5.4 below shows the total score for each item and respondents and average for the whole score. This calculation is being done on spreadsheets where the formula is implemented. Table 1 and 2 below show the formula and calculation that has been made in spreadsheets respectively. Meanwhile Figure 5 shows the results of using SUS Testing.

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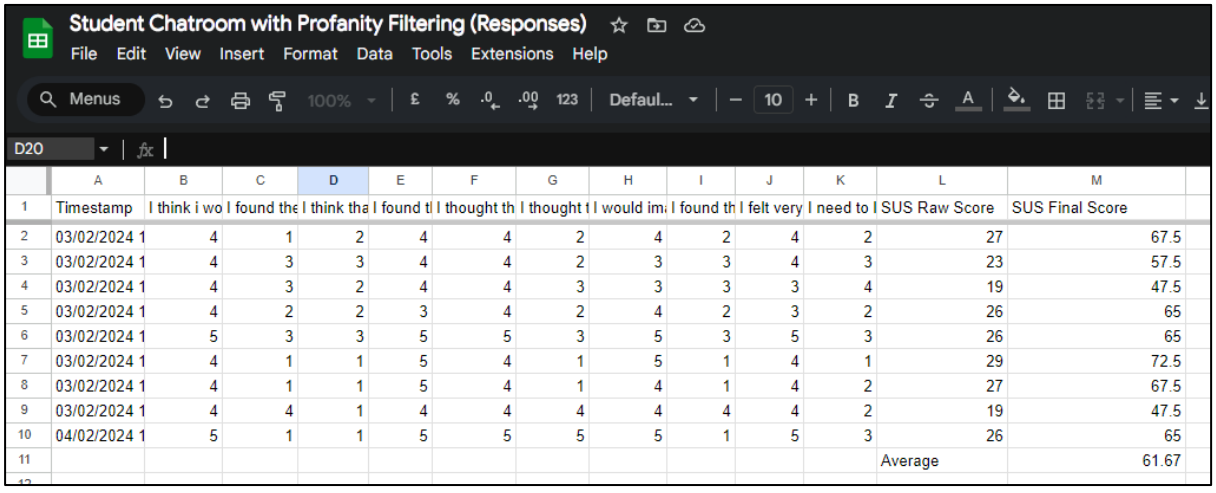
Table 1 Shows score from SUS Testing

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*Total*
1	4	1	2	4	4	2	4	2	4	2	67.5
2	4	3	3	4	4	2	3	3	4	3	57.5
3	4	3	2	4	4	3	3	3	3	4	47.5
4	4	2	2	3	4	2	4	2	3	2	65
5	5	3	3	5	5	3	5	3	5	3	65
6	4	1	1	5	4	1	5	1	4	1	72.5
7	4	1	1	5	4	1	4	1	4	2	67.5
8	4	4	4	4	4	4	4	4	4	2	47.5
9	5	1	1	5	5	5	5	1	5	3	65
											61.67
										Average	

Table 2 Shows the SUS formula

```
=((B2-1)+(5-C2)+(D2-1)+(5-E2)+(F2-1)+(5-G2)+(H2-1)+(5-I2)+(J2-1)+(5-K2))×2.5
```

(Ramadhan, 2019)



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Timestamp	I think i wo	I found the	I think tha	I found tl	I thought th	I thought t	I would ima	I found th	I felt very	I need to l	SUS Raw Score	SUS Final Score
2	03/02/2024 1	4	1	2	4	4	2	4	2	4	2	27	67.5
3	03/02/2024 1	4	3	3	4	4	2	3	3	4	3	23	57.5
4	03/02/2024 1	4	3	2	4	4	3	3	3	3	4	19	47.5
5	03/02/2024 1	4	2	2	3	4	2	4	2	3	2	26	65
6	03/02/2024 1	5	3	3	5	5	3	5	3	5	3	26	65
7	03/02/2024 1	4	1	1	5	4	1	5	1	4	1	29	72.5
8	03/02/2024 1	4	1	1	5	4	1	4	1	4	2	27	67.5
9	03/02/2024 1	4	4	1	4	4	4	4	4	4	2	19	47.5
10	04/02/2024 1	5	1	1	5	5	5	5	1	5	3	26	65
11												Average	61.67

Figure 5 Shows the results of SUS Testing

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Overall Findings

Concluding the usability testing, the final average SUS score of 61.67 places the system's usability firmly in the "Good" category, indicating that users find the application to be functional and relatively easy to use. This score reflects a positive reception from the user base and suggests that while there is always room for improvement, the foundation for a solid and user-friendly interface is well-established. The application is on the right track on the development. Figure 6 below shows rating scale of System Usability Scale (SUS).

Figure 6 Rating of System Usability Scale
(Hasanati & Nashikha, 2023)

Conclusion

The project aimed to create a Student Chatroom with Profanity Filtering for mobile applications using the Waterfall methodology. The application integrated Natural Language Processing (NLP) to filter out profane and inappropriate language, fostering a respectful online environment for students. The project followed a structured approach, documenting each phase and ensuring all objectives were met. Firebase Firestore was used for database management, while the BERT Transformer model was instrumental in the profanity filtering mechanism. The user interface design aimed to create a user-friendly experience, allowing students to navigate and engage in anonymous discussions without fear of exposure to offensive content.

The project's implementation phase was executed with attention to detail, resulting in an average SUS score of 61.67, indicating "Good" usability.

REFERENCES (APA 7TH EDITION)

Apar Garg-A systematic review on plan-driven SDLC models for software development. (2022, March 25). IEEE Conference Publication | IEEE Xplore. https://ieeexplore.ieee.org/document/9785261

Ahmed, L., & Chukwu Ogbu, R. (2021). A Comparative Analysis of Agile and Waterfall Software Development Methodologies. *Bakolori Journal of General Studies*, *11*(2), 3201–3210.

Cachola, I., Holgate, E., Preotiuc-Pietro, D., & Li, J. J. (2018). Expressively vulgar: The socio-dynamics of vulgarity and its effects on sentiment analysis in social media. Proceedings of the 27th International Conference on Computational Linguistics, 2927–2938

Chin, H., Kim, J., Kim, Y., Shin, J., & Yi, M. Y. (2018). Explicit Content Detection in Music Lyrics Using Machine Learning. *Proceedings - 2018 IEEE International Conference on Big Data and Smart Computing, BigComp 2018*, 517–521. https://doi.org/10.1109/BigComp.2018.00085

Guerci, J. (2020, 5). Easily calculate SUS Score. From uxplanet: https://uxplanet.org/easilycalculate-sus-score-a464d753e5aa

Lucidchart. (2019). The Pros and Cons of Waterfall Methodology. In *Lucidchart Blog* (p. pros-and-cons-of-waterfall-methodology). https://www.lucidchart.com/blog/prosand-cons-of-waterfall-methodology

Hasanati, N., & Nashikha, A. (2023, October 29). USER EXPERIENCE ANALYSIS OF THE CANVA APPLICATION USING THE SYSTEM USABILITY SCALE (SUS) METHOD. *JURNAL PERANGKAT LUNAK*, *5*(3), 224–231. https://doi.org/10.32520/jupel.v5i3.2630

Knudsen, T. T. (2021, December 7). *A practical guide to SUS - UX Collective*. Medium. https://uxdesign.cc/a-practical-guide-to-sus-9f41a2cb5a5

Kim, C.-G., Hwang, Y.-J., & Kamyod, C. (2022). A Study of Profanity Effect in Sentiment Analysis on Natural Language Processing Using ANN. *Journal of Web Engineering*. https://doi.org/10.13052/jwe1540-9589.2139

Mburu, J. M., & Ndia, J. G. (2022, May 20). A Systematic Mapping Study on UML Model based Test Case Generation and Optimization Techniques. *International Journal of Computer Applications*, *184*(13), 26–33. https://doi.org/10.5120/ijca2022922116

Nozza, D., & Hovy, D. (2022). *The State of Profanity Obfuscation in Natural Language Processing*. http://arxiv.org/abs/2210.07595

Razali, F., Jusoh, Z., Sallehomar, A., & Azizan, N. (2021). Implementation of Anti-Profanity Words in Mobile Application Platform. *IOP Conference Series: Materials Science and Engineering*, *1062*(1). https://doi.org/10.1088/1757-899X/1062/1/012026

Ramadhan, D. W. (2019, December 2). PENGUJIAN USABILITY WEBSITE TIME EXCELINDO MENGGUNAKAN SYSTEM USABILITY SCALE (SUS) (sTUDI KASUS: WEBSITE TIME EXCELINDO). *JIPI (Jurnal Ilmiah Penelitian Dan Pembelajaran Informatika)*, *4*(2), 139. https://doi.org/10.29100/jipi.v4i2.977

Wazir, A. S. B., Karim, H. A., Lyn, H. S., Fauzi, M. F. A., Mansor, S., & Lye, M. H. (2022). Deep Learning-Based Detection of Inappropriate Speech Content for Film Censorship. IEEE Access, 10, 101697–101715. https://doi.org/10.1109/ACCESS.2022.3208921

Hamilton, T. (2024, January 22). *What is System Testing? Types with Example*. Guru99. https://www.guru99.com/system-testing.html

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