

E-Complaint System for UiTM Perlis College Embedded with Gamification

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HIGHLIGHTS

- This paper discusses the design and development of a web-based complaint management system for colleges embedded with gamification.
- The gamification elements included during the system development.
- Discussed the three main phases in the Waterfall Model that is used in this paper.
- Discusses about the usability testing along with the results which included the PSSUQ 16 questions.

ABSTRACT

Even though people can make complaints through a computerized system, some places still use the manual system. The manual system is inconvenient for the complainant because they must visit the respective counter to channel the complaints. In addition, the form provided usually consists of long instructions for the complainant to read before channeling the complaint. This paper discusses the development of an e-Complaint System for UiTM Perlis colleges embedded with gamification. In this system, there are three gamification elements included, which are the progress bar, leaderboard, and Avatar selection for personalization. Two tests were conducted, which are functionality and usability testing through various platforms such as YouTube, 000webhost, and Google Form. There were 33 respondents for the usability testing consisting of students and staff of UiTM Perlis. While the functionality testing was conducted with UiTM Perlis lecturers who have experienced teaching IT subjects. From the responses obtained from the respondents through PPSUQ Survey, most of the respondents agreed that the developed system helped them in channeling complaints and updating the status of their complaints compared to the existing system. The system developed does include some gamification elements which can ease the users to use the e-complaint system in the future. Via this system, users were guided on how to lodge complaints via a step-by-step process instead of reading long instructions which could lead them to confusion.

Keywords: complaint, e-Complaint, gamification, PPSUQ

INTRODUCTION

A complaint is a statement that something is wrong or not satisfactory according to a person itself and can be described as an expression of discontent, pain, resentment, lament, and fault finding (Cambridge



University Press, 2019). Well-structured management will make the organization have the potential to gain a good image by focusing on customers' gratification when it comes to managing the complaints (Afify & Kadry, 2019; Msosa, 2021). For instance, for Universiti Teknologi MARA (UiTM), Malaysia, the existing e-Complaint system is handled by the UiTM headquarters which is in UiTM Shah Alam, Malaysia. The functionality of the website is acceptable since they have divided the complaints' form into three sections which are E-Aduan UiTM for any general complaint, E-Aduan Fasilitas is for complaints related to facilities in terms of electrical, mechanical, telecommunications, or landscape, and E-Aduan ICT for ICT related problem. To make an enhancement and modification in the complaint system, the researcher found that including the element of gamification into a non-game context will be able to motivate the customers and management respectively to channel and handle the complaint more effectively and efficiently. One of the advantages of having gamification elements is also being able to have a better understanding and learning experience, provide immediate answers efficiently, and promote action change (Nguyen et al., 2020).

The purpose of this paper is to discuss the design and development of a web-based complaint management system for colleges located in one of UiTM branch campuses, which is UiTM Perlis that is situated in the Northern part of Peninsular Malaysia. The suggested system named e-Complaint College Management System is embedded with gamification and the usability and functionality of the system have also been evaluated in this study. The design and development of the system was to cater students' complaints where they will have a more interactive and engaging online system to channel their complaints to the university. The management will then manage all the complaints then decide whether the complaints should be taken for further actions. Having the system in a higher education institution will improve the current services that promote complainant satisfaction and ease the management side to compile those complaints into a secured database (Bahari, Adnan & Prasetyo, 2019).

The e-Complaint College Management System is embedded with gamification elements to encourage the users to complete the complaints in more engaging ways such as through progress bar to complete the process of lodging a complaint, choosing an Avatar for more personalized user experience and leaderboard that listed the most current complaints that have been lodged by the students. By integrating the e-Complaint System with gamification, it will be able to improve the service of the existing complaint system towards a game-based complaint system, which will eventually help to improve users' satisfaction towards the handling of the e-complaint system.

INTEGRATION OF GAMIFICATION WITH E-COMPLAINT SYSTEM

Gamification is usually defined as "the use of gaming elements in non-game context or services to enhance the customer motivation in completing a task (Bitrián et al., 2021). Previous research claims that to gain effective and efficient online complaint management is by implementing gamification elements into the organization system because it can help to enhance motivation and improve user productivity (Bitrián et al., 2021). Besides that, by including gamification in an online system, it could enhance user engagement through the mediation of psychological needs, satisfaction, and enjoyment (Manuhutu & Uktolseja, 2018). Compared to the existing online system it takes less time for the user to figure out how the system works. Table 1 summarizes the gamification elements that have been included in the development of the e-Complaint College Management System adopted from Bitrián et al (2021) along with an explanation of how the gamification element works throughout the system.



Table 1: Gamification elements in the development of e-Complaint System

Game element	Examples	How element explains the gamification
Achievement (Progression)	<ul style="list-style-type: none"> ● Leaderboard ● Progress bar 	<ul style="list-style-type: none"> ● Provide a social status element, as do points and badges ● The sense of progression motivated continued effort
Personalization	<ul style="list-style-type: none"> ● Avatar selection ● Avatar naming 	<ul style="list-style-type: none"> ● The avatar selection is for the user to choose the look-and-feel options to accommodate individual preferences ● Use the information from user input fields. For example, if the user inputs a nickname into a text field, use that nickname within the environment or narrative

In the educational landscape, the benefits of embedding gamification in an online system has been widely discussed such as in the development of Memrise, an online language-learning application launched in 2010. The main function of the online system with gamification is to focus on learning vocabulary with a systematic flow. The service provided is divided into two categories, which are basic and premium, where the basic version can be used by anyone since it is free. While the premium version offers a variety of features compared to basic ones (Zhang, 2019). Besides, this language-learning application has assimilated some of the gamification elements for learning purposes. Whenever users learn new words, it is interpreted as growing a garden of flowers which starts from planting the seeds, then it will grow little by little as they learn new words (Zhang, 2019). Memrise application is able to help maintain students' attention and improves user's memorizing abilities because of the integration with game elements (Zhang, 2019). Meanwhile, Kahoot, is a game-based learning platform that is most used in Malaysia these days. One recent study shows that almost 600 students keep on repeating the advantages of using this game-based platform and, they stated that because of the variety of options the system provides it helps the students to concentrate while having fun (Lin et al., 2018). Furthermore, Kahoot! is a free game-based platform that aims to provide users with a fun learning platform for them to enjoy while learning (Lin et al., 2018).

In relation to the development of the e-Complaint College Management System, the gamification elements selected have also aimed to improve students' attention as the progress bar will lead the students to complete the given tasks. Therefore, users' experience can be more engaging and interesting rather than just a plain complaint form that needs to be filled in by the users. The leaderboard will also rank the most lodged complaints as it will also display the status of each complaint whether it has been resolved or not. This feature will encourage users to check the status of their own complaints.

METHODOLOGY

The methodology is known as a set of phases that are used to describe the flow of the project specifically. This study adapted the waterfall methodology, consisting of project requirements, project designing and



project development. The discussion of the activities carried on throughout each process is presented as follows:

Project Requirement

For the first phase, a preliminary investigation among the target users has been conducted. 50 students have been randomly picked to answer an online questionnaire on the satisfaction of using the current e-complaint system. From the investigation, 80% of the respondents have agreed that the e-complaint system is indeed useful for them to lodge any complaint, however, most of them agreed that the system needs to be more engaging so that users will feel interested in lodging a complaint. Meanwhile, 90% of the respondents have also agreed that gamification can also be embedded in the system to encourage students to participate in using the online complaint system.

Based on the preliminary investigation, a web-based system with gamification is proposed where it involves the use of various hardware and software requirements such as MySQL database, Xampp and JustinMind application in designing the user interfaces.

Project Design

In Figure 1 below is the Entity-Relationship Diagram (ERD) derived from this study. The ERD consists of 4 entities which are Staff and Student, Complaint, ComplaintAction. The Staff will register an account for the complainant which is the Student. Then, the complaint channeled by the complainant will be managed by Staff and the Staff will update any further action/ progress taken by the organization on the system. Then, the complainant can view their complaint status from the system.

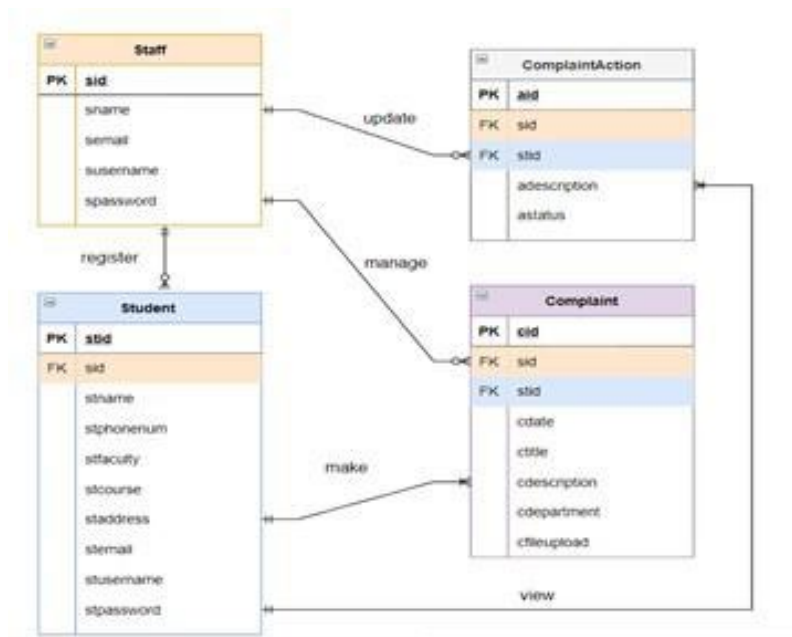


Figure 1: Entity Relationship Diagram

Project Development

The deliverable from this phase is the development of the e-Complaint College Management System with gamification elements. In order for the e-Complaint College Management System to be more useful and



meet its objectives, an evaluation for the system's usability and functionality is conducted. Functionality testing is to test whether the systems work accordingly as the requirements of the system. Meanwhile, usability testing, it is to test the usability of the e-Complaint College Management System. In addition, the functionality testing was conducted while developing the system, while usability testing are usually conducted when the process of developing the system reaches its final stage. The implementation of this testing is to make sure that the developed system's requirements are achieved.

FINDINGS AND DISCUSSIONS

Prototype of e-Complaint System with Gamification Elements

These are some of the prototypes or interfaces of the e-Complaint System with Gamification Elements. These screenshots are arranged by users, which are staff and then students, along with their respective function after they logged into this system.

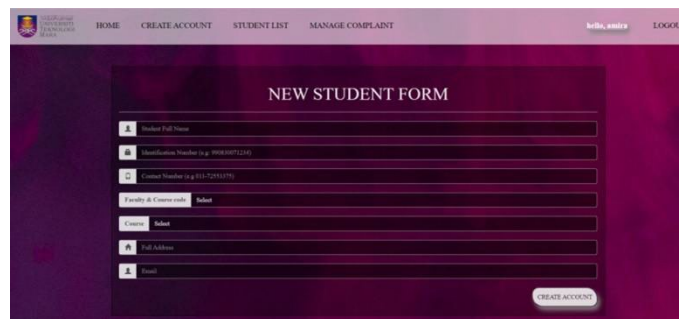


Figure 2: Register Student Page

The staff will create a new account for students as shown in Figure 2 and it will redirect to the student list page after creating.



Complaint ID	Student ID	Complaint Date	Block	Complaint title	Action
12	10000	2021-10-26	Block C	LCD	VIEW DETAILS

Complaint ID	Student ID	Complaint Date	Block	Complaint title	Action
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Complaint ID	Student ID	Complaint Date	Block	Complaint title	Action
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Figure 3: Manage Complaints Page

Figure 3 above shows that staff can view complaints sorted by department. There are three General departments, Facilities and ICT. Each department is divided into three complaint statuses which are Not Process Yet, Pending and Closed. The difference between 'Not Yet Proceed' is for complaints made by students but not yet reviewed by staff, and 'Pending' is for complaints that have been reviewed by staff but are still in the process of solving the complaint. The 'Closed' status is after the complaint process has been completed.



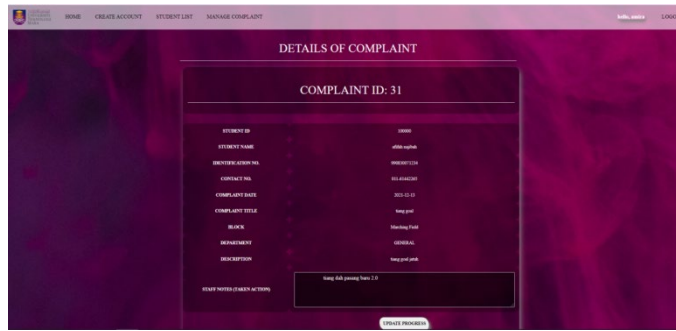


Figure 4: Take action on a complaint

Figure 4 above is a complaint details that has been selected by Complaint Id. Then there is a text box on the bottom of the form where staff can add their own notes regarding the action taken. These notes (action taken) can only be viewed by staff.

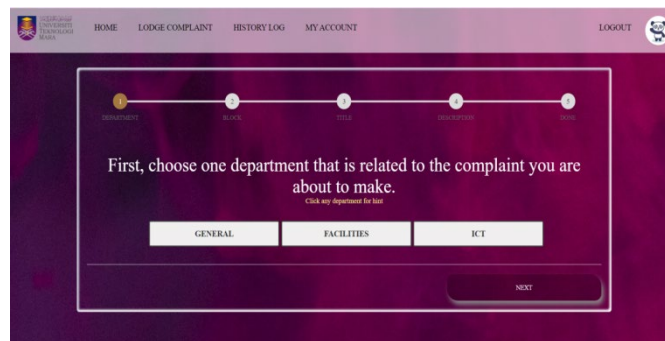


Figure 5: Make Complaint Page

This part is when students make complaints where here include one of the gamification elements which is progress bar. Figure 5 above shows the step-by-step information that needs to be answered by students when they make complaints. After completing this form, at the last page will have submit button.

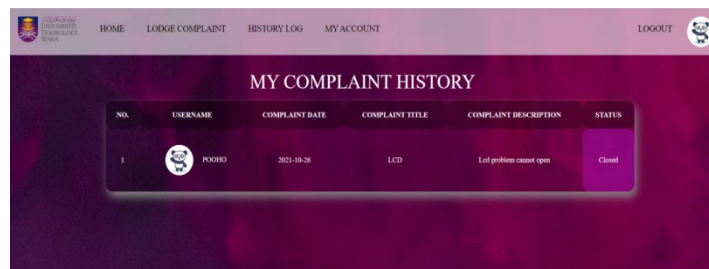


Figure 6: History Log Page

Figure 6 above are their history logs. History logs display the complaints made by them and the status complaints that are already closed.



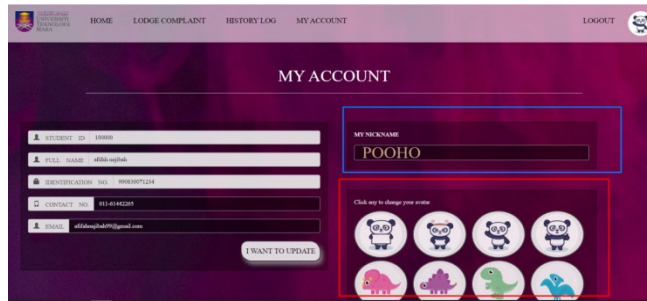


Figure 7: Personal Details Page

Figure 7 above shows their account, and they can update details on their own such as their nickname (avatar naming), avatar, phone number and email address.

Usability Testing

This section will discuss the results and analysis obtained from the questionnaire distributed to the respondents.

Demographic

As stated in Figure 8, the question asks who are the respondents that are currently answering the questionnaire. 84.8% of respondents are the students while 15.2% of respondents are UiTM Perlis staff.

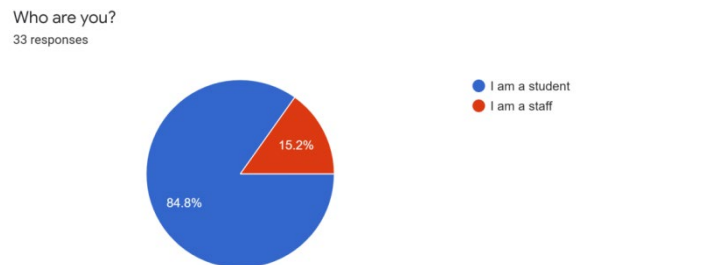


Figure 8: Respondent's Identity

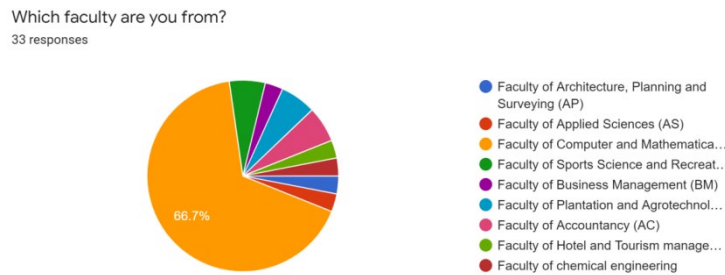


Figure 9: Respondent's faculty



Another demographic question as stated in Figure 9 above asks about from which faculty the respondent is. 66.7% which is the majority of the respondents are from the Faculty of Computer and Mathematical Sciences. While the remaining are from other faculties.

Post-Study System Usability Questionnaire (PSSUQ) Survey

Table 2: PSSUQ 16 Questions

No.	Section	Questions	Mean
1.	System Usefulness	Overall I am satisfied with how easy it is to use this system.	4.18
2.		It was simple to use this system.	4.27
3.		I was able to make complaints quickly using this system.	4.39
4.		I felt comfortable using this system.	4.24
5.		It was easy to learn to use this system because of the game element (leaderboard, progress bar, avatar naming and selection).	4.18
6.		I believe I could become productive quickly using this system.	4.18
7.	Information Quality	The system gave error messages that clearly told me how to fix problems.	3.79
8.		Whenever I made a mistake when making a complaint in this system, I could recover easily and quickly.	4.03
9.		The information (such as how to create a new account, make a complaint, view our own complaint and manage complaints) provided with the system was clear.	4.33
10.		It was easy for me to find the information I needed.	4.33
11.		The information was effective in helping me in completing the tasks and scenarios.	4.30
12.		The organization of information on the system screens was clear.	4.21
13.	Interface Quality	The interface of this E-Complaint System was pleasant.	4.09
14.		I liked using the interface of this E-Complaint System.	4.09
15.		This E-Complaint System has all the functions and capabilities I expect it to have.	4.24
16.		Overall, I am satisfied with this E-Complaint System.	4.18



This study has adopted PSSUQ Survey designed by IBM Design Centre in 1992 (Sidhu, 2020). Based on Table 2 above, the first section asks about how useful the system is to users. From the analysis, it has revealed that most of the respondents strongly agreed that they are able to make complaints more quickly by using this system, with the mean score of 4.39. In addition, most of the respondents have also agreed that it is easy to use this system, with the mean score of 4.27.

The second section of PSSUQ Survey asks the users about the quality of information provided in the system. In this section, two questions have the highest mean score, which is 4.33. The first highest mean is where most respondents strongly agreed that the information provided such as how to create a new account, make a complaint, and view their own complaint in the system was clear. The second is about how easy it is for the respondents to find information that they need when using the e-Complaint College Management System.

The last section of the PSSUQ Survey asks the users about the quality of the e-Complaint College Management System's interface. This section only consists of four questions. From the analysis, it has been found that most of the respondents agreed that the e-Complaint College Management System has all the capabilities and functions that they have expected.

RECOMMENDATIONS AND CONCLUSION

In order to improve the usability of the e-Complaint College Management System, these are the recommendations for future research. It is suggested to add a search box at the choosing for Venue/Location when the users lodge a complaint because there are so many options available, so it is hard for the users to go through one by one of the options. Besides that, the search engine also needs for the staff to search for the complaint via complaint ID or student ID. By applying these recommendations, the researcher hopes that it will help, attract, and encourage users to use the e-Complaint College Management System.

In another hand, the development of the e-Complaint College Management System embedded with gamification elements have gained positive responses from users, where some of them stating that the system helps them in lodging and managing complaints. In addition, this system allows the student to view their complaints' status and timestamp when staff update the progress through the leaderboard. The use of progress bars when channeling the complaints has helped the students to lodge complaints in a more engaging and easier way without requiring them to read long instructions. Meanwhile, the use of avatar selection has encouraged personalization in the online system, which allows students to change or update their own nickname and avatar pictures. Meanwhile, for the staff who manage the complaints, they are authorized to add notes only for them to manage, therefore, it will be easier for them to track and view the actions that have been made so far. In addition, staff can also view all complaints by department and each department has three sections or status, which are Pending, In Process and Closed. Number of complaints on each section and status will be automatically counted and displayed at the right side of each section/status, this will ease the staff work to monitor how many complaints they have at the current time.



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CONFLICT OF INTEREST DISCLOSURE

All authors declare that they have no conflicts of interest to disclose.

REFERENCES

- Afify, E., and A. Kadry, M. (2019). Electronic-Customer Complaint Management System (E-CCMS) – a Generic Approach. *International Journal of Advanced Networking and Applications*, 11(01), 4125–4141. <https://doi.org/10.35444/ijana.2019.11011>.
- Azahari L. et al. (2020). ICT Complaint Management within a higher Education Institute in Brunei Darussalam: A Case Study, *International Journal of `Umranic Studies*. Vol 3. Issue 1. Pp.13- 21.
- Bahari, B. A., Adnan, F., & Prasetyo, B. (2019). Audit Capability Level Using COBIT 5.0: A University Customer Care Center at University of Jember. Proceedings – 2019. International Conference on Computer Science, Information Technology, and Electrical Engineering, ICOMITEE 2019, 5–12. <https://doi.org/10.1109/ICOMITEE.2019.8921118>.
- Bitrián, P., Buil, I., & Catalán, S. (2021). Enhancing user engagement: The role of gamification in mobile apps. *Journal of Business Research*, 132(July 2020), 170–185. <https://doi.org/10.1016/j.jbusres.2021.04.028>.
- Cambridge University Press. (2019). Complaint. In Cambridge dictionary. <https://dictionary.cambridge.org/dictionary/english/complaint?q=complaint>.
- Lin, D. T. A., Ganapathy, M., & Kaur, M. (2018). Kahoot! It: Gamification in higher education. *Pertanika Journal of Social Sciences and Humanities*, 26(1), 565–582.
- Manuhutu, M. A., & Uktolseja, L. J. (2018). Design and Implementation of Online Students Complaint (Case Study of English Study Program at Victory University, Sorong). *International Journal of Computer Sciences and Engineering*, 6(1), 228–232. <https://doi.org/10.26438/ijcse/v6i1.228232>.
- Msoa, S. K. (2021). Service failure and complaints management in higher education institutions. *International Journal of Research in Business and Social Science* (2147- 4478), 10(3), 514–521. <https://doi.org/10.20525/ijrbs.v10i3.1098>.
- Nguyen, L. T. M., Nguyen, L. T. M., & Tan, G. (2020). Gamification in Business Education: An Experience Sharing. *ACM International Conference Proceeding Series*, 34–39. <https://doi.org/10.1145/3401861.3401867>.



Sidhu, M. (2020). *Interface Design*. IGI Global. <https://doi.org/10.4018/978-1-7998-0465-9.ch003>.

Zhang, X. (2019). Memrise. *CALICO Journal*, 36(2), 152–161. <https://doi.org/10.1558/cj.37>.

