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The Research Assistant Management System (RAMS)

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ABSTRACT

The Research Management Unit (RMU) of UiTM Terengganu currently operated manually in recording all of their Research Assistant information. The limitations in keeping the record manually are that the record may be lost due to human or environment disaster and the storage to keep all the record also may expended as the record are keep increasing. The Research Assistant Management System (RAMS) is developed to help the administrative of the RMU in UiTM Terengganu to manage the Research Assistant information more effectively. Reports can be generate easily using this system. The Rapid Application Development (RAD) model methodology is used in the development of the system. The methodology consist of five phases which are requirement planning phase, user design phase, construction phase, cutover phase and lastly the documentation. This system have been demonstrated to three expert users for the feedback and the recommendation. Besides that, user testing also conducted by distributed the questionnaire to the 30 respondents. The result based on the respondent analysis shows that the highest mean of perceive of usefulness of the system is 4.167 (SD= 0.531). In conclusions, the RAMS will give more benefit to user when using it and hopefully it can help RMU to manage their Research Assistant information.

1. Introduction

The Research Management Institute (RMI) of UiTM is establish to manage the research, consultancy, intellectual property protection and commercialization and also act as the research arm of the university. Research Management Unit (RMU) is managed under Research Management Institute (RMI). The duty of the lecturer not only lecturing the students, the lecturer also need to do the research and writing an articles based on the facts and study. Hence, the function of RMU is to encourage and assist the research activities among the lecturers in UiTM (Terengganu).

To ease the lecturer work as a lecturer and researcher, RMU establish the role of Research Assistant (RA) to help doing the research. The tasks of a RA is vary greatly from one academic discipline to another. Some of the duties of the RA is to do a clerical task, financial and reports, and the running of the project. However, the exact RA job scope is not well defined since it depends on the researcher.

2. Methodology

The Rapid Application Development (RAD) model are used in the development of RAMS. Rapid Application Development (RAD) is a team-based technique that speeds up information systems development and produces a functioning information system. RAD can developed be the higher-quality product faster through more expedient processes. Such as reuse the software components, early prototyping and less convention in team communication (Rouse, 2007). This enable the development group to build a working system with a brief of time (Apoorva Mishra and Dubey October, 2013). Table 2 shows the Project development framework of RAMS.

The Research Assistant Management System (RAMS) was developed in order to help RMU and the researchers managing the details and information of the RA in UiTM (Terengganu). Besides that, RAMS also can keep track the data of the current and past details of RA. This function can ease the administrative of RMU and researchers when they need the information of the RA especially when looking for the new RA. The payment for the RA also can be manage effectively when using this RAMS system.

Table 1 Project Development Framework of RAMS

Phase	**Activity**	**Outcome**
Phase 1: Requirement Planning Phase	1) Study of the current situations and problems 2)Literature Review 3) Conduct interview with coordinator of RMU.	1) The problem statement and end user requirement identified.
Phase 2 : User Design Phase	1) Design the site map 2) Design Context Diagram 3) Design Data Flow Diagram (DFD) 4) Develop Entity Relationship Diagram (ERD) 5) Design the interface of the system.	1)Site Map 2)Context Diagram 3)Data Flow Diagram (DFD) 4)Entity Relationship Diagram (ERD) 5)The user interface design
Phase 3 : Construction Phase	Develop the RAMS system	RAMS System

Phase 4 : Cutover phase	Conduct system and user testing using test plan and questionnaires	Tested system and user feedback
Phase 5: Documentation	Writing a report	Full and complete report

The requirement planning phase is the combination of the planning and system analysis phases in SDLC. This phase is the phase of gather the information and idea to develop the project. In this phase the developer study about the current situation of how RMU administrative managing the Research Assistant (RA). The developer also will find the problems that occur when RMU staff use manual system to record the information of the RA. The literature review also conducted in this phase to get the information related to the research element. Literature review discuss about the management information system and the information about the RA. The interview with the coordinator of RMU was conducted to gather more information in order to develop RAMS. Besides, this help support the problem statement from the The next phase is the user design phase. The users

interact with systems analysts, develop models and prototypes during this phase, hence it represent all system processes, inputs and outputs. This phase also a process of define the solution of the problem statement. In addition, in this phase the developer will design the context diagram, data flow diagram (DFD), Entity Relationship Diagram (ERD) and the interface of the system.Figure 1 shows the context diagram of the RAMS system. The RMU staff, Researcher and RA is the main part of RAMS. RA needs to apply for the RA position while the Researcher will view and approve it. For the RA payment, Researcher need to apply it and RMU staff will view and approve it. RA can directly view the status of the application.

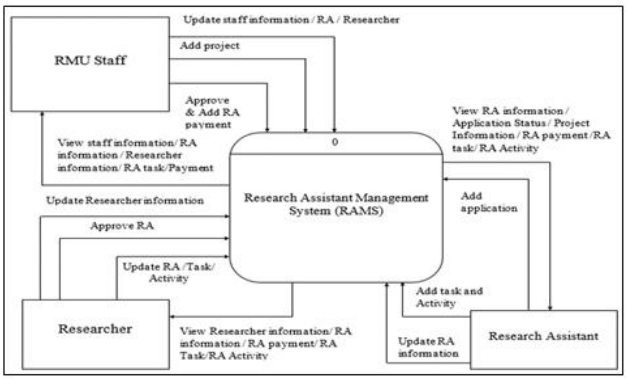

Figure 1 Context Diagram of RAMS

Figure 2 shows the Data Flow Diagram (DFD) of the RMU staff, Researcher and RA in RAMS system. Data flow diagram show the process flow that involves in the system. The system will collect all the data from RA and Researcher to generate the status of the application and payment status. The application for payment will approve by the RMU staff while RA application will approve by Researcher. All the transaction will be stored in the database.

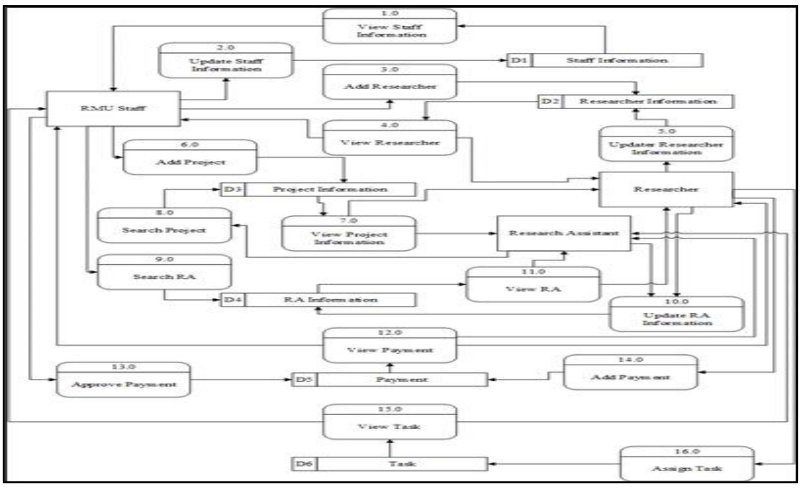

Figure 2 Data Flow Diagram of RAMS

Figure 3 show the Entity Relationship Diagram (ERD) of RAMS system. The data of RA information will be gathered especially when the RA is applying for the RA position. Only Researcher can approve the RA application and manage the RA information. The information of RA also will use in the payment approval by the RMU staff. Researcher can manage many RA and one RMU staff also can manage many RA and Researcher.

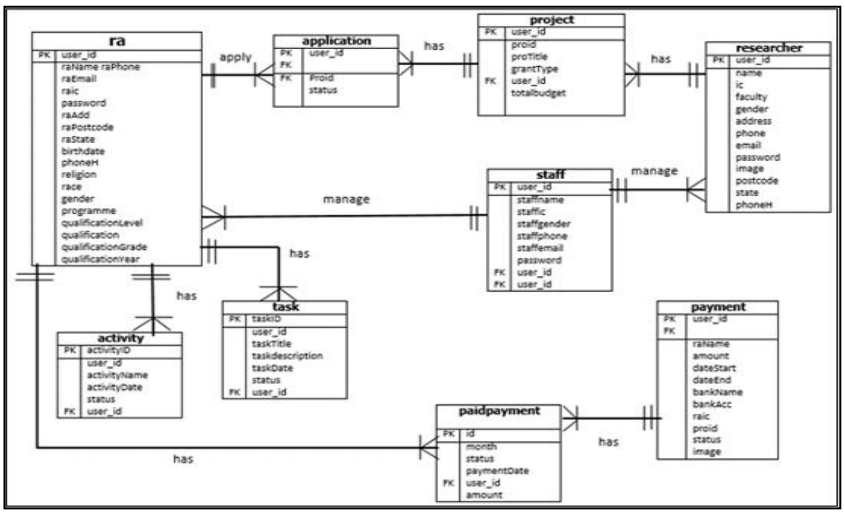

Figure 3 ERD of RAMS

Figure 4 shows the interface design of RAMS system. RMU Staff, Researcher and Research Assistant is the main user of RAMS. The main user for this system RMU Staff because this system helps them to manage all the Research Assistant and Researcher. RAMS not only can help the RMU Staff but also can help the Researcher to manage their own Research Assistant. To access this system all the user need to insert their user id and password. RMU staff is the admin of this system. Besides can view all the information of the Research Assistant and the Researcher, RMU staff also can add and view the project information including who is the project leader for the project. RMU staff also can generate the report of the monthly payment that have been made for the Research Assistant.

The second user of RAMS is the Researcher. Besides can view the details of their Research Assistant, they also need to approve or rejected the application that submitted to them. Researcher

also can view and validate the status of the task that have been done by their Research Assistant. They also can approve the activities of their Research Assistant. The last user of RAMS is the Research Assistant. After login into the system, the user can apply for the Research Assistant position just by fill up the application form and choose the project that they wanted. After the application have been approved, Research Assistant need to fill up their payment application form.

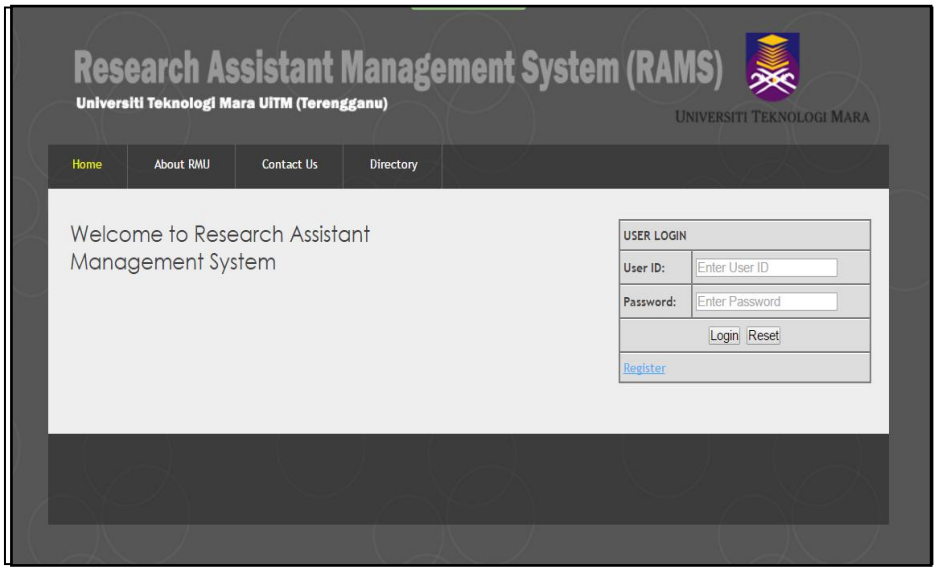

Figure 4 Interface of RAMS

Construction phase is the phase of development of the system. Development is the process of build the actual management information system. All the information that gathered will combined to develop the system. Users will continue to participate and can suggest changes and improvement as the actual report are developed. The task for this phase is programming and application development.

Cutover phase involves the training and system testing also the implementation process of the system. The data conversation, testing, change to new system and user training are the task that will be done in this phase. The system been evaluated by the lecturer that are expert in information system and multimedia. The expert from organization which is the coordinator of the RMU also have evaluated the system. The possible user that will use this system also evaluated the system by answering the questionnaire that provided.

3. Result and Discussion

The system has been presented to the tester during the development, tester will test the function of the system and the result of the tester will be recorded. During the system testing there are severe system requirements that are unsuccessful during the system test by the tester. Table 2 shows the test plan result conducted during the development of the system.

Table 2 Test plan Result

No	Behavior Description	Result	Developer	User

1	Registration 1.1Press register link	1.1 Go to register form page	✓	✓
2	Enter id login and password 2.1 Press login button	2.1 Go to user home page	✓	✓
3	Click "Profile" on menu bar 3.1 Click "Edit Profile" button 3.1.1 Fill up the form and Click "Update Profile" button after done	Go to view the user profile information 3.1 Go to update form page 3.1.1 The edited user profile will display	✓	✓
4	Hover to "Research" on menu bar and click "Apply" 4.1 Fill up the form and click "Submit" button 4.2 Click the drop down menu to choose the project title and click "Submit" button	Go to Research Assistant Application Form 4.1 Application Submitted and the Project Application page will display 4.2 Application submitted and the Status page will display	✓	✓
5.	Hover to "Research" menu bar and click "Status"	Go to Status page 5.1 View the application status	✓	✓
6.	Hover to "Research" on menu bar and click "Payment" 6.1 Click "Payment Application Form" 6.1.1 Fill up the form and click "Submit" button 6.2 Click "Payment Information" button 6.2.1 Update the payment information and click "Update" button 6.3 Click "Status Payment" button	Go to Payment page 6.1 The Payment Application Form will display 6.1.1 The payment information will submitted and the Payment page will display 6.2 The update page of the payment will display 6.2.1 The payment information will updated 6.3 View the Payment Information and Status	✓	✓
5.	Hover to "Research" menu bar and click "Status"	Go to Status page 5.1 View the application status	✓	✓

6.	Hover to "Research" on menu bar and click "Payment" 6.1 Click "Payment Application Form" 6.1.1 Fill up the form and click "Submit" button 6.2 Click "Payment Information" button 6.2.1 Update the payment information and click "Update" button 6.3 Click "Status Payment" button	Go to Payment page 6.1 The Payment Application Form will display 6.1.1 The payment information will submitted and the Payment page will display 6.2 The update page of the payment will display 6.2.1 The payment information will updated 6.3 View the Payment Information and Status	✓	✓
7.	Click "Task" on menu bar 7.2 Click "Add Task" 7.2.1 Fill up the form and click "Add Task" button	Go to Task page 7.1 View the list of the task 7.2 Add task form will display 7.2.1 The task will inserted and Task page will display	✓	✓
8.	Click "Activity" on menu bar 8.2 Click "Add Activity" 8.2.1 Fill up the form and click "Apply Activity" button	Go to Activity page 8.1 View the list of the task 8.2 Add Activity form will display 8.2.1 The Activity will inserted and Activity page will display	✓	✓
9.	Click "Logout" on menu bar	Go to the RAMS home page/ Login Page	✓	✓

There were three expert involved in evaluation process. These expert review are categorized into three which included the satisfaction, efficiency and user interface of the system. Table 4 shows the comment and suggestion from the expert.

In order to conduct the evaluation, a set of questionnaire was distributed to each 30 respondents to evaluate the six constructs based on the system development. There is two section in the distributed questionnaire, the first section is Section A and Section B.

The summary for the Section A, the highest respondent were the female respondent with the total of 16 respondents (53.33%) while male respondent only 14 respondents (46.67%). The highest average age of the respondents is among the respondents who are between 20 to 23 years old with the total respondents of 12 (40%). Then followed by respondents who are below 20 years old with total of 10 respondents (33.33%). Between 24 to 26 years old there is 8 number of respondents (26.67%) and there is no respondents who under the age of 26 who answering this questionnaire.

The highest academic level of the respondents are from bachelor level with total of 18 respondents (60%) and then diploma level with the number of 12 respondents (40%). Many respondents are do not know what is Research Assistant and their responsibility with the total number of 16 respondents (53.33%) while 14 respondents (46.67%) already know what is Research Assistant and their responsibility. Next, most of the respondents have the experience in using the online system with the total of 24 respondents (80%) and another 12 respondents (20%) do not have any experience in using the online system. Table 5 shows the respondents socio-economic and demographic profile in details.

Table 5 Respondents Socio-Economic and Demographic Profile

Respondent Demography	**Total Respondents (N=30)**	**Percentage (%)**
Gender		
Male	14	46.67
Female	16	53.33
Age		
Below 20	10	33.33
20 – 23 years old	12	40
24 – 26 years old	8	26.67
Under 26	0	0
Academic Level		
Diploma	12	40
Bachelor	18	60
Master	0	0
PhD	0	0
Know what is Research Assistant and their responsibility		
Yes	14	46.67
No	16	53.33
Experience in using Online System		

Yes	24	80
No	6	20

For Section B, there are six constructs including perceived usefulness (A), perceived ease of use (B), efficiency (C), satisfaction (D), consistency (E) and usability (F). From the summary result, the mean for the perceived usefulness construct is 4.04 (SD=0.52) while for the perceived ease of use the mean is 4.11 (SD=0.57). Next for the efficiency, the mean is 4.28 (SD=0.55) and for the satisfaction construct the mean is 4.12 (SD=0.62). The mean for the consistency construct is 4.03 (0.56) and lastly for the usability construct the mean result is 4.12 (SD=0.63). Figure 5 shows the summary result of the evaluation.

Figure 5 The summary result of the evaluation

The Rapid Application Development (RAD) model are used in the development of RAMS. Rapid Application Development (RAD) is a team-based technique that speeds up information systems development and produces a functioning information system. RAD can developed be the higher-quality product faster through more expedient processes. Such as reuse the software components, early prototyping and less convention in team communication (Rouse, 2007). This enable the development group to build a working system with a brief of time (Apoorva Mishra and Dubey October, 2013). Table 2 shows the Project development framework of RAMS.

4. Conclusion

As a conclusion, problem with the current process in managing research assistant information was discussed and online management system is proposed to be developed. The online system (known as RAMS) is develop using RAD model. Once the development process is completed, functionality test (based on test plan) was conducted. On top of functionality test, experts and users evaluation were also conducted. Result shows that experts gave good comments and suggestion on how to improve the system. Users' evaluation shows that all of respondents agrees on the constructs used in evaluation. Although there have some limitation in the system, suggestions and comments form on experts can be implemented if the system is to be used by UiTM Terengganu in managing their research assistant information.

Acknowledgement

Thank you to UiTM Terengganu for supporting this project.

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