Development and Use of A Research Database Management System

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Article Info	ABSTRACT (10 PT)
	Research Database Management System is refer to data transmission and storage of article sent by user of Politeknik Sultan Mizan Zainal Abidin (PSMZA). The problem statement are user takes advantage to their colleague for send article and at the same time they have been make plagiarism. Next, difficulty in making any dealings. Finally, difficulties in journal delivery are made systematically. Objective this project are to design of an online article data transmission system that has various interfaces that have various functions of their own. Next, to develop a database system that can receive article submissions from PSMZA user's online. Finally, to access the article delivery application from offline to online. Methodology that be used is Software Development Life Cycle (SDLC) Technology". In conclusion, this technique may facilitate the transfer of articles to UPIK team.

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Introduction

A database is an organized collection of structured information, or data, typically stored electronically in a computer system. A database is usually controlled by a database management system (DBMS). Together, the data and the DBMS, along with the applications that are associated with them, are referred to as a database system, often shortened to just database (Oracle, 2021). Students of IT should be well-versed in database analysis and the effectively application of systems. With the occurrence of performance issues, IT students have to able to address the weaknesses in the performance and time of performance (Saeed, 2017). Research in the most basic sense is an in-depth exploration of a subject to know its essence or an aspect that has never been seen or witnessed before. Thus, research can be defined as the central nervous system for the process of knowledge acquisition. In other words, research is where researchers ask questions, collect data collected and show how the data answers questions and objectives are achieved or not. This is because, research is a very important container and able to provide experience in developing learning systems in our country. Therefore, there are several reasons why the importance of research among them is that students can increase knowledge on educational issues address knowledge gaps, expand knowledge, provided opportunities for individuals to voice opinions to contribute to additional knowledge(Cheng, 2012). As a result, user gain new ideas, new methods and gain new insights into the learning learned. There is a problem faced by user in terms of writing a journal in a book because there is a copyright in print without permission. In addition, the results of the study are not stored safely. This can harm the performance of students and make it difficult for user to store data.

This is to achieve the objectives of user in Politeknik Sultan Mizan Zainal Abidin (PSMZA), to develop a system called Research Database Management System. This is because, with the existence of this system can make it easier for user to upload a article related to user research online. This system can be used throughout Politeknik in Malaysia because it can function systematically and orderly. This system will be developed at Politeknik Sultan Mizan Zainal Abidin in the department of Unit Penyelidikan Inovasi dan Komersilan (UPIK). UPIK is a research department for researchers at the PSMZA.Users takes advantage to their colleague for send article and at the same time they have been make plagiarism. This problem occurs when other user retrieve the information sent during article collection by post through other user. In this way can overcome the problem of plagiarism that occurs among users. Difficulty in making any dealings. Admin and user can access article without having to meet with the writer of the article. This is due to time constraints if admins and students need to meet to make further arrangements in the Research Database Management System . Difficulties in journal delivery are made systematically. This is because offline submissions cannot be systematically recorded. It is likely that some data will be overlooked by the admin and there will be a drop in information.

Method

Methodology is the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge (Igwenagu & Chinelo, 2016)
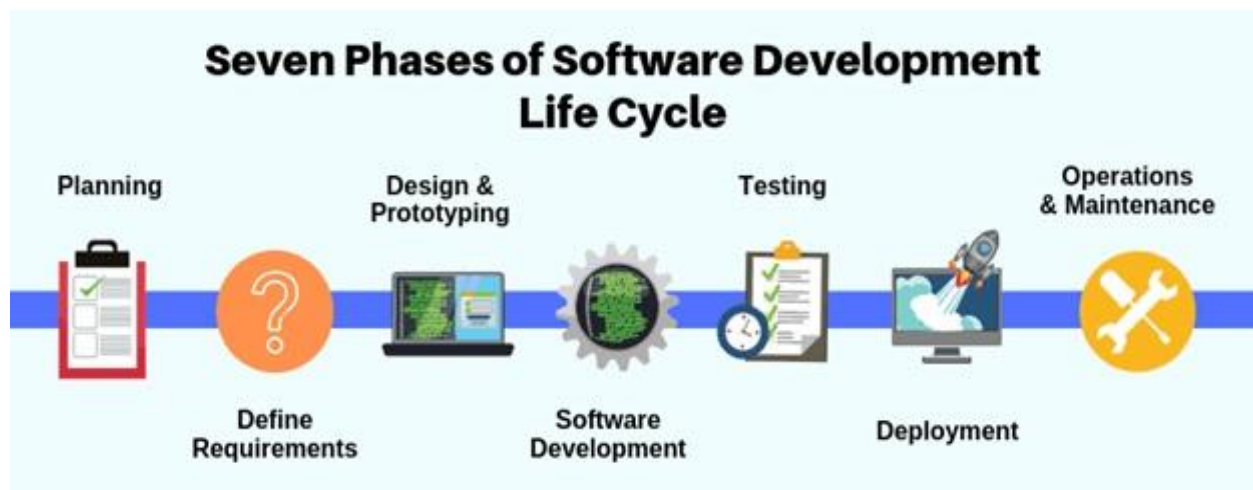

Figure 1 < Software Development Life Cycle (SDLC) Technology >

The Software Development Life Cycle (SDLC) (Figure 1) is a framework that is used to understand and develop information system and software successfully (Dennis, 2020). These phases are, investigation, analysis, design, build, test, implement, and maintenance and support. All software development methodologies such as the more commonly known waterfall and scrum methodologies follow the SDLC phases but the method of doing that varies vastly between methodologies. First phase is planning. In this phase, preliminary analysis has been done. It is a purpose alternative solution to describe costs and benefits than submit a preliminary plan with recommendation to client in UPIK. System investigation also get along during this step. This will help to determine the costs, benefits, resource requirements, and specific user needs required for completion.After planning phase, analysis had been done for determine where the problem is in an attempt for create a new system for help UPIK to handles all article task everytime they make an open competition. With this system also make every student that join this competition can get certificated that was generated by computer.

After making an analysis about this system, designed had been done. The design functions and operations are described in detail, including screen layouts, business rules, process diagrams, and other documentation. The output of this stage will describe the new system as a collection of modules or subsystems. The design stage takes as its initial input the requirements identified in the approved requirements document. For each requirement, a set of one or more design elements will be produced as a result of interviews, workshops, and prototype efforts. Then, after finished making a completed design, phase implementation has been done. In this phase, the code is tested at various levels in software testing. This system had been implement in UPIK

department for make sure that system did not have any problem or corrupt. Lastly, if something happened to this system, it will be go to maintenance phase to make sure the system in good condition (Pilar et al., 2014).

Logical Design
Before the development of the system is done, sketch of system design should be done in order to develop the system be more systematics.

Entity Relationship Diagram
Relationship between one entity to another entity it is necessary to demonstrate the functions of the entity by another entity. Relationship that commonly used is one to many. Attributes is the items that display the characteristics of an entity. Important attributes are illustrated. The figure shown the relationship between one entity to another entity.
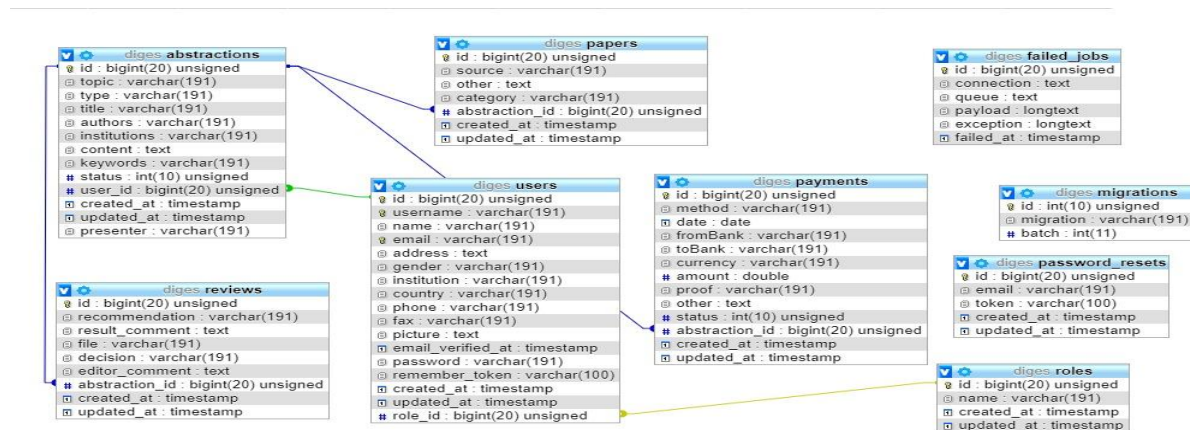

Figure 2 < Entity Relationship Diagram (ERD)>

Data Flow Diagram
Students will need to register for an account to login into the website. Students can register by click Register button in the Home page. Students required to enter e-mail and password then e-mail will be sent to verify the account. The information entered by students will be saved into the database. The admin will manage the data from database and control data like delete, update and manage.
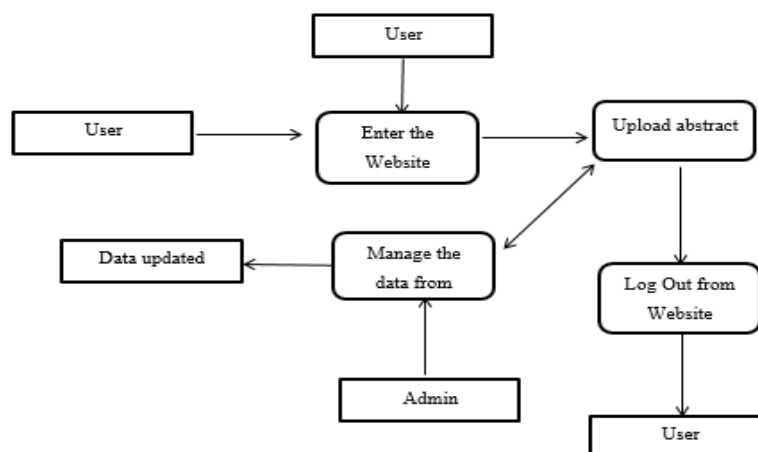

Figure 3 < Data Flow Diagram (DFD)>

Results and Discussions

Research Database Managwment System is a system where it is used for the purpose of sending data online. The production process of this system begins with the overall data planning required to obtain a good system. The revenue of this system is started by creating an interface. Generating ideas to produce this interface system is taken from several existing websites. It is integrated and becomes the Research Database Management System . The color chosen is in accordance with the design that has been made.Next, the production is continued by entering the functions for each page created such as attach file, give accepted, certificated, and etc. there are some constraints at first in the production of this project. This is because, the PHP language that had been try to use is too complicated. And then modified using the Laravel Framework. By using this framework, the production of this project becomes easier because most of the files have been generated by themselves. Laravel also uses two tools that are not used by other frameworks, namely composer and artisan.

Unit Testing Plan

Table 1 < Unit Testing Plan>

Test Case Name	Test Procedure	Pre- condition	Expected Result	Result (Pass/ Failure)
Sign Up	User is required to register user name, name, email, phone no. and password before access to the login system	User need to confirm their password.	Register successful	Pass
Sign In (login)	User is required to fill the username and password field before access the system	User need register before login	Login successful	Pass
My Profile (dashboard)	User is required to fill all the form in edit profile	User need login first.	Data in profile has been added and view in My Profile	Pass
My Abstract (abstract)	User is required to fill all the form in create new abstract	User must login first.	Data had been added and view at My Abstract, then it can make editing and revise	Pass
Payment Proof	User is required to fill all the form in upload payment proofs	User must wait for abstract status for uploading payment proofs	Data had been added and view at upload payment proofs.	Pass
Full Paper	User is required to fill all the form in upload full paper	User need to wait for get valid payment status before upload full paper	Data had been added and view at upload full paper. It also can upload revised paper	Pass
Certificated	User can view certificated that was generated from this system	None	Can print certificated	Pass
Change Password	User can change their password if they need it	User must login first	Data was secure	Pass
All Abstract	Admin can edit and revise paper from user and also can give abstract status	Admin must login first	Data in My Abstract can be view from this page	Pass

Test Case Name	Test Procedure	Pre- condition	Expected Result	Result (Pass/ Failure)
User Profile	Admin is required to fill all the form in edit profile	Admin must login first	Data in profile has been added and view in My Profile	Pass
Presenter	Admin can view all data presenter	Admin must login first	Data presenter has been view and admin can delete if did not argue with user.	Pass
Log Out	User required to log out	None		Pass

Table 2 < Integration Testing Plan>

Test Case Name	Test Procedure	Pre- condition	Expected Result	Result (Pass/ Failure)
Sign Up	User is required to click button submit	None	User will directly go to login page	Pass
Sign In (login)	User is require to click login button	None	Login successfully	Pass
My Profile (dashboard)	User is required to click edit and save.	None	Your profile updated successfully.	Pass
My Abstract (abstract)	User is required to click save button	None	Your abstract updated successfully.	Pass
Payment Proof	User is required to click send button	None	Your payment proofs updated successfully.	Pass
Full Paper	User is required to click send button	None	Your full paper updated successfully.	Pass
Certificated	User is required to click certificated button	None	Print certificated	Pass
Change Password	User is required to click save button	None	Your change password updated successfully.	Pass
All Abstract	User is required to click send button	None	Your full paper updated successfully.	Pass
User Profile	User is required to click save button	None	Your user profile updated successfully.	Pass
Presenter	User is required to click delete button	None	Your presenter deleted successfully	Pass
Log out	User required to log out button	None	-	Pass

User Acceptance Test

<div align="center">Table 3 <User Acceptance Test ></div>

Test Case Name	Acceptance Requirement	Test Result Pass	Fail	Comments
Login	User need login before upload article	Pass		-
Upload paper(Article)	User can upload paper and upload payment proofs before upload their paper (Article)	Pass		-

Conclusions

A database management system (DBMS) stores data and provides facilities for managing that data (Howard, 2019). This project as a whole serves as a article delivery where it has the best range of functions. Research Database Management System is system that make transmission article from offline to online platform. Before this, article has been send by manual as writing on paperwork. Writing on paper has many disadvantage such as waste of time and waste of paper. Research Database Management System already has main-function is upload article. There are various sub-function such as upload payment proof, upload full paper, view invoice, get and view letter of acceptance and view certificate. The result of Research Database Management System are suitable to be used in the industry with our situation which is Covid-19 hit in our country. This is because nowadays people send their work via online platform. This system are gathering the article in systematic. This can reduce waste of time and paper. It can be accessed via any devices because this system is responsive to devices. So, article transmission can be sent right on time. Finally, as this system evolves, it may become easier for people to utilise it effectively.

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