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The Development of Information System for Manage Articles and Academic Articles by Using Object Oriented Programming: OOP

Warut Ploysuayngam^{a,*}, Dussadee Terdbaramee^b, Denchai Panket^c

^{a,b,c}Computer Science Program, Faculty of Science and Technology, Bansomdejchaopraya Rajabhat University, 1061 Isaraphab 15 Rd. Dhonburi, Bangkok, Thailand
E-mail address: warut_p@hotmail.com

Abstract

The objective of this research was to develop a information system for manage articles and academic articles by using Object Oriented Programming (OOP) and evaluate the efficacy of this system. This system was developed using the PHP language and MySQL as the database. The efficiency of this system was tested by 5 expert users. Results found that the mean score equaled 4.01 with the standard deviation at 0.16, which can be considered as a good efficiency level. In conclusion, one can conclude by saying that this system was able to meet the needs of users and archived the objective successfully.

Keyword: Information System, Database System, Management, Articles and academic articles

1. Introduction

As a result of increasing population, it has brought about competition in so many ways: remarkably economic, social and education competition which are obstacle and problematic to develop the country (Office of the National Economic and Social Development, 2012) .Being in charge of Education of the country, Ministry of Education drafted the 11th education development plan(2012-2016) which helps promote training and development of lecturer and education personnel to achieve higher quality standard; to make a society of virtue, wisdom and learning. To achieve these goals, it is important that we need to promote academic research and development in order to expand knowledge and to create new intellectual property as well as to develop a system to manage and make use of those knowledge.

Both government agency and private sector organization consequently hold national and international convention to publish academic article and research paper. It is standard procedure for writers to send a copy of the article to publication department. However, in case of increasing number of authors, the number of documents should also increase. As a result, publication department have difficulty with management; thus, they need more time and resources for revision. In more serious case, some documents are lost during the procedure, this means that the authors lose their opportunity to publish their works. To prevent such loss, an evaluation report system has been developed to carefully select, manage and collect academic and research article (phase 1) by using internet. In a year, there are a lot

of document are selected so it is difficult to find a specific published research paper. Therefore, there are more people who are interested in Information system development for academic document management by using Object Oriented Programming (OOP). Further, this new system can be also interacted by users through internet. Users can register an account and send documents from anywhere as easy as connecting to the internet. Firstly, all documents will be sorted, manage and then stored in digital format (1st stage); peer review and editorial department will then can access to the documents through internet and users can also search for a specific published document or well selected academic article. With this additional channel, people can now conveniently perform a search which is much useful and beneficial to the country education.

2. Main Body

2.1 Research goals and objectives

2.2.1 To develop an information system for academic document management by using Object Oriented Programming (OOP)

2.2.2 To test out the information system developed by using Object Oriented Programming (OOP).

2.2 Scope of study

2.2.1 Population and samples are 5 computer specialists

2.2.2 Evaluation tools are performance assessment developed by the computer specialists

2.2.3 Variable

2.2.3.1 Independent variables are information system for academic document management

2.2.3.2 Dependent variables are efficiency of the information system

2.2.4. Developed in web-based application which can be categorized by usage scope and thus divided into 2 parts

1st part: evaluation report system for research and academic articles; the users in this part can be further divided into 3 groups:

Administrator	Author	Peer Review
<ul style="list-style-type: none"> - Can edit personal data of the administrator - Can create new database for the new journals - Can edit system Administrator data - Can edit data of the peer review - Can edit data of the authors - Can edit organization data - Can access to the Content Management System (CMS) - Can save data of the evaluated document and store them on the database 	<ul style="list-style-type: none"> - Can edit personal data - Can edit and send documents - Can check the document evaluation result - Can send proof of payments 	<ul style="list-style-type: none"> - Can edit personal data - Can search for and evaluate documents

2nd parts: Database, research article and academic paper

- Can search for a specific article in the published documents
- Can download research article and academic paper evaluated and published in digital format

2.2.5. System architecture

2.2.5.1 Architecture of the valuation report system is as shown in Fig. 1.

Fig. 1: Architecture of the Evaluation Report System

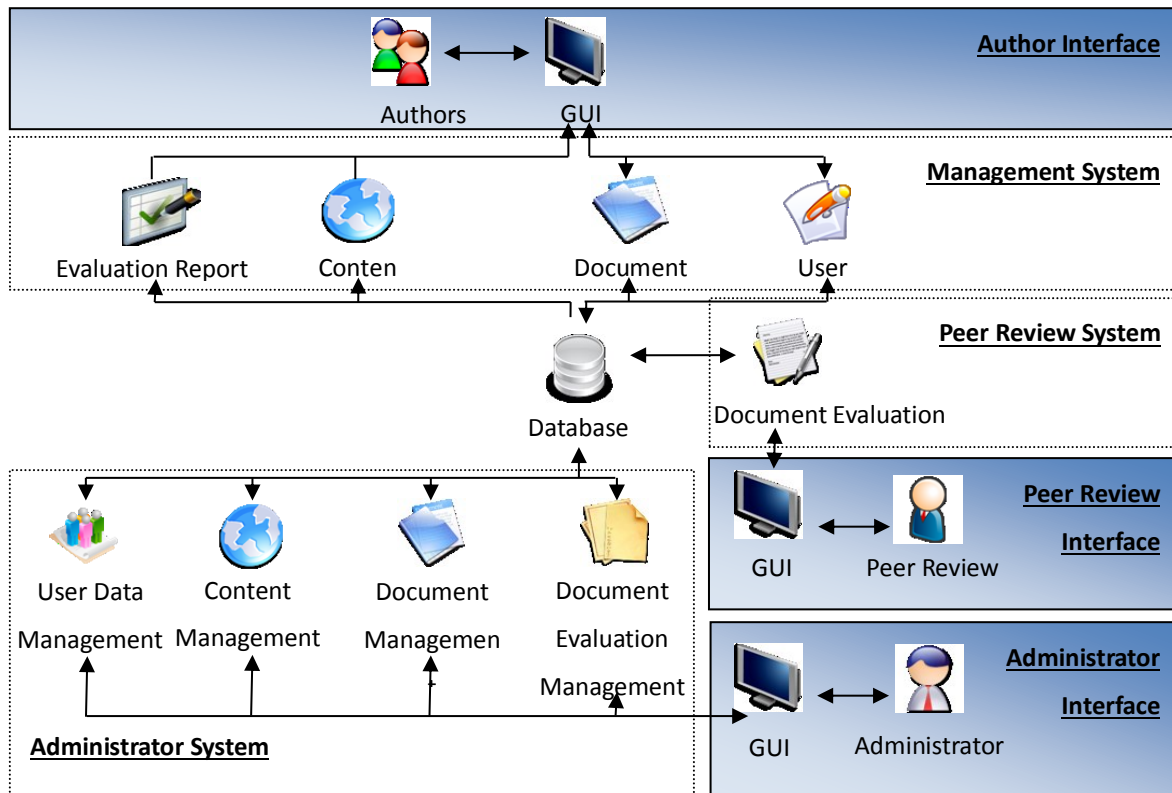
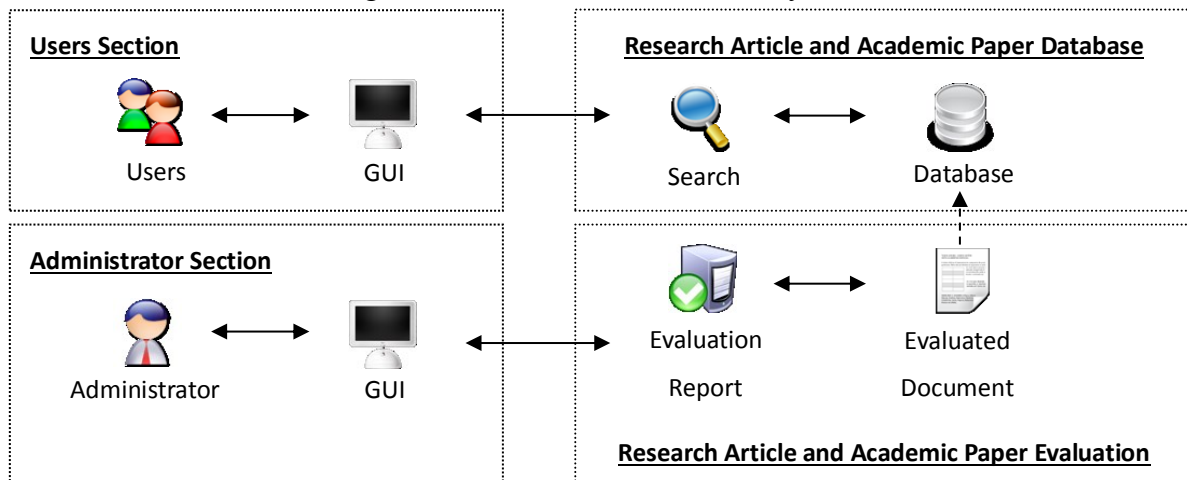


Fig. 2: Architecture of the Whole System



2.2.6. Research tools: performance assessment developed by the computer specialists

2.2.7. Data collection of the system evaluation performed by 5 computer specialists using black box testing

2.2.8. Data analysis

2.2.8.1 Analyze general status data of the computer specialists by putting data into frequency distribution table, calculate the percentage and present the result using table with explanation.

2.2.8.2 Analyze system performance in all 4 aspects which are Functional requirement test, Function test, Usability test and Security test. Based on the data provided, we can find the mean as well as the standard deviation and present the result using table with explanation.

2.3 Research methodology

2.3.1 Study and collect related research documents to analyze and design the system

2.3.2 Analyze data, technique and technology required for system development

2.3.3 Design and develop system; the specific tool researchers using to help analyze and design system for Object Oriented Programming (OOP) is called UML modeling and shown as follow:

Fig. 3: Use case diagram

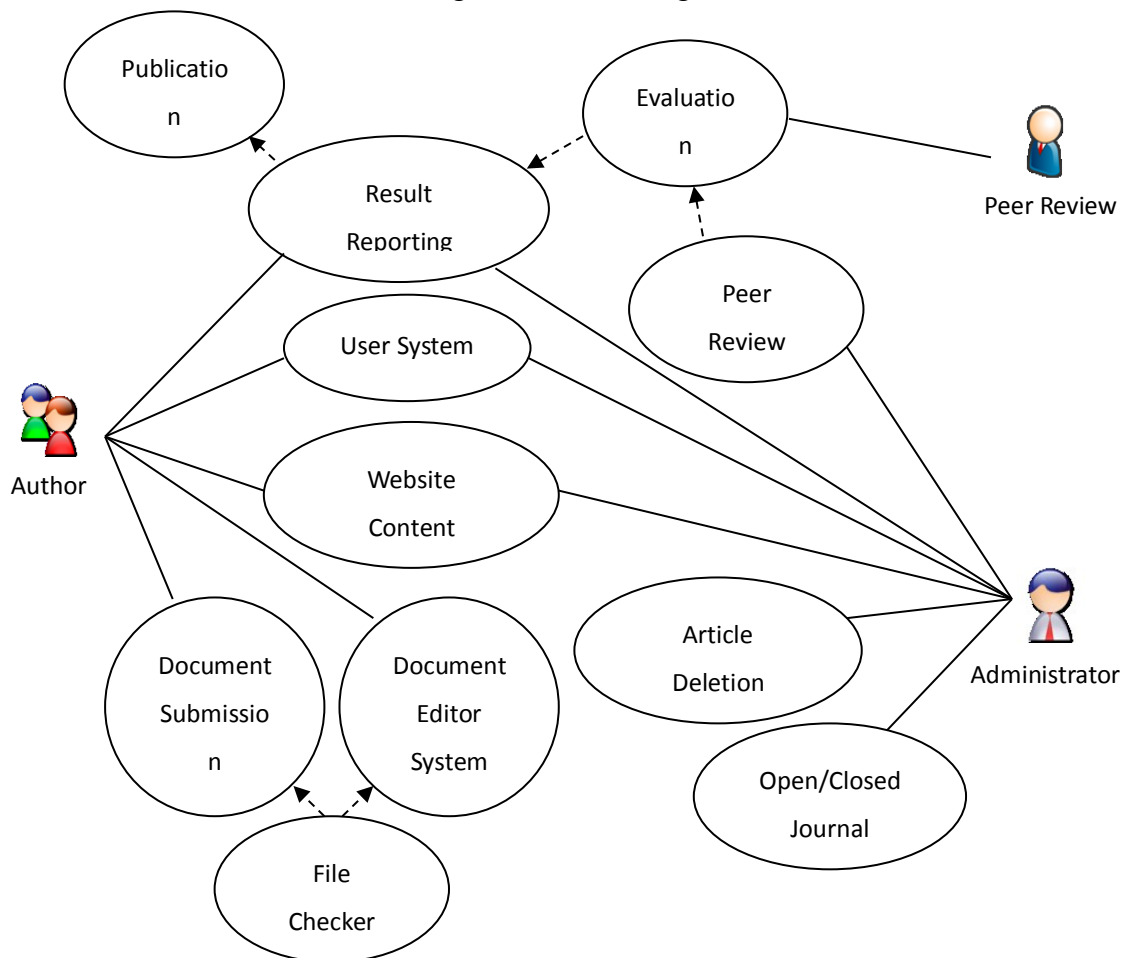


Fig. 4: Sequence diagram

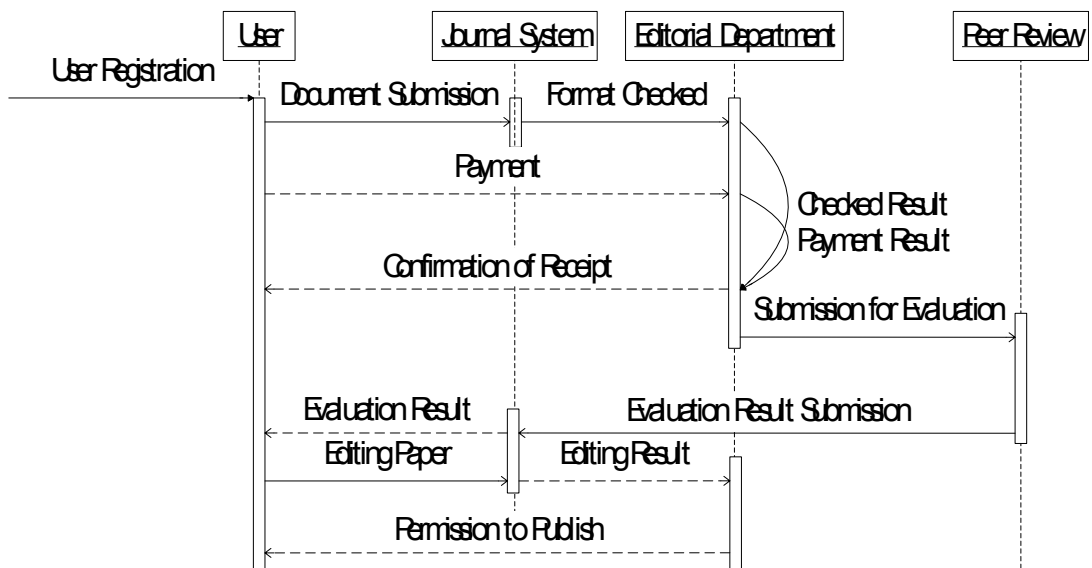


Table 1: Publication System Explanation

Article	Explanation
User Case Name	Publication system
Actor	-
Description	Save data of evaluated documents and store them on the database so that users can easily search for a specific article
Normal Course	Users need to input search term: title, author, etc.
Alternate Course	-
Pre-condition	-
Post-condition	-

Table 2: Result Reporting System Explanation

Article	Explanation
User Case Name	Result reporting system
Actor	Administrator, author
Description	Report detailed score and summarize document evaluation result sent from evaluation system
Normal Course	Administrator and author need to select an article for evaluation
Alternate Course	Author can request to check the evaluation result of his or her document only
Pre-condition	Administrator and author first need to register an account
Post-condition	-

Table 3: Evaluation system explanation

Article	Explanation
User Case Name	Evaluation system
Actor	Peer review
Description	Present the article to the peer review for evaluation, comment and filling out detailed score
Normal Course	Peer review need to select an article to evaluate
Alternate Course	Peer review can select, fill out detailed score and make a comment on the article selected by the peer review system only
Pre-condition	Peer review first need to access to the peer review system
Post-condition	In case a peer review has evaluated an article, the system will then send the result to the result reporting system to notify the administrator and the author

Table 4: Peer review system explanation

Article	Explanation
User Case Name	Peer review system
Actor	Administrator
Description	Save and edit peer review data and manage articles for selecting article system.
Normal Course	Administrator first need to input the peer review data, then send articles to the peer review for evaluation
Alternate Course	-
Pre-condition	Administrator first need to access to the administrator system
Post-condition	After the evaluation, the articles will be sent to the peer review's evaluation system

Table 5: User system explanation

Article	Explanation
User Case Name	User system
Actor	Administrator, author
Description	Save and edit author data.
Normal Course	User need to fill out and save
Alternate Course	-
Pre-condition	-
Post-condition	-

Table 6: Website content system explanation

Article	Explanation
User Case Name	Website content system
Actor	Administrator, author
Description	Store and display any data, for instance: pictures, videos, audios, records, etc. which is supported by the site (Content Management System is the system which an administrator uses to edit content on the site without any knowledge of making website)
Normal Course	Author can read the detailed content stored on the website content system
Alternate Course	The data can be stored on the website by only the administrator.
Pre-condition	Administrator need to be registered to store the data on the website
Post-condition	-

Table 7: Document submission system explanation

Article	Explanation
User Case Name	Author system
Actor	Author
Description	Save the document data to export to the journal system
Normal Course	Author need to fill out required information and attach the article for evaluation
Alternate Course	-
Pre-condition	Author first need to be registered
Post-condition	If the information of the article is accurate and complete, it will further be stored on the database.

Table 8: Document editor system explanation

Article	Explanation
User Case Name	Document editor system
Actor	Author
Description	Edit content of the article and upload the edited version of the article to the journal system
Normal Course	Author need to fill out information on detail of the editing or the edited article for evaluation
Alternate Course	-
Pre-condition	Author first need to be registered
Post-condition	If the information of the edited article is accurate and complete, it will further be stored on the database.

Table 9: File checker function explanation

Article	Explanation
User Case Name	File checker function
Actor	-
Description	A small program specially designed for information and file format correction
Normal Course	The program will check information and file format before upload to the database
Alternate Course	-
Pre-condition	-
Post-condition	If the information and file format are correct, they will be stored on the database.

Table 10: Article deletion system explanation

Article	Explanation
User Case Name	Article deletion system
Actor	Administrator
Description	Delete an article content
Normal Course	Administrator will have the corrupted article or those whose evaluation had been cancelled deleted from the article database
Alternate Course	-
Pre-condition	Administrator first need to be registered
Post-condition	-

Table 11: Open/Closed journal system explanation

Article	Explanation
User Case Name	Open/ closed journal system
Actor	Administrator
Description	Open and close the system in order to manage each journal
Normal Course	Administrator will create and open the system so that authors can send articles for evaluation for each journal. First the administrator need to create a journal, next is followed by member registration, article collection, editing and evaluation respectively. Once the process is complete, the administrator need to close the system to prevent data corruption.
Alternate Course	-
Pre-condition	Administrator first need to be registered
Post-condition	The journal system must be open first, the article submission, editing and evaluation can then be functional

4. Evaluate and summarize the system

5. Publish and publicize research paper

2.4 Research results

Table 12: Shows Evaluation Result by the Peer Review

Aspects	Quality		
	X	S.D.	Score range
1. Functional Requirement Test	4.03	0.43	Good
2. Function Test	4.03	0.10	Good
3. Usability Test	3.93	0.25	Good
4. Security Test	4.09	0.22	Good
Total	4.01	0.16	Good

According to the table 12, it is obvious that the system performances evaluated by the 5 peer reviews are good in all aspects. The mean and the standard deviation are 4.01 and 0.16 respectively. Further, when consider each aspects of performance, they are all in good results, thus we can conclude that the developed system have good performance.

2.5 Research result discussion

The peer reviews have tested the system and answered to performance assessment questions developed by the computer specialists. The evaluation consists of 4 aspects of system performance which are:

2.5.1 Functional requirement test is to test if the system can perform well enough up to the level users required;

2.5.2 Function test is to test if every operations run correctly and smoothly;

2.5.3 Usability test is to test if the system is user-friendly;

2.5.4 Security test is to the system on data security.

The results are shown as follow.

2.5.1 On functional requirement test, it is found that the overall performance is good. The one with the highest mean is the ability to add data to the system through the especially designed user interface, the ability to delete data stored on the system, the ability to display information according to the specific requirement and the ability to store data onto the database. there are numbers of collection of information and test by authors and editorial departments which are according with the research by Apiwut Kaewsong (Apiwut Kaewsong, 2009) who developed a research database in support of the operation of the Thailand Research Fund Regional Office (ISAAN). The system used Black Box Testing as an evaluation tool; the evaluators are users, researchers, coordinator Officers, ISAAN Regional Officers and administrator. According to the evaluation results, it is found that the system run correctly and smoothly with no bug reported.

2.5.2 On function test, it is found that the overall performance is good. The one with the highest mean is the accuracy of deletion and editing data stored on the system, the ability to display information according to the specific requirement and the accuracy of articles publication of the system. It might be the fact that researchers have examined in every details of the system, for instance, authors who had experience in sending articles for publication on publication system as well as those who have

worked in editorial department, resulting in good system performance; the process of examination took quite amount of time, thus no fault on the database reported. The correction process is very essential which accord with Ophas Eamsiriwong's design and analytical theory (Ophas Eamsiriwong, 2005), which stated, regarding the main reason for analysis and design, that a good system need an effective way of controlling data storage system in order to ensure data accuracy.

2.5.3 On usability test, it is found that the overall performance is good. The one with the highest mean is user-friendliness. Since the research has been developed to solve the problems where people with no computer knowledge always encounters, the system have been developed using the least complicated approach as possible and thus leaving the whole complicated issues to the administrator. The evaluation report system has now become even more user-friendly than ever which accord with Arkom Ngamperdpring's research (Arkom Ngamperdpring, 2006). He developed an information system to help users analyze and make decision to solve issues through intranet and online data analysis. According to the evaluation of usability test by users, user-friendliness is absolutely essential.

2.5.4 On security test, it is found that the overall performance is good. The one with the highest mean is failure notification. Because in this research, the researchers have used various technology to develop online system and analyzed and simulated great numbers of different situations where users encounter technical failures. Based on those issues, the researchers then have analyzed and developed a failure notification which will notify users, should there any issues. Most importantly, upon facing different issues, the specific notification will be sent to the user accordingly.

2.6 Suggestion

The information system developed for managing articles and academic articles have been put in practical use, however, being restricted only to use in journal publication of Bansomdejchaopraya Rajabhat University. Should the system be applied to different institutes or organizations, the collaboration between institutes and the university is essentially needed to maximize the system performance since each institutes have different procedures of journal publication and requirement.

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