Inventory Control Processing System (ICProS)

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ABSTRACT

Nowadays, many companies use modern technology in the operation of their business. However, there are some companies that still use the traditional way in processing their data and one of this is Organization A. The business process in Organization A is still using manual way on monitoring daily transactions and managing an inventory. All the necessary records of completed transaction are being filled in different ways such as log book, papers of letters and forms. Observation and interviewed with the staf in charge has been conducted and there is a need for Organization A to have a computerization system to lessen their work: procedures and process flow; and can secure files and information within their business as the data will be save into the database. An online system known as Inventory Control Processing System (ICProS) is developed to assist in establishing the monitoring process of the inventory in Organization A. Adapted Waterfall Model has been used in the system development process that consists of 5 phases; planning, analysis, system design, system development and testing. Evaluation has been conducted for 30 respondents and result shows that respondents perceive ICProS as a useful system that can be implemented in Organization A (Mean=3.99, SD=0.755). Result of the evaluation also indicate that there are some improvement needed (interface and feedback) before the system can be implemented.

1. Introduction

An inventory control system is a process for managing and locating objects or materials [1]. As goverment and organization sectors move ahead in the 21st century, it is becoming increasingly difficult to compete on a global scale without proper inventory management strategies. The effectiveness of an innovative distribution department is limited if it is unable to deliver a desired product to customers at the correct time, to the right place, and in sufficient quantity. Therefore distribution decisions must be quick, robust to uncertainty in the business enviroment, and optimized to meet the key supply chain objectives [2].

In this recent years, there are some organization that still uses offline system to deliver and managing their inventory. The offline system is a manual process in term of organizing and managing their inventory. This ultimately result to flaws in execution, flaws in communication, and flaws in decision making. These also lead to common inventory problems such as order quantities,

safety stock, and lead time [3]. Otherwise manual system is good for small business, but it bring some flaws for large business operation.

Inventory Control Processing System (ICProS) is an inventory control system that is propose to be developed to improve deliveries' ability of the organization. ICProS is propose to be developed to manage the inventory and record the transaction data for reporting uses in such for large business operation. The Web-based software, uses online system to tie fast and reliable distribution transactions to a system of inventory control, the company says. This ICProS also capable in control over the inventory process as in efficient and systematic.

Therefore by using ICProS, it is hope that the problems can be minimized as well as providing other benefits such as updated stock in inventory, excellent execution, great communication, and right decision making. Eventhough manual system used currently is required low cost on development, but the system itself is highly host in operation. This is due to the cost of labour, paper and time on managing the system.

2. Methodology

Adapted Waterfall model has been used in the system development process that consists of 5 phases; planning, analysis, system design, system development and testing and evaluation. Figure 1 shows the Context Diagram of the ICProS. As the Context Diagram itself is the general overview of the system [4,6], Manager main task is on reporting. While Administrator responsible on managing the system which they run the data entry and manage inventory transactions. The Staff on the other hand who is employee, in which the client of the system located in specific department. Their main task is inventory request.
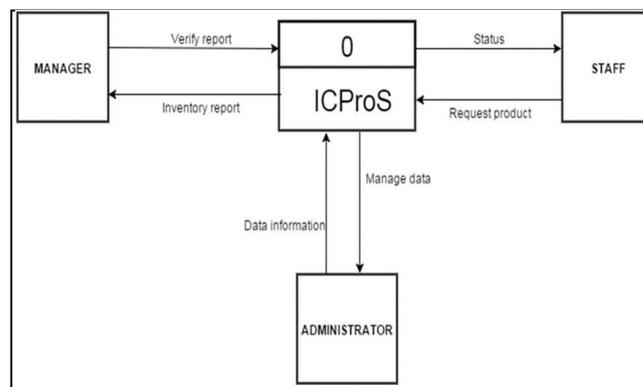

Figure 1 Context Diagram of ICProS

Figure 2 shows the Data Flow Diagram level 1 of the ICProS.   This DFD level 1 consist of 9 activities and single database. ICProS is operated in single database as there are no required for other database due to small size of system it is. The Manager, Administrator, and Staff represented the user of the system.
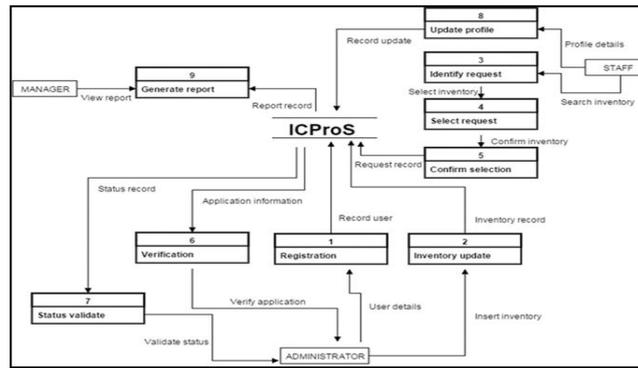
Figure 2 Data Flow Diagram level 1 of ICProS.

Figure 3 shows the Entity Relationship Diagram (ERD) of the ICProS. The ERD of this system shows how the tables in the database relate with each other and escribes their attribute of each table that will explain the entity and relationship among them [5,7]. The primary key and foreign key are also identified so that between tables is able to be linked.
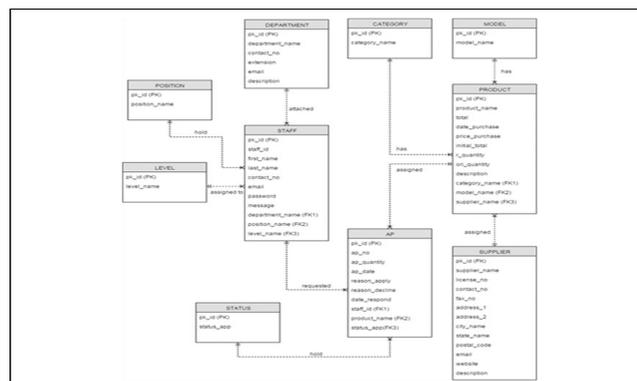
Table 1 Age Information

Age	Frequency	Percent	Cumulative Percent
18-23	21	70.0	70.0
24-29	7	23.33	93.33
30-35	2	6.67	100.0
Above 36	0	0	100.0
Total	30	100.0	100

Figure 3 Entity Relationship Diagram of ICProS.

3. Results and Discussion

ICProS web-based inventory system is developed to improve manual inventory control system in Organization A. ICProS system is dividing into three categories of user. There are Manager and Administrator that both from IT Department of Organization A and Staff. The Manager and Administrator are who's in charge of the system management as the Administrator hold the main role in managing the system whereby Manager have the ability on reporting tools. Staff is who eligible to apply for the inventory as they are the staff from all departments in Organization A. For every category of users have different list of menu. The applicant can make request by fill in the application and the application will be managed by Administrator. Figure 4 shows the screenshot of selected interface of ICProS system.

Figure 3 Screenshot of selected interface of ICProS system.

Evaluation of ICPoS was conducted for 30 respondents. Table 1, 2, 3 show the percentage in term of age, gender, and type of respondents. Result shows that 70.0% of respondents are age between 18 and 23, 23.33% is age between 24-29, and 6.67% age between 30-35. As for the respondents' types, there are 86.67% students, 3.33% lecturer, 3.33% KBS staff, and 6.67% experts.

Table 2 Gender Information

Gender	Frequency	Percent (%)	Cumulative Percent
Male	15	50.0	50.0
Female	15	50.0	100.0
Total	30	100.0	100

Table 3 Type of Respondent

Type	Frequency	Percent	Cumulative Percent
Student	26	86.67	86.67
Lecturer	1	3.33	90.0

KBS staff	3	10.00	100.00
Total	30	100.0	100

There are six (6) constructs has been use to evaluate ICProS which are; Construct 1 (User interface), Construct 2 (perceive usefulness), Construct 3 (perceive ease of use), Construct 4 (usability), Construct 5 (feedback and error message) and Construct 6 (overall system). Figure 5 shows the average of each construct represented by their mean and standard deviation.

The highest mean of the overall constructs is construct 2 (perceive usefulness) with the mean value = 3.96 (SD=0.755). Result shows that respondents perceive ICProS as useful to be implemented in their organization. The lowest mean is Construct 4 (usability) with the mean value = 3. 28 (SD=0.878) which indicated that in term of usability, there are still some improvement needed for ICProS before the system can be implemented in the organization.

Result Summary	1	2	3	4	5	6
Mean	3.728333	3.956667	3.528333	3.281667	3.883333	3.611667
Stadard Deviation	0.668333	0.755	0.75	0.878333	0.766667	0.963333
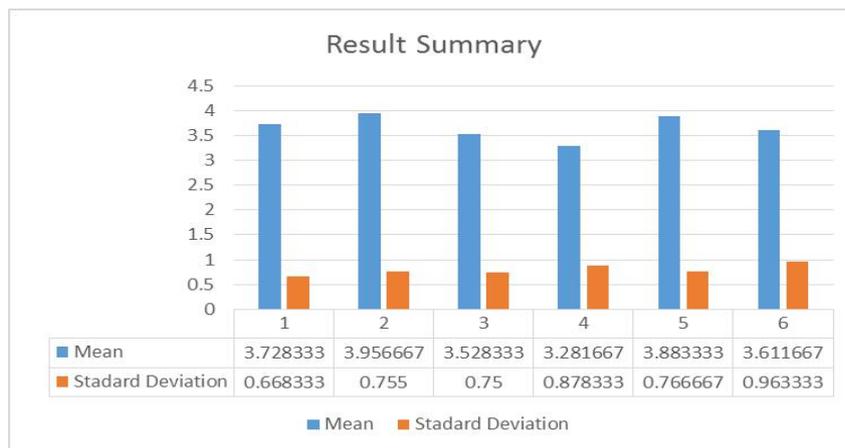
Figure 5 Result Summary

In terms of experts' evaluation, there are three (3) experts involved in evaluating ICProS. The first expert has five (5) years' experience working as system developer. The second expert is system design engineer with experience in field for six (6) years. The last expert is IT lecturer with experience of teaching system development more than 5 years. Table 6 shows the experts comments and suggestions regarding the system.

Table 4 Experts Comments and Suggestions

User Interface Satisfaction		
	Comments	Suggestions

Expert 1	Interface too empty	Added the dashboard details and element of KBS into the system.
Expert 2	Some buttons are not organize in standard	Standardize the buttons layout
Expert 3	The interface should follow the theme of Organization A. Colors not suit.	Added more themes of Organization A into the interface of system.
Perceived of Usefulness		
Expert 1	There are some complexity on the certain pages that may made complicated on the use of system	Pages of new application and verify of application should be simple yet efficient. Cut the long procedures.
Expert 2	The info message is much helped for user to blend with the system	-
Expert 3	Info message do assist user to interact with system	-
Attributes Usability		
	Comments	Suggestions
Expert 1	A bit hard to learn with no guidance from experienced user	Increase the level of friendliness on the system.
Expert 2	No brief introduction on the system in staff side	Explanation of the system on how to use in the home page of staff will enhance understanding.

Expert 3	Fresh user may face difficulty on using the system as no simple tour or introduction to brief the system operation.	Provide simple brief when user entered into the system.
Feedback and Error Message		
Expert 1	Pop up of error messages should be credited	-
Expert 2	Simple word use is good but may also do harm on the system efficiency	Add on small pop-up info in every simple word used.
Expert 3	-	-
Perceived of Ease of Use		
Expert 1	Limited in flexibility of the system	Specifically focus in details on the scope and give flexibility on user.
Expert 2	Too many pages on the system	Try to use ajax in the system.
Expert 3	The dummy on the contact in not acceptable	Make the leave comments and suggestion real.

4. Conclusion

As a conclusion, problem with the current process in managing inventory record has been highlighted and an online system is proposed to be developed. The online system (known as ICProS) was developed using adapted Waterfall model. Once the development process is completed, experts and users evaluation were 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 from experts can be implemented to improve the system

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