

Design Approach in Document Management System: The Development of EZDESK Dashboard

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Abstract. Document Management System is a concept of planning and managing a document in various activities simultaneously, which one of common activity is publication from before the conference starts to after the conference finished. Pre-conference activities include the process of registering a conference, the admin process of verifying the registered conference, until the conference has been published. In this case, user experience (UX) orientation and paradigm was investigated through the simplified RMS (Recognize, Materialize and Scrutinize) design approach by generating the prototype with the usability criteria and aspects to comply with the user demand as the critical factors and trigger for comprehensive execution. The EzDesk application is an application designed to assist users in registering conferences and verifying conference registration documents. There are 2 actors, primarily in this module, which are chair as the conference organizer and the admin plays a role in conference verification. To verify a conference to be held, the admin must check the required documents for holding a conference. After going through the verification stage, a conference can be distributed via visualization on the main page of document management system application.

1 Introduction

Clarity and accuracy of information at this time is an important thing in the management of information technology. This is important because all human and business activities currently use information technology so that the process becomes fast and precise. Therefore we need a media that can present information effectively and efficiently. Simply the effective means that it can bring results or benefits while efficient means easy and fast. The scientific conference is a space for academics to present and discuss the research they are doing, which in general, it involves various interactions and communication among diverse participants, sponsor and organizers through a concept of planning and managing a conference activity from pre-conference to post-conference.

Currently, there are several conference management system applications commonly used by users, including EasyChair and Edas. In short, several participant found out there are issues in the usability especially uneasiness of getting information on conference research topics, details of the place and time of the conference and visualization of conference distribution. The results have been presented through survey to at least 31 participants in

order to investigate the critical function for document management system based on benchmarks. Besides that, there are others indicator to look for developing suitable design such as the brief summary of conference or journal details and progress page of submission to notify and remind participant for the purpose of prepare every related thing before the deadlines coming.

One way that can facilitate the activity of analysis and exploration of information is to use data visualization techniques. One form of data visualization is using a dashboard. Dashboards provide an interface with forms such as charts, reports, and visual indicators combined with dynamic and relevant information. Dashboard is a visual display of important information needed to achieve goals, connecting and compiling that information on a single screen so that information can be monitored at a glance. The dashboard displays the information needed to monitor business aspects, enabling business people to quickly identify problems and determine corrective steps to improve organizational performance.

Based on the background of the existing problems identified through benchmark, they can be formulated by developing the main page that displays conference data and registered user data, to make it easier for admins to know the number of conferences and registered users. Then, information about conferences should be displayed on similar applications, somehow complicated for users to understand, so it is better there are alternative way to look for the statistic data. Meanwhile, the application should have enhanced capability to store and manage every conference requirements documents in hierarchical and structure way to ensure the verification, validation and credibility to be fulfilled accordingly.

2 Literature Review

According to the principles of interface design, visual elements should be designed in a way that is clear and can be seen by the user. It can use many components in interface design, such as visual popups, shape attachments, features, and visual form movements [1, 2]. People are very difficult components to deal with because of the different needs and other expectations that make up the mind of something. In fact, the use of technology needs to support management issues in order to meet the needs of satisfaction and productivity more [3]. During the development phase, website and database designs should be designed to avoid duplication and redundancy issues that can eliminate customers due to dissatisfaction with products and services. The design process uses application prototypes to increase knowledge and feedback and improve the typical and interactive design of your application. The user interface is built with universal design as a principle for efficient and effective system usability, accessibility and learning [4].

In fact, the document management process needed to create the best model for the activities performed within your organization. This needs to be modified as a model for determining how an organization operates, including its main objectives and strategies being reflected in the general public. Thus, supported features and sector-specific system activities can achieve the objectives and collection of transactional processes leading to contribute for the effectiveness of each activity's implementation [5].

Document management system are categorized for many reasons such as project, life cycle stage, product composition and regulation resource, which has the purpose of the thematic area to classify the customers according to economic characteristics through preparing the package to calculate, plan and managing the financial components of the development process [6]. Therefore, interaction design can provide a clear view of the weaknesses of the system to improve decision making by creating the right strategies to generate effective processes [7]. It employs paper files and physical filing systems to help professionals move into an innovative business world by organizing digital documents for searching and storing document files, which later on eliminating the loss suffered [8].

In this modern era, there are many developments and developments in the field of information and communication technology, changing the tendency of people to act and interact with each other. It requires computer power but is applicable to make important contributions by understanding key users' perceptions of innovation, such as professional work lifestyles, organizational culture and corporate environment [9]. Digitization is the process of converting information from a document to a digital document. Paper or non-digital files and documents have played a vital role in the growth of the world since the previous era with they are difficult to keep and even invisible due to weaknesses in physical files and documents. Before it can digitize these documents, it is important to have to go through the document preparation process. Without digitizing it, getting past information in the future would be a problem while, in the time of digitizing files and documents, an archivist or records manager must consider all requirements and standards for files and documents in a repository [10]. Therefore, large amounts of data are generated together by people, devices, and sensors so the admin need a data processing system that helps with document management and version control as the task is clearly beyond human capacity [11].

3 Research Method

In this case, the modified design approach was used to emphasize and enhance the degree and intensity of interaction by formulating the potential and possibility of activity for dynamic conversation between the user and the system. Through the guidance process, it was implemented in the form of an RMS design approach to allow the optimized usability criteria in managing documentation within administration process. Thus, it has a specific meaning to provide what you need based on specific required features by designing the best user experience when using the service or product within the scope of developing the application. To achieve at least the suitable results match the user demand, designers need to consider future implementations in terms of an open and innovative platform that enables a variety of inclusivity to provide service by balancing function and service offered. The function take the picture to arrange the requirement that present particular user characteristics have been identified to achieve effectiveness, efficiency and satisfaction in specific context of situation. Therefore, service related on how the customer can feel supported through engaging look of the application interface. It is important to underline the relevant business processes involving requirement analysis and user specification that interact within the application system, taking into account technical and operational point, as well as user preferences for expected and accepted behavior.

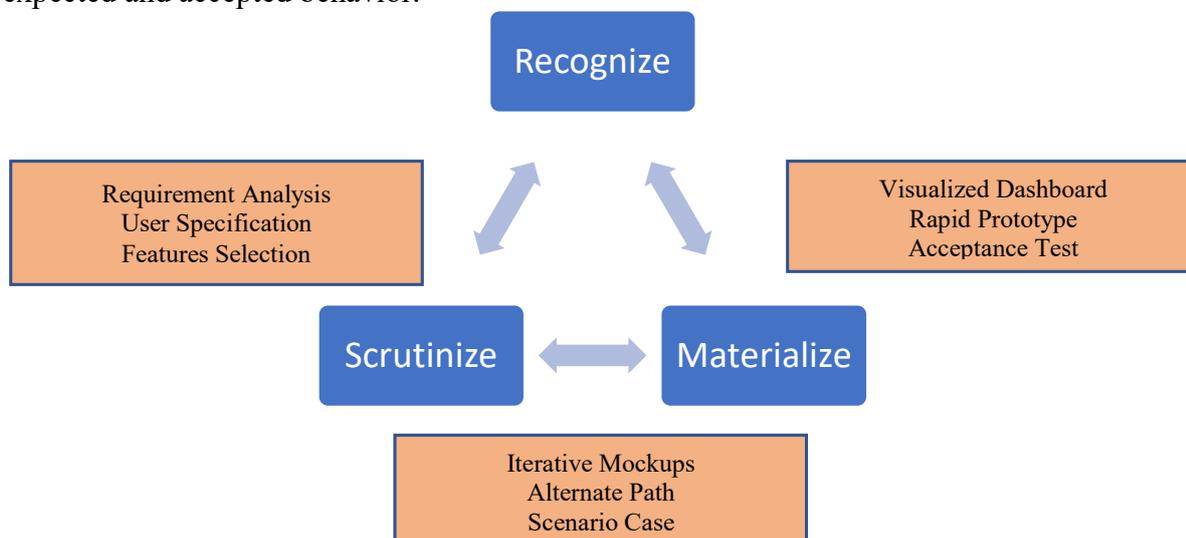


Fig. 1. RSM Design Approach

Having an interaction model helps designers define usage contexts and determine who uses the product, what they want to use, and when they use it, as shown in Figure 1. Group understanding patterns or models support the process of narrowing down the typical features to which they apply, and by creating design solutions that are implemented step-by-step from broad concepts, such as defining requirements and user goals, etc. Allocate resources and effort to wherever you want to complete your design. It also helps evaluate the design using appropriate mechanisms such as usability testing to see how easy it is to use the design in a representative group of users. It is best to find design issues and design-related issues as soon as possible so that designers can fix them before they are implemented or mass-produced. User orientation plays an important role as a target attribute achieved based on many metrics such as customer preference, usage, shared value, and personality threats. Designers need to carefully and scrutinize requirements analysis to prioritize further features to be developed.

4 Result and Evaluation

A. Requirement Analysis

People, Activity, Context, and Technology (PACT) analysis is carried out to identify and determine what things can be developed from the targeted user or participant based on several aspects to create requirement. Several aspects that will be considered related to the people such as channel, mental model and differences, then activity related to temporal, safety critical and cooperative complex, then context involves organizational, social, physical and lastly, technology such as data, media and communication. The EzDesk application is intended for several purposes of actors, which the types of users include the author as a paper owner and writer in a conference or journal, a reviewer as the one that evaluated the paper submitted to conference or journal, the chair as the manager of the conference or journal and admin as the one that handle and control the party with the task of monitoring the registered conference and journal by verifying and validating them. Here the brief summary of PACT analysis as can be seen in Table 1, which design problem focuses in the identification process of current situation to solve while design issues tries to predict the future condition to anticipate the worst case scenario.

Table 1. Design Problem and Issues of PACT Analysis

Criteria	Design Problems	Design Issues
Channel	There is no presentation list with thumbnail or small picture within the system that might distress certain user to recognize them.	Application hinder the condition in which user can select multiple items from different categories simultaneously; eventually wasting precious time of user.
Mental Model	The system cannot display the list of reviewer even the comment yet automatically whom user likes.	Having many feedbacks and suggestions from user is great resource for improvement, but if there is no proper standard for ranking or prioritizing, the decision might be blurred; misleading advice; stagnancy; mismanagement, etc.
Differences	No quick process to see that certain conference by providing the details and additional information.	The system should maintain the user through certain appreciations in term of distinct reward, unique status, high discount, special gift or promotional offerings.
Safety-Critical	The payment method (balance) for transaction takes long time and difficult to process or to complete.	The application allow different method of payment with debt card from various banks, credit card/master visa and balance points.
Cooperative-Complex	Certain user might have difficulty to navigate through	Certain user have problem adapting with the menu structure, icon, color and label, which

	the website to find or decide upon good conference or journal, which take a longer time than originally predicted.	there is no possibility for customization as the alternative solution.
Temporal Aspect	User have difficulty to learn the feature to ask and add more days for further submission.	Before adding more features to specific menu category; system supposedly provides notification message, announcement or tutorial with grand tour.
Physical Context	Required laptop to access website comfortably and full screen.	Compatibility and acceptability issues can be occur if the system do not provide alternative mode to explore the app features.
Organizational Context	Maintenance in specific time and event might hinder potential user to access the system	As the function expanded, the reporting problems/complaints will be increased; the automatic process became critical.
Social Context	The use of sound for notification message might help the user identified the meaning behind certain process.	User have subjective thinking and preference, which the system should allow them to customize background, sound, theme, etc.
Data & Media Characteristic	There is no preview of conference and journal, where the system should allow the collection of photos to be uploaded.	Provide more storage in the database server to allow user in uploading video in term of trailer, review and any additional supplement for their conference and journal paper in order to validate the novelty and significance.
Communication Channel	Lack of interaction between users through application due to less features to allow that process occur.	Provide alternative means to interact such as chatting, messages, stickers, smiley, etc. as added value in the application.

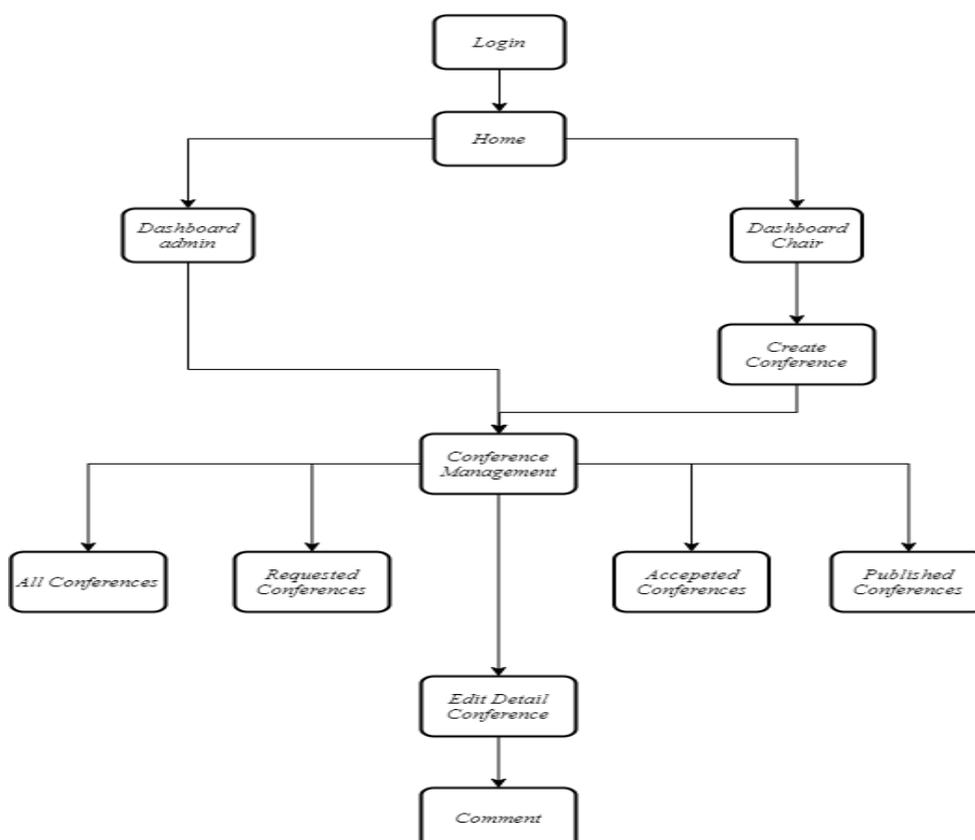


Fig. 2. Activity Flow Design

As can be seen in the figure 2, the activity flow design have been presented, which has primary function such as flowcharts or data flow diagrams to provide a visual representation of a set of actions or control flows within the system. In this case, it is used to define business process modeling and describe the steps in a use case diagram in which typical activities are provided in a sequential and simultaneous order started from login and ended with generate comment for the conference in the administration process.

B. Iterative Mockups

In the developing the mockups, iterative process should be conducted to allow the improvement take places after trial error process, which in this case, the usability is defined based on convergence benefit within the RSM interaction paradigm and user oriented. The formulation has the purpose to simplify the design thinking process that have the capability to be more flexible and affordable. The cognitive walkthrough is extremely important, which in this case was used to investigate the activity flow design to describe several critical incidents that might occurred and suggesting the feature selection or restructuring for menu item to be addressed in order to overcome the usability issues [12]. There is no doubt that there is a large gap between the design requirements and the way the theory is conceived [13], which also become the considerate and determinant for this study to generate iterative and non-linear execution phases. The mockups version can be seen in the figure 3, 4 and 5 that present the latest structure of user interface after several improvement based on feedback from user to resolve certain issues. In the first iteration, the conference management has been created based on the identification and resolution of risks. The conference management page contains a list of conferences that have been registered in the EzDesk application. However, at the evaluation stage, users have difficulty filtering conferences whose status is requested, accepted, and published. Then it was decided that the application was not ready for user use and it was decided to carry out the next iteration.

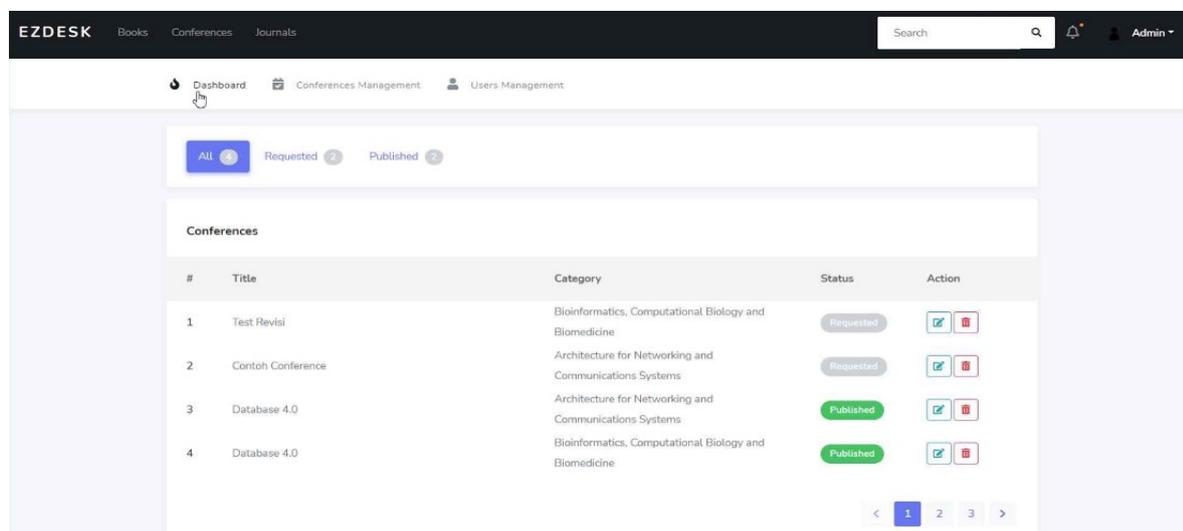


Fig. 3. Dashboard Mockups Design

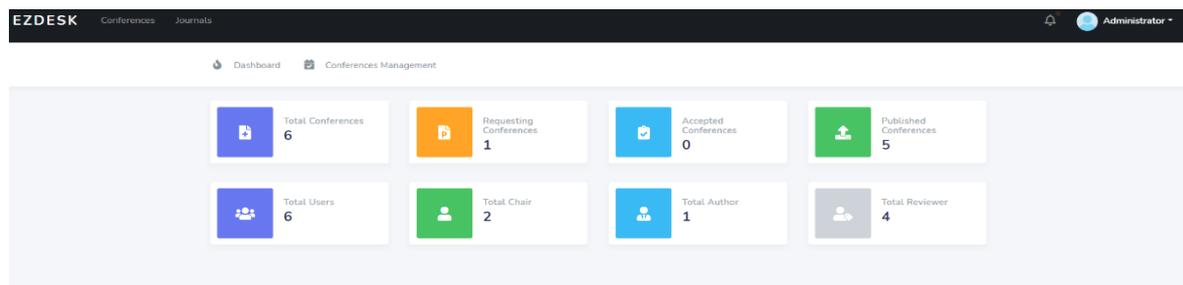


Fig. 4. Statistics Mockups Design

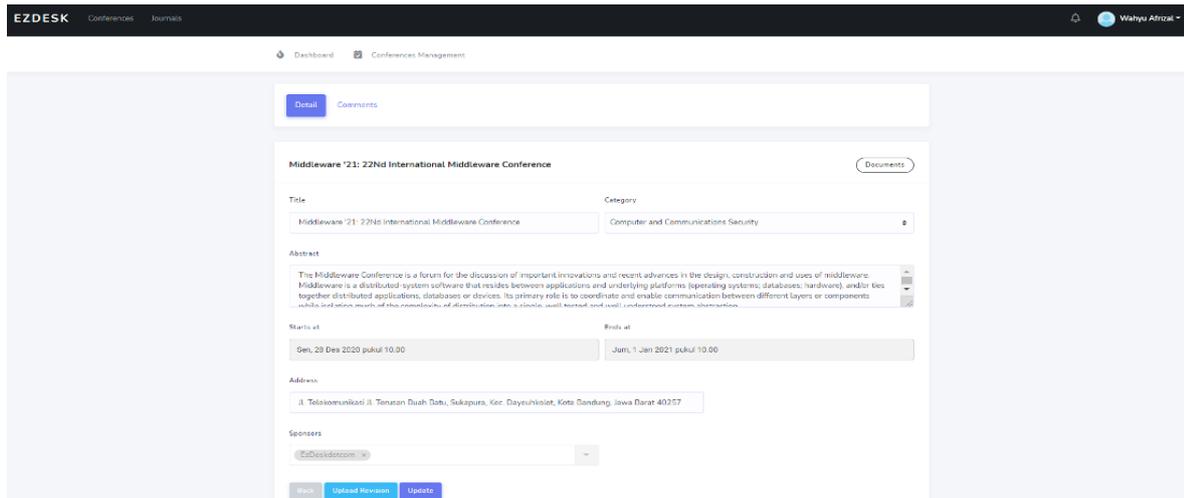


Fig. 5. Conference/Journal Detail Mockups Design

In iteration second iteration stage, the user wants to filter the conferences that have been registered based on their status, this is needed because it will make it easier for users to separate conferences with requested, accepted, and published statuses. The conference list has been displayed according to its status. However, at the evaluation stage, users have difficulty finding conferences based on title, category, and city of implementation. So it was decided to do the next iteration. In the third iteration stage, users need a search feature to help find conferences based on the title, category and city of the conference. This is needed to speed up the chair to find the conference that is registered. An advanced search feature has also been added based on the title, category, and city of the conference. Meanwhile, at the evaluation stage it has been stated that the application is ready to be used by the user.

C. Acceptance Test

A good software should be software that has met all the needs of its users. The method used to find out whether the software made is in accordance with the use case is done with a test case. Meanwhile, acceptance testing is a formal description of the behavior of a software product and is generally presented as an example or use scenario. Several codes and approaches have been proposed for these examples and scenarios. Often the goal is to allow development teams to automate the execution of such ad-hoc tests or with off-the-shelf software tools. Based on normal scenarios and alternate paths in the use case, a set of testing scenarios was developed. In addition, each testing scenario will be given a series of dummy data that will be used as a testing tool.

Acceptance testing complements the benefits of unit testing, such as facilitating close collaboration between developers and customers, users, or domain experts, where they need to articulate their business requirements. Also, providing a clear and clear agreement between the client and the developer. Customers and developers have clear reason to improve on existing tests or suggesting new ones as needed, but products that pass acceptance tests are considered appropriate. It also reduces the likelihood and severity of both new defects and regressions associated with hindrance that were previously reviewed and declared accepted.

The results of this test will show the extent of the suitability between the use case and the software. There are 24 test cases have been conducted for the several type of scenarios to evaluate the performance and acceptance of the system, which can be seen one of them in the table 2 related to register test case from 31 testers. The V symbol means valid, while I refer to invalid and NA related to not access. Besides that, there are other test case such as login, conference view, conference detail, statistics, verification, validation, generate, delete, revision, review, published and so on. Thus, the result indicated the usability criteria has been fulfilled in term of ease of learning, task efficiency, ease of remembering, subjective

satisfaction, understandability and conviviality. At the same time, when it comes to data sharing, policy management is implemented according to various security privileges, and data security is ensured from the network level. It is important to understand that the document management system not only manages the document, but also provides information and knowledge contained in the document [14, 15].

Table 2. Test Case Scenarios for Register

Us er	Scen ario	Pa ge	Input Full Name	Input Institu tion	Input E- mail Address	Input Passw ord	Input Retype Password	Button Registe r	Result
1	1	V	V	V	V	V	V	V	Page of <i>register</i> as expected
	2	V	I	I	I	I	I	I	Appearance of warning “ <i>this field is required:</i> ”
	3	V	V	V	I	V	V	I	Appearance of pop up “ <i>this e-mail has already taken</i> ”
2	1	V	V	V	V	V	V	V	Page of <i>register</i> as expected
	2	V	I	I	I	I	I	I	Appearance of warning “ <i>this field is required:</i> ”
	3	V	V	V	I	V	V	I	Appearance of pop up “ <i>this e-mail has already taken</i> ”
3	1	V	V	V	V	V	V	V	Page of <i>register</i> as expected
	2	V	I	I	I	I	I	I	Appearance of warning “ <i>this field is required:</i> ”
	3	V	V	V	I	V	V	I	Appearance of pop up “ <i>this e-mail has already taken</i> ”

5 Conclusion

An important fact that has been confirmed in many experiments is that no person, even a usability expert, can predict an interface problem in a given context. They may expect many design problems and design problems, but about half of the expected problems are wrong in the sense that the user does not feel that it is a problem. Therefore, acceptance tests that focus excessively on technical execution also run the risk of failing due to minor or cosmetic changes that do not actually affect the behavior of the product. For example, if the acceptance test refers to a label in a text field and the label changes, the acceptance test will fail even if it does not affect the actual functionality of the product. Meanwhile, the use of design approach help the development phase to be more iterative in order to be flexible and accurate in aligning with the user demand and request in quickest and easy response. In further development, it is expected for the data presentation can be presented in the other forms such as graphs or charts to monitor the number of conferences that occur over several periods can be more meaningful in certain context. Also, there is an additional forum or group feature for communication between authors or between reviewers can be good improvement in terms of appearance to make it easier for users to carry out activities on an application.

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