 ISSN:2302-8149
e-ISSN:2540-9719

A Model Design of Lesson Learned System (LLS) for Accountability Report: A Case Study of Tourism Promotion Agency

Ahmad Anshari*
Department of Computer Science, Faculty of Computer Science, Universitas Indonesia
Depok, Indonesia
*e-mail: ahmad.anshari@ui.ac.id

(***received:*** *10 October 2023,* ***revised:*** *16 January 2024,* ***accepted:*** *21 June 2024*)

Abstract

The tourism industry is one of valuable industries in Indonesia that needs a high level of expertise through the knowledge management systems in order to improve the tourism service delivery quality performance. Problems faced by this institution is the complexity and hardness in defining and enhancing knowledge through an accountability report, this is due to the lack of management through the process of applying an accountability report. This attracts us to make a research about the users' perception towards the lesson learn system prototype where this study will examine the users' perception in designing Lesson Learn System based on the requirements in order to enhance employees knowledge through an accountability report.. After examining the perception of the lesson learn system users, we will design Lesson Learn System prototype by using User Centered Design that describe the relationship between the lesson learn system and its users by specifying the context of using the lesson learn system in tourism. This also will specify the requirements needed for the lesson learn system that help for designing the Lesson learn system design solution.

Keywords: lesson-learned system, knowledge management system, prototype, user-centered design.

1 Introduction

Learning lessons system is dependent on the ministry of tourism doing better in five areas of expertise, including information sharing and learning, management practices, strategy formulation, collaboration mechanisms, and knowledge capture and storage [1]. Activities in each area can be supported by a variety of knowledge management methods, such as knowledge audits, activity-based knowledge mapping, action learning sets, peer helps, and exit interviews. This can be achieved by considering the Lesson learn system uses' perception towards the information technologies that complement and supplement the knowledge management tools are crucial for improving information transfer within and outside the ministry of tourism [2].

Knowledge Management Lesson learn System will help the Tourism promotion Agency to be successful in creating accountability reports due to the experience learned from success and failure[3], and to capture, share, transfer and apply lessons learned[4]. The knowledge from the learned lesson will help the Tourism promotion Agency to improve the day to day service quality performance and It will help the Tourism promotion Agency to build the commitment that will help them to plan productively for their future in terms of partnership and share the organizational learnings and service delivery knowledge. This will also help the Ministry of tourism to deliver service with high quality which is responsiveness to the customers that can meet the willingness with timeliness service which will be available to all stakeholders with cost effectiveness. The users' perception shows how the somebody perceives that LLS is useful for what they do or to achieve[5]. We defined our research question based on this problems as follows:

- RQ1: How is the lesson learned system (LLS) designed based on the requirements in the tourism promotion agency?
- RQ2: What are the users' perceptions towards the proposed LLS design?

 ISSN:2302-8149
e-ISSN:2540-9719

In order to manage this research paper, we described the literature review in section 2, section 3 consists of our research methodology, as for the results and contribution, we stated it in section 4. Finally, the conclusion and limitation of this research are stated in section 5.

2 Literature Review

Literature review is the stage where the author defines the theories utilized within this study. In general, this study mainly discussed two theories, Lesson Learned System and User-Centered Design. Lesson Learned System is the aim of the study's prototype development, moreover, the User-Centered Design is the methodology theory used by the author.

2.1. Lesson Learned System (LLS)

Lesson learned systems (LLS) are programs for knowledge management (KM) that are organized on a database of lessons learnt (LL). Lessons learnt are knowledge artifacts that communicate practical experience that is relevant to a task, choice, or process that, when used again, improves an organization's outcome. Because of this, LLS are common in governmental entities that must use knowledge [6]. A lesson must be readable, emotionally engaging, and applicable to the user's practice. The government group was concerned that people's behavior and the surrounding context be precisely defined since policy teachings produce guiding principles for large-scale collective social actions [7]. It is preferable to use more LLs-generating actions that are spread out over the course of the project rather than fewer actions (such as producing LLs solely towards the conclusion of the project). The project team's ability to learn will be aided by a working atmosphere where team members may freely admit mistakes and discuss problems and their solutions. The LLs can be utilized for planning or for taking action once they have been documented [8].

Learning lessons system prototype will improve the Learning lessons system usability and enhance the tourism service delivery workflow efficiency to facilitate the construction knowledgebase using user-centered design (UCD) approach [9].

2.2. User-Centered Design (UCD)

User-centered design (UCD) is an iterative design method [10] where designers pay close attention to users' needs at each stage of the design process for lesson- learned systems. A design phase follows, in which the design team develops solutions. User-centered design is an iterative process that emphasizes comprehension of the lessons discovered by system users, tasks, environments, and their context throughout all design and development stage [11]. This involves Users constantly, design improvement through user-based evaluation, consideration of the entire user experience, taking into account expertise from other disciplines, and iterative processes [12].

User-centered design begins collecting feedback before anything is actually designed. They observe and interview users, evaluate the market and competitors, and use even before the basic design is prototyped, this feedback can be used to establish what the product needs to be [13]. User-centered designers consult with users and let them test numerous prototypes throughout the process rather than waiting until the end for them to validate a nearly finished product [14].

The Lesson Learn System prototype using user centered design help the us to try to understand the context in which users may use a lesson learn system to help the ministry of tourism to enhance the services by considering making the knowledge flow more efficiently within and across the ministry of tourism depends on how users of the Lesson Learn System perceive the information technologies that support and enhance the knowledge management tools [15]. The requirements of the users are then determined and specified.

3 Methodology

The lesson learned system model that we proposed is adopted from (webber, 2001) and re-designed based on the users requirement. We designed our lesson learned system model with the approach of user-centered design (UCD) methodology, our proposed user-centered methodology consists of four general phases.

 ISSN:2302-8149
e-ISSN:2540-9719

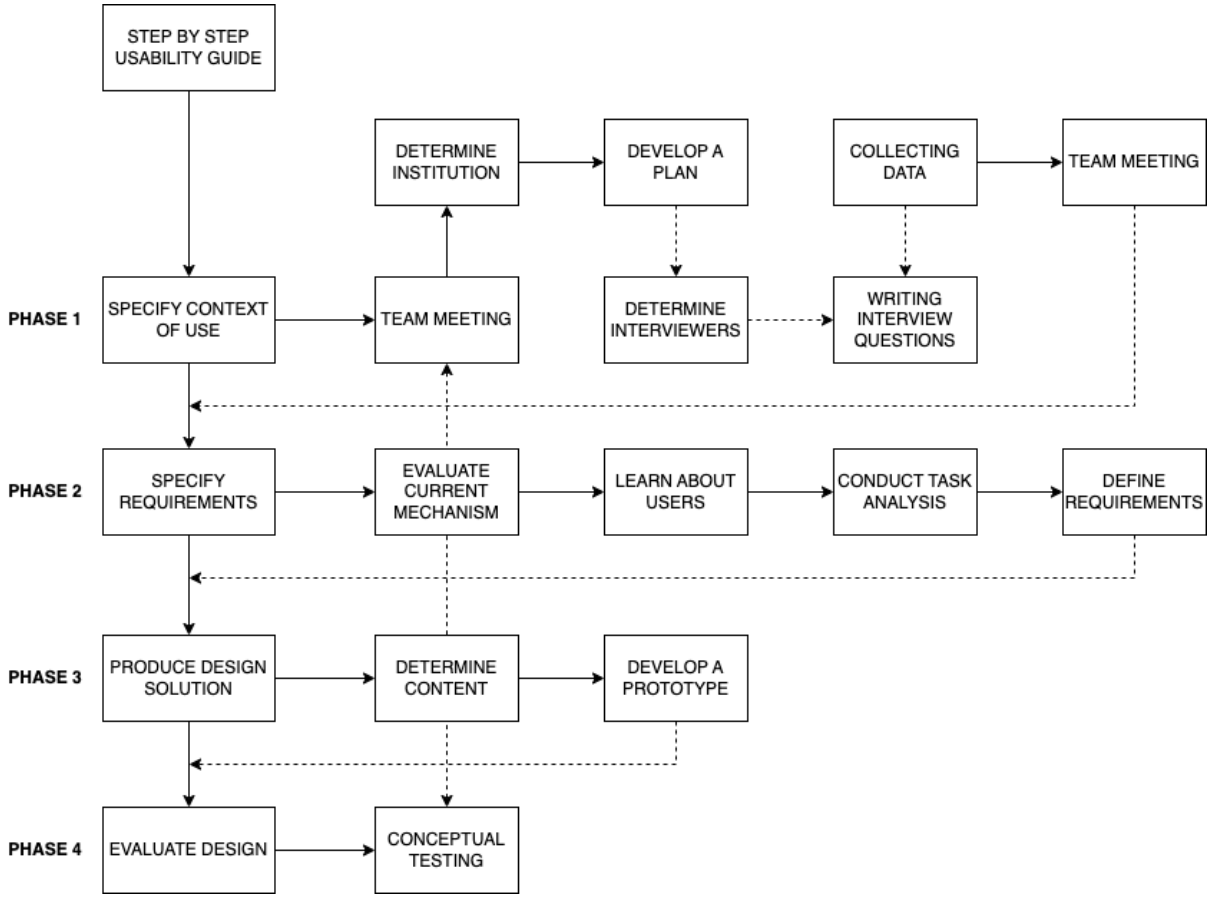

Figure 1. UCD process

The UCD methodology utilized by this study was derived by study from Ying and Boyer (2020). Based on the Figure 1, it shows that there are 4 phases that consists of:
Phase 1: Specify Context of Use (Identify the users, what they will use the product for, and how and where they will use it).
Phase 2: Specify Requirements (Identify any business criteria that the product must meet in order to succeed).
Phase 3: Produce Design Solutions (This step may be completed in phases, progressing from a basic idea to a finished design).
Phase 4: Design Evaluation.

3.1. Specify Context of Use

In this phase, the first thing we do is have a team meeting to determine the research aim for our university. The next step is to create a study plan, which entails selecting an approach. In this study, we take a qualitative approach to data collection and use interviewing. Our interviewer consists of Deputy Chief, General Secretary, General Treasure, and two ordinary members. All of our interviewers work in the Tourism Promotion Agency. Our questions were:

1. What are the problems commonly faced in carrying out accountability reports on a tourism project?
2. What are the requirements in designing an accountability report from a technical point of view?
3. What are the requirements in terms of human resources?
4. What is the need to minimize invalidity in an accountability report?
5. What knowledge / lessons learned do employees need from an accountability report?
6. What kind of system is expected in the context of managing project lessons learned?

 ISSN:2302-8149
e-ISSN:2540-9719

After we held the interview, we held a team meeting in order to discuss our next phase based on our proposed UCD methodology.

3.2. Specify Requirements

In this phase, there are four stages to the accountability report in conducting a lesson learned system: Evaluate current mechanism, learn about users, conduct task analysis, and define requirements. The evaluation of the current mechanism according to the result of our interview shows that the current mechanism in carrying out accountability reports in the tourism promotion agency are still manual. Therefore, most of our interviewers complained about the documentation and administration in the current mechanism.

After we found out their problems, we learn about user by focusing on their intended action and:

1. How users feel (about the desired activity);
2. What emotions are elicited;
3. What are their emotional drivers for carrying out the intended action;
4. What are their hurdles that might prevent them from taking the intended action;
5. Their values and beliefs in relation to the intended activity;
6. Elements of social or cultural context that could affect the experience.

The next stage that we applied in this phase is to conduct a task analysis. From our own analysis, we concluded our task based on what users are trying to accomplish:

1. Trying to use e-budgeting.
2. Trying to get a real-time documentation
3. Trying to get an effective and efficient lesson learned.

How are users currently completing the task? People are completing that task using:

1. Easier budgeting information
2. On the spot dokumentation through the application
3. Accessing lesson learned repository in the application

3.3. Produce Design Solution

In this phase, there are two stages to the accountability report in conducting a lesson learned system: First, we determine the content in our prototype, then we develop it. We determined the content based on our research interview on users' requirement in enhancing lessons learned for the employers through the accountability report.

3.3.1. LLS Cycle

One of the most important aspects of knowledge management and a major factor in continual performance improvement is the implementation of an efficient lessons learned system. However, many businesses have discovered that it is difficult to apply a lessons learned system successfully. Although there are classes in some companies' databases, none are being submitted. Some businesses also have a database of lessons, but it's not complete or it's full of high-quality lessons, but nothing ever appears to change and the same mistakes keep happening [16].

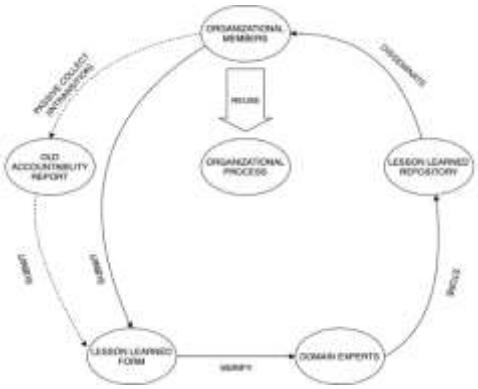

Figure 2. LLS cycle

 ISSN:2302-8149
e-ISSN:2540-9719

As can be seen in Figure 2, the Lesson Learned System (LLS) Cycle that we proposed is adopted from webber (2001) and re-designed based on the users requirement. The cycle consists of 5 entities and one alternative-entity. The five entities are organizational members, in this case are the members of tourism promotion agency, lesson learned form, domain experts, in this case are the senior members of tourism promotion agency, lesson
learned repository, and organizational process. Based on the research interview and users requirements, organizational members can read old accountability reports from old mechanisms, which have not been stored in the system. That flow is intransitive and the data is passively collected. Then they store their lessons in lesson learned form. The basic flow of this LLS System is that the organizational members submit their lesson learned through lesson learned form that is available in the prototype. After the lesson learned has been stored, the lessons are verified by the experts, in this case the senior members of the tourism promotion agency. After the lesson learned has been verified, it is stored in the lesson learned repository. All lessons learned in the lesson learned repository can be disseminated by the organizational members and reuse its knowledge through the organizational process for the upcoming projects.

3.3.2. System Context Diagram

In the system context diagram, two kinds of users interact with the system to realize different functions, as can be seen in the figure below.

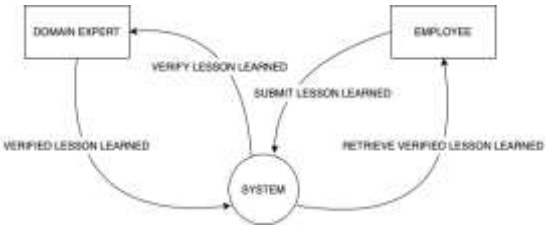

Figure 3. System context diagram

The LLS Cycle that we proposed is adopted from webber (2001) and re-designed based on the users requirement. Based on Figure 3, employees can submit their lessons learned from the previous project by reading the current accountability report and can receive their verified lessons learned to enhance their knowledge. As for Experts, they can verify lessons learned submitted from the employees then store it into the lesson learned repositories.

3.3.3. Use Case Diagram

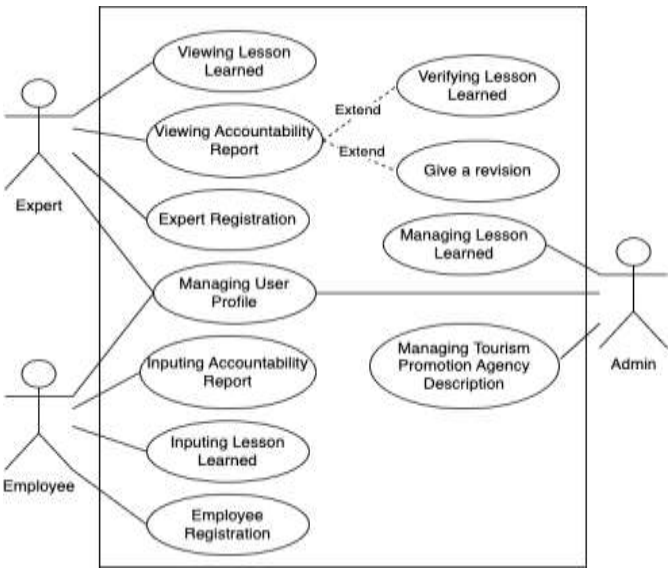

Figure 4. Use case diagram

 ISSN:2302-8149
e-ISSN:2540-9719

In this section, we explain the actors and their use case within our proposed prototype. As shown in Figure 4, there are three actors, expert, employee, and administrator. In our proposed prototype, experts can do registration, view lessons learned, view accountability reports, and experts can also revise if there is a need to revise the current work in the accountability report. Our aim is to create a lesson learned model through an accountability report, therefore, experts can verify the lessons learned that are submitted by the employees. As for the use case of an employee, they can do registration, submit lessons learned, write their reports, view verified lessons learned, and view report revision. The last actor that we include in our proposed prototype is administrator, an administrator can manage lessons submitted by the employees, manage verified lessons learned from the experts, and also manage the description of the tourism promotion agency.

3.3.4. Prototype Design

In this section, we will show the prototype design in the accountability report scenario. The prototype interface accountability report scenario consists of two sub-scenes, employee point of view scenario and experts point of view scenario.

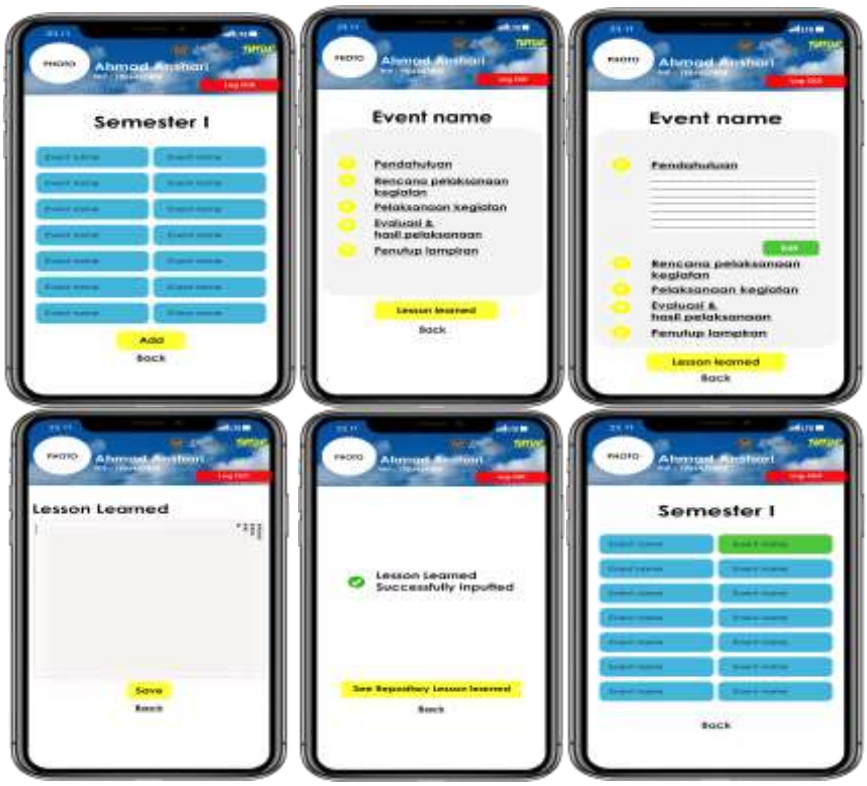

Figure 5. Employee scenario of lesson learned

Based on Figure 5, in creating an employee scenario, the user first registers his account on the start screen. Then the employee inputs his username and password. After the employee successfully signed in, he can see a brief description of the tourism promotion agency. The application displays two buttons, which are the sections in the structure of the tourism promotion agency. After the employee clicks on his section, he will be displayed a brief description of his section. The application displays two buttons on the screen, which are the semesters. The employee clicks on the semester that he wants to edit. The application will display a list of events during the semester, the employee then clicks on the event that he wants to write the accountability report on. The application screen will display the edit button for the employee to do his accountability report, besides the edit button, the employee could also write his lesson learned by clicking on the lesson learned button on the bottom of the screen. The employee writes his lesson learned then submitting it by clicking on the save button. If the submission is completed, the application will display a screen to let the employee know that his submission has succeeded. The employee then waits for his lesson learned to be verified by the experts. The employee will know whether his lesson learned has or has not been verified by accessing

 ISSN:2302-8149
e-ISSN:2540-9719

back the list of events. If the event that he has submitted his lesson learned is marked 'green', that means that his lesson learned has been verified by the expert. Otherwise if it is 'red', that means his lessons learned are not verified by the expert which would have him to submit his lesson learned again. The employee could disseminate all the lessons learned that have been verified by the experts by clicking on the 'lesson learned repository' button in the application. In addition, the experts point of view scenario could be seen in the figure below.

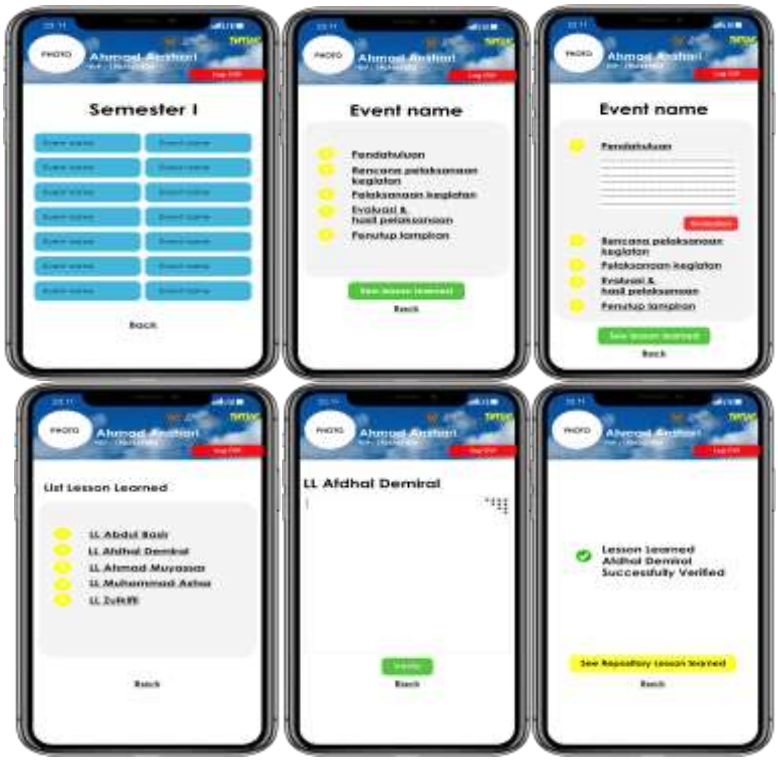

Figure 6. Expert scenario of lesson learned

In creating an expert scenario in Figure 6, the user first registers his account on the start screen. Then the expert inputs his username and password. After the expert successfully signed in, he can see a brief description of the tourism promotion agency. The application displays two buttons, which are the sections in the structure of the tourism promotion agency. After the expert clicks on the section that he wants to review, he will be displayed a brief description of the section. The application displays two buttons on the screen, which are the semesters. The experts then click on the semester that he wants to review. The application will display a list of events during the semester, the experts then clicks on the event that he wants to evaluate on the accountability report. Besides evaluating the content of the accountability report that has been inputted by the employee, the experts also can verify the lesson learned from the employee by clicking on the 'see lesson learned' button. When the expert has clicked on the 'see lesson learned' button, the application screen will display the list of names that has submitted the lesson learned, the experts then clicks on the name. After the expert has clicked on the name, he could read the lesson learned from the employee and then verifies it if it is satisfied from the expert point of view. After he verifies the lesson learned, the application will display a screen showing that the lesson learned has been successfully verified.

3.3.5. Design Evaluation

The evaluation method that we use in this research is a qualitative interview approach. Our interviewer consists of the two experts and three members in the tourism promotion agency, also ten from different organizations that are in charge of carrying out accountability reports in their organizations. We provide them with our prototype, we also describe the scheme and function in each feature. We then ask them three general questions, which are:

 ISSN:2302-8149
e-ISSN:2540-9719

1. What do you think about this prototype?
2. What do you suggest after seeing this prototype?
3. To what extent can this prototype help you gain useful knowledge for future projects?

4 Results and Contribution

The results showed that our designed prototype could solve the problems stated in the interview and also some features have satisfied users demand and requirements.

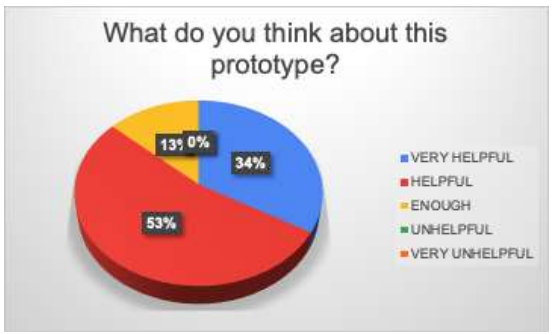

Figure 7. Prototype user experience

Figure 7 shows that 34% of our interviewees stated that our proposed prototype is very helpful to ease the writings of an accountability report, 53% said it is helpful, 13% said enough, and none of them thinks that it is unhelpful or very unhelpful.

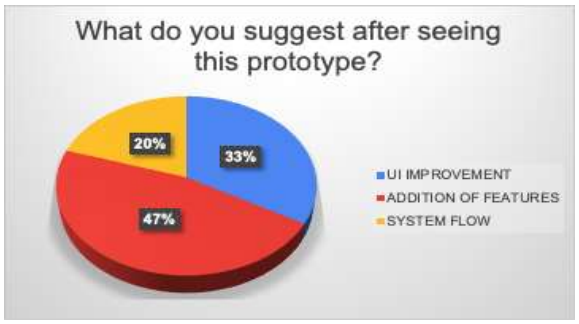

Figure 8. Prototype suggestions

As for the second conceptual testing question in Figure 8, 33% of our interviewees suggest to improve the UI in our proposed prototype, 47% of them suggest to add more features, and suggestion of improvement in the system flow is 20%. The result of this second question could be seen in Figure 8.

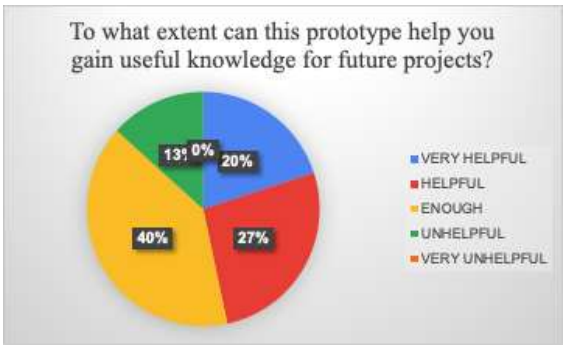

Figure 9. Prototype knowledge gaining

 ISSN:2302-8149
e-ISSN:2540-9719

Figure 9 defines the result of how this prototype could enhance employees' knowledge through an accountability report. 20% of them said it is very helpful, 27% said it is helpful, 40% of them stated their satisfaction, 13% said it was unhelpful, and none of them stated that our proposed prototype is very unhelpful to enhance employees' knowledge.

Table 1. Research contribution

Type of Contribution	Information
Suggestions	UI Improvement, Addition of Features, System Flow
Knowledge Gaining	45% positive response
User Experience	87% positive response

Based on Table 1, there are three suggestions towards the development of TUTOR, which are UI Improvement, Feature Addition, and the Flow of the System. Furthermore, the TUTOR mockup contributed by receiving 45% of positive response, this is due to the first appearance of accountability report and lesson learned digitally in tourism promotion agency. Lastly, the research contributed to 87% of positive response towards user experience within the TUTOR app. Our contribution to this research is that we designed an effective and efficient way to share knowledge amongst employees in the tourism promotion agency. In that way, employees and experts could prepare their next project to get better knowledge. Thus upcoming projects could be done better than before. We also contributed by providing members of the tourism promotion agency an easier way to carry out a relevant and integrated accountability report which manages the problems found in the current mechanism.

5 Conclusion and Limitation

We concluded that designing conceptual LLS with the approach of UCD could satisfy the demands and needs of members of the tourism promotion agency. UCD helps the research being conducted in a structured and comprehensive way with applying each phase respectively. Yet this research found many limitations throughout the process. Besides the limitations stated in table 1, we have not done a usability testing in order to test our prototype, that is because our time in conducting this research is limited. Our amount of interviewers whether it is interviews in phase specify context of use or phase evaluation are still lacking, that is also because our time of conducting this research is limited. Developing this prototype into an interactive user prototype and carrying it out to conduct a real application will be our future work to this research. The suggestions stated in chart 1 would also be our future work in order to enhance a better product so that this product could be implemented in the tourism promotion agency.

References

[1] O. Serrat, “Learning Lessons with Knowledge Audits,” no. April, 2008.
[2] E. J. Sterling *et al.*, “Try , try again : Lessons Learned from Success and Failure in Participatory Modeling,” 2019.
[3] A. W. Joseph, D. A. Boone, D. E. Mathews, L. S. Laing, and D. G. Smith, “Lessons Learned From A Successful Experience in Technology Transfer,” vol. 7, pp. 77–84, 1997.
[4] S. Duf and S. J. Whitty, “Sciencedirect How to Apply the Systemic Lessons Learned Knowledge Model To Wire An Organisation for the Capability of Storytelling,” *JPMA*, vol. 34, no. 3, pp. 429–443, 2016, doi: 10.1016/j.ijproman.2015.11.004.
[5] S. Bwigenge, D. I. Sensuse, and R. R. Suryono, “Passengers Acceptance of Cashless Payment System for Public Bus Transportation System in Kigali City (Rwanda),” 2020.
[6] V. Michelle, J. McKenzie, “Lessons learned: Structuring Knowledge Codification and Abstraction To Provide Meaningful Information for Learning”, VINE Journal of Information and Knowledge Management System, 14 August 2017.

[7] Kotnour, T. (2000), "*Organizational Learning Practices in the Project Management Environment*", International Journal of Quality and Reliability Management, Vol. 17 Nos 4/5, pp. 393-406.
[8] I. Becerra-Fernandez and R. Sabherwal, Knowledge Management Systems and Processes, New York, NY, USA:Routledge, vol. 2, 2015.
[9] P. Tang *et al.*, "User-Centered Design Approaches to Integrating Intellectual Property Information into Early Design Processes with a Design Patent Retrieval Application," *Int. J. Human–Computer Interact.*, vol. 00, no. 00, pp. 1–19, 2019, doi: 10.1080/10447318.2019.1699747.
[10] B. Still, K. Crane, "Fundamentals of User-Centered Design: a practical approach", 2017, 329 pages.
[11] X. He, H. Zhang, and J. Bian, "User-Centered Design of a Web-Based Crowdsourcing-Integrated Semantic Text Annotation Tool for Building A Mental Health Knowledge Base," *J. Biomed. Inform.*, vol. 110, no. April, p. 103571, 2020, doi: 10.1016/j.jbi.2020.103571.
[12] K. M. Ying and K. E. Boyer, "User-Centered Design of a Mobile Java Practice App : A Comparison of Question Formats," pp. 1158–1164, 2020.
[13] G. R. Philips *et al.*, "Disability and Rehabilitation : Assistive Technology User-Centred Design , Evaluation , and Refinement of a Wireless Power Wheelchair Charging System," *Disabil. Rehabil. Assist. Technol.*, vol. 0, no. 0, pp. 1–13, 2020, doi: 10.1080/17483107.2020.1818135.
[14] X. Liu, W. Wang, "User Centered Design of Attendance Record System Based on Mobile Terminals", International Symposium on Computer Science and Intelligent Controls, 2017.
[15] Ji, Yongjun, *et al.* "A Hypernetwork-Based Context-Aware Approach for Design Lesson-Learned Knowledge Proactive Feedback In Design For Manufacturing." *Advanced Engineering Informatics* 54 (2022): 101794.
[16] Kangas, Jenni. "Improving the Lesson Learned Process: A Proposal for Case Company." (2023)