

DESIGNING MINI MASTER PLAN FOR DEVELOPING E-LEARNING CONTENT IN PROJECT MANAGEMENT COURSE (CASE STUDY: PROJECT PROCUREMENT KNOWLEDGE)

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Abstract— The application of smart technology must be undertaken to achieve innovative learning and challenge of the era industrial revolution 4.0. Telkom University especially at the faculty of Industrial Engineering has applied the concept of E-learning in several courses. Therefore, the amount of material make students difficult in understanding project management materials. The design of e-learning content is very important because it affects the level of understanding of students to project management course. The author tested the design of e-learning content at the procurement knowledge area of Project Management. The media chosen to make e-learning content is video. The first step that needs to do before making a video learning is to make a project management plan. Planning can maintain the project under control and help every one to participate in right way. To meet customer expectation, design sprint is needed for generates idea from team member to developing E-learning content. The result of this study, student performance has increased after watching the video learning about the project procurement knowledge.

Keywords: E-learning, project management plan, design sprint, student performance.

I. INTRODUCTION

The application of smart technology must be taking to achieve innovative learning and challenge of the era industrial revolution 4.0. It encourages many educational institutions use E-learning to improve quality of learning. Around the mid-1800s E-learning began to be applied by the world community, especially in the United States, French, and some other European countries [1].

Project Management course is a mandatory course that must be taking by industrial engineering students at 7th semester. Project management course exams, are not open book while other theory lessons are open book. Therefore, the amount of material make students difficult in understanding project management materials.

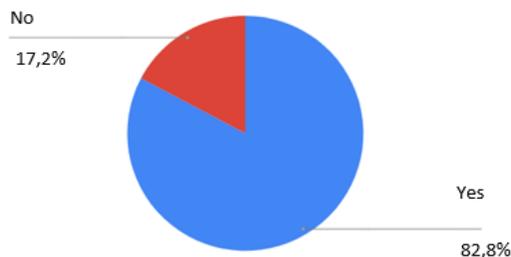


Figure 1 Need for E-Learning



Figure 2 Media for E-learning

Based on a questionnaire survey to Industrial Engineering Students generation 2013 and 2014, many of students need for E-learning and good media used that support E-learning is a video. The design of E-learning will be successful if supported by the design of good e-learning content. Design of e-learning content is very important because it affects the level of understanding of students to project management course. E-learning content design is said to be successful if student performance, before and after using video learning increases [2].

This study tested the design of e-learning content at the procurement knowledge area of Project Management. Project procurement management is a process required from outside project team to buy or obtain services, products, or results [3]. Project procurement management is a process that involves an agreement between two parties: buyers and sellers. The first step that needs to do before making a video learning is to make a project management plan. Planning can maintain the project under control and help every one to participate in right and an ordered way [4].

To meet customer expectation, design sprint is needed for generates idea from team member to developing e-learning content. Design sprint is a method to build concept of product and prototype through 5 stages in 5 days. Design sprint is useful when the risk of failure wants to reduce, get efficiency, align the project team, and build the initial process [5].

The purposed of this study is make students easily understand about project procurement knowledge in Project Management course. The writer want to give test and see the result to make sure this video learning helpful student to learn Project Management course. In the last, the writer will evaluated for before and after using e-learning content in project management course to look student performance.

II. LITERATURE STUDY

A. Projects

A project is a temporary activity to create a product, service or result that have uniqueness. A temporary project means the beginning and end of the project is certain. Projects are run to meet the objectives by generate deliverables. Deliverable may be two possibilities that is intangible or intangible. Deliverable is defined as something unique and verifiable product, result, or capability to perform a services needed to complete a process, a phase, or a project. An objective is defined as a result to which the work is directed, the strategic position to be achieved, the objective to be achieved, the results to be obtained, the product to be produced, or the service to be performed [3].

B. E-learning

E-learning is the use of internet and technology to support the learning process and create experiences that educate fellow human beings [6]. The characteristics of E-learning are as follows [7]:

1. Utilizing electronic technology
2. Utilizing the benefits of a computers that consists of digital media and computer networks
3. Using self-learning materials stored on the computer, so it can be accessed easily by faculty and students
4. Ensuring the schedule of learning, curriculum, learning progress, and all related to the administration of education so that data can be view on the computer anytime with ease.

C. Design sprint

Design sprint is needed for generates idea from team member to developing e-learning content. Design sprint is a method to build concept of product and prototype through five stages in 5 days. The general problems need to know first, before starting to design sprint. Design sprint is useful when the risk of failure wants to reduce, get efficiency, align the project team, and build the initial process [4].

In designing e-learning content, begins with a statement of work. The statement of work contains the project scope, product scope, constraints, key deliverable, assumption, and acceptance criteria of this project. Statement of work needed to avoid misunderstandings that will help team members in running the project. After the statement of work is define, next step is to make the project management plan.

In the planning stage that determined the scope, resource, schedule, stakeholder, cost, communication and risk on the project. Planning can maintain the project under control and help everyone to participate in right way. After planning is complete, the project is executed using the design print method. Design sprint is needed for generates idea from team member to developing e-learning content.

Design sprint is a method to build concept of product and prototype in five stages during 5 days. Stage-1 is about identifying and clarifying the problem on the project such as business goals, process and user needed to create a solution. Stage-2 is about sketch exercises and collaborative brainstorming that to solve the problem. Stage-3, team member discussed to choose the best idea based on voting. Stage-4, team member gathers to build a realistic prototype. Stage-5, the prototype will be tested and assessed by the target.

All processes in the design sprint will produce video learning. Student performance can be measure before and after using video learning on project procurement knowledge. The e-learning content is successful if the student performance improves better. In more detail, the design of e-learning content in the subject of project management is expect to improve student performance. With improve of students performance will make the achievement of student desire to get high grade.

III. RESEARCH METHODOLOGY

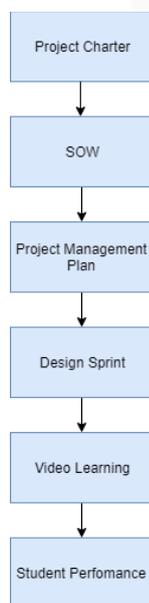


Figure 3 Research Methodology

IV. RESULT AND DISCUSSION

A. Result of Mini Project Master Plan

This section will discuss about the result of mini project master plan regarding the project.

1. Scope Analysis

TABEL I
SCOPE STATEMENT

Product scope description	The Project procurement material in project management course consist of 7 videos. The video learning for Industrial Engineering students at Telkom University.
Project scope	In scope : 1. Create a project plan 2. Design and develop video learning 3. Final video 4. Student performance Out scope : 1. Designing e-learning content for other than project management course.
Project Deliverables	The deliverable of this project is project management, project implementation and video finalization.

Acceptance Criteria	<ol style="list-style-type: none"> 1. The video learning content should be completed before the end of December 2018 2. The e-learning content is successful if the student performance improves better. 3. The project should completed on budget or under budget.
Assumptions	<ol style="list-style-type: none"> 1. The project team does not change 2. The hardware that required to make video learning can be borrowed 3. All participants of project team are present during testing phase. 4. The video learning consist of 7 videos with duration 5-7 minutes for each video.

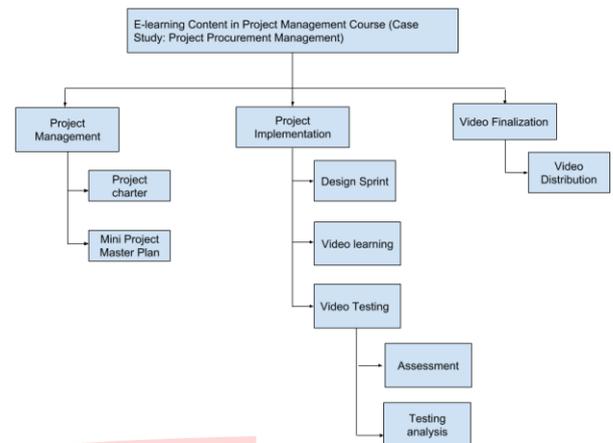


Figure 4 Work Breakdown Structure

The product scope is the Project procurement material in project management course consist of 7 videos. The video learning for Industrial Engineering students at Telkom University. There are 2 scopes in the project, in scope and out scope. In scope, means the project need to create a project plan, design and develop video learning, final video and the result of student performance. Out scope means this project not designing e-learning content for other than project management course.

2. Stakeholder Analysis

TABEL II
STAKEHOLDER ANALYSIS

The deliverable of this project is project management, project implementation and video finalization. Each major deliverable consist of a work package and every work package consist of many activities. There are 4 acceptance criteria of this project. The first is the video learning content should completed before the end of December 2018. The second, is e-learning content is successful if the student performance improves better.

Co de	Role in Project	Pow er	Imp act	Main expectation	Attitude about the project	Category
A	Project Manager	High	High	Good procurement and good skill resources	Leading and Managing	Manage Closely
B	Project owner	High	High	On time, on budget, and good result.	Leading	Manage Closely
C	Project team	Low	High	Appropriate to the criteria and meet the target	Analysis and design	Keep informed
D	Sprint master	High	High	Effective and efficient	Leading (Design sprint)	Monitor
E	Expert	Low	High	Good result	Supportive	Keep satisfied
F	Students	Low	High	Good result	Supportive	Keep satisfied
G	Lectures	Low	Low	Good result	Supportive	Keep satisfied
H	CTLE Telkom University	Low	Low	Good result	Supportive	Keep satisfied

The third is the project should completed on budget or under budget. The fourth is the project procurement material in project management course consist of 7 videos. There are 4 assumption on this project. The first is the project team does not change. The second is the hardware that required for making video learning can borrowed. The third is all participants of project team are present during testing phase. The fourth is the video learning consist of 7 videos with duration 5-7 minutes for each video.

All activity in the implementation of the project according to WBS of the scope plan. Based on the picture below, the project that will executed is designing e-learning content in project management course (case study: Project Procurement management). There are 3 major deliverables from this project including project management, project implementation and video finalization.

Each major deliverable consists of several work packages. Meanwhile, for deliverable of project implementation consist of work package and sub-deliverable. First, the work package of project management are project charter and mini project master plan. Second, the work package of project implementation are design sprint, video learning, and video testing. Video testing as sub-deliverable consist of 2 work package, including assessment and testing analysis. Third, work package of video finalization is video distribution.

Based on the table above, it can be seen that there are 8 stakeholders involved in this project. Stakeholders consist of two types, there are internal and external. Project manager, project owner, project team and sprint master are internal stakeholders. Meanwhile, expert, students, lectures, and CTLE Telkom University are external stakeholders. Each stakeholder has different power and impact on the project.

First is a project manager that has high impact on the sustainability of the project because the one responsible if the project fails is the project manager. Second, project owner that has high impact on starting a

project. Third, project team that has high impact because people are assigned to several activities on the same project. Fourth, sprint master that has high impact on the project because who responsible for the sustainability of the design sprint process from the beginning to the end.

After that, experts and students that has low impact on the project because the person who are give advice about the content in the video learning. Sixth, lectures has low impact because the person who gives advice on the project procurement material. The next, CTLE Telkom University that has low impact on the project because it is responsible for controlling the project.

3. Resource Analysis

There are 11 resources involved in this project. There is a project manager who responsible for making project charter. Each stakeholder must have specific skills and educational background that has been determined to run the project. There are 4 resources in making the mini project master plan including the project manager, and 3 team members. In making sprint design there are 11 resources, including sprint master, project manager, 3 team members, 1 lecture, and 5 participants. Sprint master who guide the team member to design sprint for procurement management videos. Lecture and participants who give feedback for the content of procurement management videos. In implementing this project, another requirement needed such as pen, paper, laptop, and others. RACI chart describe the responsibility of each resource.

4. Schedule Analysis

The schedule plan carried out to ensure the project runs on time in accordance with the planned schedule.

The total duration of the project is 84 days. This project starts on September, 05th 2018. The critical path of this project is A-B-C-D-G-H-K-L-M-N-O-P-Q-R-S-T-U-V-W. This project end on December, 31th 2018. The calculation of duration not involving holidays such as Sunday and Saturday. The team members of this project has successfully run the project based on the planned schedule. The lesson learned of schedule plan is schedule must considered based on the academic timeline so that the project completed faster.

5. Cost Analysis

The total estimates cost of the previous cost plan is Rp 888,000 for requirements. However, the actual cost of the project was carried out is Rp 153,000. There are differences in actual and planned costs because there is no salary paid to the team members involved in the project. The costs needed to run the project are only costs for requirements such as paper, cardboard, sticky notes and others. The lesson learned from cost management is not all the requirements needed to execute a project must purchased. However, these requirements can borrowed from those who have them. It is better if each team member has these requirements.

6. Communication Analysis

In communication plan, the first meeting is an activity that occurs before the project starts which involves team members and project manager. The purpose of this meeting is to determine the project manager and gather some information. The communication method used is through line and meeting.

The second activity is the implementation of sprint to determine e-learning content that involves sprint master, project manager, and team members. The communication method used is through whatsapp and meeting. The third activity is weekly meeting for submitting

progress reports and monitoring the project involving project managers and team members. The communication method used through line and meeting. The fourth activity is user interview to know users requirement that involve project managers, users, and team members. The communication method used through line and meeting.

The last activity is interview expert to know expert requirement that involve expert, project manager and team members. The communication method used through whatsapp and meeting. The lesson learned from project communication plan is important to maintain communication among stakeholders involved in the project to avoid misunderstandings that occur. It necessary to document every communication on the project.

7. Communication Analysis

There are some potential risk that might occur in the project. Risk owners are those who are responsible for the risks that occur. Risk response is the action of the risks taken by the team members and the project manager. There are 2 categories of risks which are threat and opportunity in the project. Result can be determined from the multiplication of probability and impact. Based on the results of probability and impact there are 3 different colors that categorize each level of risk. The red color indicates that the risk is high, yellow indicates the risk is medium, and green indicates that the risk that occurs is low. The lesson learned from risk management is to avoid some risks that might occur in the project and use appropriate actions and responses to risk.

B. Design Sprint Analysis

The first activity to make design sprint is preparation for equipment and tools needed. Then, sprint master and all participants of team member should be completed when execution of design sprint. The idea of team member write on the note and then put on the board. Sprint name, team member, and sprint master should defined to execute the design sprint.

Devi Pratami as sprint master who guide the team member to design sprint for procurement management videos for improves student performance. Design sprint takes 5 days. Design sprint on the first day is about identifying and clarifying the problem on the project such as goals, process and user needed to create a solution.

Design sprint on the second day is about sketch exercises and collaborative brainstorming to solve the problem. Design sprint on the third day is about team member discussed to choose the best idea based on voting. Design sprint on the fourth day is about team member gathers to build a realistic prototype. Design sprint on the fifth day is the prototype will be tested and assessed by the target.

D. Video Testing Analysis

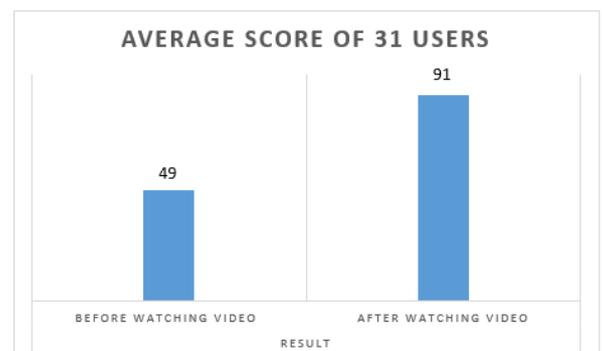


Figure 5 Average Score of 31 Users

From the picture above, the average score of 31 users before watching the video is 49. Meanwhile, the average value of 31 users after watching the video is 91. The number of questions that must be answered by each user is 21 questions before watching the video and 21 questions after watching the video with the same type of question. These videos and questions are included in the Google Form. Student performance has increased after watching the video learning about the project procurement knowledge.

CONCLUSION

Based on the results obtained from this study, it can be concluded that:

1. This project is successfully implemented based on scope, objective, and not over budget. The lesson learned from scope is very important to pay attention to the scope of the project and product. The lesson learned of schedule plan is schedule must be considered based on the academic timeline so, the project completed faster. The lesson learned from resource plan is that it is important to document all performance of the resource. The lesson learned from cost management is not all the requirements needed to execute a project must be purchased. The lesson learned of stakeholder is project manager that has high impact on the sustainability of the project because the one responsible if the project fails is the project manager. The lesson learned from project communication plan is important to maintain communication among stakeholders involved in the project to avoid misunderstandings that occur.
2. For developing e-learning content that is in accordance with the expectations of the user, it is very helpful to use sprint design. Design sprint takes 5 days. Design sprint on the first day is about identifying and clarifying the problem on the project such as goals, process and user needed to create a solution. Design sprint on the second day is about sketch exercises and collaborative brainstorming to solve the problem. Design sprint on the third day is about team member discussed to choose the best idea based on voting. Design sprint on the fourth day is about team member gathers to build a realistic prototype. Design sprint on the fifth day is the prototype will be tested and assessed on the target.
3. Based on the analysis of average score before and after watching video learning, student performance increase as much as 85%. Student performance has increased after watching the video learning about the project procurement knowledge.

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