

Project Management Plan Design for Developing E-learning Content

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ABSTRACT: *E-learning is considered as a better learning that provides technology assistance to support learning. While e-learning gives more flexibility toward learning, the creation of e-learning content needs more attention. The purpose of the paper is to provide project management plan based on Project Management Body of Knowledge or PMBOK in short, to the creation of e-learning content. The creation of something that produces product, service or result is considered as a project. In other words, the e-learning content creation is one of the definitive project. However, 71% of the projects were failed or challenged and one of the top reasons why project failed is bad estimates of planning in the project. Even more challenging, e-learning project suffers more than the failure rate of information system. Just having a plan and poor planning may lead to failed project. Nevertheless, the e-learning project needs project management plan. Rather than as a methodology of the research, the project management plan can be considered as a guide to carry out the work in the project. The study found that the project management plan consists of scope, time, cost and quality. This research will be useful for those who concerned in creating project management plan. Mostly of project plans are based on scope, time, and schedule. But it remains to be seen whether the product has met the customer or owner expectation. Thus solution to the e-learning project failure lies in creating project management plan which includes scope, schedule, cost, and quality.*

Keywords: E-learning, Project Management, Project Management Plan, Agile

Received: 1 November 2018, Revised 24 December 2018, Accepted 20 January 2019

DOI: 10.6025/jism/2019/9/2/37-47

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1. Introduction

The use of online learning is not a new thing anymore. By deploying online learning, the educator may improve the efficiency and effectiveness of their services (Park & Lim, 2015). Online learning, in this case, may refer to e-learning and mobile learning. While mobile learning can be accessed through mobile devices, elearning can be accessed through Personal Computer (PC), laptop, smartphone, and an electronic device. In other words, any learning that uses internet or intranet may refer to e-learning (Fee, 2009). It could be video, games, animation (Clark & Mayer, 2016), etc.

E-learning is a new way of learning in which technology plays a vital role in supporting learning (Clark & Mayer, 2016). It also has brought advantages to learners and trainers and has been adopted in various fields from educational institutions, the companies,

and the military (Bezhovski & Poorani, 2016). One of the reasons that e-learning should be built since it is useful for learning and teaching (Somayeh et al, 2016).

According to Orbis Research report, the global e-learning market is accounted for \$165.21 billion in 2015 and by 2020, the global e-learning market is expected to reach \$275.10 billion (Orbis Research & Orbis, 2017). Based on that forecast, global e-learning market in 2020 will be even more booming than it is now. It shows a huge demand for implementing e-learning.

However, Should the need for e-learning is a must, providing the better e-learning services might be one of the hardest things to do. Without purposeful planning, it will potentially lead to negative disruption and may damage to an institution's culture (Picciano, 2015).

And then, the question is which plan should be created? Developing e-learning content and implementing it in the course, is one of the examples of the project. The project is a temporary activity which is producing product or service and the result is unique (Project Management Institute, 2017). Anything that has time to end and produce unique product or service is a project by definition. In other words, the plan, which is required to develop e-learning content, is the project management plan.

Even so, how does the project management plan have to do with that? executing the project is risky. Most organizations failed the project or were challenged for 71% according to the Standish Group "Chaos Report" in 2015 (Standish Group, 2015). Not to mention that the failure rate of information system is 30% (Brown et al, 2007), and e-learning itself as information system, suffers higher failure rates (Hogarth & Dawson, 2008).

Even more surprising, according to the PricewaterhouseCoopers report in 2014 (PricewaterhouseCoopers, 2014), one of the top three reasons why the project failed is caused by bad estimates in the planning phase. In other words, just having a plan to execute the project (Aileron, 2011), and poor planning, may lead to failed project (Thomas et al, 2008).

Thus, the project management plan is important for all projects (DepczyDska & Lanfranchi, 2016). One thing for sure, the critical factor for project success is having a well-develop project plan (DepczyDska & Lanfranchi, 2016). Project plan refers to project management plan. Project management plan is a process of preparing all components and create them as an integrated plan (Project Management Institute, 2017). The output of the project management plan may vary due to the different requirement between each project, but ones remain certain at least are scope, time or schedule and cost (Project Management Institute, 2017).

In the past, the projects were delayed because changes in scope during execution (PricewaterhouseCoopers, 2014). Not to mention, in 2012, poorly defined goal and objectives led the projects to failure (PricewaterhouseCoopers, 2014). And still in the same survey, 24% of Project Managers say that costs are not clear within the lifecycle of delivery (PricewaterhouseCoopers, 2014). As for schedule, almost a third of Project Managers do not have integrated schedule within the project (PricewaterhouseCoopers, 2014). As for the quality, some 94% defects (Nichols, 2002) were occurred in the past. That is why scope, time, and schedule are related to each other and need to be paid attention during planning phase with quality is also included.

On top of that, having a project management plan will be useful because the report showed that 80% of global executives believed that project management as a core practice may help them to remain competitive during the recession (Berkun, 2008).

Especially for e-learning project, the e-learning content that needs to be developed is for project management course due to the massive need of project management practice in the coming years (PMI, 2017). The average project-oriented workers will have an 82% premium than other workers (PMI, 2017). Since project management skill will be on high demand in the coming years, providing the better course may help them to master the project management.

At one point, project management plan can be implemented by Center for Teaching and Learning Excellent or CTLE in short, at X University. CTLE has recruited some students to be involved in the project for developing e-learning content for students.

This study focuses on how to create the project management plan at X University. This study explores the project management plan for developing e-learning content with a case study from CTLE. Hence, we proposed the project management plan, which includes: scope, schedule, cost, and quality, to develop e-learning content for project management course at X University.

2. Literature Review

Unlike previous researches, the study from Iqbal et al (2015) did not tell whether the framework of e-learning content has been met the criteria. It only has agile lifecycle and no explanation regarding to how the project has completed on scope, time, budget or not. The quality metric does not apply in this study.

Another study also did not mention whether the efforts to make multimedia games cost some amount of money to conduct (Kaewkiriya, 2013). Or how the scope and schedule were met, remains a mystery in the study (Kaewkiriya, 2013). The similar study from Owen and Furham (2015) was conducted using agile method to develop e-learning content (blended flipped learning), but still no information on how the scope of the project should be, the timeline to conduct the project, and how much money it has to spend to implement the results which were obtained from agile method.

Another researcher tried to implement project management plan by focusing on triple constraint: scope, time, and schedule (Fitri et al, 2018). But they did not focus on e-learning project. They also did not use quality metric to indicate the tasks were still on the right path. Because of those positions based on researchers, this study, conducted by the writers, focus on scope, time, cost, and quality within the project management plan.

There are many methodologies in the world to execute the project. Here, authors used guidance from Project Management Body of Knowledge or PMBOK in short. Instead of using PRINCE2, which is a structured methodology for project management used extensively by the United Kingdom government, PMBOK is more completed when it comes to planning view (Matos & Lopes, 2013). The methodology could be anything, such as agile, waterfall, or even PRINCE2 as well (Project Management Institute, 2017). Rather than a methodology for the project, PMBOK is like a guide for carrying out the work in the project (Project Management Institute, 2017). That is why authors choose the Project Management Body of Knowledge as a guide to carrying out the work in the project.

This study was examined by creating project management plan. As stated earlier, the project management plan in this case, consists of scope statement, schedule management, cost management and quality management. By doing so, the project team can simplify the plan into several parts within the project management plan. The project management plan is based on Project Management Body of Knowledge or PMBOK.

The following are should be considered in the project management plan:

2.1. Project Objective

To earn the best result, the objective can be explained by using the SMART approach. The SMART consists of 5 elements. The SMART approach consists of Specific, Measurable, Attainable, Relevant, and Time-Bound (Scott, 2015).

Specific means the objective must avoid misunderstanding about the project itself. Measurable is how the project can be measurable. On the other hand, Attainable is about the possibility to end within the given time. And Relevant. It means the mission, whom the project manager leads in charge, should align with the organizational goal. And last but not least, Time-Bound. The project must be finished before the given deadline ends.

2.2. Project Scope Management

Project scope management documents description of how the project will be defined, developed, monitored, controlled, and validated (Project Management Institute, 2017). The scope here refers to product scope and project scope. Product scope is about features and functions to characterize the output such as product, service, or result. Project scope means what work has to be performed to deliver such outputs.

Work breakdown structure is the list of work activities to be delivered within the project (Project Management Institute, 2017); Ubani et al, 2015). Work breakdown structure decomposes the scope of work into the smaller one which becomes the work package or the lowest level of work breakdown structure. The goal is to easier the deliverable into the smaller ones.

2.3. Project Schedule Management

Project schedule management is how to manage activities based on activities planned date until the completion of the project. The schedule is one of the triple constraints that play a vital role (Project Management Institute, 2017). One of the main things

to deliver the project is the completion of the project itself based on the schedule.

One of scheduling tools is the Critical Path Method (Rautela et al, 2015). Critical path may refer to the longest path which comes from the beginning to the ending of the project (Kerzner, 2009). And by calculating the earliest time the activity can start (ES), latest time the activity can start (LS), the earliest the activity can finish (EF), and the latest time the activity can finish (LF), the expected minimum duration and slack time can be determined (Gul, 2017).

2.4. Project Cost Management

Project cost management is concerned with the cost needed to finish project activities (Project Management Institute, 2017). For instance, estimating cost allows forecasting cost in the project with some available information. It is to determine the monetary resources required in the project.

There is no absolute method to estimate cost. It may rely on the estimator to predict the cost (Haroun, 2015). One of the methods to estimate cost is activity-based costing. Activities that consume resources, which results in generating cost, is activity-based costing. The key thing is to identify the cost for each activity required in the project.

2.5. Project Quality Management

Plan quality management is to identify quality requirements for the project and its deliverables (Project Management Institute, 2017). The quality means meeting the customer or customer expectation (Fitri et al, 2018). The main focus the quality plays is the correctness of any deliverables in the project (Project Management Institute, 2017). One of the possible ways to do that is to use

Code	Activity name	Predecessor	Duration (days)
A	Define the project objective	None	1
B	Define Scope	A	2
C	Estimate schedule	B	3
D	Estimate cost	C	5
E	Identify stakeholder and communication	D	3
F	Identify risk	B	4
G	Generate ideas	E	4
H	Choose concept	G	1
I	Determine requirement	H	1
J	Design video	I	4
K	Testing content	J	7
L	Evaluate content	K	3
M	Publish content	L	1

Table 1. Duration Estimated by Ctle

quality metric. Quality metric means that the customer expectation is translated to numerical indicator to make sure the work in the project stays on the right track. One of tools of quality metric is internal earliest the activity can finish (EF), and the latest time the activity can finish (LF), the expected minimum duration and slack time can be determined (Gul, 2017).

3. Case Study

The Center for Teaching and Learning Excellent (CTLE) at X University will have an upcoming project for developing e-learning content in a project management course. The project should be started on October, 10th 2018. The outcome will be e-learning content for project management course no later than November, 27th 2018.

The CTLE has set the objective that e-learning content is a must and e-learning content will cover all the learning outcomes in the course. There are 13 learning outcomes in the course. The CTLE has predicted the project will be possible to finish within the given time. The outcomes of the project are 13 learning outcomes in the course must be converted to video-based learning. The project is relevant to the organization goal to make learning even better.

The project manager will lead the project team to deliver the project. The project scope is divided into two categories. The first one is in scope. It consists of planning the project management plan, designing and developing the video learning, and delivering the final product. Out of the scope will be creating e-learning content for other courses. The project focuses on delivering the video-based learning.

The acceptance criteria will be e-learning content, which supposed to be video learning, by the end of the project. The project

Code	Activity name	Resources (n)	Estimated cost
A	Define project objective	2	\$ 30
B	Define Scope	3	\$ 50
C	Estimate schedule	4	\$ 60
D	Estimate cost of the project	4	\$ 60
E	Identify stakeholder and communication	4	\$ 40
F	Identify risk	2	\$ 80
G	Generate ideas	3	\$ 20
H	Choose concept	2	\$ 200
I	Determine requirement	4	\$ 400
J	Design video	3	\$ 300
K	Testing content	4	\$ 150
L	Evaluate content	3	\$ 70
M	Publish content	4	\$ 40

Table 2. Cost Estimated by CTLE

should be on a budget or under budget and on time or under time. All criteria should be met in order to close the project.

As for the schedule, the Center for Teaching and Learning Excellent has estimated the duration for each activity to be carried out until it is finished (see Table 2). The duration of the project is expected to start on October, 10th 2018 and end no later than November, 27th 2018.

The project manager can decide just how many resources should be assigned to. There are 4 members in the project team including project manager. How many members are assigned to activity will not change the allocation of cost (see Table 2). Resources who are assigned to an activity will be under the project manager decision. Project team members consist of member 1, member 2, and member 3.

The Center for Teaching and Learning Excellent has set the estimated cost for each activity. The project budget is \$ 1,500. There will be no additional fund for this project, therefore the project must be completed within the given budget (see Table 2). The estimated cost will not be changed due to the fixed price set by CTLE of X University.

4. Result and Findings

Specific	E-learning content for project management course for students. It will be started on October, 10th 2018
Measurable	There are 13 e-learning contents which are videobased learning for project management course for all learning outcomes on November, 27th 2018
Attainable	The project is still possible to do within the given time
Relevant	E-learning aligns with organization goal to create better learning
Time- Bound	The project must be completed before November, 27th 2018

Table 3. Smart Objective

Based on the case study, the specific goal is to deliver the e-learning content for a project management course. The expected outcomes are 13 e-learning contents for all learning outcomes in the course. The project is possible to execute. The project supports the organization goal to create better learning. And the project must be completed before or no later than November 27th.

The smart objective aligns together with scope statement to ensure the product scope is as same as the specific has described. The measurable is to prove that the project has been met the criteria with the numbers of result speaks itself. That proves the result of the project in measureable number or criteria.

4.1. Project Scope Statement

Project name	Developing e-learning content for project management course
Prepared by	Project manager
Date	October, 10th 2018
Product scope description (product, service or result)	There will be 13 e-learning contents, which are video-based learning, in project management course for all learning outcomes

Project scope	In scope: 1.Create a project plan 2.Design and develop video learning 3.Publish video learning
	Out of scope: 1.Design and develop e-learning content other than project management course
Project deliverables	Major deliverables are project management, video learning, and final product (see Fig.1).
Acceptance criteria	1. The outcomes are 13 video-based learnings 2. E-learning should be done before or on November, 27th 2018. The project must be completed on time or under time 3. The project must be completed on budget or under budget

Table 4. Scope Statement

Based on a case study, the product or result of the project is video-based learning for a project management course. All learning outcomes will be converted to video learning as many as 13 videos. The project focuses on creating project management plan, designing, developing and publishing video learning.

Project deliverables consist of the project management, video learning, and final product. All are included in the work breakdown structure (see Fig. 1). Acceptance criteria for this project are 13 video-based learnings, the product must be done before or on November, 27th 2018, it must be completed on time or under time and the project must be completed on or under the budget.

4.2. Project Schedule Statement

Figure 3 shows the timeline of the project starting on October, 10th 2018 to November, 27th 2018 in critical path. Based on Fig. 3, the duration of the project is 38 days. The red color indicates the critical path or the longest path the project is going to take. Based on the critical path, the expected duration of the project can be shortened by 4 days or just 34 days to end the project (see Fig. 3)

Critical path method network is activity based (Rautela et al, 2015). Of which, the longest path has zero total floats. Fig. 3 shows the selected critical path is start-A-B-C-D-E-G-H-I-J-K-L-M-Finish. It can be obtained by comparing the longest duration of all possible paths.

From there, the critical path will have no total float. As shown in Fig. 2, there are 6 elements in the box. The upper left is the earliest start, the upper right is the earliest finish, the bottom right is the latest finish and the bottom left is the latest start. Between the earliest start and earliest finish is the duration of the activity and between the latest start and latest finish is a total float.

Suppose in this case, there are two paths. The first one is start- A-B-C-D-E-G-H-I-J-K-L-M-Finish and the other one is start-A-B-F- Finish. The first one duration is 34 days while the other one is 7. Therefore, the selected critical path is start-A-B-C-D-E-G-H-I-J-K-L- M-Finish.

For activity F, due to the expected minimum duration of the project is 34 days, therefore, the latest finish is as same as the expected minimum duration to end the project. Then, the total float of activity F will be the difference between the latest finish of activity F and the earliest finish of activity F. The total float is 27 days. That means if the activity has not finished yet, the activity still can be delayed or extended for 27 days without delaying the project finish date.

For the latest start of activity F, it can be obtained by subtracting the latest finish of activity F with duration of activity F and adding 1. The latest start is 31 days. That means the activity can be started as late as 31 days of the project without delaying the project finish date.

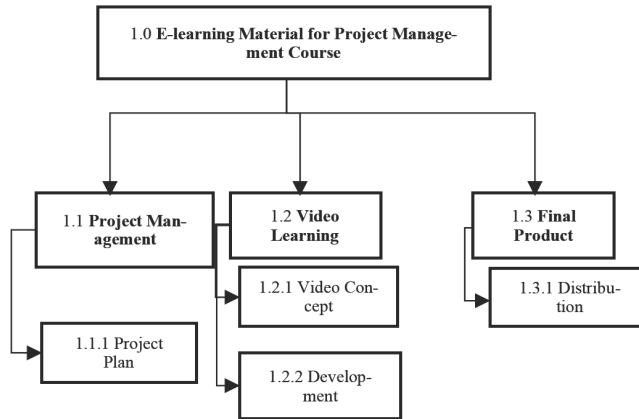


Figure 1. Work Breakdown Structure

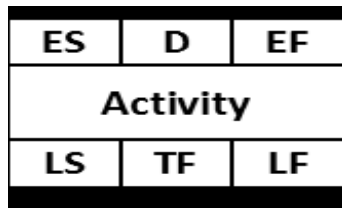


Figure 2. Critical Path Method (Project Management Institute, 2017)

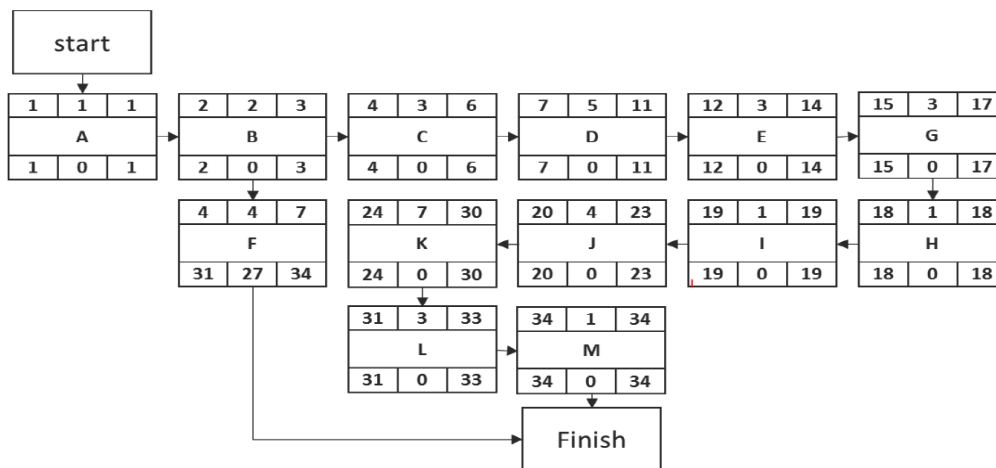


Figure 3. Critical Path

4.3. Project Cost Management

The project cost is based on activity-costing of which the activity cost the project some amount of the money and will be used to produce deliverables to accomplish the objective. All activities can be found within the work breakdown structure (see Fig. 1 and Table 1). Resources here, whom are assigned to the project, are the project team.

For the project plan, project management plan will be divided into smaller ones. They are defined as defining objective, scope, estimating schedule, cost, identifying stakeholder and communication, and risk. Each activity is given the estimated cost to produce deliverables.

The estimated cost for each deliverable can be seen in Table 5. Each deliverable is estimated by estimating each activity cost. The

total budget will be \$ 1,500 for the project. No additional budget will be increased, consider to finish the project within the budget.

Deliverable number 1, project management, consists of creating document related to project management. Each activity in deliverable number 1 uses different numbers of resources. Each activity will not change the allocation of cost. Therefore, the activity must be completed either on or under budget. Estimated cost for project management deliverable is \$ 320 (see Table 5).

No	Deliverable	Estimated cost
1	Project management	\$ 320
2	Video learning	\$ 1,140
3	Final product	\$ 40

Table 5. Estimated Cost for Deliverables

The same goes to deliverable number 2. Deliverable number 2, video learning, will use 4 resources for each activity. Its resources will not change the allocation of cost. Estimated cost for video learning is \$ 1,140. As stated earlier, there will be no additional budget in this project. As for the last deliverable, the final product, the cost of deliverable is \$ 40. The activity in this deliverable is publishing the content. Four resources are up for the task (see Table 2). The final product will be video-based learning for project management course.

4.4. Project Quality Management

Deliverables	Possible errors	Success Criteria	Internal Control
Project Management	Not get approval	One approval from executive in the project	Getting approval on the appropriate date
Video-based learning	<ol style="list-style-type: none"> 1. More than 7 minutes for each video 2. No talking head 3. The quality is not in 720p 4. Use too much colours 5. Make more 13 video-based learning 	<ol style="list-style-type: none"> 1. No more than 7 minutes for each video (Guo et al, 2014) 2. Should have talking head (Guo et al, 2014) 3. In 720p quality (Garapati, 2010) 4. Do not have two colours in the same time (Jones, 2003) 5. 13 video-based learning are produced 	<ol style="list-style-type: none"> 1. Check the final result of Videos and remind the team to implement it 2. Check the final result of Videos and remind the team to implement it 3. Try to re-produce (render the video) 4. Set the appropriate colours 5. Get agreement from executive
Final Product	Get plagiarism	Not a single video get indicated by plagiarism	Make sure to check the video based learning before released.

Table 6. Quality Metric

The quality metric is made for all deliverables. The purpose of quality metric is to measure the work in the project stays on the right track. For each deliverable, the critical success factors are also given as a measurement. The video-based learning should be made as the following criteria (see Table 6).

5. Conclusions

Through examining the project management plan, the project management plan in this study consists of scope statement, schedule management, cost management and quality management. In this regard, this study suggests by applying project plan in creating elearning allows to be more prepared in preparing the project. Through the creation of the project, relying on facts and evidence can make the project to be more specific in details. The more details of it, the better project management plan will ever be created.

The authors suggest that future researchers, instead of using PMBOK as a guide to create project management plan, may use PRINCE2 to create project management plan. From there, another researcher could compare the project management plan between using PMBOK and PRINCE2. For now, all suggestions remain unanswered.

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