Designing Project Baseline Team 2 and Cost Reimbursement Dashboard of Integrated Educational Application Development Project at XYZ Company

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Abstract—One of the most critical issues while implementing the project is Project delay. The delay will affect cost overruns and take longer to complete when it is delayed. And the costs that must be expended for a project must be precisely maintained and tracked. this study focused on the design of the baseline scope, baseline schedule, and dashboard of the reimbursement dashboard system. The decomposition method is used to divide the scope or project scope and project results into levels or hierarchical tiers of work to make them more specific and manageable. Designing the schedule baseline using the critical path method (CPM) to calculate the time required to complete the various stages of a project, which is supposed to be precise as well as the relationship between the resources utilized and the time required to complete the project. The design of the cost reimbursement dashboard is based on the issues stated in this project because the reimbursement process is still conducted manually, making it difficult to monitor and control expenses. By utilizing this dashboard, it is expected that users and other stakeholders will be able to streamline each step of this expense reimbursement.

Keyword— scope baseline, schedule baseline, cost reimbursement

I. PRELIMINARY

The use of information and communication technology (ICT) is increasing day by day because it has so many benefits for society. In Indonesia, information and communication technology (ICT) is quickly expanding.

FIGURE 1
(ICT Index)

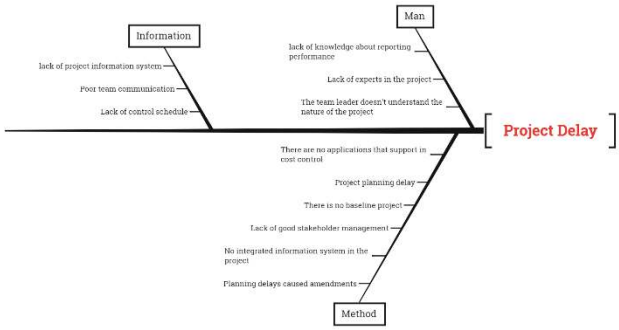
One of the benefits of information technology that can be felt by the community in everyday life is information technology in the field of education. Z University is one of the universities that implement information technology systems. XYZ Company is an intermediation institution under the auspices of Telkom Education Foundation, which was established in 2010.

Timeline	2021		
Month	10	11	12
Project Plan	Start Plan	Project Running	
Actualization of Project Start	Delays		Actualization Start

FIGURE 2.
(Project Delay)

Based on the interview results with project owners, as can be seen in figure 2 above, there is a delay in the integrated education application development project for Z University from the plan set out at the beginning. The yellow color indicates the project work plan, and the green color indicates the actual realization of the project

work. The project was supposed to have started in October, but the realization was that it began in December. This indicates that the project is already 2 months behind the original plan. This will have an impact on the addition of time and cost to the sustainability of the project in the future.



Based on the Figure of the fishbone diagram above, project XYZ company has some problems in the project planning phase that have not been under the system in project management. The alternative solution for the problems is designing a scope, schedule baseline, and cost reimbursement dashboard.

II. THEORITICAL REVIEW

A. Project Management

project management is the application of knowledge, skills, tools, and techniques in project activities to meet project needs. The process of project management is divided into five phases:

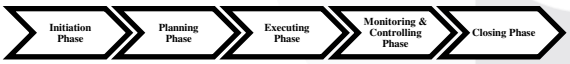


FIGURE 4.
(Project Management Phase)

B. Scope Baseline

The baseline scope is one of the components of the project management plan. Scope baseline is an approved version of the scope statement, WBS, and WBS dictionary (Project Management Institute, 2017). The baseline scope may change if there is an activity update or quality improvement on the project. If the baseline scope is to be changed it must be compared with the actual result whether it needs to change or not. The baseline scope can only be changed through formal change control procedures.

C. Decomposition

Decomposition is a technique used to break down, divide, and divide the scope and project deliverables into smaller, manageable parts (Project Management Institute, 2017). With decomposition techniques, the team will more easily define the work package to the lowest level to reduce the complexity of the project.

D. Schedule Baseline

A baseline schedule is an approved schedule model that can be changed only through formal changes to control procedures and used as a basic benchmark for comparison with actual results (Project Management Institute, 2017). The start date and finish date on the baseline schedule must be accepted and approved by stakeholders. From this baseline schedule, a project can be said to be delayed if the date that has been determined on the baseline with the implementation date is not appropriate or experiencing delays.

E. Critical Path Method

The critical path method (CPM) is a method used to estimate the minimum duration of a project and determine the amount of schedule flexibility in a schedule model (Project Management Institute, 2017). The function of CPM is to show the relationship between activities conducted in a project, and whether the project is following the schedule or requires additional time (Leksono & dkk, 2018). This method calculates early start, early finish, and late finish for all activities without considering the limitations of resources. In the Critical Path Method, there is a critical path, the critical path is the path that has the longest duration between any activity node.

F. Reimbursement

The process of replenishing funds in a nominal amount from the company to employees as a claim for funds issued by employees for the benefit of the company is known as reimbursement (Anugerah & al, 2020). In the process, each company will have a policy governing the limitations and uses of reimbursable funds.

G. SDLC (System Development Life Cycle)

The system development life cycle (SDLC) is a process cycle used in the creation and modification of systems as well as models and methodologies for developing systems in system engineering and software engineering (Rohmah, 2021). The function of the system development life cycle (SDLC) is as a means of communication of teams with stakeholders, also functioning in dividing roles and responsibilities clearly between

developers, designers, business analysts, and project managers.

H. UML

Unified Model Language (UML) is a visual modelling language, that was used by system developers to create a blueprint that outlines their concept for a system in a standardized, intelligible format and facilitates communication with other parties (Simaremare & al, 2013). UML is comprised of several graphical elements that are merged into diagrams. The objective of portraying graphical elements in a diagram is to display many perspectives of a system dependent on the function of each diagram. This assortment of diverse perspectives is known as a model.

III. METHOD

The flow of the design process is described as follows:

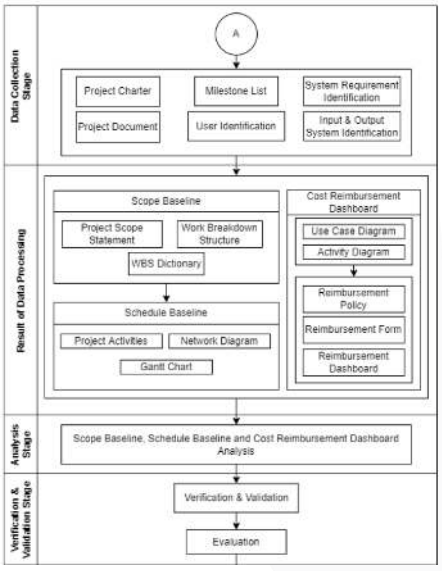


FIGURE 5.
(Research Systematic)

At the data, collection stage gathers the equipment needed as research input. In the processing stage, data that has been collected at the previous stage is processed at this stage. The data processing stage starts with the design of the baseline scope with project charter input using decomposition methods that produce project scope statements, work breakdown structures, and work breakdown structure dictionaries to find out in detail the activities in the project. Baseline scope design uses decomposition methods. After the baseline scope design is completed, the design of the baseline schedule can be done with an input activity list, milestone list, sequence activity, and estimation activity duration using the critical path method (CPM) method that produces network diagrams and Gantt charts.

After gathering user data, system requirements, and system inputs and outputs for the dashboard design for cost reimbursement, the following stage is to design the system. In the process of creating this system, UML will be generated in the form of use case diagrams and activity diagrams that provide references for dashboard design. This design generates a policy for cost reimbursement, a form for cost reimbursement, and a dashboard for cost reimbursement.

IV. RESULT AND DISCUSSION

A. Scope Baseline

The design of the scope baseline involves two inputs, a project document, and a project charter, with the project document containing the business requirements for creating team 2 accreditation applications. The project charter includes an agreement between team 2 and project stakeholders. The design is then executed with the outcomes of the project scope statement, WBS, and WBS Dictionary.

B. Schedule Baseline

The output of designing the scope baseline and milestone list is the input to the schedule baseline design process. Based on the acquired data and the project charter, the first step of the schedule baseline design process is to create a time plan. The BRS stage is predicted to take two months, the development stage is estimated to take three months, the UAT and BAST phases are each estimated to take one month, and the retention term is twelve months. data collected and processed into project activities, network diagrams, and Gantt charts.

C. Cost Reimbursement Dashboard

1. Reimbursement Status Log

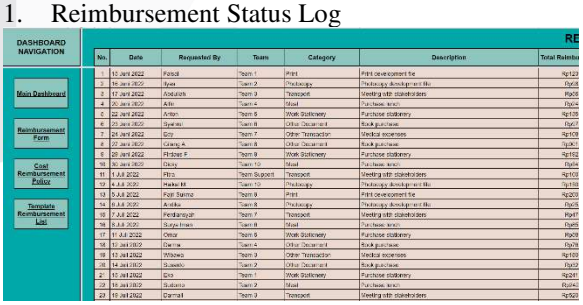


FIGURE 6.
(Reimbursement Status Log)

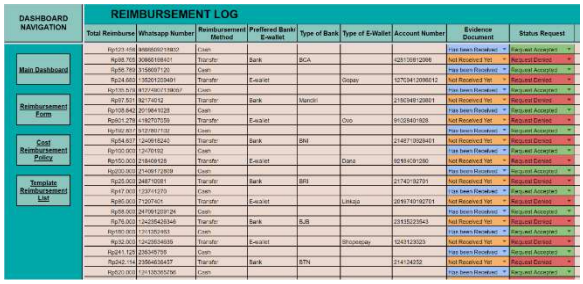


FIGURE 7.
(Reimbursement Status Log 2)

This reimbursement status log provides all information pertinent to the user's reimbursement request. This log is integrated immediately into the reimbursement form. This log's purpose is to allow applicants to view the status of their reimbursement request, whether it has been approved or denied, as well as if the project support party has received physical proof. The requester can only view the contents of this log and cannot modify it.

2. Database

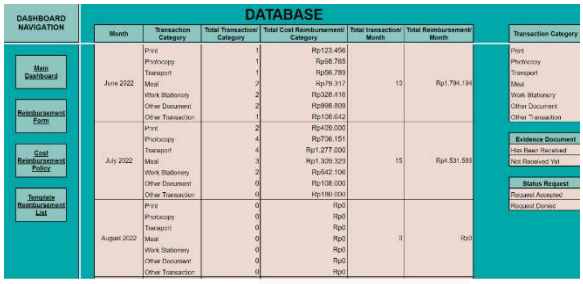


FIGURE 8.
(Database Dashboard)

The reimbursement database is part of the system where all applicant data that has been entered into the reimbursement status log will be processed in the database. The data processing is conducted before being displayed in a visual form on the dashboard. Database compilation by month, category, team, etc. This part collects all data so that it is nicely arranged, and the process of data tracking is simplified.

3. Dashboard

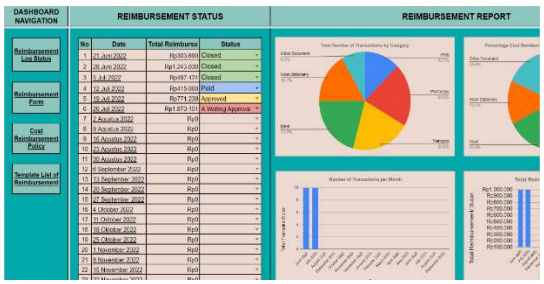


FIGURE 9.
(Cost Reimbursement Dashboard)

In the reimbursement dashboard, all data gathered in the database is visually shown on the dashboard; in other words, the dashboard displays the outcomes of data processing. This makes it easier for the team to analyze what the team's biggest expenses are for transaction fees, the most wasteful month on the project, the category of transactions that require the most fees, the team with the most transactions, the team with the largest use of fees, and information on whether requests from forwarded applicants to the project support have been processed by the finance.

V. CONCLUSION

The scope baseline design generates multiple deliverables that can be utilized as references for project implementation. In defining the scope baseline, you can determine the extent of the activities that will be performed during the project. Project documents and project charters are inputs for the design of the scope baseline. The scope baseline outputs are WBS and WBS Dictionary. The WBS specifies the work or activities to be performed through the project, from the BRS preparation phase to the closing phase or retention period. In the WBS design, it is divided into 3 levels where level 1 is the name of the project, then it is broken down to level 2 which contains the stages of project work. Level 3 contains the work package of each activity on the project. After the WBS is designed, the next step is to create a WBS dictionary which contains a detailed description of each activity covered by the WBS starting from the BRS Phase to the retention phase.

The baseline schedule design produces several outputs that can be used as a reference for project implementation. This design produces project activities, network diagrams, and Gantt charts. The project activities contain the WBS number, project activity, activity sequence, start date, end date, and the duration of each activity that must reach the project milestones that have been made. The total activity on the project is 14 activities and the total duration of development of the accreditation application will be carried out for 577 days / approximately 19 months starting from December 1, 2021 and is estimated to end on June 30, 2023. with the BRS stage conducted for 2 months, the development stage conducted for 3 months, the UAT stage conducted for 1 month, the BAST stage conducted for 1 month, and the retention period stage is 12 months. The result of the network diagram shows that the project has a critical path as a result that ten out of 15 key activities have the

longest time. The output of another schedule baseline design is a Gantt chart, which is a horizontal bar chart displaying a network diagram with start and end dates for each activity, sequence, and duration.

The dashboard design for cost reimbursement generates cost reimbursement policies, forms, and dashboards. The dashboard for cost reimbursement is designed to streamline the reimbursement process and make it easier to monitor and control costs. For each reimbursement process, the team must adhere to the policies, fill out the form with pertinent information, and indicate whether the reimbursement was accepted or rejected.

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