SISTEM INFORMASI MANAJEMEN PROYEK DI PT. RENOVINDO UTAMA

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ABSTRACT

PT. Renovindo Utama is a company engaged in the procurement of goods and services, including the procurement of accessories for raw materials BUMN or Private Enterprise maintenance and construction services such as building construction of storied buildings, offices and other buildings. PT. Renovindo Utama in the previous project implementation often occurs delays where the project is done can not be completed within the specified time. These delays occur due to difficult community coordination, access to project environments that do not support the project implementation and protests of certain organizations that lead to increased time spent on project execution, the absence of risk recording and handling if such risk occurs. From the above problems, it takes an analysis and application of methods that can improve the effectiveness in controlling at the time of project implementation. Precedence Diagram Method (PDM) is used to find the critical path. The Earned Value Management (EVM) method is used to control the cost and time of the project, and to assess risk by combining risk aversion opportunities using method Failure Mode Effect Analysis (FMEA). Based on the results of research and analysis that has been done, is expected to project management information system at PT. Major Renovindo can assist project managers in controlling projects that are being worked on, so that the project can proceed with what has been planned.

Keyword : Information system, project management, Precedence Diagram Method, Earned Value Management, Failure Mode Effect Analysis.

1. INTRODUCTION

PT. Renovindo Utama is a company engaged in the procurement of goods and services, including the procurement of accessories for raw materials SOEs or Private Enterprise maintenance and construction services such as building construction of storied buildings, offices and other buildings. PT. Renovindo Utama is located at Jalan L.i.r.e. Martadinata no 44 Bandung and has experience in working on project procurement of accessories and building construction of buildings for government agencies and private.

Based on interviews conducted with Mr. Bagus Ari Wibowo as the project manager, explained that in the previous project implementation there is often a delay where the project is done can not be completed within the specified time. As in the construction of the renovation project of PLN rayaon Rancaekek office which can be seen in Appendix D which is the scheduling of the renovation project of PLN rayon Rancaekek office, where the project schedule is not in accordance with what has been planned, the delay that occurred in the renovation project of PLN rayon Rancaekek is found in the preparation of work, where the delay in the preparation of this work occurs because of the coordination with the difficult community, access to the project environment that does not support the time of project implementation and protests from certain organizations that cause more time during the preparation of work, resulting in setbacks schedule on job preparation. The project manager has not yet determined which activities can not be postponed so that in the event of a delay in a prior work the project manager can find out which work must be completed in order not to affect the workmanship of others and can be in accordance with the time set. In addition, project managers do not record the amount of risk that may occur during the project

implementation and how to overcome it so as not to affect the subsequent workmanship. Risks that occur include the ordering of material goods required are not in accordance with the existing specifications, lack of material, late delivery of goods, the destruction of material goods and labor that sometimes have work accidents. So that will affect the control of cost estimates for the next work where the cost has not been in accordance with what has been budgeted.

Based on the problems faced by PT. Renovindo Utama, a project management information system is needed to assist project managers in planning project scheduling, managing project costs and timing and identifying possible risks and determining mitigation. In the previous project the Precedence Diagram Method (PDM) method can help plan project scheduling and determine activities that can not be postponed, [7], and on the previous project also Earned Value Method (EVM) method can be used to control cost and time because it can show project performance, project end time and final project cost. the Failure Mode and Effect Analysis (FMEA) method is useful for identifying project risks and for knowing the magnitude of risk based on possible and likely impacts. From the exposure will be built Project Management Information System at PT. Renovindo Utama, which implements Precedence Diagram Method (PDM), Earned Value Management (EVM) and Failure Mode and Effect Analysis (FMEA) methods, in the hope that the project management information system built will assist project managers in planning project scheduling that can not be postponed. , monitors the costs and timing of project work to fit the project's original estimates and plans and defines project risk mitigation.

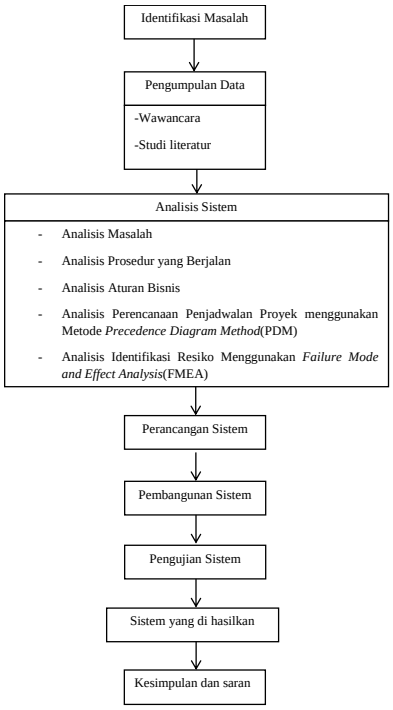
1.1 Research purposes

Objectives to be achieved from the construction of project management system at PT. Renovindo Utama is as follows:

a. Assist project managers in planning project scheduling and determine activities that can not be postponed
b. Assist project managers in identifying project risks and to determine the level of risk importance based on the likelihood and impact that will occur during the project.
c. Assisting project managers in monitoring the estimated cost and time of the project so that the funds that have been issued in accordance with what is done.

1.2 Research Methodology

The research method is the stages that have been determined in conducting a useful research as a guide in conducting the research process so that research can be done properly and systematically. Here are the steps that will be done in the research can be seen in Figure 1 below



Picture 1 Research Methodology

1.2 Theoretical Basis

Theoretical basis on the writing of this thesis will explain the theories related to Project Management Information System at PT. Renovindo Utama.

1.4 Information System

Information system is a system within an organization that brings daily transaction management needs, support operations, managerial, and strategic activities of an organization and provide certain outside parties with the required reports [1].

1.5 Precedence Diagram Method (PDM) Method

Precedence diagram is actually a relic / development of the bar chart. In the PDM method the activity time scale and calendar are placed at the top, this of course shows the schedule instead of logic diagrams that are not time scale or have calendar lines. The use of these functions really requires high level

training and experience in construction scheduling [2].

PDM uses a graphical representation technique using a boxed arrow diagram and the basic rules of dependency logic in arranging the sequence of activities on a project. AON is a project management terminology generally applied to the PDM method, the activity written in the box (Activity On Node) arrow just explains the dependence relationship between activities [3].

The process of critical paths there are several terms among them:

a. *d is the duration of any of the activities initialized from the specified timeframe.*
b. *Id is the serial number of an activity that is initialized so that each activity does not confuse other activities.*
c. *ES is the earliest time of an activity can begin.*
d. *EF is the earliest time of an activity can be completed, with the formula calculation is EF = ES + d.*
e. *LS is the deadline for activities to start. With the calculation formula is LS = SL + ES.*
f. *LF is the slowest completion of activity time, with the calculation formula is LF = LS + D*
g. *SL is the delay time of an activity, with its calculation formula SL = ES (after) - EF.*

1.6 *Earned Value Management* (EVM) Method

The EVM method is a more accurate method of project performance control. This method can provide information on the progress of the project progress within a certain timeframe and may take into account the progress of the project in a future period either in time of completion or project cost [4].

a. *There are 3 indicators in informing the progress of the project:*
b. BCWS (Budgeted Cost of Work Shedule), describes the budget for a work package, but is compiled and linked to its implementation schedule [4].
c. BCWP (Budgeted Cost of Work Performed), describes the project plan budget for a certain period of what has been done on the actual volume of work [4].
d. ACWP (Actual Cost of Work Performed), describes the actual cost of the work that has been done.

The calculations used in the evm method are:

a. BCWS = *(%plan porogress)* × BAC
b. BCWP = *(%actual progress)* × BAC

After getting the results from BCWP and BCWS then performed two analyzes used to measure a job performance variance. variants analyzed are cost and schedule.

a. *Cost Variance (CV) is the comparison between the value obtained after completing the work package with the actual cost incurred during the project implementation.*
b. *CV = BCWP-ACWP*
c. *Schedule Variance (SV) Used to calculate the deviation between BCWP and BCWS. SV = BCWP-BCWS*

Table 1 analysis of variants

Schedule Variance (SV)	*Cost Variance* (CV)	*Information*
Positive	*Positive*	Work is done ahead of schedule at a lower cost than the budget
Zero	*Positive*	Work is done on schedule at a lower cost than the budget
Positive	*Zero*	Work is done ahead of schedule at a budget cost
Zero	*Zero*	Work is done according to schedule and budget
Zero	*Negative*	Work is done on schedule at a cost greater than the budget
Negative	*Zero*	Work is done on schedule at a cost greater than the budge
Positive	*Negative*	Work is done ahead of schedule at a cost greater than the budget
Negative	*Negative*	Work takes longer than scheduled at a cost greater than the budget

After obtaining the CV and SV values then performed the job index analysis to find the efficiency of time and cost by finding the value of Schedule Performance Index (SPI) and Cost Performance Index (CPI).

a. *Cost Performance Index (CPI) Is a cost efficiency factor that has been issued.*
   CPI = BCWP/ACWP
b. *Schedule Performance Index (SPI) Is a factor of performance efficiency in completing the work.*
   SPI = BCWS/BCWP

Performance index <1 (less than one), then the expenditure is greater than the budget or the implementation is longer than the planned schedule, while the performance index> 1 (more than one), then the spending performance is lower than the budget or the implementation is ahead of schedule.

The estimated cost and time estimation analysis is done by finding the estimated cost or Estimate At Completion (EAC) and the estimated completion of the project or Estimate To Complete (ETC).

Predicted Final Settlement Cost (EAC)
EAC = BAC/CPI

a. Predicted Finish Time (ETC) ETC = OD/SPI

1.7 Risk Management

Project risk management encompasses processes in risk management planning, risk identification, risk analysis, risk response planning, and risk control. The objective of risk management is to prevent or minimize adverse effects due to unforeseen events by avoiding risks or preparing contingency plans related to those risks [5].

1.7.1 *Failure Mode Effect Analysis* (FMEA) Method

Failure Mode and Effect Alalysis (FMEA) is an engineering technique used to define, identify, and to eliminate known failures, problems, errors, and the like from a system, design, process, and or service before reaching consumers [6]

As for some terminology associated with the use of Failure Mode and Effect Analysis are as follows:

a. *Component, Component of the system or tool being analyzed*
b. *Potential Failure Mode, describes the way in which a product or process can fail to perform the required functions.*
c. *Failure Effect, the impact or consequences caused if the component fails as mentioned in the potential failure mode.*
d. *Severity (S) is a quantification of how serious the condition is caused if a failure is consequently mentioned in the Failure Effect.*
e. *Occurance (O) is a possible level of failure.*
f. *Detection (D) indicates the probability of escape failure from the controls already installed.*
g. *Risk Priority Number (RPN) is the result of multiplication of weight of severity, occurance and detection.*

To reflect from the detected failure is sought the value of Risk Priority Number (RPN). RPN is calculated by multiplying the Severity, Occurrence, and Detection values.

To set the risk category searched for critical value. The critical value is calculated by dividing the total RPN value by the number of risk lists. The high risk category is the risk that has a RPN value greater than or equal to the critical value (RPN value ≥ critical value)

2 THE CONTENT OF RESEARCH

2.1 *Analysis Of Project Planning*

The project design analysis contains scheduling planning analysis, cost and time control analysis and risk analysis on PT. PLN (PERSERO) Cirebon by PT. Renovindo Utama. In this case, project scheduling planning uses Precedence Diagram Method (PDM) method, cost and time control using Earned Value Management (EVM) and risk management using Failure Mode Effect Analysis (FMEA) method.

2.1.1 *Presedence Diagram Method* (PDM) Method

Precedence Diagraming Method (PDM) is one of the scheduling techniques that belong to the network planning scheduling technique or network plan. In this network of PDM focuses on the activity of using nodes so often called activity on node (AON). With this pdm method the project manager is easier in planning the project scheduling and determining activities that can not be postponed. The activity data of PT. PLN (PERSERO) Cirebon area which can be seen in table 2 below.

Table 2 Job Activities

No	Deskripsi pekerjaan	Durasi	Kegiatan Pendahulu	Kegiatan Selanjutnya
1	**PEKERJAAN PERSIAPAN**	**4 hari**		
1.1	Dokumentasi dan pelaporan	1 hari	_	1.2
1.2	Mob demob tenaga kerja dan peralatan	1 hari	1.1	1.3
1.3	Sewa peralatan scafolding & peralatan pendukung lainnya	2 hari	1.2	2.1
2	**Perbaikan Plafond luar lantai 3 entrance bangunan**	**5 hari**		
2.1	Bongkaran plafond lama	2 hari	1.3	2.2
2.2	Buangan bongkaran	1 hari	2.1	2.3
2.3	Pekerjaan Pas. Plafond GRC rangka kayu	2 hari	2.3	3.1
3	**Pengecatan Plafond luar lantai 3 entrance bangunan**	**1 hari**		
3.1	Pekerjaan cat plafond ex.propan	1 hari	2.3	4.1
4	**Perbaikan Plafond luar lantai dasar entrance bangunan**	**3 hari**		
4.1	Bongkaran plafond lama	1 hari	3.1	4.2
4.2	Buangan bongkaran	1 hari	4.1	4.3
4.3	Pekerjaan Pas. Plafond gybsum ex.Jayaboard	1 hari	4.2	5.1
5	**Pengecatan Plafond luar lantai dasar entrance bangunan**	**1 hari**		
5.1	Pekerjaan cat plafond ex.propan	1 hari	4.3	6.1
6	**Perbaikan plafond luar depan pintu masuk**	**3 hari**		
6.1	Bongkaran plafond lama	1 hari	5.1	6.2
6.2	Buangan bongkaran	1 hari	6.1	6.3
6.3	Pekerjaan Pas. Plafond gybsum ex.Jayaboard	1 hari	6.2	7.1
7	**Pengecatan plafond luar depan pintu masuk**	**1 hari**		
7.1	Pekerjaan cat plafond ex.vinilex	1 hari	6.3	8.1
8	**Perbaikan nok atap lantai 3 entrance bangunan**	**3 hari**		
8.1	Bongkaran nok atap lama	1 hari	7.1	8.2
8.2	Buangan bongkaran nok atap	1 hari	8.1	8.3
8.3	Pekerjaan Pas. nok atap	1 hari	8.2	9.1
9	**Perbaikan nok atap lantai 2 entrance bangunan**	**3 hari**		
9.1	Bongkaran nok atap lama	1 hari	8.3	9.2
9.2	Buangan bongkaran nok atap	1 hari	9.1	9.3

2.1.2 *Failure Mode Effect Analysis* (FMEA)

In the risk management process has several stages of risk identification, determining the possibility and impact of risk and handling of those risks. At this stage to identify, determine the value of the possibility and impact of risk and handling of these risks using the Failure Modes and Effects Analysis (FMEA) method.

The risk identification process aims to make a list of possible or current risks in the project The risk identification process is conducted by direct interview with Mr. Bagus Ari Wibowo as the project manager explains that there are several risk factors that become delays in the construction project of rayaon rayon office renovation can be seen in table 3 below.

Tabel 3 Identifikasi Resiko

No	Risiko	Kode Risiko
1	**Risiko Lingkungan Kerja**	
	1.1 Koordinasi dengan masyarakat yang sulit	R1
	1.2 Akses menuju lingkungan proyek yang tidak mendukung	R2
	1.3 Cuaca yang tidak dapat di prediksi	R3
2	**Risiko Pengadaan Bahan Material**	
	2.1 Material bahan yang tidak sesuai dengan spesifikasi yang dibutuhkan	R4
	2.2 Kerusakan bahan material	R5
	2.3 Terlambatnya Pasokan bahan material	R6
	2.4 Kurangnya jumlah material yang diperlukan	R7
3	**Risiko Pelaksanaan Proyek**	
	3.1 Kecelakaan kerja	R8
	3.2 Protes dari organisasi tertentu	R9
	3.3 pemasangan bahan material yang membutuhkan waktu yang lama	R10

At the stage of risk identification research that has been done in the previous stage. The purpose of risk research is to obtain a list of risks that have been assessed based on Severity, Genesis and Detection values. The results of these risk assessments are then mapped to determine the main risks that could lead to failure of a project.

To reflect from the detected failure is sought indigo Risk Priority Number (RPN). RPN (Risk Priority Number) is calculated by multiplying the value of Severity, Occurrence value and Detection value a

Table 4 Total RPN

Kode Risiko	Risiko	Keparahan *(severity)*	Kejadian *(Occurrency)*	Deteksi *(Detection)*	RPN *(Risk Priority Number)*
R1	Koordinasi dengan masyarakat yang sulit	1	2	1	2
R2	Akses menuju lingkungan proyek yang tidak mendukung	1	3	2	6
R3	Cuaca yang tidak dapat di prediksi	4	5	5	100
R4	Material bahan yang tidak sesuai dengan spesifikasi yang dibutuhkan	2	3	3	18
R5	Kerusakan bahan material	2	2	3	12
R6	Terlambatnya Pasokan bahan material	3	3	3	27
R7	Kurangnya jumlah material yang diperlukan	2	2	3	12
R8	Kecelakaan kerja	3	2	4	24
R9	Protes dari organisasi tertentu	1	2	2	4
R10	Pemasangan bahan material yang membutuhkan waktu yang lama	3	4	3	36

From the results of the analysis of the causes of failure that occur in a project when the RPN (Risk Priority Number) value has been obtained then it can assist the project manager in determining which risks will have the greatest impact on making the project failure, such as the unpredictable Weather Risk RPN (Risk Priority Number) values, because by knowing the highest RPN value then the project manager can observe daily weather predictions, stop work that is affected by the weather and do other jobs that are not affected by the weather.

After the RPN value of each risk is known, then it can be calculated the critical value. Critical values are used to determine what risks fall within the high risk category. High risk categories are risks that have a RPN value greater than or equal to the critical value (RPN value ≥ critical value).

$$\textit{Critical value} = \frac{2+6+100+18+12+27+12+24+4+36}{10}$$
$$= 24{,}1 \approx 24$$

From the calculation result in equation 2.14 obtained the critical value is 24 which means if the value of RPN at each risk is above 24 or equal to 24, it is a high risk.

2.1.3 Analysis Of Project Control

Budget Cost for Work Scheduled (BCWS) is the budgeted expense for a given period and is defined in the budget of a project. This calculation is obtained by multiplying the percentage of plan progress with the project's total budget (BAC). The calculation of BCWS.

(BAC) = RP.147.098.600

%

Settlement = 10,4711 %

BCWS =10,4711% x RP. 147.098.600

= RP. 15.402.841,5

Table 5 Analysis of Calculation Budget Cost for Work Scheduled (BCWS)

Minggu ke	BOBOT	Hasil BCWS	Kumulatif
1	10,4711%	Rp.15.402.841,50	Rp.15.402.841,00
2	40,2473%	Rp.59.203.214,84	Rp.74.606.055,84
3	33,4149%	Rp.49.152.850,09	Rp.123.758.905,34
4	15,8668%	Rp.23.339.840,66	Rp.147.098.600,00

It can be concluded that the project implemented has a duration of 4 weeks and has different workloads according to the difficulty level of project work and project cost. The result of this calculation is the budgeted cost of this project.

Budget Cost of Work Performed (BCWP) menggambarkan anggaran rencana proyek pada periode tertentu terhadap apa yang telah dikerjakan pada volume pekerjaan aktual. Nilai BCWP dihitung dengan cara mengalikan total anggaran proyek dengan bobot BCWS.

(BAC)= RP. 147.098.60

%Actual Progress= 7,2312%

BCWP = 7,2312% × Rp. 147.098.600

= Rp. 10.636.994

Table 6 Analysis of Calculation Budget Cost of Work Performed (BCWP)

Minggu ke	BOBOT	BCWP	Kumulatif
Minggu 1	7,2312%	Rp.10.636.994	Rp.10.636.994
Minggu 2	23,5790%	Rp.34.684.378,9	Rp.45.321.372,9

It can be concluded that the value of BCWP that runs from week 1 to week 2 has inconsistency with planned work plan.

The Actual Cost of Work Performed (ACWP) analysis illustrates the budget spent on job execution on the actual job volume. The ACWP value is obtained based on the expenditure data from the work that has been performed. The value of ACWP in 2 weeks of roof renovation project of PT. PLN (PERSERO) Area Cirebon in table 7 below.

Table 7 Analysis of Calculation Actual Cost of Work Performed (ACWP)

Minggu ke	ACWP	
	biaya per minggu	kumulatif
minggu 1	Rp.12.450.600	Rp.12.450.600
minggu 2	Rp.36.550.300	Rp.49.000.900

Based on the above ACWP value can be concluded that the budget issued for the implementation of work is higher than the budgeted in each week.

Scheduling Variance (SV) can show the difference in the time the work is carried out against the planned time of work. The positive value of the SV result can indicate that the work is completed faster than the planned time, otherwise if the negative SV value then the work is completed longer than the planned time.

BCWP = Rp.10.636.994

BCWS = Rp.15.402.841,50

SV = Rp.10.636.994 – Rp.15.402.841,50

= Rp -4.765.847,5

Table 8 Analysis of Calculation Scheduling Variance (SV)

Minggu ke	BCWP	BCWS	SV
Minggu 1	Rp.10.636.994	Rp.15.402.841,50	Rp. -4.765.847,5
Minggu 2	Rp.34.684.378,9	Rp.59.203.214,84	RP.-24.518.835,94

Based on the analysis of SV calculations above can be concluded that the value of SV at week 1 and week 2 is negative which indicates that the project work is executed slower than the planned schedule.

Cost Variance (CV) shows the difference in the value obtained after completing the job part with the actual value of the project implementation. the positive value of Cost Variance (CV) indicates that the part of the job provides the opposite advantage if the negative CV indicates that the part of the job is providing a loss in the project. The calculation of Cost Variance (CV) ..

BCWP = Rp.10.636.994
ACWP = Rp.12.450.600
CV = Rp.10.636.994 - Rp.10.636.994
= Rp -1.813.606

Table 9 Analysis of Calculation Cost Variance (CV)

Minggu ke	BCWP	ACWP	CV
Minggu 1	Rp.10.636.994	Rp.12.450.600	Rp – 1.813.606
Minggu 2	Rp.34.684.378,9	Rp.36.550.300	RP – 1.865.921.1

It can be concluded that the project work on the first week to the second week costs are higher than the cost that has been done. \

To determine a time performance index value or so-called schedule performance index (SPI) can be calculated. The calculation of schedule performance index (SPI) is aimed SPI value shows how much work can be completed (relative to the overall project) to the planned work unit. Here is an example of calculating schedule performance index (SPI).

BCWP = Rp.10.636.994
BCWS = Rp.15.402.841,50
SPI = 10.636.994 / 15.402.841,50
= 0,69

Table 10 Analysis of Calculation schedule performance index (SPI)

Minggu ke	BCWP	BCWS	SPI
Minggu 1	Rp.10.636.994	Rp 21.782.866,94	0,69
Minggu 2	Rp.34.684.378,9	Rp.59.203.214,84	0,58

It can be concluded that at week 1 to week 2 the project has deviation schedule and time. To determine the value of cost performance index or so-called Cost Performance Index (CPI) can be calculated using equation of formula 2.9. The example calculation Cost Performance Index (CPI) is as follows.

BCWP = Rp.10.636.994
ACWP = Rp.12.450.600
CPI = 10.636.994 / 17.130.000
= 0,85

Tabel 11 Analysis of Calculation Cost Performance Index (CPI)

Minggu ke	BCWP	ACWP	CPI
Minggu 1	Rp.10.636.994	Rp. 17.130.000	0,85
Minggu 2	Rp.34.684.378,9	Rp.36.550.300	0,94

The value of Cost Performance Index (CPI) from 1st to 2nd week has CPI value <1. Based on the calculation rule of Cost Performance Index (CPI), it can be concluded that on the 1st week until the 2nd week the project experiences delay from scheduled (CPI) Schedule overrun)

From the calculations that have been done, here is the ranngkuman of calculations SV, CV, SPI, and CPI can be seen as follows

Table 12 Analysis SV, CV, SPI, dan CPI *Cumulative*

BCWP	BCWS	ACWP	SV	CV	SPI	CPI
Rp.10.636.994	Rp 21.782.866,94	Rp. 17.130.000	Rp. -4.765.847,5	Rp – 1.813.606	0,69	0,85
Rp.34.684.378,9	Rp.59.203.214,84	Rp.36.550.300	RP.-24.518.835,94	RP – 1.865.921.1	0,58	0,94

Based on the analysis of SV, CV, SPI, and CPI calculations that have been done before it can be seen that the project completion time will be late or faster and the cost will be excess or less than budgeted. In addition, project progress for the foreseeable future also needs to estimate

the time and cost of completion. The calculation as follows.

ETC (Estimate to Complete) *Sunday* 1

OD = 31
SPI = 0,69
ETC = 31 / 0,69
= 44,9 ≈ 45

Table 13 Estimated Project Completion Time.

Minggu ke	OD	SPI	ETC
Minggu 1	31	0.69	45
Minggu 2	31	0.58	53

an be concluded to complete this project the company takes 53 working days in order to complete the repair of PT office roof. PLN (Persero) Cirebon area. The above calculation results assume that the trend of project performance will be the same until the end of the project without any special handling and solution of the delay of this project.

To find out the estimated cost required to complete the project, it can be done by looking for the value of EAC (Estimate at Completion). The example calculation is as follows.

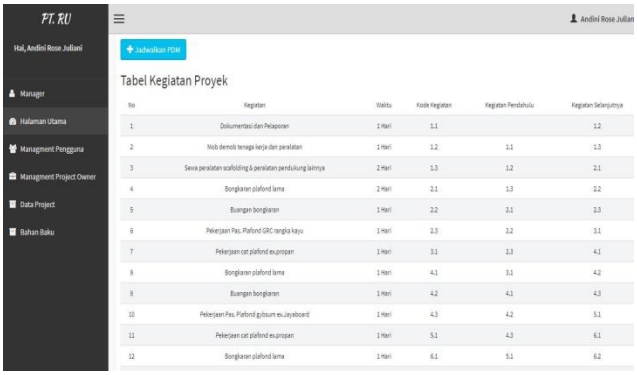
EAC (Estimate at Complete) *Sunday* 1
BAC = RP. 147.098.600
CPI = 0,85
EAC = RP. 147.098.600 ÷ 0,85
= Rp. 173.057.176

***Table 14** Estimated Project Completion Cost*

Minggu ke	BAC	CPI	EAC
Minggu 1	RP. 147.098.600	0,85	Rp. 173.057.176
Minggu 2	RP. 147.098.600	0,94	Rp. 156.487.872

From the above calculation it can be concluded that the estimated cost required to finish the project if starting from week 1 to week 2 exceeds the total project budget.

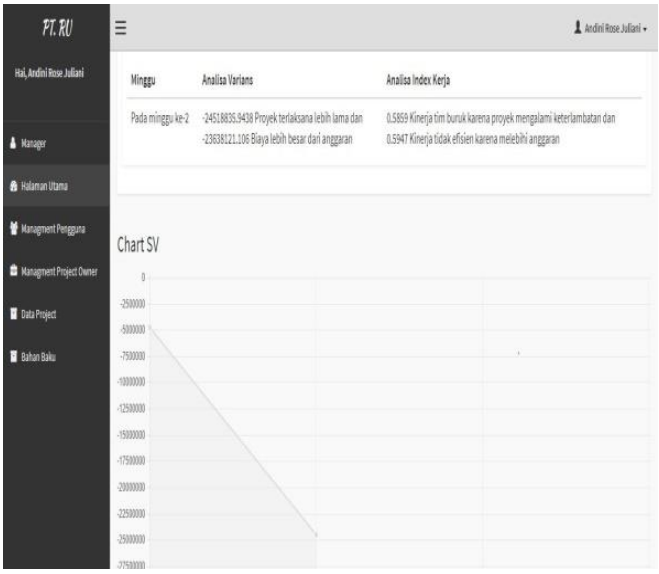
2.3 Interface Implementation



Picture 2 Scheduling Activities

Inferential from Figure 2 this project management information system can assist the project manager in planning the schedule and determining the critical path.

2.3 Interface Implementation

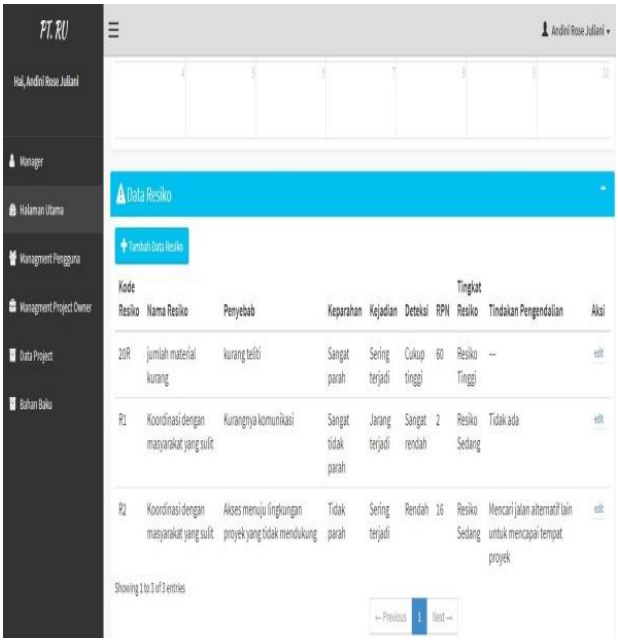


Picture 3
Evm Method Results

It can be deduced from Figure 3 that this project management information system can generate a conclusion for the cost control and time of the project and produce a progress graph of the implementation of the project.

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2.4 *Interface Implementation*



Picture 4 Added risk

It can be concluded from Figure 4 that this project management information system can provide a low to high risk rating and also how it can be handled if the risk occurs during project implementation.

3. Final

3.1 Conclusion

Based on the research and test results that have been done on Project Management Information System at PT. Renovindo Utama, can be drawn some conclusions as follows:

a. Project Management Information System at PT. The Main Renovindo can assist managers in planning the project's cost and time.
b. The built system can assist the Project Manager in managing project risks
c. System can assist Project manager in making project schedule of activities.

3.2 Suggestion

Based on the results of system testing, obtained some suggestions that can be taken into consideration.

a. *Project Management Information System at PT. Main Renovindo should be added some additional features, such as a warning message when there is work that is not done.*
b. *Added features for the project manager to leave messages to the Chief Executive.*

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