PROJECT MANAGEMENT INFORMATION SYSTEM ON PT. EXCELLENT INFOTAMA KREASINDO

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ABSTRACT

PT Excellent Infotama Kreasindo is a business entity engaged in the field of computerization. PT Infotama Kreasindo Excellent frequently experience problems in drafting the employment duration and cost jobs. This problem occurs because several factors of calculation using one value and the lack of value of optimistic and pessimistic in the calculation makes the project unknown probability of completion of the project. And yet the presence of logging risks, risk mitigation and cost is carried out by the project manager.

Information system project management in the wake can answer all the problems that exist in the PT Infotama Kreasindo Excellent, because on information systems project management is already planning the work, planning costs, look for critical path and the probability of completion of the project by using the methods of the Programe Evaluation and Review Technique (PERT). Management information systems this project there is also a Probability Impact Matrix Method (PIM) is useful to perform identification, opportunities, impact and risk mitigation projects as well as your Expected method of Monetery Value (EMV) that is used to determine the cost of risk of the project.

Based on the description of the results of research that has been done, it is expected the project management information system in PT Infotama Kreasindo Excellent. can help project managers in planning scheduling, project costs as well as knowing the probability of completion of the project. As well as assisting the project manager in identifying, mitigating risks and know the costs that will be incurred.

Keyword: project management, Programe Evaluation and Review Technique, Probability Impact Matrix, Expected Monetery Value.

1. INTRODUCTION

PT Infotama Kreasindo Excellent is a business entity engaged in the field of computerization, IT professional konsultant & IT training. PT Infotama Kreasindo has Excellent experience in working on software procurement and implementation (professional service) for government agencies and private.

Based on the results of the interview directly with Mr. Arif Rahman Hakim as the project manager for project activity Information Agency Geospatial software (BIG). He sets forth the calculation still uses one value estimation. The calculation of this estimate one value does not match the software project in karenakan uncertainty more in the time of completion of the project. Weakness in the calculation of this estimate of the value of one when there is a technical disruption as the affected server installation against a job then the calculation of the cost budget and duration of the work already done would have to count on the back makes the scheduling planning do become ineffective. Furthermore the absence of optimistic and pessimistic time in any job creating project manager cannot predict or know the probability of completion of the project. Currently not doing risk management that may be encountered and how to handle it so it can't be anticipating the possibility of risks will occur and also not doing an analysis of the cost of risk.

Based on problems in the can, then needed a management information systems projects that can help project managers in planning scheduling, set up costs and management risks will occur. The methods used in the construction project management information system in PT Infotama Kreasindo Excellent to help planning scheduling and project costs using methods Programe Evaluation and Review Technique (PERT), this method is mirrored by the three values of estimation that is optimistic duration, duration of most likely and pessimistic duration. With these three values estimation can help project managers to do project planning scheduling and calculation of the cost of the project. While the methods used to find out the importance of risk and costs based on the likelihood and the impact that will occur using the method of Probability and Impact Matrix (PIM) and Expected Monetery Value (EMV).

Based on the exposure it will be built on project management information system in PT Infotama Kreasindo Excellent method which implements the Programe Evaluation and Review Technique (PERT), Probability and Impact Matrix (PIM) and Expected Monetery Value (EMV). The hope project management information system to be built will help project managers in project planning scheduling,

manage project costs and determine the risk of the project

The purpose of such research to assist the project manager in the planning time and cost of project work, help project managers identify risks and memitigiasinya as well as the costs that will be incurred.

1.1 Research Methodology

The research method is the stages that have been specified in the conduct of a study that is useful as a guide in the process of doing the research so that research conducted can be run correctly and systematically. The methodology used in this study using a descriptive method. Research methodology can be seen in Figure 1 below

***Figure 1.** Research Methodology*



1.2 Program Evaluation and Review Technique (PERT)

In 1958, Booz Allen Hamilton found a scheduling method that is named PERT diagram, stands for Program Evaluation and Review Technique. PERT diagrams can be used to simplify the process of planning and scheduling for the project with a capacity of large and complex because it is able to cope with the uncertainty in the project without needing to know the duration of each activity[1].

1.2.1 Probability In Project Scheduling

Outline methods of PERT is almost the same in the management of its network. The difference is found in the determination of the duration of the activity and the duration of critical path with known three figures estimate per activity. The purpose of the use of three-digit estimation is to provide the widest span of time in conducting the estimation in conducting target timeframe of activities [1].

The third estimated duration is:

1. Duration of optimism (optimistic time)

Optimistic duration is the duration of the fastest to complete an activity if things are going well.

2. Duration most probably (most likely time)

The duration of most probably is the most commonly occurring duration compared with the other activities when done over and over again with almost the same condition.

3. The duration of the pessimistic (pesimistic time)

Pessimistic duration is the duration of the longest to complete the activity, when everything was not a good all-round.

Next the third time duration it is encapsulated into a single number called (te) or the expected (expected duration time). The beta distribution function is used as the basis for the standard deviation (se), and variansi (ve) PERT.

The formula is as follows:

$$te = \frac{(a + 4m + b)}{6} \quad (1)$$

$$se = \frac{(tp - to)}{6} \quad (2)$$

$$ve = \left\{\frac{(tp - to)}{6}\right\}^2 \quad (3)$$

Possibility/uncertainty hit the target on schedule method PERT revealed with z, namely the relationship between the expected time (te) and target (ts) by the following formula:

$$Z = \frac{Ts - Te}{\sqrt{\sum(S^2)}} \quad (4)$$

Information:

te: Excpected time
a: optimistis time
m: most likely
p: pesimistis time
se: standard deviasi
ve: Variansi
z: Probabilitas
Ts: Schedule Proyek duration

1.2.2 Network Diagram

There are two methods used in the calculation of the critical path, i.e. the calculation of forward and backward calculation. There are a few important things to note with the calculation due to the forward and backward calculation as follows [2]:

1. Forward Pass

Forward Pass is to determine the slowest time started and completion of each activity, as well as the latest occurrence of any activity.

EF = ES + D

EF(i-j) = ES(i-j) + D(i-j) (5)

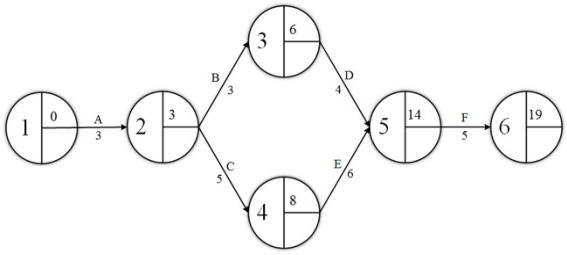


Figure 2. *Example Forward Pass*

2. Backward Pass

Backward Pass is the slowest time of the start and completion of each activity, as well as the latest occurrence of any activity.

$$LS = LF - D$$

$$LS(i\text{-}j) = LF(i\text{-}j) - D(i\text{-}j) \quad (6)$$

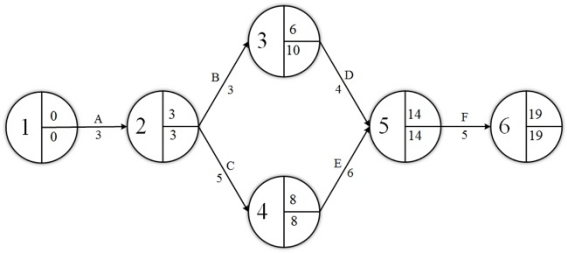


Figure 3. *Example Backward Pass*

3. Total Float (TF)

The total float is the amount of time that allowed a malicious activity can be delayed, without affecting the overall project schedule. Total float equal to time an activity was completed most recently reduced the earliest finish time, or start time end time minus the start early.

$$TF = LS - ES \quad (7)$$

1.3 Management Risk

The risk is the activities or factors that will increase your chances if there is not a project goal, namely according to the time, cost and performance. Risk management is the process of simantik the identification, analysis, response and control of project risk.

1.3.1 Probabilty and Impact Matrix (PIM)

Probability Impact Matrix (PIM) is an approach developed using two criteria that are important to measure risk [2].
as shown in Figure 4:

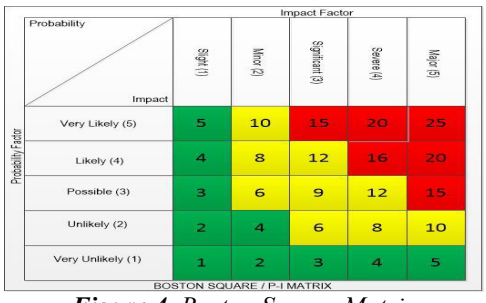


Figure 4. *Boston Square Matrix*

Table 1 *Criteria For Impact Assessment*

No	***Assessment***	***Impact***
1	*(slight)*	*The impact of insignificant perceived a financial loss does not mean*
2	*(minor)*	*Need to direct handling where they are , a financial loss being the cost of additional spending*
3	*(significant)*	*Need to be handled by the manager, a financial loss significant*
4	*(severe)*	*The failure , productivity decline , a financial loss significant*
5	*(mayor)*	*The impact on other , need handling by the director , big losses , need to special handling*

Table 2. *Probability*

No	***Assesment***	***Probability***
1	*(very unlikely)*	*only on certain conditions*
2	*(unlikely)*	*Sometimes occurs on certain conditions*
3	*(possible)*	*Happened on certain conditions*
4	*(likely)*	*Often occurs in any condition*
5	*(very likely)*	*Always happens in any condition*

Table 3. *Skala Risk*

Skala	*Point*
1-5	*Low*
6-14	*Midle*
15-25	*High*

The importance of a risk is the multiplication of the values of probability and impact rating obtained from respondents. The value of risk is the multiplication of the values of probability and risk impact rating, the value obtained from the respondents.

$$Risk\ Exsposure = Probability * Loss \quad (8)$$

1.3.2 Expected Monetery Value (EMV)

The method Expected Monetary Value (EMV) is a method of analysis that calculates the average statistical concept – average expenditure in the future that may happen or not happen. The value of EMV positive value indicates the opportunities, while negative EMV showed the threat or threats which may be detrimental to the company. EMV is calculated by multiplying the value of the probability of how each risk multiplied by the likelihood of money spent when the risk occurs.

*EMV = Probability * Consequences (9)*

2. THE CONTENT OF RESEARCH

2.1 Analysis Of Project Management

Analysis of the design of the project contains analysis planning scheduling and cost on procurement projects and the renewal of the license of the Agency's Geospatial Information in email. In this case the planning scheduling project costs using the method of Program Evaluation and Review Technique (PERT).

2.1.1 Program Evaluation and Review Technique (PERT)

Program Evaluation and Review Technique (PERT) is a project management technique that can be used to plan the scheduling and cost activities as well as showing the relationships between the activities. Used to determine the critical path and the probability of completion of the project [1].

Where each project activity that is included in the critical path must not be a fulltime jobs.

2.1.1.1 Planning Time

On project procurement and license renewal Information Agency Geospatial email already done the calculation using the formula 1. Here is a recap of the predecessor activity table from each activity together with figures expected time (te) which can be seen in table 4. under this.

Table 4. *Project Activities*

No	Deskripsi Aktivitas	Kode Aktivitas	Kegiatan Pendahulu	Te
0	Mulai	Mulai	-	-
1	Pengadaan Lisensi	A	Mulai	17
2	Instalasi Server	B	A	5
3	Instalasi & konfigurasi serta improvement Zimbra Mail Server	C	B	10
4	Konfigurasi Meningkatkan reputasi email	D	C	3
5	Migrasi Data	E	D	7
6	Ujicoba Pengiriman dan Penerimaan	F	D	2
7	Pendampingan (Support) & Dokumentasi Sistem	G	E, F	5
8	Proses Switching Sistem	H	E, F	2
9	Proses Transfer Knowledge	I	G, H	5

Based on a series of activities in project procurement and license renewal Information Agency Geospatial email on table 4. and, after calculations using equations 5.6 and 7. Following are the results of the calculation of the recap of the critical path can be seen more in the table 5. under this:

Table 5. *Recapitulation Of Critical Path Calculation*

Kode Kegiatan	Kegiatan		Waktu (Te) Dalam hari	Paling Awal		Paling Akhir		Total Float
	i-node	j-node		Mulai (ES)	Selesai (EF)	Selesai (LF)	Awal (LS)	
A	0	1	17	0	17	52	47	0
B	1	2	5	17	22	47	42	0
C	2	3	10	22	32	47	45	0
D	3	4	3	32	35	42	35	0
E	4	5	7	35	42	35	32	0
F	4	6	2	35	37	35	33	2
G	5	7	5	42	47	32	22	0
H	5	8	2	42	44	22	17	2
I	7	9	5	47	52	17	0	0

Based on the data in table 5. created network diagram or critical path as Figure 6 below:

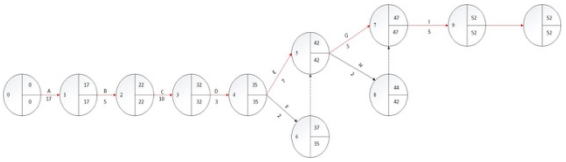


Figure 6. *Critical Path Diagram*

Based on critical path network diagrams that can be seen in Figure 6. It can be concluded that lines A, B, C, D, E, G, I, is the critical path then the work through critical path must not be a lull time job.

Based on the results of the calculation of the critical path and the network diagram in produce that lines A, B, C, D, E, G, I, is the critical path..

Critical Path= A, B, C, D, E, G, I
= 17 + 5 + 10 + 3 + 7 + 5 + 5
= 52

Standard Deviasi = A, B, C, D, E, G, I
= 1 + 0,5 + 0,84 + 0,67 + 1 + 0,34 + 0,34
= 4,69

After getting the value of the critical path can calculate the probability that the value of time of completion of the project is less than 66 days, then::

$$Z = \frac{Ts - Te}{\sqrt{\sum(S^2)}}$$

$$= \frac{66 - 52}{\sqrt{\sum(4{,}69^2)}}$$

$$= \frac{14}{21{,}9}$$

$$= 0{,}639 \sim 0{,}6$$

In the get the value of Z to Z probability of 1.7 0.6 is 0.7257. Thus, it is estimated that the probability of the project was completed in less than 66 today is 72%.

2.1.1.2 The Planning Of The Project Cost

In project procurement and renewal of License Information in the body of the email there are 2 types of Geospatial cost on plan i.e. a license fee and the cost of professional server. Where the business rules to be built for planning costs is as follows:

1. *the standard Cost/most likely are in simbolkan with (m) in the master data set and as a reference for the cost of the optimistic pessimist (a) and (b)*
2. *the optimistic (a) value is 15% less than the cost of standard/most likely (m)*
3. *The cost of the pessimistic (b) is 15% more value than the cost of standard/most likely (m))*

2.1.1.2.1 License Fee

Here is a sample calculation for licence fees where the activity has A standard fee of Rp45.560.250. Based on business rules that are already in the detailkan the value of optimistic and pessimistic in get by using the following calculation:

Note : Fee standard = Rp45.560.250
*a = Rp45.560.250 - (Rp45.560.250 * 15%)*
= Rp45.560.250 - Rp6.834.037
= Rp38.726.213
*b = Rp45.560.250 + (Rp45.560.250 * 15%)*
= Rp45.560.250 + Rp6.834.037
= Rp52.394.288

More information can be seen in table 6. under this

***Table 6.** Recapitulation Of The License Fee*

Aktivitas	a	m	b	*Expected*
A	38.726.213	45.560.250	52.394.288	37.726.917
B	35.311.125	41.542.500	47.773.875	41.542.500
C	163.059.750	191.835.000	220.610.250	191.835.000
D	21.741.300	25.578.000	29.414.700	25.578.000
E	51.635.375	60.747.500	69.859.625	60.747.500
SUB TOTAL				357.429.917
PPN 10%				35.742.992
TOTAL				393.172.909

After the performed calculations and in the get your expected value (te) the next step is to do a comparison of budget plan costs. Comparison of license fees can be seen in table 7. under this:

***Tabel 7.** Comparison Of License Fee*

Aktivitas	Sebelum Perhitungan	Sesudah Perhitungan PERT	Perbandingan
A	Rp45.560.250	Rp37.726.917	Rp7.833.333
B	Rp41.542.500	Rp41.542.500	0
C	Rp191.835.000	Rp191.835.000	0
D	Rp25.578.000	Rp25.578.000	0
E	Rp60.747.500	Rp60.747.500	0

Based on a comparison of the already performed on table 7. in the get the following conclusion, that there is an excess of fees amounting to Rp 7.833.333 out of a budget plan that is planned. This indicates that the excess of the cost of the benefits that will be able to.

2.1.1.2.2 The Cost Of Professional Service

Here is a sample calculation for the cost of professional service where activity B has a standard fee of Rp24.000.000. Based on business rules that are already in the detail can the value of optimistic and pessimistic in get by using the following calculation:

Note : Fee standard = Rp24.000.000
*a = Rp24.000.000 - (Rp24.000.000 * 15%)*
= Rp24.000.000 - Rp3.600.000
= Rp20.400.000
*b = Rp24.000.000 + (Rp24.000.000 * 15%)*
= Rp24.000.000 + Rp3.600.000
= Rp27.600.000

More information can be seen in table 8. under this

***Table 8.** Fee Professional Service*

Aktivitas	a	m	b	*Expected*
A	-	-	-	-
B	20.400.000	24.000.000	27.600.000	24.000.000
C	42.500.000	50.000.000	57.500.000	50.000.000
D	4.335.000	5.100.000	5.865.000	5.100.000
E	22.525.000	26.500.000	30.475.000	26.500.000
F	4.250.000	5.000.000	5.750.000	5.000.000
G	7.978.738	9.366.750	10.794.763	9.366.750
H	3.400.000	4.000.000	4.600.000	4.000.000
I	1.700.000	2.000.000	2.300.000	2.000.000
J	15.300.000	18.000.000	20.700.000	18.000.000
SUB TOTAL				143.966.750
PPN 10%				14.396.675
TOTAL				158.363.425

After the performed calculations and in the get your expected value (te) the next step is to do a comparison of budget plan costs. A comparison of the cost of professional service can be seen in table 9. under this

***Table 9.** Comparison Of Costs Professional Service*

Aktivitas	Rencana Biaya	Perhitungan Biaya PERT	Perbandingan
A	-	-	-
C	Rp24.000.000	Rp24.000.000	0
D	Rp50.000.000	Rp50.000.000	0
E	Rp5.100.000	Rp5.100.000	0
F	Rp26.500.000	Rp26.500.000	0
G	Rp5.000.000	Rp5.000.000	0
H	Rp9.366.750	Rp9.366.750	0
I	Rp4.000.000	Rp4.000.000	0
J	Rp2.000.000	Rp2.000.000	0
I	Rp18.000.000	Rp18.000.000	0

Based on the results of the comparison was done on table 9. In all the activity get value = 0, this indicates that the cost of the budget plan in the plan is in compliance.

2.1.2 Probability Impact Matrix (PIM)

To identify the risks, determine the value of the likelihood and impact of risks as well as those against the risk of handling

1. Risk Identification

Risk management process begins with the identification of risks aiming to identify and make a list of the risks that may occur. The identification of risks in information systems project management at PT Infotama Kreasindo Excellent can be seen in table 10. under this.

***Table 10.** Identification Risk*

Kode Risiko	Jenis Risiko	Deskripsi Risiko
R1	Kebutuhan	Penambahan atau perubahan spesifikasi dari *Client*
R2	Estimasi	Perkiraan sistem perangkat lunak tidak sesuai
R3		Perkiraan jadwal tidak sesuai perencanaan
R4	Orang	Ada tim proyek yang sakit sehingga berpengaruh terhadap pelaksanaan proyek
R5		Kurang koordinasi di dalam tim, kurangnya kerja sama tim
R6		Kekurangan SDM yang memiliki kompetisi yang diharapkan
R7	Kebutuhan	Tim proyek lambat menangkap bisnis model yang dibangun
R8	Orang	User belum mengerti cara penggunaan aplikasi setelah dilakukan *training*
R9	Alat	Terjadi kerusakan *tools* yang digunakan untuk mengembangkan sistem
R10	Kebutuhan	Tingkat kesulitan pekerjaan yang tidak terprediksi sebelumnya
R11	Teknologi	Aplikasi tidak jalan sebagaimana mestinya
R12	Teknologi	Teknologi yang digunakan tidak *compatible* dengan kebutuhan yang ada
R13	Estimasi	Bencana Alam

2. Determine the likely value of and impact

After the identification of the risk will then be assessed by giving the scale of values using a matrix of quadrilateral boston (Boston Square Matrix). The value of the likelihood and the impact can be seen in table 11. below.

***Table 11.** Identification of the results of the analysis of the likelihood and impact of*

Risiko	Kode Risiko	Kemungkinan	Dampak
Kebutuhan			
Penambahan atau perubahan spesifikasi dari *client*	R1	2	4
Estimasi			
Perkiraan sistem perangkat lunak tidak sesuai	R2	3	3
Perkiraan jadwal tidak sesuai perencanaan	R3	3	4
Orang			
Ada tim proyek yang sakit sehingga berpengaruh terhadap pelaksanaan proyek	R4	4	4
Kurang koordinasi di dalam tim, kurangnya kerja sama tim	R5	4	4
Kekurangan SDM yang memilii kompetisi yang diharapkan	R6	3	3
Kebutuhan			
Tim proyek lambat menangkap bisnis model yang dibangun	R7	3	3
Orang			
User belum mengerti cara penggunaan aplikasi setelah dilakukan *training*	R8	4	4
Alat			
Terjadi kerusakan *tools* yang digunakan untuk mengembangkan sistem	R9	2	2
Kebutuhan			
Tingkat kesulitan pekerjaan yang tidak terprediksi sebelumnya	R10	4	4
Teknologi			
Aplikasi tidak jalan sebagaimana mestinya	R11	3	3
Teknologi yang digunakan tidak *compatible* dengan kebutuhan yang ada	R12	2	3
Estimasi			
Bencana Alam	R13	1	5

3. Determine the level of interest risk

After determining the value of the probability and impact of risks, further calculation of the importance of the risk of using the method of Probability Inpact and Matrix (PIM). Using the formula 8 here is the results of the analysis of the likelihood and impact of which can be seen more in table 12. under this.

***Table 12.** The results of the analysis of the likelihood and impact of*

No	Kode Risiko	Kemungkinan	Dampak	Tingkat Kepentingan Risiko
1	R1	2	4	8
2	R2	3	3	9
3	R3	3	4	12
4	R4	4	4	16
5	R5	4	4	16
6	R6	3	3	9
7	R7	3	3	9
8	R8	4	4	16
9	R9	2	2	4
10	R10	4	4	16
11	R11	3	3	9
12	R12	2	3	6
13	R13	1	5	5

1. Risk mitigation

From the results of the assessment of the significance of the risks has been done before and then do the handling of risk mitigation or control measures of risk. Risk mitigation can be seen more on the table 13. below.

***Table 13.** Mitigation Risk*

Tingkat Risiko	Kode Risiko	Penanggung Jawab	Tindakan Pengendalian Risiko
Risiko Tinggi	R4	1. Manajer Proyek 2. Divisi Support	1. Memanfaatkan SDM yang ada dengan menambah jam kerja dan pemahaman tentang proyek yang di kerjakan. 2. Pengorganisasi pekerjaan agar setiap bagian dapat memahami tugas dengan baik.
Risiko Tinggi	R5	1. Manajer Proyek 2. Divisi Support	Sering lakukan komunikasi dalam tim, agar terjalin *chemistry* dan kenyamanan saat bekerja sama.
Risiko Tinggi	R8	1. Manajer Proyek 2. Divisi Support	Dilakukan training ulang selama 1 hari jika belum mengerti dan ingin di perpanjang maka harus ada tambahan biaya training.

Risiko Tinggi	R10	1. Pimpinan 2. Manajer Proyek 3. Divisi Support	Melakukan komunikasi dan cari solusi bersama tim agar kerumitan sistem bisa segera teratasi
Risiko Sedang	R1	1. Pimpinan 2. Manajer Proyek	1. Selalu mengacu pada spesifikasi/fitur yang sudah disepakati. 2. Jika ingin tambah fitur maka harus ada penambahan biaya karena itu di luar harga proyek yang telah di sepakati
Risiko Sedang	R2	1. Manajer Proyek	Melakukan perbaikan jadwal pengerjaan dengan mengkomunikasikan dengan tim dan *client*.
Risiko Sedang	R3	1. Manajer Proyek	Pemimpin proyek selalu melakukan pengawasan pada tim dan memantau kinerja tim serta membantu mencarikan solusi terhadap permasalahan yang di hadapi tim dalam pengerjaan proyek.
Risiko Sedang	R6	1. Manajer Proyek	Memanfaatkan SDM yang ada dan di berikan training serta buku pelatihan agar lebih memahami proses bisnis yang akan di kerjakan
Risiko Sedang	R7	1. Manajer Proyek 2. Divisi Support	Diadakan rapat sebelum mulai pengerjaan dan beri pemahaman kepada tim sejelas mungkin tentang proyek yang akan dikerjakan.
Risiko Sedang	R11	1. Manajer Proyek 2. Divisi Support	Dilakukan perbaikan terhadap fitur yang bermasalah
Risiko Sedang	R12	1. Manajer Proyek 2. Divisi Support	1. Sebelum pemilihan teknologi dilakukan pengecekan 2. Menyiapkan teknologi alternatif
Risiko Rendah	R9	1. Divisi Support	Usahakan disediakan sistem cadangan.
Risiko Rendah	R13	1. Manajer Proyek 2. Divisi Support	Setiap pekerjaan yang telah dilakukan usahakan selalu di buatkan *back up*.

2.1.3 Expected Monetery Value (EMV)

At this stage it will count on the extent of the costs that must be incurred to handle those risks by using the method of Monetery Expected Value (EMV). Probability value is how likely these risks will occur and the consequences of cost is the cost that will be incurred if the risk occurs. While the costs incurred if the risk occurs in the take of the profits will be in the project. Costs in each of the respective risks can be seen in table 14. below.

Table 14. *Fee The Consequences Of Risk*

Kode Risiko	Keterangan Risiko	Probabilitas	Konsekuensi (Rupiah)
R1	Penambahan atau perubahan spesifikasi dari *client*	30%	Rp5.000.000,-
R2	Perkiraan sistem perangkat lunak tidak sesuai	30%	Rp1.000.000,-
R3	Perkiraan jadwal tidak sesuai perencanaan	30%	Rp1.500.000,-
R4	Ada tim proyek yang sakit sehingga berpengaruh terhadap pelaksanaan proyek	70%	Rp2.500.000,-
R5	Kurang koordinasi di dalam tim, kurangnya kerja sama tim	70%	Rp2.500.000,-
R6	Kekurangan SDM yang memilii kompetisi yang diharapkan	30%	Rp2.500.000,-
R7	Tim proyek lambat menangkap bisnis model yang dibangun	30%	Rp1.750.000,-
R8	User belum mengerti cara penggunaan aplikasi setelah dilakukan *training*	70%	Rp5.000.000,-
R9	Terjadi kerusakan *tools* yang digunakan untuk mengembangkan sistem	10%	Rp10.500.000,-
R10	Tingkat kesulitan pekerjaan yang tidak terprediksi sebelumnya	70%	Rp2.500.000,-
R11	Aplikasi tidak jalan sebagaimana mestinya	30%	Rp2.500.000,-
R12	Teknologi yang digunakan tidak *compatible* dengan kebutuhan yang ada	30%	Rp1.500.000,-
R13	Bencana Alam	30%	Rp7.500.000,-

Based on the formula of 9 here is a recap of the calculation of the risk cost can be seen more in table 15 below.

Table 15. *The Results Of Calculation Of EMV*

Kode Risiko	Keterangan Risiko	Probabilitas	Konsekuensi (Rupiah)	EMV (Rupiah)
R1	Penambahan atau perubahan spesifikasi dari *client*	30%	5.000.000	1.500.000
R2	Perkiraan sistem perangkat lunak tidak sesuai	30%	1.000.000	300.000
R3	Perkiraan jadwal tidak sesuai perencanaan	30%	1.500.000	450.000
R4	Ada tim proyek yang sakit sehingga berpengaruh terhadap pelaksanaan proyek	70%	2.500.000	1.750.000
R5	Kurang koordinasi di dalam tim, kurangnya kerja sama tim	70%	2.500.000	1.750.000
R6	Kekurangan SDM yang memilii kompetisi yang diharapkan	30%	2.500.000	750.000
R7	Tim proyek lambat menangkap bisnis model yang dibangun	30%	1.750.000	525.000
R8	User belum mengerti cara penggunaan aplikasi setelah dilakukan *training*	70%	5.000.000	3.500.000
R9	Terjadi kerusakan *tools* yang digunakan untuk mengembangkan sistem	10%	10.500.000	1.050.000
R10	Tingkat kesulitan pekerjaan yang tidak terprediksi sebelumnya	70%	2.500.000	1.750.000
R11	Aplikasi tidak jalan sebagaimana mestinya	30%	2.500.000	750.000
R12	Teknologi yang digunakan tidak *compatible* dengan kebutuhan yang ada	30%	1.500.000	450.000
R13	Bencana Alam	30%	7.500.000	2.250.000

Based on the table above it can be concluded that the greatest risk is the R8 with a risk description of "users do not understand how to use the application after training", where the cost of risk amounted to Rp 3,500,000.

2.2 Analysis of User Needs

Analysis of the user (user) is required to support the project management system will be built in accordance with the needs of the system. Analysis of present users with required are as follows in table 16 below.

Table 16. *User Needs*

No	Pengguna	Tanggung Jawab	Tingkat Pendidikan	Tingkat Keterampilan	Pengalaman
1	Manajer Proyek	a. Memasukkan dan merubah data. b. Mencetak atau Print data.	Lulus minimal D3	a. Terampil menggunakan dan mengerti komputer b. Bahasa Inggris	Pernah atau mengerti bidang ekonomi dan ilmu komputer.
2	Divisi Support	Melakukan pekerjaan sesuai yang di arahkan oleh manajer proyek	Lulus minimal SMK	Pernah menjalankan website, pengenalan komputer dan jaringan.	Pernah atau mengerti bidang ekonomi dan ilmu komputer.

2.3 Analysis Database

Database analysis is the analysis phase to describe the desired system in the form of the relationships between the entities involved in the project management information system in PT Infotama Kreasindo. Excellent. The following figure 5. ERD LICENCE Project Pt. Excellent Infotama Kreasindo .

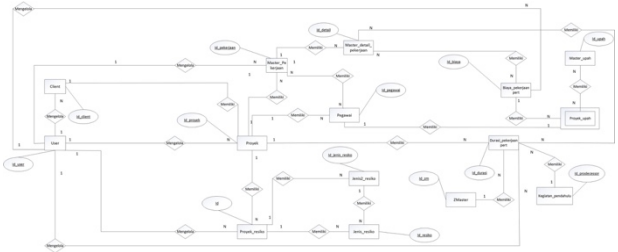


Figure 5. *ERD SIM Proyek PT. Excellent Infotama Kreasindo*

2.4 A Functional Needs Analysis

In building information systems project management at PT Infotama Kreasindo used this Excellent modelling analysis tools include structured diagram context, data flow diagrams, data dictionaries and process specifications. The following diagram and context DFD level 1.

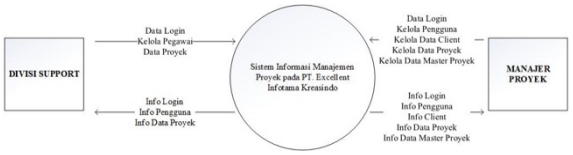


Figure 6. *Diagram Konteks*

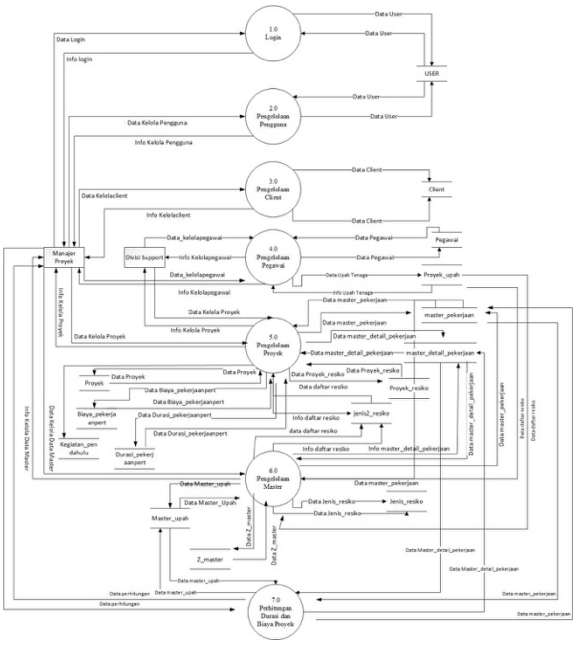


Figure 7. *DFD Level 1*

2.5 The Design Of The System

From the functional requirements and is a preparation for designing the wake system implementation or constitute how to describe a system that will be established. The following scheme of relations to be built on a figure 8 relation scheme.

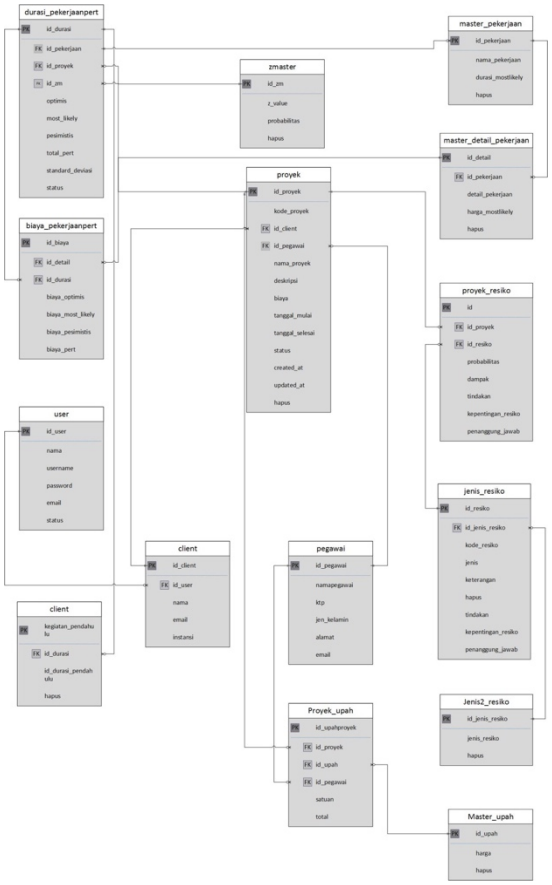


Figure 8. *Relation Scheme*

2.6 The Design Of The Menu Structure

The design of the structure of the menu is the description of the line usage application so that applications built easily understood and easy to use. The Division of the menu structure is done based on the user which consists of the project manager and the Support Division.

Design Project Manager menu structure can be seen.

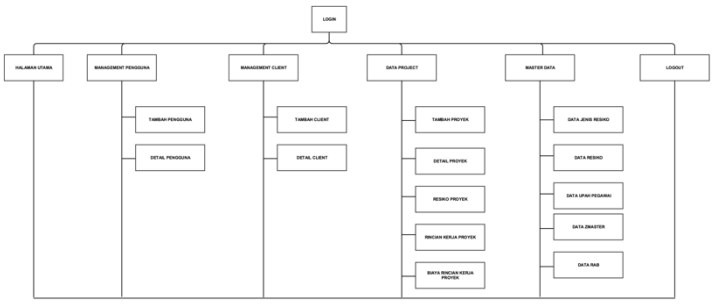


Figure *9.* *Menu Structure project manager*

2.7 The Design Of The Interface

The design of the interface is the project manager's main page main page when login is successful project managers used to perform data management. The design of the main page project manager interface can be seen in Figure 10 below.

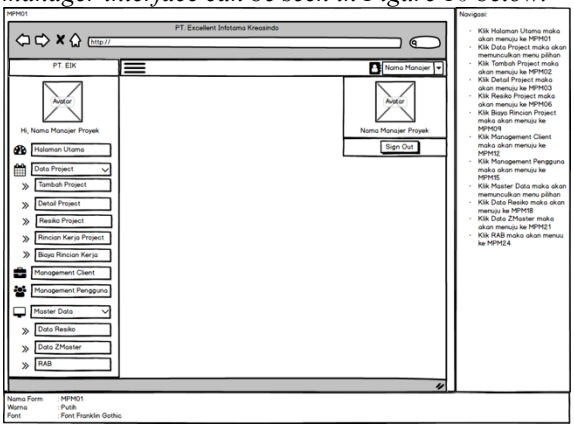


Figure 10. *Design Interface*

2.8 Testing

Software testing i.e. all activities aiming to evaluate the attribute or the ability of a program or system and determines that the software testing met the required results [4].

2.8.1 Testing Blackbox

Based on the results of tests conducted with the black box test cases have been conducted before, the conclusion can be drawn as follows:

1. the method of PERT as expected i.e. project managers can know the time optimistic, pessimistic and normal in completing the work as well as the probability of completion of the project. So that helps project managers in planning scheduling project.
2. the method of PERT also help project managers in putting together a budget plan cost by knowing the cost of a normal charge optimistic, pessimistic and cost of project work that will be done.
3. The PIM method and EMV as expected i.e. storing risk data that occurs in companies with risk mitigation and cost based on the results of the calculation of the level of interest has been made using the formula that had been discussed earlier. The results of the calculation of the level of interest and the cost of this risk showed a risk which should really respond seriously in so that the company can alert when tiling project

2.8.2 Testing Beta

Based on the answers of the interviewees, namely Mr. Arif Rahman Hakim as project manager and Mr. Ahmad Imanudin as the Support Division of PT Infotama Kreasindo Excellent. to the question posed in the beta testing, then it can be drawn the conclusion that the system is easy to use, built by users, as well as features such as scheduling, cost planning, identification and mitigation of risk is already meeting the needs of the company, but the need for system development

3. FINAL

Based on the results of the research and testing that has been done to the project management information system in PT Infotama Kreasindo Excellent., some conclusions can be drawn as follows:

1. *Project management information system in PT Infotama Kreasindo Excellent. can do planning schedule and figure out the probability of completion of the project. So you can help project managers in knowing the probability of whether the project can be completed by the time specified.*
2. *Project management information system in PT Infotama Kreasindo Excellent. can do planning employment costs. With the cost of the work associated with the exchange rate of the currency then in create business rules for the cost of the work so that it helps the project manager in the planning costs jobs.*
3. *Information systems project management at PT Infotama Kreasindo Excellent can help project managers identify and mitigate risks and know the costs that will be issued for the risk of the project. The results of the calculation of the level of interest and the cost of this risk showed a risk which should really respond seriously in so that the company can alert when tiling project.*

REFERENCE

[1]. Muslich, Muhammad. 2009. Metode Pengambilan Keputusan Kuantitatif. Jakarta: PT. Bumi Aksara.
[2]. Soeharto, Iman. 1999. Manajemen Proyek: Dari Konseptual Sampai Operasional. Jakarta. Erlangga.
[3]. Husen, Abrar. 2011. Manajemen Proyek Perencanaan, Penjadwalan, dan Pengendalian Proyek (Edisi Revisi). Yogyakarta: Andi.
[4]. Muhammad Rizki Ridho dan Syahrizal. 2012. Evaluasi Penjadwalan dan Biaya Proyek Dengan Metode PERT dan CPM (Studi Kasus: Proyek Pembangunan Gedung Kantor Badan

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