PROJECT MANAGEMENT INFORMATION SYSTEM IN PT. QUICKSTEPS SARANA SOLUSINDO

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ABSTRACT

PT. Quicksteps Sarana Solusindo (QSS) is a Information Technology(IT) and Support System company. Currently, PT. QSS has a chance to handle a accounting information system project. In the execution of project PT .QSS are experiencing delay, the delay is caused by several factors, there are : the complexity of a system built, calculation error occured estimated time and costs of the projects , ineffective of human resources to handle it and there is no risk recording which will occur and how to handle it. Based on to the problems that exist, require an analysis and development system with the application of methods that can increase effectiveness in monitoring and controlling the implementation of project.

Function Point method is used to calculation of estimated levels of complexity. Earned value Management(EVM) method is used to control the time and costs of the project, EVM is used because this method is able to integrate the time and costs so that it can show performance of activities. While to do assessment by combining oppurtunities for the appear of risks and impacts is used method probality method Impact Matrix (PIM) method.

Based on the description of the results of research and analysis has been done, estimate of complexity level of the value obtained can be conluded,that the software is a complex software and project management produces some of risks that may be encountered, produce steps of risks mitigation based on the level of importance of risk. Monitoring of human resources can be more easily with the activities reporting system. And based on the value of ETC and EAC are obtained if the performance is not renewed will be a delay that causes changed the time for 6 days and costs as much Rp. 3.055.555.

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Keywords: project management,function point, earned value vanagement,evm, pim.

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1. INTRODUCTION

1.1 Latar Belakang

PT. Quicksteps Sarana Solusindo (QSS) is a Information Technology(IT) and Support System company. Pt.quicksteps facilities solusindo have experienced for the development of software good desktop , website and mobile. Pt.qss often trusted to do many project software good from government and private.

The project manager a project pt .Qss difficulty in monitoring project his sustainability, So sometimes not pelaksaan project in accordance with first plan that has been scheduled , this has resulted in the late project. This delay occurred because some of them are a variety of factors , complex system that built so as to cause difficulties in developers do it, error flags in performing calculations an estimate of the cost and extra time project as there is typically uses the calculation it in estimate schedule for implementing projects, the ineffective human resource handle so there is some work excess not finished meet the planned, besides that the recording risks to be in face and way handle it, can also results delay project. The longer time this delay, the bigger also it would cost issued by a corporation.To these problems otomotis resulting in corporate profits reduced, but sometimes they do not even profit.

Based on the problems explained previously to settle the matter are needed an analysis by the application of a method of increase effectiveness in on the monitoring of the and control the project. Here is some Method able to meet the purpose of them , Method Earned Value Management (EVM) , method Fucntion Point , the Probability the Matrix (PIM). Evm is a method ease in containing costs and time project[2]. Method *Fucntion Point* is one approach measurement software for measuring the size of the system under the system. PIM is the method in used to do assessments and combining opportunities the emergence of risk by the impact .Of exposure who explained previously , so research times it is given the title "Project Management Information System In Pt. Quicksteps Sarana Solusindo".

1.2 Purpose and objectives

Based on the description of the background issues, the purpose of this study is to Build a Project Management Information System in PT. QSS. The objectives to be achieved from the development of information systems project management are as follows :

1. Estimates the degree of complexity of software projects to be undertaken.
2. Assist Product & Development Manager in the calculation of the estimated cost and project time.
3. Assist Product & Development Manager for monitoring of human resources in the implementation of the project to fit the estimates and the preliminary design of the project.
4. Knowing the risks that may be encountered during the implementation of the project and how to control these risks.

1.3 Project management

Project management is the application of knowledge, expertise and skills, is technically the best and with limited resources, to achieve the goals and objectives set in order to get optimal results in terms of cost performance, quality and time, as well as occupational safety[1]. Project management is a science and an art related to lead and coordinate the resources that consists of human and material by using modern management techniques to achieve predetermined objectives, the scope, quality, schedule, and costs, and meet the wishes of the stake holders.

1.4 Method Earned Value Management

Method EVM Or method value of control is a method of performance project more progressive.This method can provide information about the position of progress projects in a certain period and can expect project progress in the period next in both the cost and the completion of projects [1].

This method used of curves S as display of information to the x show duration projects and the y axis to declare cumulative costs. Where excess of this method is as follows[1] :

1. Display of information method earned value more progressive curve s than conventional.
2. This method can predict the cost and time loss based on the progress of work which tend to be slow, so the additional duration of the project and the final cost could be calculated by a systematic approach.
3. Information from the prediction of the final settlement fee and the final completion time prediction can be used to accelerate the progress of corrective action in the form of an exchange project with cost and time or by the addition of labor or overtime and rescheduling resources, for example labor, equipment, and materials.

The terms used in the method of EVM are as follows :

1. Planned Value(PV)

PV the budgeted cost for the work scheduled in a given period and is set in the budget. Obtained by multiplying the percentage of progress plans with total project budget (BAC)[5].

$$PV = (\%progres\ rencana) \times BAC \quad (1)$$

2. Earned Value(EV)

EV or Budgeted Cost of Word Performed (BCWP) the budgeted cost for the work that has been completed held. Obtainable by multiplying the percentage of progress that has been implemented with the total project budget (BAC)[5].

$$EV = (\%progres\ aktual) \times BAC \quad (2)$$

3. Cost Varience (CV)

CV represents the difference between the value obtained after completing the work packages with actual expenses incurred during project implementation.

$$CV = EV - AC \quad (3)$$

4. Schedule Varience (SV)

SV used to calculate the deviation between EV at PV.

$$SV = EV - PV \quad (4)$$

5. Cost Performance Index (CPI)

CPI A factor efficiency the money that has been issued can be made compare in value work physically have close (EV) with the money that has been issued in the same period (AC) [5].

$$CPI = EV / AC \quad (5)$$

6. Scedule Performance Index (SPI)

SPI A factor efficiency performance in finish the job shown by comparison between grades work physically has been completed (EV) to a plan expenditure cost under the plan work (PV)[5].

$$CPI = EV / PV \quad (6)$$

7. Predictions the cost of a final settlement (EAC)

Prediction of the cost of a final settlement the project can calculated by comparison between total budget (BAC) with CPI.

$$EAC = BAC/CP \quad (7)$$

8. Prediction time of final settlement (ETC)

Prediction time of the final settlement can be calculated by the ratio between the duration of the project (OD) with SPI.

$$ETC = OD/SPI \quad (8)$$

1.5 Method Function Point

Function Point is one approach to measuring software for measuring the size of the system based on the needs of the system. Function Point Analysis (FPA) is an indirect measure of the functional size of a system[1].

In the method of Function Points, the size of a system can be calculated by three components, namely information processing size (Unadjusted Function Points-UFP), Relative complexity adjustment factors and Function Points.

1. Crude Function Points(CFP)

Crude Function Point in a software identified and categorized into one of five types of user functions, are: External Input (EI), External Outputs (EO), Internal Logical File (ILF), External Interface Files (EIF) dan External Inquiry (EQ), then assessed the complexity and given a number of values Function Points.

2. Relative complexity adjustment factors (RCAF)

RCAF calculated based on the overall complexity of the system by using 14 General System Characteristics(GCS), where the value of each GCS scale of 0 (zero) to 5 (five). Table 1 shows 14 *General System Characteristics* which will be given ratings. Information :

0 = No effect, 1 = Insidental , 2 = Moderat, 3 = Average, 4 = Significant, 5 = Essential.

Table 1. 14 General system Characteristic

General System Characteristic	Bobot
Data Communication	[0/1/2/3/4/5]
Distributed Data/Processing	[0/1/2/3/4/5]
Performance Objecives	[0/1/2/3/4/5]
Heavily Used Configuration	[0/1/2/3/4/5]
Transaction Rate	[0/1/2/3/4/5]
Online Data Entry	[0/1/2/3/4/5]
End-User Effiency	[0/1/2/3/4/5]
Online Update	[0/1/2/3/4/5]
Complex Processing	[0/1/2/3/4/5]
Reusability	[0/1/2/3/4/5]
Conversion / Installation Ease	[0/1/2/3/4/5]
Operation Ease	[0/1/2/3/4/5]
Multiple Site ease	[0/1/2/3/4/5]
Facilitate Change	[0/1/2/3/4/5]
Total RCAF	**?**

3. Function Point(FP)

Function Point Is the process of doing the calculations to get the value Function point of the software to be built. FP obtained from the multiplication CFP and RCAF with formula:

$$FP = UFP*(0.65+(0.01*RCAF)) \quad (9)$$

Score 0.65 and 0:01 is a constant or constant created by Function Point International User Group (IFPUG).

1.6 Method Probability Impact Matrix

Probability Impact Matrix(PIM) was an approach that was developed using two criteria that are important for measuring risk[18], are :

1. The possibility (Probability), is the possibility (Probability) of an unwanted event.
2. Impact (Impact), is the degree of influence or effect size (Impact) in other activities, if undesirable events occur.

Rate the probability of each risk and the impact that is made in a scale of 0 to 1, where the scale of the stated levels of low, medium and high, as described in the table 2.

Table 2. Value Scale Risks

Skala	Nilai Resiko
0 - 0.30	Low
0.31 - 0.7	Medium
0.71 – 1	High

Value risk is the product of the probability value and assess the impact, risk value obtained from respondents. Where the value is composed of a scale is 0 to 1 stated levels of low, medium and high probability and impact of each risk. To measure the interest rate risk can be using the following formula :

$$\text{Risk Exposure} = \text{probality} * \text{Loss} \quad (10)$$

Where :

Risk Exposure = The level of importance of risk

probality(outcome)= risk probability value

Loss(outcome) = assess the impact of risk

Table 3. The result of the calculation of interest rate risk

Code Risk	Probability	Impact	Importance Risk
R1	0.7	0.8	0.56
R2	0.2	0.7	0.14
R3	0.1	0.7	0.7
R4	0.3	0.5	0.15
R5	0.5	0.5	0.25

Based on the results of the calculation of the interest rate risk, the risk matrix is then created. Table 4 is a risk matrix resulting from the calculation of the benefit risk.

Table 4. Risk Matrix

Probability / Impact	Low (0 – 0,3)	Moderate (0,31 – 0,7)	High (0,71 – 1)
High (0,71 – 1)		R4,	R1
Moderate (0,31-0,7)	R2,R3	R5	
Low (0-0,3)			

2. RESEARCH CONTENTS

2.1 Problem Analysis

Based on the results of research conducted, it was found problems as follows :

1. The complexity of the system is so constructed that causes difficulty in working developer.
2. The occurrence of errors in the calculation of estimated project costs and additional time because it usually does not use appropriate calculation methods in estimating the project implementation schedule.
3. Lack of effective human resources to handle so there is some work can not be completed according to the schedule of activities.
4. The absence of recording problems to be encountered and how to deal with them can also cause project delays.

2.2. Analisys Methods

The analysis method is to explain the application of the method to the data used as research material which has been described previously. The analysis method in this research is as follows:

2.2.1 Function Point

Methods used to estimate the function point software complexity. Software estimation using a model function point calculation consists of three stages is:

1. Crude Function Points

Software estimation using a model function point where the first step is to provide an assessment on the weight of each part of the five types of functions to determine the quantity Unadjusted Function Point(UFP). Five of these functions is External Input (EI) , External Output(EO) , Internal Logical Files(ILF), External Interface Files(EIF) dan External Inquery(EQ). These five functions are classified into three levels of complexity is simple , average dan complex, each level has a weight varying complexity. Table 5 below describes the constant weight has been determined by the*Function Point International User Group*(IFPUG) for each component of the system.

From the results obtained weighted total value of the CFP that is equal to 745 points.

2. Relative complexity adjustment factors (RCAF)

Giving the value of each GSC is done by discussion with the company, namely by Mr. Sandy as produck and development Manager PT.QSS, to determine the level of importance of each GSC. Table 5 shows the results of the assessment system complexity using GSC.

Table 5 Results weighted votes GSC.

General System Characteristic	Weight
Data Communication	5
Distributed Data/Processing	4
Performance Objecives	4
Heavily Used Configuration	3
Transaction Rate	3
Online Data Entry	2
End-User Effiency	4
Online Update	2
Complex Processing	4
Reusability	5
Conversion / Installation Ease	3
Operation Ease	3
Multiple Site ease	3
Facilitate Change	2
Total RCAF	**47**

3. Function Point

After getting value calculation RCAF Function Point (FP). FP is the calculation of multiplication CFP and RCAF with equations 9.

$$FP = CFP*(0.65+(0.01*RCAF)) \quad (2.9)$$

The result of the calculation is as follows AFP :

$$FP = 745*(0.65+(0.01*47)) = \mathbf{834}$$

Based on FP value obtained is 834 points, then the accounting information system project PT. Karaba Jabaku Technologies include software complex.

2.2.2 Risk management

Here are some steps that are used in analyzing the possible risks that will occur as well as handling .And steps involved in risk management in this study are as follows.

1. Identifikasi Resiko

Risk identification process is carried out with the approach of discussions and interviews with the company in this case is Mr. Sandy as produck and development Manager PT.QSS that generates a list of risk. Risk identification is grouped by the type of risk. Here are the results of the analysis of risk identification has been carried out, can be seen in Table 6.

Code Risk	Kind of Risk	Description of risk
R1	Needs	Additions or changes to specifications of the client

Code Risk	Kind of Risk	Description of risk
R2		Business models to be created not fix
R3	Estimates	Estimates of the size of the software system is not appropriate
R4		Estimated schedule is not based on planning
R5		Estimated repair scheduling system is too little
R6	Personal	There is a project team who are sick and therefore contributes to the implementation of the project
R7		Lack of coordination within the team, lack of teamwork
R8		Shortage of human resources that have the competence expected
R9		The project team there who resigned
R10		The project team was slow to catch business models built
R11		This user does not understand how to use the application after training
R12	Tools and technology	Damage to the tools used to develop the system
R13		The level of difficulty of the job that are not predictable in advance
R14		Applications do not work properly
R15		The technology used is not compatible with existing needs
R16		Tools used for the development of inefficient
R17		The database used is not required to process transactions
R18	External	Natural disasters

2. Analaisis Possibilities and Consequences Risk

Scoring the probability and impact of each risk is done by discussion with the company, namely by Mr. Sandy as produck and development Manager PT.QSS, where the value is composed of a scale is 0 to 1 stated levels of low, medium and high probability and impact of each risk.

Table 7 Matrix Risk

Probability / Impact	Low (0 – 0,3)	Moderate (0,31– 0,7)	High (0,71 – 1)
High (0,71 – 1)	R9,R14,R18	R4,R7	R1,R6
Moderate (0,31-0,7)	R2,R3,R8,10, R12,R13, R15,R16	R5,R11,R 17	
Low (0-0,3)			

Table 8 below shows the results of calculations grouping interest rate risk Based on the matrix in table 7.

Table 8 Categories Of Risk Level

Code Risk	Level Of Risk
R1	High Risk
R2	Low Risk
R3	Low Risk
R4	High Risk
R5	Risk Of Being
R6	High Risk
R7	High Risk
R8	Low Risk
R9	Risk Of Being
R10	Low Risk
R11	Risk Of Being
R12	Low Risk
R13	Low Risk
R14	Risk Of Being
R15	Low Risk
R16	Low Risk
R17	Risk Of Being
R18	Risk Of Being

3. Mitigation Risk

From the results of the risk assessment of importance that has been done before and then do the handling of risk mitigation or risk control measures. The control measures against each of these risks can be seen in Table 9.

Table 9 Measures for risk control

Level Of Risk	Code Risk	Risk Control Measures
High Risk	R1	1. Always refer to the specifications / features already agreed, 2. If you want the added

Level Of Risk	Code Risk	Risk Control Measures
		feature there must be additional costs because it is beyond the price of projects that have been agreed
High Risk	R4	The project leader on the team always supervise and monitor the performance of the team and help find solutions to the problems faced by the project team.
High Risk	R6	1. Utilizing the existing human resources by increasing the hours of work and an understanding of the project that was done. 2. Organizing the work so that each part can understand the task well.
High Risk	R7	Frequent communication within the team, in order to create the chemistry and comfort while working together.
Risk Of Being	R5	Gives understanding to the client that the repair of the system takes no little.
Risk Of Being	R9	1. The SDM requesting that I can commitment to the project that is being worked on, if you want to resign welcome after the project is completed. 2. Utilize other human resources, could be of outsourcing or other teams that are not pengerjakan project.
Risk Of Being	R11	Doing retraining for 2 hours if not understood and wanted to be extended, there must be additional training costs.
Risk Of Being	R14	Make improvements to the features that are problematic
Risk Of Being	R17	The possibility of this happening because the data is processed very much so his solution is to replace the engine with a database that has advantages in processing requires huge data.
Low Risk	R18	Each work has been carried try to always be made back up.
Low Risk	R2	Assessing together in order to find solutions and business models that have agreed not fundamentally changed.
Low Risk	R3	Make improvements to the work schedule by communicating with the team and the client
Low Risk	R8	Utilizing the existing human resources and given training as well as training books to better understand the business processes that will be done
Low Risk	R10	Held a meeting before the start of workmanship and give insight to the team as clear as possible about the projects to be undertaken.
Low Risk	R12	Try to provide a backup system.
Low Risk	R13	Communicate and find solutions together with the team so that system complexity can be resolved soon
Low Risk	R15	1. Before the choice of technology to be checked 2. Setting up alternative technologies
Low Risk	R16	Selection tools should be made based on the experiences or recommendations has been an expert in the use of similar tools.

2.2.3 Earnerd Value Management

The problem is analyzed in one report PT accounting information system project. Jabaku Karaba Technologies. This project was done by PT. QSS with a total budget (BAC) Rp.27.500.000, - and the processing time for 10 weeks or 50 days, divided into three sprint workmanship. From the results reported in the first week following reports the data obtained :

Table 10 Reports The Project

Name Of Activity	Weight(%)	Execution(%)	
		Week 1	Week 2
Design	10%	10%	10%
Sprint 1	30%	0%	8%

Name Of Activity	Weight(%)	Execution(%)	
		Week 1	Week 2
Sprint 2	30%	0%	
Sprint 3	30%	0%	
	100%		18%
AC		2.750.000	5.500.000
OD		50	50

1. Planned Value (PV)
Calculation PV at week 1 :
PV = (%progress plan) x BAC (1)
= 10% x 27.500.000
= Rp. 2.750.000
Calculation PV at week 2:
PV = (%progress plan) x BAC (1)
= 20% x 27.500.000
= Rp. 5.500.000

2. Earned Valeu(EV)
Calculation EV at week 1 :
EV = (%progress current) x BAC (2)
= 10% x 27.500.000
= Rp. 2.750.000
Calculatiom EV at week 2 :
EV = (%progress current) x BAC (2)
= 18% x 27.500.000
= Rp. 4.950.000

3. Analisis Varian
Calculation CV and SV at week 1 :
CV = EV – AC (3)
= 2.750.000 - 2.750.000 = 0
SV = EV – PV (4)
= 2.750.000 - 2.750.000
= 0
Calculation CV and SV at week 2 :
CV = EV – AC (3)
= 4.950.000 - 5.500.000
= -550.000
SV = EV – PV (4)
= 4.950.000 - 5.500.000
= -550.000

4. Analysis Of The Performance Index
Calculation CPI and SPI at week 1 :
CPI = EV/AC (5)
= 2.750.000/2.750.000
=1
SPI = EV/PV (6)
= 2.750.000/2.750.000
=1

Calculation CPI and SPI at week 2 :
CPI = EV/AC (5)
= 4.950.000 /5.500.000
=0,9
SPI = EV/PV (6)
= 4.950.000 /5.500.000
=0,9

5. Analysis of Cost Estimation and Project Completion Time
Calculation EAC and ETC at week 1 :
EAC = BAC/CPI (7)
= 27.500.000/1
= Rp. 27.500.000
ETC = OD/SPI (8)
= 50/1
= 50 hari
Calculatuin EAC and ETC at week 2 :
EAC = BAC/CPI (7)
= 27.500.000/0,9
= Rp. 30.555.555
ETC = OD/SPI (8)
= 50/0,9
= 55,5
= 56 hari

From the analysis above can be concluded if the project is running behind schedule have been determined. because it was detected too late for the estimated value of the time of completion (ETC) was 56 days, greater than the duration of the project (OD) of 50 days and cost estimates were issued Rp. 30,555,555 greater than the total budget (BAC) Rp. 27.5 million. Then the result is what helps a project manager to decide what to do in order to finish the project schedule can be in accordance with a predetermined schedule.

3. COVER

3.1 Conclusion

Based on the results of the research and testing that has been done to the Project Management Information System in PT. QSS, can pull some conclusions as follows:

1. The system is built can produce the level of complexity of the project.
2. Development of the Project Management Information System in PT. The QSS can help product and development manager in the calculation of time and cost of the project.
3. The system can help product and development manager HR performance monitoring involved in work on the project.
4. The system can store data risks and how to control it.

3.2 Suggestion

Based on the results of testing the system, got a few suggestions that can be considered.

1. Project Management Information System in PT. QSS must be added a few extra features, such as

notification to managers when there are jobs that are not resolved.
2. In this study, no analysis if the project is done accelerating.
3. In terms of the development of this system is built using CodeIgniter framework may order more resilient system performance can be tested using a PHP framework such as Yii or laravel.

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