

## Study of Cost, Time and Quality Modeling for Improving Project Management Decision Making

Wiwik Sumarmi<sup>1</sup>, Ribangun Bamban Jakaria<sup>2</sup>, Nani Sutarni<sup>3</sup>, Jems KR Maay<sup>4</sup>, Mariia Pavlovna Glyzina<sup>5</sup>

<sup>1</sup>*Universitas Muhammadiyah Sidoarjo, Sidoarjo, Indonesia. E-mail: ribangunbz@umsida.ac.id*

<sup>2</sup>*Universitas Muhammadiyah Sidoarjo, Sidoarjo, Indonesia.*

<sup>3</sup>*Universitas Pendidikan Indonesia, Indonesia.*

<sup>4</sup>*Politeknik Kesehatan Kemenkes Jayapura, Indonesia.*

<sup>5</sup>*Don State Technical University, Russian Federation, 344000, Rostov-on-Don, Gagarin square 1*

### Abstract

*With complete project through the level of quality the value of the project can be estimated to the client. As the part of project management the quality is consider as a major aspect but as the association with cost and time it has not been modeled previously. For the satisfaction of client to provide the successful target project management addresses performance, cost and schedule. As the part of the whole project level of quality measure the cost of the project. For every task of project to achieve the level of quality it follow the necessary managerial decisions. Quality of the task defined by level of the quality.*

**Keywords-***quality; time; project management; cost.*

### I. INTRODUCTION

An association with time and cost the quality management is equally prioritized, in the field of project management [1] [2]. In order to achieve the project target it has been seen that the project management is not only concern with managing time and cost but for completing the target it also concern for complete work. Quality of the project directly relevant to the project value undertaking expectations, so the quality of the project that is provided after completing the project is very important. One definition of quality is defined by PM-BOK (Project Management Body of Knowledge) [3] that quality is for fulfill the requirements a set of inherent characteristics degree is known as quality [4].

Every day in daily life it is required to take small or big decisions, as project managers. The decision should take according to the consideration that the important decision affect the future and well beings of the project. To put it plainly, such decisions can shape the exceptionally nature of the professions and even the lives of every one of the individuals who depend on us.

### II. THE PROCESS OF DECISION MAKING

In the process of decision making the steps that are involved are as follows:

1. Managerial problem definition or identification
2. Problem analysis
3. Alternative solution should be developed
4. Out of the alternative select the best solution
5. Decision should converted in to an action
6. For following up ensure the feedback

Steps Involved In Decision Making Process

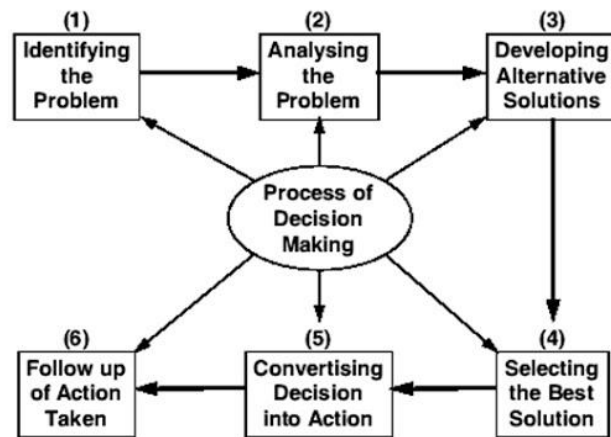


Figure 1: Decision making fundamnetal process

### Step 1: Define the Question

The initial phase in handling the above choice is to unmistakably record the inquiry that must be replied from the point of view of the individuals who must answer it. The model is taken from paper [5].

Given what is known up until now, the inquiry can be expressed as pursues:

"We're intending to migrate, yet we're experiencing some kind of hysteria. Would it be a good idea for us to swallow our pride and choose not to go?"

### Step 2: Perfect the Question

The subsequent stage is to examine the inquiry and expel any components that are not seen as fitting deeply choice to be made. This incorporates factors that are seen as unseemly to the current issue or potentially don't mirror the estimations of the leaders. In this circumstance, the family recognizes pride as simply such a factor, as a result of its capability to unfavorably impact the basic leadership process.

### Step 3: Answer the Question

A key comprehension is to recognize that there are three significant measurements to be inspected:

- Regardless of whether the family ought to or ought not be moving dependent on certainties
- Regardless of whether the family can or can't move dependent on sentiments
- Regardless of whether those engaged with the choice are in a situation to settle on choices autonomously

Family proceeds as follows for achieving the goals:

Facilitator (can be any relative – John fills the job in this model) opens up the floor for dialog, expressing, "What certainties, sentiments, suppositions, and so forth., are pertinent to our choice to migrate?"

Facilitator records precisely what every individual says in precisely the manner in which they state it. No worth decisions are made now. No prioritizations are made. The objective is just to get each idea down as it emerges

Facilitator at that point drives the family in analyzing every announcement to decide whether an announcement is irrefutable as a reality or speaks to an inclination. A Used table is shown given bellow:

Item	Who	Pro/Con	Weight	Score	Value
1. The weather is always warm in the new location.	John				
2. We can build our dream house for less.	Mary				
3. John will be able to go fishing every day.	John				
4. Utilities will be expensive.	John				
5. We will not have a car.	Jane				
6. I will not be able to make new friends.	Jane				
7. We will hate the food.	Jane				
8. I will miss my family and friends.	John				
9. I will miss my family and friends.	Jane				
10. I will miss my family and friends.	Mary				
11. The people are friendly.	Mary				
12. We will need to buy new furniture.	Mary				
13. I will not know how to speak the language.	Jane				
14. I will know how to speak the language.	John				
15. Etc.					

Table 1: For first pass decision Support Table  
 For determining that a statement is defining the feeling or statement is verifiable it examine each statement through facilitator that lead the family.

Item	Who	Pro/Con	Weight	Score	Value
1. The weather is always warm in the new location.	John				
2. We can build our dream house for less.	Mary				
<b>3. John will be able to go fishing from time to time.</b>	John				
4. Utilities will be expensive.	John				
5. We will not have a car.	Jane				
<b>6. I am afraid I will not be able to make new friends.</b>	Jane				
<b>7. Jane will hate the food.</b>	Jane				
8. I will miss my family and friends.	John				
9. I will miss my family and friends.	Jane				
10. I will miss my family and friends.	Mary				
11. The people are friendly. <b>WAITING FOR VERIFICATION.</b>	Mary				
12. We will need to buy new furniture.	Mary				
13. I will not know how to speak the language.	Jane				
14. I will know how to speak the language.	John				
15. Etc.					

Table 2: For second pass decision Support Table [5]

Item	Who	Pro/Con	Weight	Score	Value
1. The weather is always warm in the new location.	John	Pro			
2. We can build our dream house for less.	Mary	Pro			
3. John will be able to go fishing from time to time.	John	Pro			
4. John may not be around the house as often as needed because he will be fishing.	John	Con			
5. Utilities will be expensive.	John	Con			
6. We will not have a car to get around.	Jane	Con			
7. We will save on car related expenses.	Jane	Pro			
8. I am afraid I will not be able to make new friends.	Jane	Con			
9. Jane will hate the food.	Jane	Con			
10. I will miss my family and friends.	John	Con			
11. I will miss my family and friends.	Jane	Con			
12. I will miss my family and friends.	Mary	Con			
13. The people are friendly. WAITING FOR VERIFICATION.	Mary	Pro			
14. We will need to buy new furniture.	Mary	Con			
15. I will not know how to speak the language.	Jane	Con			
16. I will know how to speak the language.	John	Pro			
17. Etc.					

Table 3: For third pass decision Support Table [5]

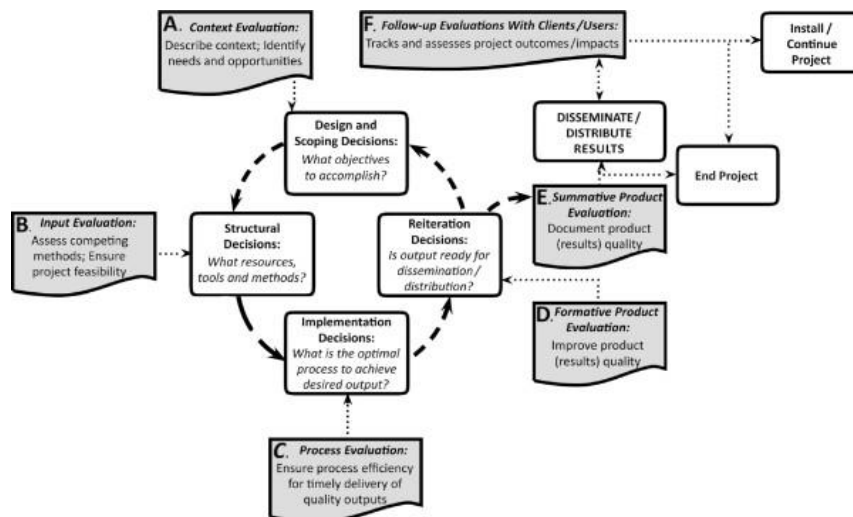


Figure 2: Measurement of decision making in a project

### III. MAKING BETTER DECISIONS

For making the project decision better there are some factor are given below:

1. The two-minute rule

Would you be able to finish the activity in less than two minutes? Do it at the present time and quit pondering it any further. This great bit of direction originates from David Allen's book Getting Things Done. It's great exhortation that has the right to be relashed and put vigorously.

2. Make minor decisions fast

For little choices, invest a modest quantity of energy. For instance, I as of late had a few talks about the correct method to deal with a \$15 receipt from a provider. Given this provider sends over \$50 million in solicitations for every year, it just isn't justified, despite any potential benefits to invest much energy in these solicitations. Settle on a choice quick and proceed onward.

3. Pick up the phone

Do you use email a great deal? I do! Email is fabulous from multiple points of view (particularly as a memory help). Lamentably, email can hinder basic leadership. Whenever you need more data so as to settle on a choice, make a short telephone call. You will settle on numerous choices quicker along these lines—simply attempt it.

4. Establish criteria for major decisions

With regards to dispensing assets, allocating real undertaking assignments and spending a lot of cash, it's imperative to be mindful. That doesn't mean you should waste your time.

5. Avoid big decisions before lunch

Never seem a judge directly before lunch. As per an examination detailed in Discover Magazine, experienced Israeli judges assessing parole solicitations were factually bound to deny demands directly before a supper break.

6. The halo effect

Star entertainers are in extreme interest. Many venture administrators contend energetically to get the colleagues with the best notorieties on their undertakings. Nonetheless, there's a concealed risk to putting stars on your task group without find out about how their qualities identify with your undertaking.

7. Bias availability

How would it choose what to focus on? Mental research finds that numerous individuals center around data that feels accessible to them. The accessibility predisposition is regularly affected by the passionate relationship of the memory.

8. Escape the curse of knowledge—act like a beginner

Our propelled economy is loaded up with specialists with profound information. Truth be told, numerous ventures are staffed with topic ability on subjects extending from security to database advancement.

9. Endowment effect: loss hurts

Like or it not, we will in general get connected to our assets. The blessing impact makes it harder for us to make exchanges that would improve our prosperity. For instance, we'd keep our present vehicle or most loved shirt as opposed to swapping it for its fiscal worth.

10. Error of fundamental attribute

"He's out and out reckless and amateurish—that is the reason he's disregarding my solicitations."

To abstain from succumbing to essential attribution blunder on your undertakings, ask yourself what else could be affecting a partner's activities. This activity will make you increasingly sympathetic and better at conveying ventures.



Figure 3: decision making process for quality modeling

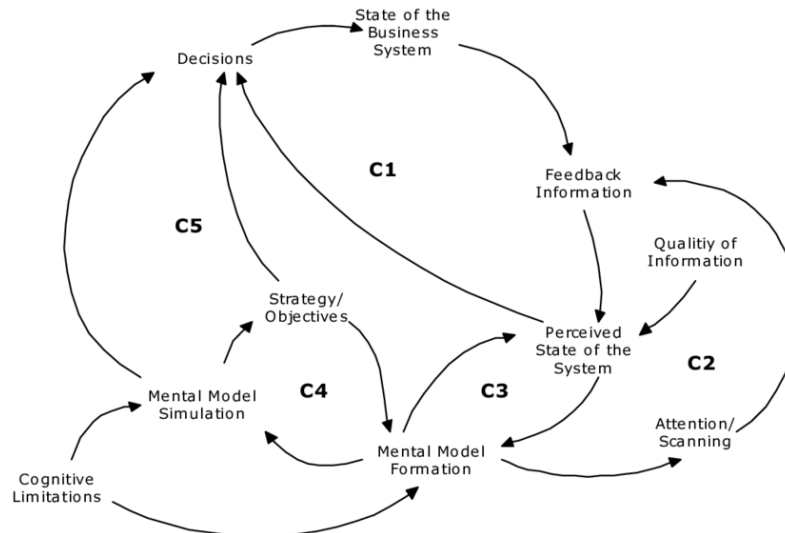


Figure 4: Dyanamic decision making process

#### IV. STUDY OF TIME IN DECISION MAKING

Time is imortnat factor in decision making. It is extremely intriguing how the job of time in basic leadership has changed throughout the years. Our folks invested energy attempting to set aside cash and we invest cash attempting to spare time. It's quite reasonable that individuals esteem what they have less of. So a youthful struggler with additional time on their hands would most likely invest a great deal of energy searching for a deal while a set up representative would presumably wouldn't fret spending more on the off chance that it spares him some time. At the point when the decisions are clear, to be sure we are relied upon to consider the exchange off while deciding. Nonetheless, as we travel through the existence's stages and the youthful struggler is en route towards turning into a set up agent, our needs regularly fall behind our present circumstance. It is very imprtnat to take right decision at right time.

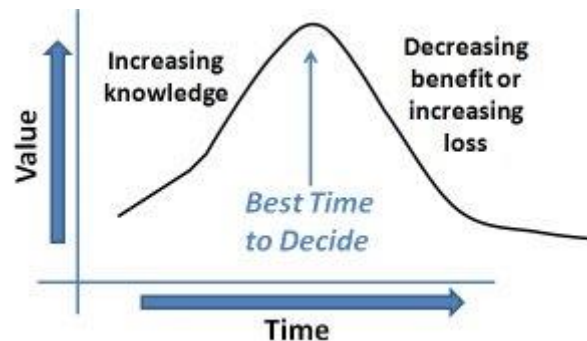


Figure 5: When to take the decision graph

#### V. THE IMPORTANCE OF THE COST INFORMATION IN MAKING DECISIONS

within the process of decision-making in every organization the information system of cost plays a significant role. To guarantee the command over activity sectors, processes, operations, and not conclusively on cost is the major task of management. It needs to contend with many control frameworks like stocks control, production control and quality control for achieving the target, for monitoring the result of others the cost information system is necessary. For the financial control the loss quantification, detailed analysis of costs, work efficiency measurement and the estimation of production cost gives a strong premise.

For decision making relevant cost is one of the awesome device of cost accounting in which it gives the principal inclination to pay the cost which will be pertinent. For getting the maximum output it pays minimum cost. In this process all non-relevant or irrelevant costs are eliminated.

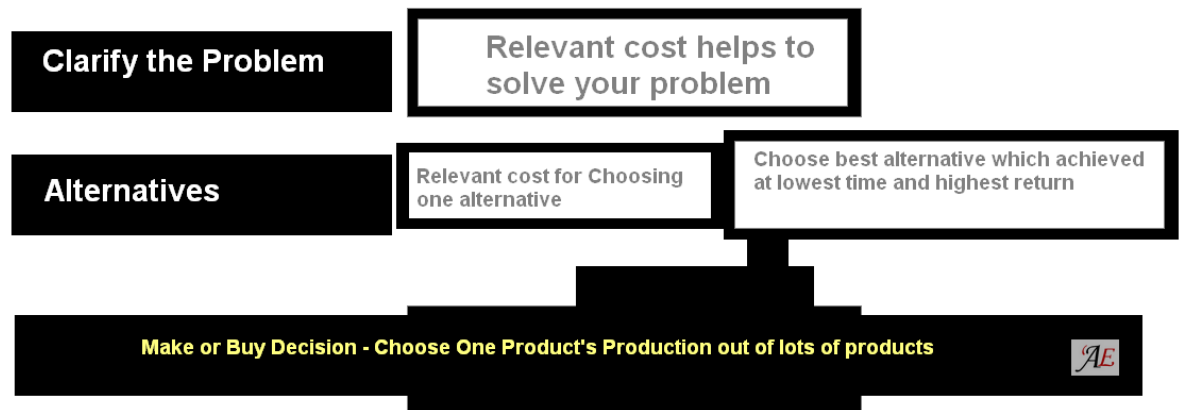


Figure 6: Relevant Cost for Decision Making

## VI. CONCLUSION

For the satisfaction of client to provide the successful target project management addresses performance, cost and schedule. As the part of the whole project level of quality measure the cost of the project. Quality of the task defined by level of the quality. In order to achieve the project target it has been seen that the project management is not only concern with managing time and cost but for completing the target it also concern for complete work. It is very important to take right decision at right time. For the financial control the loss quantification, detailed analysis of costs, work efficiency measurement and the estimation of production cost gives a strong premise.

## REFERENCES

- [1] Liberatore, Matthew & Pollack-Johnson, Bruce. (2013). Improving Project Management Decision Making by Modeling Quality, Time, and Cost Continuously. *Engineering Management, IEEE Transactions on*. 60. 518-528. 10.1109/TEM.2012.2219586.
- [2] H. Kerzner, *Project Management: A Systems Approach to Planning, Scheduling, and Controlling*, 8th ed. New York: Wiley, 2003.
- [3] Project Management Institute, *A Guide to the Project Management Body of Knowledge*, 3rd ed., Newtown Square, PA, Project Management Institute, 2004.
- [4] Maselena, A., Huda, M., Jasmi, K. A., Basiron, B., Mustari, I., Don, A. G., & bin Ahmad, R. (2019). Hau-Kashyap approach for student's level of expertise. *Egyptian Informatics Journal*, 20(1), 27-32.
- [5] Cohen, C. B. (2005). Project management decision making: blending analysis and intuition. Paper presented at PMI® Global Congress 2005—Latin America, Panama City, Panama. Newtown Square, PA: Project Management Institute.
- [6] Vessey, I.; Ramesh, V.; Glass, R.L. *Research in Information Systems: An Empirical Study of Diversity in the Discipline and Its Journals*; M.E. Sharpe, Inc.: Armonk, NY, USA, 2002; Volume 19, pp. 129–174.
- [7] Sepasgozar, S.M.E.; Bliemel, M.J.; Bemaian, M. Discussion of “Barriers of Implementing Modern Methods of Construction” by M. Motiar Rahman. *J. Manag. Eng.* 2015, 32, 07015001.
- [8] Hinsch, A.; Behrens, S.; Berginc, M.; Bönnemann, H.; Brandt, H.; Drewitz, A.; Einsele, F.; Faßler, D.; Gerhard, D.; Gores, H.; et al. Material development for dye solar modules: Results from an integrated approach. *Prog. Photovolt. Res. Appl.* 2008, 16, 489–501.
- [9] Kam, C.; Senaratna, D.; Xiao, Y.; McKinney, B. *The VDC Scorecard: Evaluation of AEC Projects and Industry Trends*; CIFE: Maharashtra, India, 2013.
- [10] Damanpour, F.; Schneider, M. Phases of the Adoption of Innovation in Organizations: Effects of Environment, Organization and Top Managers. *Br. J. Manag.* 2006.
- [11] Teixeira, H. *VDC Implementation in Transport Infrastructure Projects*. Master's Thesis, Institutt for Bygg, Anlegg og Transport, Trondheim, Norway 2014.

- [12] Ebrahimnejad, S.; Mousavi, S.M.; Mojtahedi, S.M.H. A Model for Risk Evaluation in Construction Projects Based on Fuzzy MADM. In Proceedings of the 2008 IEEE International Conference on Management of Innovation and Technology, Bangkok, Thailand, 21–24 September 2008; Volumes 1–3, pp. 305–310.
- [13] Hinsch, A.; Behrens, S.; Berginc, M.; Bönnemann, H.; Brandt, H.; Drewitz, A.; Einsele, F.; Faßler, D.; Gerhard, D.; Gores, H.; et al. Material development for dye solar modules: Results from an integrated approach. *Prog. Photovolt. Res. Appl.* 2008, 16, 489–501.
- [14] D. B. Khang and Y. M. Myint, “Time, cost and quality trade-off in projectmanagement: A case study,” *Int. J. Project Manage.*, vol. 17, no. 4, pp. 249–256, 1999.
- [15] Sturman M.C., 2003, Searching for the inverted U-shaped relationship between time and performance: Meta-analysis of the experience/performance, tenure/performance, and age/performance relationships. *Journal of Management*, 29: 609-640.
- [16] Winch, G.M., Kelsey J., 2005, What Do Construction Project Planners Do? *International Journal of Project Management*, 23.2: 141-149.
- [17] Mukerji D., 2011, A Study to Improve Decision Making Processes in Construction Planning to Reduce Project Failures, Doctoral Thesis, SKEMA Business School, Lille France.
- [18] Dvir D., Lipovetsky S., Shenhar A., Tishler A., 2008, What is really important for project success? - A refined, multivariate, comprehensive analysis,” *International Journal of Management and Decision Making*, 4.4: 382-404.