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CONSTRUCTION COST MANAGEMENT IN RESOURCE BASED ECONOMY

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ABSTRACT

Resource Based Economy tested according to criteria formulated from the construction cost management best practices. A cost management plan modeled to demonstrate the possibility of construction management under a new socio economic system, which counts the consumed natural resources by construction as the dry cost to the environment.

KEYWORDS: *Construction Cost Management, Resource Based Economy.*

INRODUCTION

Construction accounts for one of the basic needs for all humanity throughout the history of the world. It consumes natural resources, both to form the physical part of the construction, and to assist in construction in the form of energy and scaffolding for examples. The natural resources that are parts of the physical matter of construction, which forms the main components, have changed through research and development, from natural stone bricks, to reinforced concrete and steel structures. They are mined and processed to satisfy the specified characteristics, as required by designers.

Cost management has been a very important part of all projects, because it provides the information required to evaluate the profits and losses, before, during, and after the projects. Resource management addresses the availability of all resources, which are c (Gasiorowski 1995)onsumed totally or partially by the projects, calculated as dry costs or overheads.

Technology is progressing exponentially and inventions in the robotics field are opening new potentials for Artificial Intelligence (AI) and Automation future, where human interaction in manufacturing and construction is being decreased and replaced by machines. In order to investigate deeply in ideas related to the future of human kind, several aspects are researched to clarify the vision from several points of views. One of these ideas is The Venus Project (TVP) which considers a civilization that is based on three aspects, Society, Environment, and Technology. Progressing from the current technological and environmental status, society is expected to thrive to the level where humanity can survive without war, poverty and hunger.

OBJECTIVES OF THE STUDY

The goal of this study is to analyze ways to improve the efficiency of project cost management. To

achieve this goal, it was necessary to solve the following objectives:

- 1) To analyze the main components that affects the cost of the project.
- 2) To analyze the main risks of construction and investment projects in a crisis.
- 3) To identify the benefits of using BIM technologies in project cost management.

LITERATURE REVIEW

Renata stiatk-Betlejewska, marek potkany al, 2015; His paper introduces an instance of development of cost examination for wooden vitality proficient house that meets reasonable viewpoints. From this examination it was reasoned that expenses of development costs of vitality house are higher than conventional venture. **Tatyana Simankina, Jasmina cetkovic, Nataliaverstina, Evgeny Evseev et, 2017,** His paper represents that Economy significantly affects primarily the project cost management. It was concluded that cost management of projects directly depends on certain measures. **Flore bridoux et al, 2010,** his paper extends the resource based view of the firm to give connection between resources and competition. He was concluded that developed a general framework integrating resources and competitive environment as a sources of firm competitive advantage and performance. **Dr. Arshad ali amjad et al, 2005,** His paper presents that cost benefits analysis, CBA is for evaluating the benefits and drawbacks associated with any particular project. It was concluded that CBA analysis demonstrates the financial applications.

TESTING PROCEDURE

Survey Method:

The survey conducted by Iyer and Jha, 2005 give some indication off the factors affecting the cost performance of Indian construction projects. In this survey the questionnaire was piloted with two associates from the Indian construction industry- a senior Architect and a project control manager. A total of 51 responses were obtained. The respondents

comprise of 21 architects, 9 project managers, 2 surveyors and 19 engineers.

According to Project management Book of Knowledge issued by Project Management Institute (PMI) there are four processes in project cost management knowledge area.

1. **Plan Cost Management:** “The process that establishes the policies, procedures, and documentation for planning, managing, expending, and controlling project costs.”
2. **Estimate Costs:** “The process of developing an approximation of the monetary resources needed to complete project activities.”
3. **Determine Budget:** “The process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.”
4. **Control Costs:** “The process of monitoring the status of the project to update the project costs and managing changes to the cost baseline.”

The final result of the system is a cost administration show that records for the characteristic assets that structures the volume of the development as the primary dry cost. Vitality isn't presented as dry cost, yet as a free asset, since innovation is getting towards free vitality. Additionally with the computerization of development being under innovative work, it is relied upon to include least human communication inside development forms. For straightforwardness, the layers and the plan blend are introduced on a general scale, and the amounts of materials and normal assets are evaluated generally.

Case study 1 (New Construction):

Case study 1 investigates the construction of a new rural road, single carriage way, starting with the excavation and earth work, until the final layer of asphalt. The road is 60 km long with width of 10.5 meters for the two asphalt layers, and 11 meters for the sub-base.

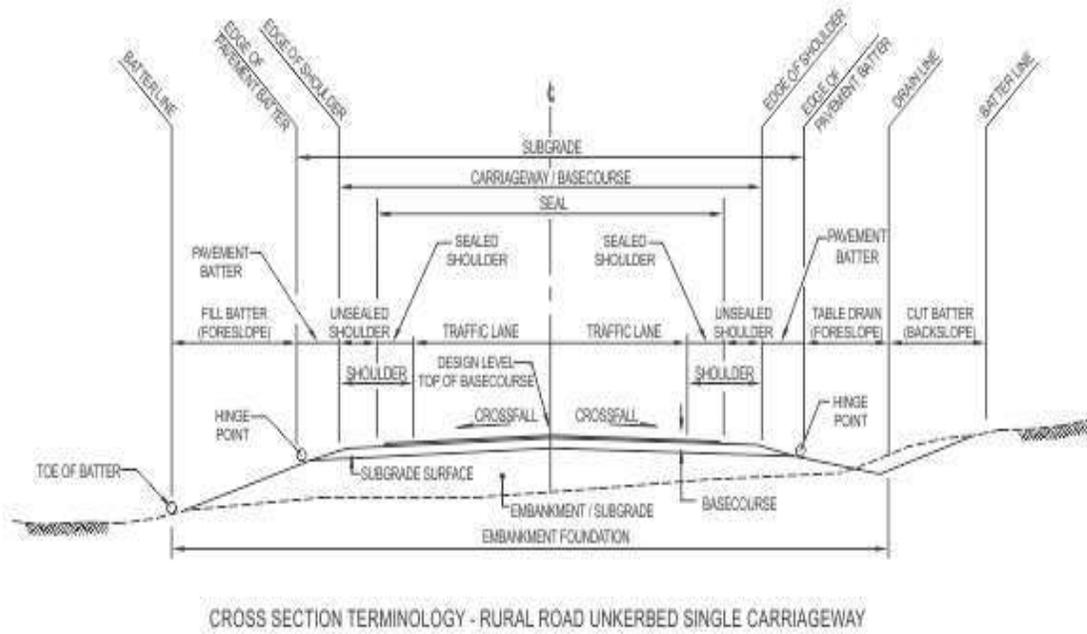


Fig.1: Cross Section terminology-Rural Road Un kerbed Single Carriage way

Table1The total quantities used for the case study 1

S.No	Description	Unit	Quantity	Notes
1	Subgrade Fill	cu.m	175000	Procured
2	Subgrade Cut	cu.m	15000	Disposed
3	Rock Demolition	cu.m	15000	Disposed
4	Base Coarse	sqm	660000	25cm thick
5	MCO-Medium curing cutback asphalt	sqm	630000	1.5 kg/m ²
6	Asphalt Layer 1	sqm	630000	6cm thick
7	RC3000-Rapid curing cutback Asphalt	sqm	630000	0.5 kg/m ²
8	Asphalt Layer 2	Sqm	630000	5cm thick

Table 2 Procured and Disposed quantities for case study 1

Procured petroleum products	Barrels	8152
Dispose rocks and ground	Cubic meter	-30000
procure aggregates and water	Cubic meter	853458

Case study 2 (Road Rehabilitation):

Case study 2 investigates the rehabilitation of a road, where the final layer is to be removed and another layer with the same thickness is added instead.

Table 3 The quantities of the materials used in case study 2

S.No	Description	Unit	Quantity	Notes
1	Asphalt Layer removal	Sqm	630000	5 cm thick
2	RC3000-Rapid curing cutback asphalt	Sqm	630000	0.5 kg/m2
3	Surface asphalt Layer	Sqm	630000	5 cm thick

Table 4 Procured and Disposed quantities for case study 2

Procedure petroleum products	Barrels	4023
Dispose rocks and ground	Cubic meter	-52500
Procure aggregates and water	Cubic meter	59381

RESULTS

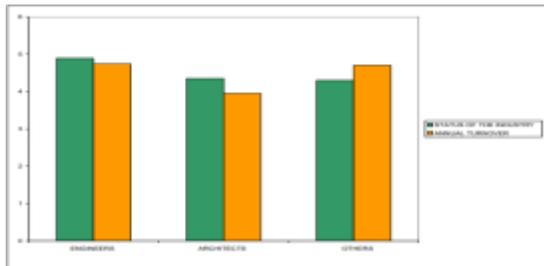


Fig.2: Status of industry and annual turnover

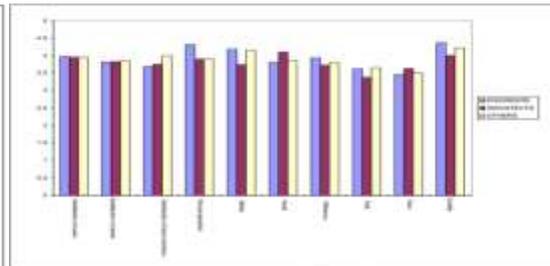


Fig.3: Success criteria and different professions

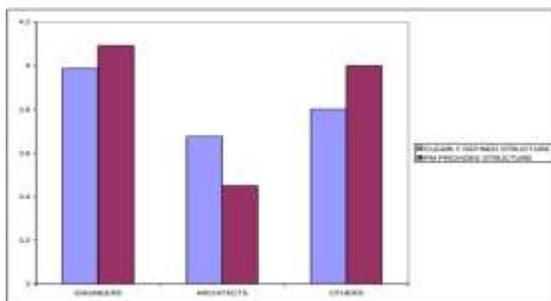


Fig.4: Need for clearly defined structure and extent to which pm can provide structure

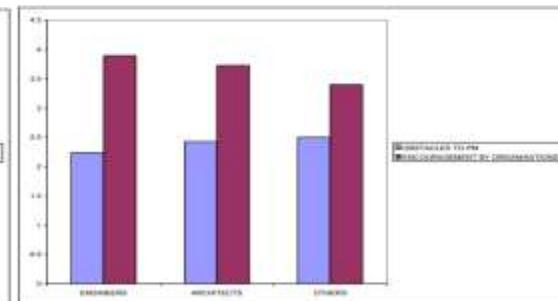


Fig.5: Obstacles to PM and encouragement required from organizations

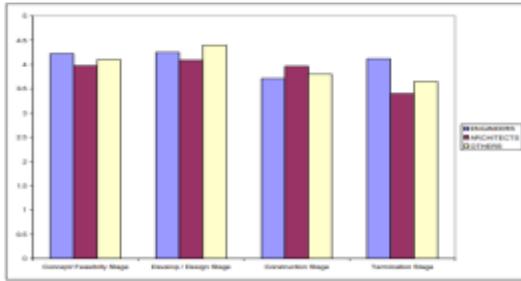


Fig.6: Different professions mean scores of the importance of various phases of a project

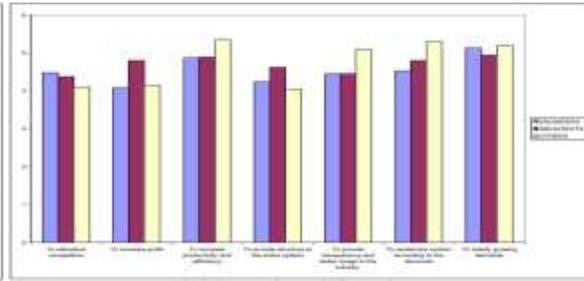


Fig.7: Reasons to change and different professions

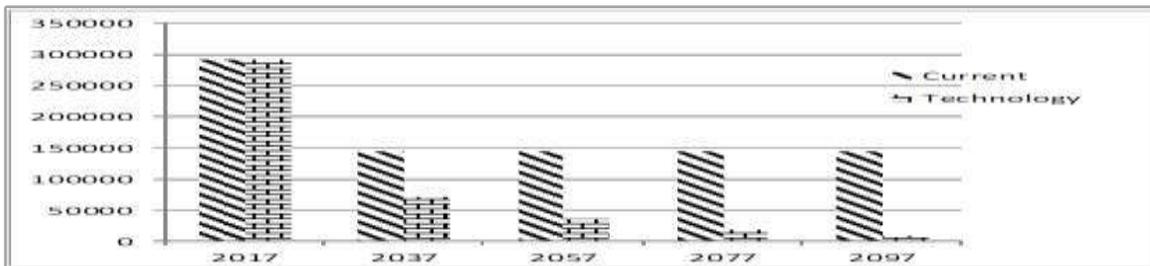


Fig.8: Current Technology VS Required Technology

The above figure demonstrates the difference between the amounts of barrels as natural resources using the current road technology, against the future technology which suggests the usage of fewer resources

CONCLUSIONS

1. Resource Based Economy can be applied to the cost management model.
If it is treated as a national project, the Venus project can be the starting point to a new socio-economical system that is suitable to all people, where the natural resources are maintained, and the supply exceeds the demand.
2. In addition, when considering the rate of renewal of natural resources, it is the opposite of the inflation in the monetary system, as the value of natural resources increases when used later than now. In the monetary system, and due to inflation, money loses its value, that is one reason, it is better to use the money now than later, which in return means using more resources now than later.
3. While in resource based economy, when the resources are left for the next generations, they increase, either by the rate of renewal, or the discovery of new resources.

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