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Literature Review on Decision making and Optimization Techniques

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Abstract - *This paper is the study of literature available on the Decision making and optimization techniques, during construction of any project there are various stages and various systematic approaches are adopted by the project manager for the benefit of the project. Here we are dealing with sewer and Drainage line construction. From initial to final stage of life cycle of the project various difficulties and problems arises in the project execution. Also for an sewer and drainage line construction strata of soil identifies the way of execution for foundation work the strata may be hard strata which takes more time for completion of foundation and if the strata is soft strata then it will take an sorter span of completion of foundation work . Also if the excavated area is water logged then its become more difficult to execute and will reduce the time of excavation work which leads to delay in project completion. Other berrieation like crossing of service line, barrier like owned property, position of man hole can also increase the completion time of the project and also may cause in temporary hold of the execution of work until the issue is closed .*

Key Words: **Decision making, Strata, Optimization Techniques, life cycle, water logged berrieation.**

1. INTRODUCTION

There are several reasons why the construction industry suffers from low productivity. For example, the construction process is very fragmented, where many actors with different disciplines are involved. Each actor is responsible for a specific part of the project and tends to focus on their own interest, rather than making the final product the best possible.

Another important reason for low productivity is that a construction site has many impact variables, e.g. E.g. Different weather conditions, different locations on site, different material delivery times, different stock sizes, different models and different working conditions. These variables make planning a construction project much more complicated than planning, for example, an assembly line in a car factory where every day is the same. So what can be done to make the construction industry more efficient? It is generally accepted that the lack of proper planning is one of the main reasons for poor project execution. Today, it is complicated and time consuming in many planning programs to take into account any uncertainties or disruptions that occur during a construction project. Traditional planning methods and tools do not fully support the planning engineer in managing these complexities. Therefore, better project planning tools are needed to make it easier for the user to create better plans with greater accuracy.

A optimization may include complex relationships between activities that specifically consider resource use and uncertainty, such as variable weather conditions or random machine failures. Today, discrete event simulation is a common tool that supports decision making in the manufacturing industry. In the construction industry, the use of discrete event simulation has been limited to research projects, although the technique has been shown to shorten design cycles, reduce costs and improve knowledge in the construction industry. However, in order to put the technique into practice, the tools must be easy to use.

1.1 Need of the study

Decision making for an activity is being used in construction to get an optimized solution is an important procedure for getting an end results in various important factors which effect the project .This project study will ease the different factors which effect the construction of Drainage line and storm water drain and find out the optimized solution for difficulties arise while construction activities.

1.2 Objective

To study the literature available on the topic of Decision making and Optimization Techniques.

1.3 Methodology

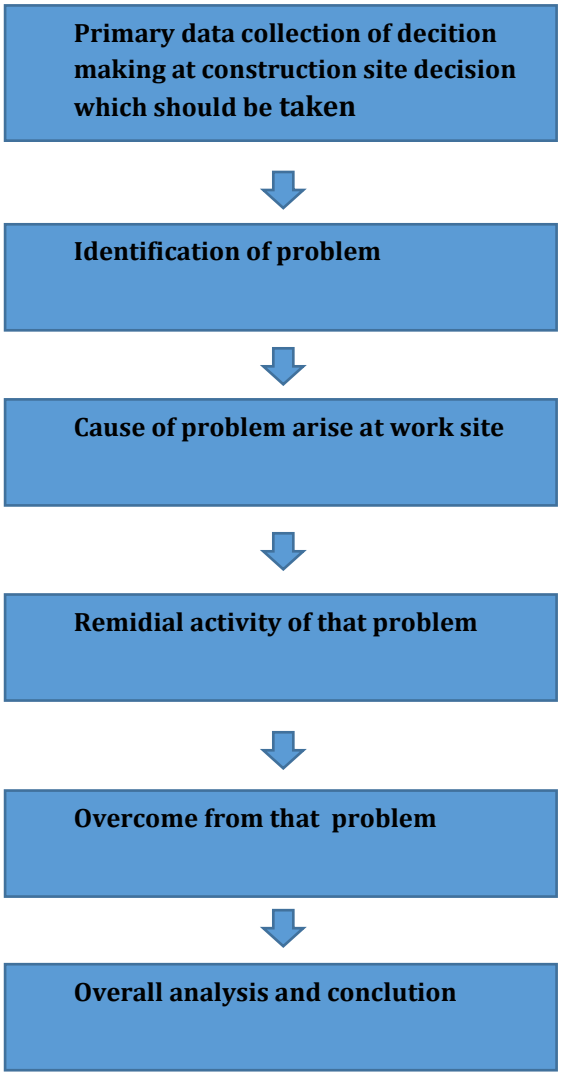

Chart -1: Project flow chart

2. Literature review

a) Sustainable Decision making in civil Engineering ,construction and Building Technology by Edmundas Kazimieras Zavadskas, Jurgita Antucheviciene (2018)

In this paper the Sustainable decision making in construction, civil engineering and construction technology can be supported by basic scientific advances and multi-criteria decision theories (MCDM). This article aims to take stock of the state of the art with regard to published articles on theoretical methods used to support sustainable assessment and selection processes in construction

b) Multicriteria-decision making in yhe sustainability assessment of sewerage pipe systems by Albert de la Fuentea (2016)

The study shows a methodology based on evaluation analysis and several test methods was used in this study to assess the durability of steel and plastic pipes. This process minimizes participation in multiple processes and compares other factors. For this purpose, timber should be defined as a non-distance measure of each structure, using the cost and weight assigned to them. This model was developed and tested by interviewing business leaders and leaders in the Spanish community and asking questions. This model is used to measure the durability of eight variants, including reinforced concrete and reinforced concrete and flexible pipes made of polypropylene, polyethylene, polyvinyl chloride and fiberglass-reinforced polyesters

c) Optimizing decision in advanced manufacturing of prefabricated products: Theorizing supply chain configurations in off –site construction by Mehrdad Arshpoura (2017)

This paper focus on Determining the stability of a material is very important for the production of high quality pre-made products. Previous research has focused on reducing the high cost of external network sites in decision making. However, decisive processes such as strategies that some vendors prefer to add or remove and use multi-vendor configurations have not yet been developed and evaluated. Optional models are designed to improve plant performance with minimal investment

d) Selection of optimization objectives for decision making in building energy retrofits by Amirhosein Jafari (2018)

The papers considered the Renewable energy has proven to be the first way to reduce energy consumption and carbon emissions. One or more objectives are the solutions that are most valued as used in a particular project Solve problems with limitations and multiple obstacles. It has different goals However, the literature uses target identification and selection for these business issues There is still competition. This study develops decision models that guide the decision to choose a goal(S) Resolve one or more optimization issues leading to the best editing system selection Commented on the term “market growth”, which is a kind of investment capital Types of positive energy recovery benefits

e) Interactive evolutionary multi –objective optimization and decition –making on life –cycle seismic of bridge by Yu-Jing Li (2018)

This paper focus on the seismic risk and future cost of living, the design of the bridge's seismic life was developed as an option based on multiple development goals and decisive issues in which design conflicts that reduce life costs and seismic maximizations are resolved. Simultaneously. In particular, the desired data is packaged in a small format, taking into account theoretical analysis and measurement skills. Depending on the need for ongoing payments, the security and priority data to be used in orderly determining the value of a feature has made it possible to improve various modifications to accommodate further solutions.

f) A Decision Making System for Construction Temporary Facilities Layout Planning in Large –Scale Construction Projects by Xiaoling Song (2017)

In this research the design of temporary care facilities (CTFLP) requires the establishment of temporary accommodation facilities (CTFs), training sites and CTFs in the training area. This study provides guidance on how to determine the effectiveness of CTFLP in large development projects to improve reliability and efficiency. The system includes import equipment, CTF and candidate analysis, quality determination, inspection and completion of the selection and delivery phase. Wrong conditions are used to resolve differences in the real situation.

g) A novel multi criteria decision making for optimizing time –cost-quality trade- off problems in construction projects by Shahryar Monghasemi (2015)

This paper described the planning phase of each construction project involves several and sometimes conflicting criteria, which must be optimized at once. Multi-scale decision-making processes (MCDMs) help decision makers in selecting the appropriate solution from a number of appropriate solutions. The 'Evidence Region' (ER) approach was first used in project planning to identify the best Pareto solution to personal cost quality balancing problems (DTCQTP). An integrated system for the synthesis of MCDM methods using multi-measure optimization methods has also been proposed. To identify all global pareto-optimal solutions, a multifunctional genetic algorithm (MOGA) incorporating the NSGA-II approach in the case study of highway projects has been developed and tested.

h) Decision Making in Construction Management : AHP and Expert Choice Approch by Seyit Ali Erdogana (2017)

This paper described the timing and details of the development plans are described in this section. Significant structural management issues and problem-solving opportunities have been identified. A multi-model decision model was developed and used to investigate current issues. AHP process and choice skills are used for computer calculation. © 2016 Authors. Published by Elsevier Limited. Responsibility for the team participating in MBMST 2016.

3. CONCLUSIONS

Various papers on Decision making and optimization techniques has been studied .It has been clear the application of the change in decision of an particular schedule of the activity to get an optimal solution to reduce the various factors which effect the time completion, resource management, cost reduction of an project . which become an ease to an optimal tool to the execution of an project.

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