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Implementation of VSM in Disaster Resilience Construction Projects

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ABSTRACT
Construction Industry is one among the most important within the world economy, with about $10trillion spent each year on its goods and services. It is well known that majority of Construction Budget consists of material cost, manpower, equipment's therefore managing complete cycle of project is considered as the core responsibility of the industry. Delay in Supply, Wastage of material and Excessive Supply of materials etc. are few problems in material management & similarly in other factors. To overcome the problem, idea of lean tools such as Value stream mapping (VSM) can be profoundly exercised. Studies have shown that use of VSM has not been fully utilized or almost not used in many Construction firms despite of the potential benefits. This analysis is carried out to identify the problems and also to investigate the vsm process. Qualitative approach has been chosen to conduct the research. Content analysis will be done after obtaining the required data to derive a Solution.

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I. INTRODUCTION

Value stream mapping (VSM) in the construction project is that the application of lean thinking to the planning and construction method making improved project delivery to fulfill consumer needs and enhance edges for company. several constructions come expertise intensive delays and thereby exceed initial time and value estimates. Construction comes face issues like improper designing and management, lower productivity and huge quantity of waste generation. Researchers thought-about waste as unskillfulness that ends up in the employment of apparatus, materials, labor, or capital in larger quantities than those needed for the assembly of production. Waste includes each the incidence of fabric losses and also the execution of needless work, that generates further prices however don't add worth to the merchandise. the foremost supply of construction waste is concreting works (almost twenty ninth of the waste) followed by reinforcement works, formwork, staging, material handling and finishing works. These wastes ought to be decreased method should be optimized for the flourishing completion of project. Value stream mapping (VSM) was created by Toyota production system and Lean producing principles. VSM is outlined as a pencil and paper tool that helps to examine and perceive the flow of fabric and data as a product makes the way through worth stream. worth Stream could be a progression of steps that happens to administer the merchandise or service that their shoppers want. Managing the worth stream involves a method of understanding, measuring, and rising the flow of materials and data and also the interactions of all tasks, to stay a company's prices, services, and quality merchandise as competitive as attainable. Application of VSM in construction is rigorously observant and following a construction stage/process and distinguishing the waste i.e., non-value-added time, activities and resources throughout the method. Finally, rising every stage by applying lean techniques. There square measure many obstructions whereas implementing VSM in construction. a necessary demand for implementing VSM is that production method ought to be repetitive in nature. All construction comes square measure distinctive style, specifications and method square measure advanced. Second, VSM could be a quantitative instrument that utilizes a summation of cycle data to portray the present state of the method and to work out what the long run state are going to be. Most of the development stages square measure prolonged and subject to several variables. Also, construction corporations don't seem to be ready to track full construction method. Third, key ideas of VSM like cycle time, amendment over time, takt time square measure outlined for producing and completely different for construction method. Although several researchers have enforced VSM in construction comes. analysis has shown that the proportion of added activities in method is incredibly little and most activities square measure non-value-added necessary activities and waste activities. worth stream analysis incorporates the 2 components that square measure current state valuable stream mapping and future state valuable stream mapping. The main aim of drawing current state map is to induce a transparent image of gift production method. to duplicate existing production method, knowledge square measure collected associated with flow materials and data regarding schedule. Analysis of current state map is to spot wastes and propose improvement actions for the

development of a replacement flow that generates the shortest time interval, highest quality, and also the lowest value. once analysis, Ideal state map is to be created that will eliminate all the wastes that were known in existing production method. Ideal state worth stream is that the final goal of the advance method and supply with associate objective to figure towards, the long run state map. the main target of future-state valuable stream mapping is to eliminate the basis causes of wastes and implement the enhancements projected for linking the worth stream during a sleek flow

II. LITERATURE REVIEW

1. choice of construction method and information assortment

- A set of successive activities that type a personal method is chosen.
- Data is collected by mistreatment timer and intranet- based mostly production following system.
- Key parts of VSM are recorded.

2. Map of the present State

- The goal of current state mapping is to form the clear image of the prevailing method and to spot waste.
- Sequences of activities are sketched mistreatment symbols and information collected.
- Every side of the map is examined and price and non-value adding activities are known

3. Map of Ideal & Future state

- Ideal state price stream is that the final goal of the development method and supply with Associate in Nursing objective to figure towards, the longer-term state map.
- It is to be created to eliminate all the wastes that were known in existing construction method.
- The focus of future-state useful stream mapping is to eliminate the basis causes of wastes and propose the enhancements for linking the worth stream in a very swish flow.
- Different measures like 5S, Just-In-Time (JIT),FIFO lane, Work standardization are planned to scale back the waste

4. Implementation of the future state map and continuous improvement

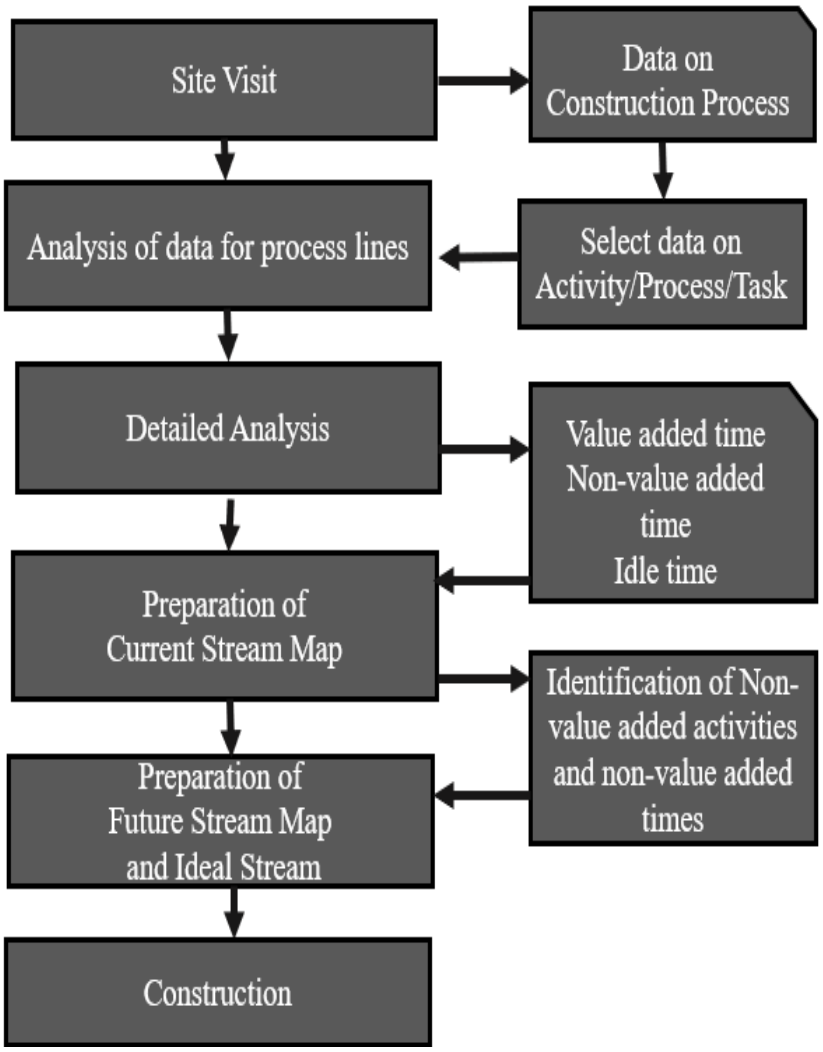
- The Future State Map is sent to the task cluster and therefore the basic changes area unit dead within the enterprise.
- Any non-value-added activities from Current State Map area unit eliminated with increasingly
- The productivity of continuous exercises is calculable and contrasted and therefore the previous profit.
- The improvement in terms of time/cost is followed (improvement tracked).

III. OBJECTIVE

Objective of this study is to discover and describe the benefits, barriers, use of Value Stream Mapping of a Construction Project. It involves use of

- Identify the current state map of selected construction process
- Identify the waste in the process
- Prepare the ideal state map of the process
- Prepare the Future state map of the process

IV. METHODOLOGY



CONCEPT OF VSM

Value stream mapping is a flowchart method to illustrate, analyze and improve the steps required to deliver a product or service. A key part of lean methodology, VSM reviews the flow of process steps and information from origin to delivery to the customer. As with other types of flowcharts, it uses a system of symbols to depict various work activities and information flows. VSM is especially useful to find and eliminate waste. Items are mapped as adding value or not adding value from the customer's standpoint, with the purpose of rooting out items that don't add value.

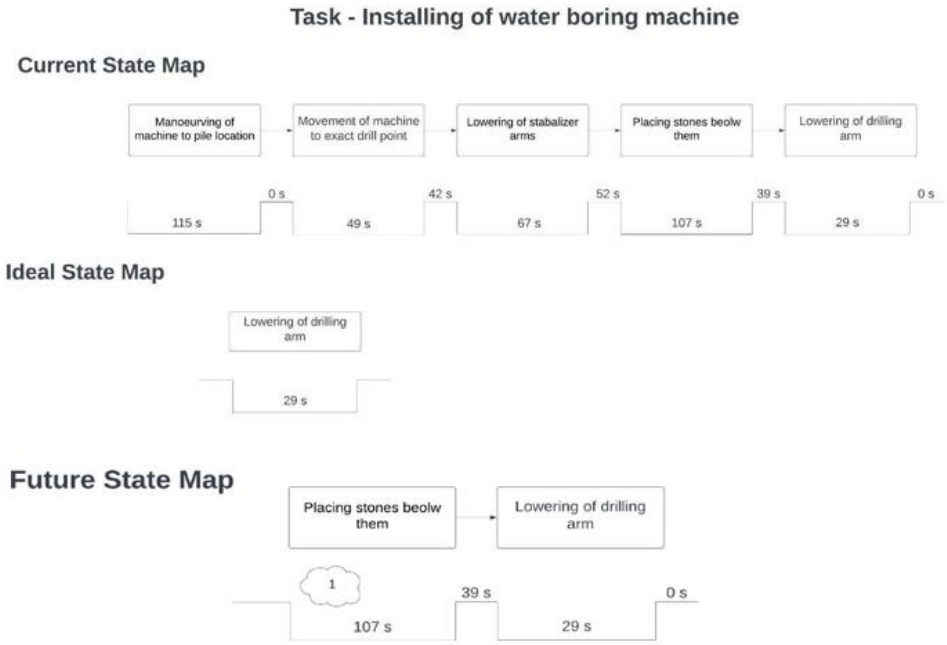
DATA COLLECTION AND VALUE STREAM MAPPING

A particular activity of a pile foundation is taken aimed at the study of applying Value stream mapping in construction industry. An activity is drilling by water boring machine. The process involved in drilling are recorded with device with timestamp.

Data is analyzed and the process are identified into value and non- value added.

With the data collected from multiple recordings, the current state map for the processes has been drawn. After analyzing the diagram, value and non-value added activities are identified and ideal state map has beendrawn. After applying the improvements in the processes to decrease the non-value added time, waiting timethe future state map was drawn.

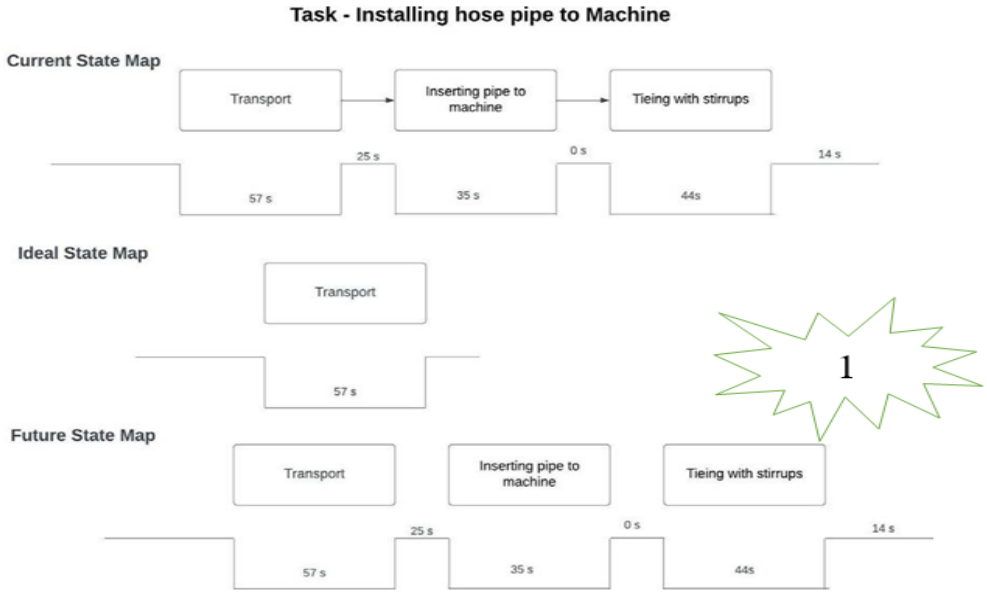
TASK 1



From current state map, value added time of task is 29 seconds.

Lead time of task is 501 seconds.

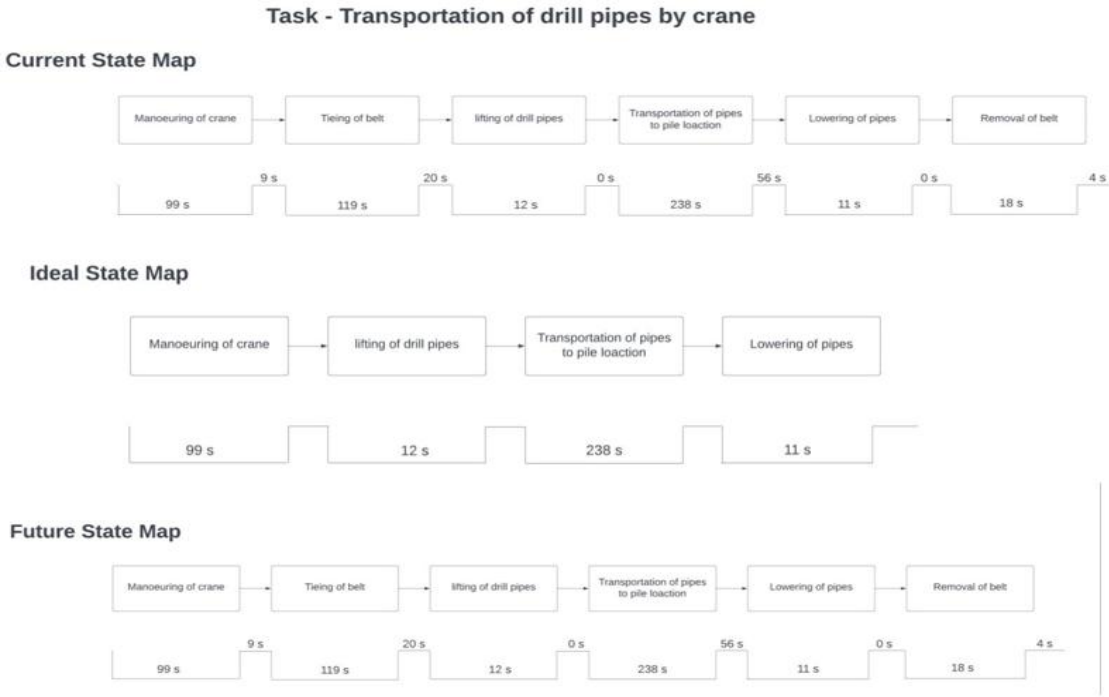
Task 2



From current state map, value added time of task is 57 seconds

Lead time of task is 161 second

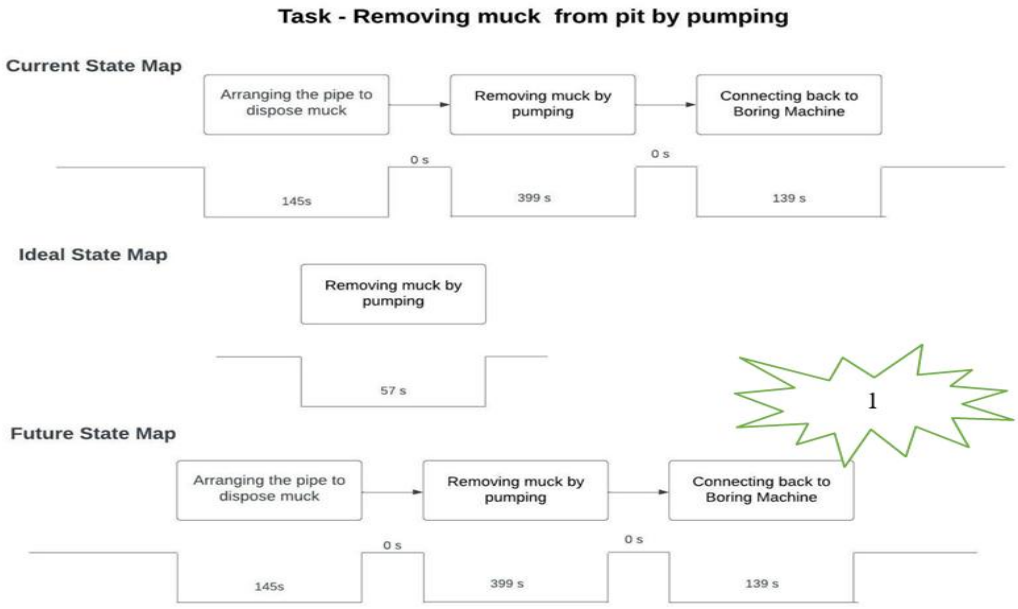
TASK 3



From current state map, value added time of task is 360 seconds.

Lead time of task is 586 seconds

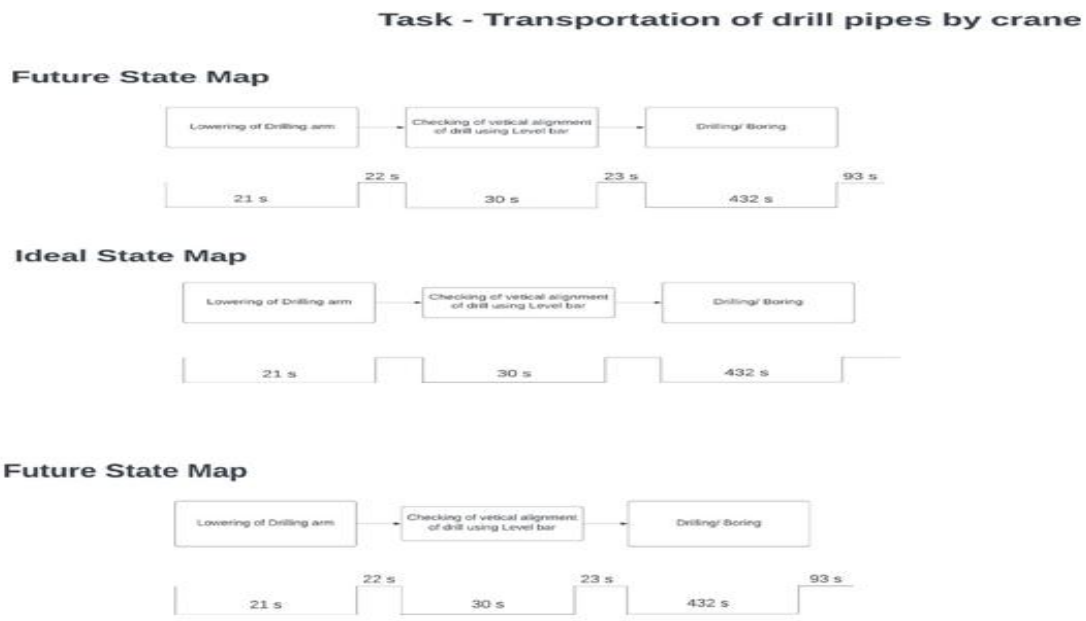
Task 4



From current state map, value added time of task is 399 seconds.

Lead time of task is 683 seconds.

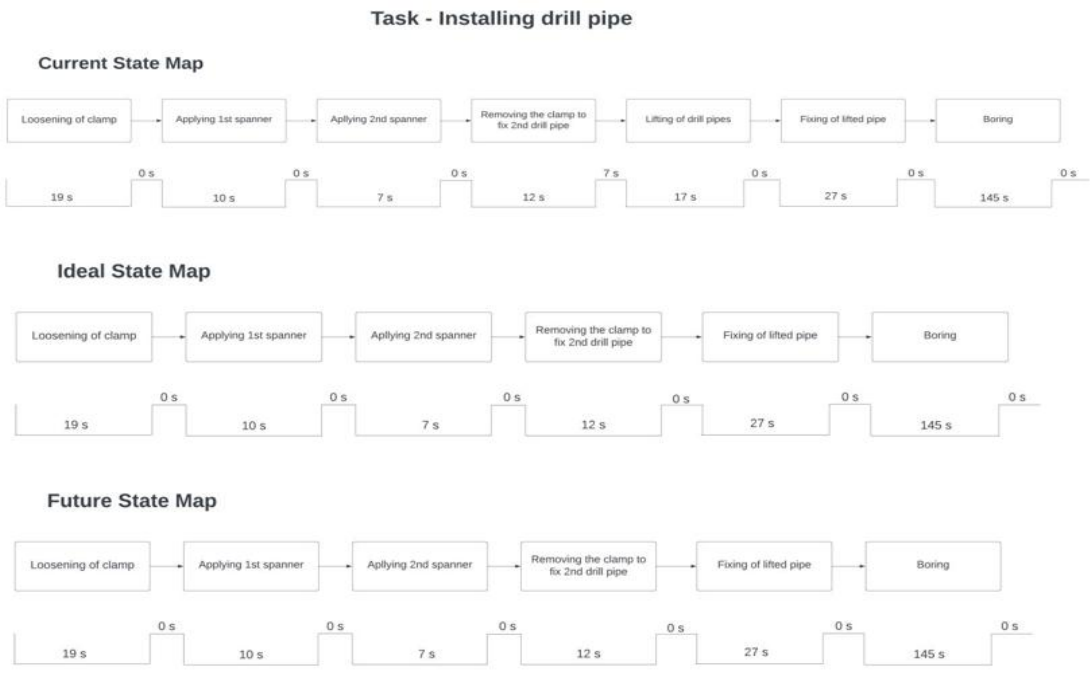
TASK 5



From current state map, value added time of task is 432 seconds.

Lead time of task is 621 seconds.

TASK 6



From current state map, value added time of task is 220 seconds.

Lead time of task is 287 seconds.

V. CONCLUSION

The results of the study clearly indicate that wastages were primarily generated from procedural lapses within the project execution. as an example, the improper use of fabric ar accustomed support the machine, to carry the objects that delay themethod activity. Removal of such wastages by tweaks created to the prevailing processes and removal of obstructions in web site supplying can improve the productivity. This way, the execution of construction may be achieved with reduced prices, larger quality and speed, countering to demands of the consumer in terms of prices, deadlines and quality.

The current study has thought-about the activities of a case study on associate elementary level. additional studies willconcentrate on the applying of VSM and different lean tools like Last Planner System that might be effective in extra increase of productivity. The study are often extended to the life cycle of a construction project specializing in micro- level activity sequences. Moreover, the lean implementation are often increased by adding additional info like resource availableness and different job website constraints so as to realize the most effective results. Necessary pointers and coaching to the project personnel ought to be provided during this regard. Also, the whole advantage of lean construction lies solely within the continuous watching and improvement of its implementation.

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