
Smart Construction Project Management

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ABSTRACT

Project management process is revolutionized by the Invent of project management software. Computerized planning and scheduling renders efficient and probable plan for enormous projects. The key features of any project management software includes producing and manipulating a schedule, resource planning, possible delay estimates, allocation of budgets and communication within the team.

This work aims to survey and understand the existing construction project management measures and the aiding software. The deficits prevailing in the current scenario are identified. One major disadvantage in the highly popular CPMS is the non-availability of e-procurement process. Procurement of construction materials is a multidisciplinary process spanning through the entire project life-cycle. Social e-procurement involves the usage of online collaborative networks that is effective and discovers new prospects of construction business. The features of ideal internet based smart construction management software are suggested. Some of these include calculating earned value check, effective dynamic scheduling with algorithms and e-procurement.

This work provides information about steps in construction management, traditional methods of construction management, need for e- construction management, difference between manual and e- construction management, problems improvements in e- construction management and ideal e- construction management.

1.INTRODUCTION

Development Management or Construction Project Management (CPM) is the general arranging, coordination, and control of a venture from starting to fulfillment. CPM is gone for meeting a customer's necessity so as to deliver a practically and fiscally feasible venture. Development ventures all through the world are tested to enhance execution on the off chance that they are to contribute completely to the accomplishment of monetary success, manageable situations and solid satisfied populaces.

With the appearance of web time, savvy development administration is needy upon web based coordinated venture administration frameworks. Development extend administration programming (CPMS) alludes



to the frameworks that assistance extend proprietor/administrators, program supervisors, and development chiefs, control and deal with the immense measure of data that capital development ventures make. These frameworks, accessible from sellers, oversee capital tasks as well as the whole venture portfolio.

This work means to overview and comprehend the current development extend administration measures and the supporting programming. The shortages winning in the present situation are recognized. One noteworthy inconvenience in the exceedingly well known CPMS is the non-accessibility of e-acquisition process. Acquisition of development materials is a multidisciplinary procedure crossing through the whole venture life-cycle. Social e-obtainment includes the utilization of online cooperative systems that is powerful and finds new prospects of development business. The elements of perfect web based keen development administration programming are recommended. Some of these incorporate computing earned esteem check, compelling dynamic planning with calculations and e-acquirement

2. THEORITICAL BACKGROUND

PROJECTMANAGEMENT

Venture administration is the train of arranging, sorting out, securing, and overseeing assets to accomplish particular objectives. A venture is a transitory Endeavor with a characterized starting and end (normally time-obliged, and frequently compelled by financing or expectations), embraced to meet one of a kind objectives and destinations, commonly to achieve gainful change or included esteem. The

impermanent idea of undertakings remains conversely with the same old thing (or operations), which are redundant, changeless, or semi-perpetual useful exercises to create items or administrations.

E-PROCUREMENT

E-acquisition (electronic obtainment, some of the time otherwise called provider trade) is the business-to-business or business-to-customer or business-to-government buy and offer of provisions, work, and administrations through the Internet and in addition other data and systems administration frameworks, for example, electronic information exchange and undertaking asset arranging.

EARNED VALUE CHECK

Earned Value Analysis (EVA) is an industry standard strategy for measuring a venture's advance at any given point in time, anticipating its fulfillment date and last cost, and examining fluctuations in the calendar and spending plan as the venture continues. It contrasts the arranged measure of work and what has really been finished, to decide whether the cost, calendar, and work achieved are advancing as per the arrangement. As work is finished, it is viewed as "earned". EVA is a depiction in time, which can be utilized as an administration apparatus as an early cautioning framework to distinguish insufficient or imperiled advance.

- [1]. At the finish of the venture, is it likely that the cost will be not as much as, equivalent to or more prominent than the first gauge?
- [2]. Will the venture likely be finished on time?

WBS (Work Breakdown Structure)

EVA works most successfully when it is compartmentalized, i.e. at the point when the venture is separated into a sorted out Work Breakdown Structure, or WBS. The WBS is utilized as the essential building hinder for the arranging of the venture. It is an item situated division of venture errands that guarantees the whole Scope of Work is caught and considers the joining of specialized, timetable, and cost data. It separates all the work scope into fitting components for arranging, planning, booking, cost bookkeeping, work approval, advance measuring, and administration control.

STEPS IN CONSTRUCTION MANAGEMENT

PRE-CONSTRUCTION

- ❖ Site assessment
- ❖ Obtaining Financing
- ❖ Budgeting
- ❖ Design
- ❖ Scheduling

CONSTRUCTION PROJECT AND SITE MANAGEMENT

- ❖ Procurement

POSTCONSTRUCTION

- ❖ Certificate of Occupancy
- ❖ Closeout Documentation

3. LITERATURE REVIEW

Conlin.J and Retik.A (1997) classifies the procurement software characteristics into general,

technical and specialist features. General features are the basic information about the software while technical features perform the examination of particular features.

Liberatore.M.J et al. (2009) emphasizes the need for project management software to provide near-optimal schedules. An option to maximize the net present value of cash flow is advisable.

Costa.A.A and Tavares.L.V (2014) discuss estwo game theory based models for analysis of e-procurement network dynamics. The simulation for procurers and administrative environments reveals that with constant rules and features of the network, the benefits for administrators diminish overtime.

4. TRADITIONAL METHODS OF CONSTRUCTION MANAGEMENT

Differences in cultures can be used to understand variations in construction practices. This cultural understanding of construction has two levels; first relative to the dominant culture of the day and then relative to the culture of the project.

Investigation of a “building culture” must first develop an appreciation of the larger culture in which the construction project occurred. Understanding at this level helps explain the major societal forces that shape construction practice. Considering the relationship between the building culture and its society leads to consideration of the impact of individual projects on society. For example, large religious projects – Ankor Wat, Cambodia; Chartres Cathedral, France_ were often the major enterprise of the local community for decades. They were both the source of livelihood for



many and the object of monetary donations by affluent citizens of the community. These projects were the source of pride for rich and poor alike.

5. NEED FOR e- CONSTRUCTION MANAGEMENT

The administration of development ventures requires learning of present day administration and additionally a comprehension of the plan and development process. Development ventures have a particular arrangement of goals and imperatives, for example, a required time allotment for culmination. While the significant innovation, institutional plans or procedures will contrast, the administration of such activities has much just the same as the administration of comparable sorts of tasks in other claim to fame or innovation spaces, for example, aviation, pharmaceutical and vitality advancements.

The merging of data administrations, correspondence, and registering usefulness in the Web advancements enables specialists in development to perform Web-based venture administration over the Internet. More than 100 programming designers have created electronic venture administration programming and administrations for the development business (Extranet World 2000). Various development organizations everywhere throughout the world embraced this innovation either on the grounds that they understood its upper hands or they were being compelled to receive it by their customers. At the point when a development organization resolves to embrace a Web-based venture administration framework, there are two conceivable procedures that the organization can pick in building up the framework: in-house advancement or outsourcing this movement to

an expert advisor.

As to first alternative, development firms that settle on in-house improvement should remember the significant monetary, specialized, and HR important to create and keep up the framework. The organization can have a Web server inside and modify its usefulness to satisfy the corporate needs and those of the venture operations. Additionally financially accessible Web-empowered venture administration programming can be redone into exclusive frameworks. Then again, the second choice to outsource is helpful for organizations with constrained assets to build up their own Web-based venture administration frameworks, and there are an assortment of chances in outsourcing. Experts might be enlisted to assemble a site to satisfy the organization's Internet promoting needs, request work applications, or lead far reaching venture administration over the Internet.

Numerous Internet-based data administrations for the development business give a capacity to construct one's own particular free restricted website page living on the supplier's server. In any case, to execute Internet-based applications in development extend exercises effectively, the applications ought to be adequate in the development condition and the utility appraisal of such applications is required. The evaluation will decide if the Internet-based applications in development industry can execute as expected and give an ideal arrangement of Internet-based administrations for supporting development extend exercises.

6. IMPROVEMENTS IN e- CONSTRUCTION MANAGEMENT

Lean development is an approach to outline creation frameworks to limit misuse of materials, time, and



exertion with a specific end goal to produce the most extreme conceivable measure of significant worth. The most critical determinants of development should be work process dependability and work stream, however lean development has changed the conventional perspective of the venture as change, and grasps the idea of stream and esteem era. Lean development is made out of the accompanying strategies:

1. Concurrent Engineering

Concurrent designing can be depicted as parallel execution of different errands by multidisciplinary groups with the objective of getting most good items concerning usefulness, quality, and profitability. Planning could be recuperated by arrange investigation (CPM and PERT). Numerous different open doors can be accomplished through covering exercises, part exercises and decreasing the exchange time between various exercises. The essential arranging parameters for booking simultaneous exercises are lead time, amount, and hazard under equivocalness. Simultaneous building is concentrating on the collaborations; correspondence and data sharing are the keys for finding new thoughts. While collaborating with subcontractors and providers can likewise be great changes in regards to simultaneous building, the achievement of lean generation is relying upon the inclusion of all members in the beginning times of the plan;

2. Last organizer:

The last organizer is the individual or gathering of individuals in charge of generation unit control, which implies fruition of individual undertakings at the operational level. Last organizer requires work process

control, finding out the flood of supply, plan, and establishment all through creation units. This must be finished by utilizing look-ahead calendar, which decides the movement and rate of work. It cuts up the ace calendar into many bundles, determining the systems of check limit, execution, and sets up a reserve of remaining by work. The extent of look-ahead timetable reaches from 2 to a month and a half and ought to be placed all together by cooperation;

3. Daily cluster gatherings:

Daily group gatherings gives a stage to the colleagues to share their perspectives and to share what has been accomplished, in the meantime, disk issues they are confronting amid the creation procedure;

4. The Kanban System:

The procedure of Kanban is grounded on key segments, i.e., commercial center, provider kanbans, gathering vehicle, satellite stores, and stock administration framework. Commercial centers are site distribution center that allot distinctive materials and little apparatuses to the laborers. Correspondingly, satellite stores are arranged nearby, where they get items from commercial centers. Accumulation vehicle gathers materials from favored providers to the operational site. Kanban utilize plastic containers as a flag to pull materials from providers to site, utilizing the idea of Just In Time. Demand shapes are typically utilized as kanban motions between commercial center and satellite stores. The arrangement of kanban begins regularly with open entryways, so the site can pull materials from the provider up to specific borders. Therefore, the material asked for from providers touches base at market, and items are later on picked

from the stores, which are typically overseen by recorder focuses;

5. Plan Conditions and Work Environment in the Construction Industry (PCMAT):

The object is to present an arrangement of wellbeing and security into the venture execution, called "Plan of Condition and Work Environment." These security exercises can create impediments for planned errands and that is the reason it ought to be held onto as a piece

of assignments. All security rehearses are along these lines amalgamated in here and now arranging, which can be examined through every day criticism from team and subcontractors individually and

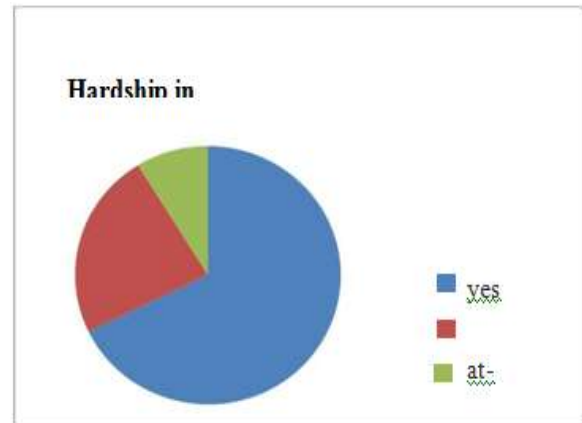
6. Visual Inspection:

Visual examination demonstrates the uneven idea of the development and prompts the utilization of visual devices for material, work and data stream, and so forth. Distinguishing proof of materials can quicken redundant procedures and lessens the danger of choosing incorrectly item. Advance outlines and calendars can execute the commitment to the fruition of assignments. Data and innovation can likewise enhance the correspondence between leader and executer, and can quicken the procedure also.

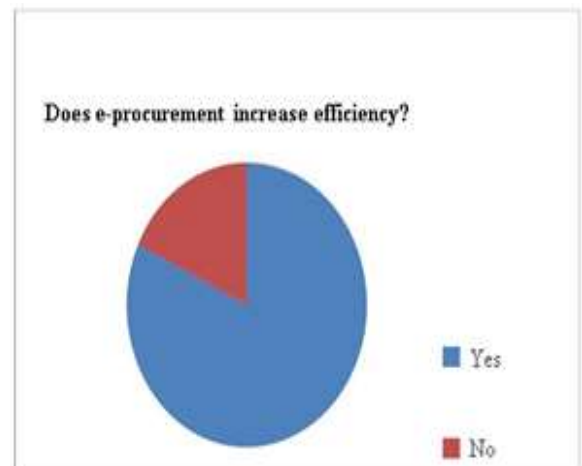
7. RESULTS AND DISCUSSIONS

An online study was led through Google shape. The study contained 20 inquiries concerning different development administration programming utilized as a part of the business,

useful challenges and the need of the business in development extend administration.



Percentage of companies who have hardship in finding suppliers

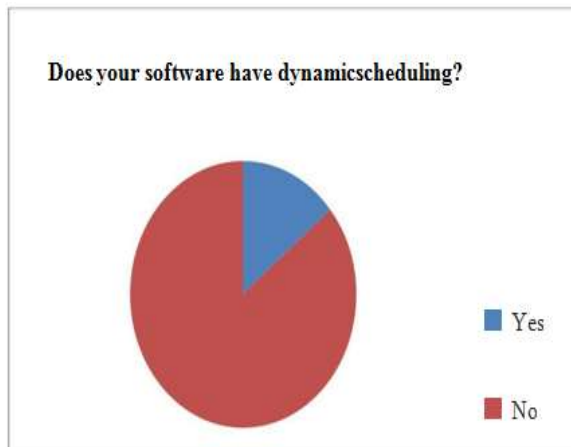


Pie chart to depict the of increase in the efficiency using e-procurement

Lean development is an approach to outline creation frameworks to limit misuse of materials, time, and exertion with a specific end goal to produce the most extreme conceivable measure of significant worth. The most vital determinants of development should be work process unwavering

quality and work stream, yet lean development has changed the conventional perspective of the venture as change, and grasps the idea of stream and esteem era. Lean development is made out of the accompanying procedures:

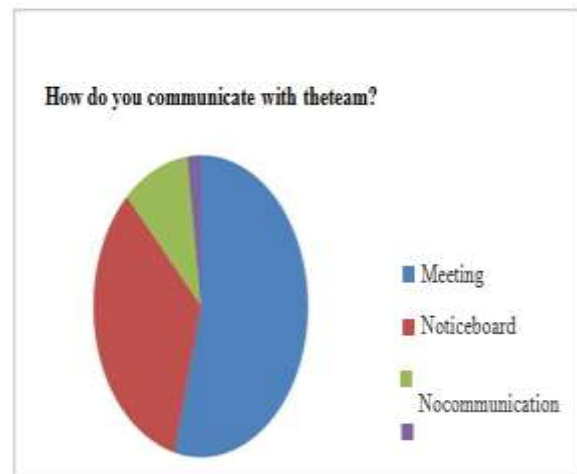
Simultaneous Engineering: Concurrent designing can be depicted as parallel execution of different undertakings by multidisciplinary groups with the objective of acquiring most ideal items concerning usefulness, quality, and profitability. Booking could be recouped by arrange examination (CPM and PERT). Numerous different open doors can be accomplished through covering exercises, part exercises and decreasing the exchange time between various exercises.



Pie chart revealing the percentage of industries using dynamic scheduling software

To begin with our planning should be founded on the utilization of antecedent connections between undertakings, not the utilization of settled begin and complete dates. There are three essential sorts of forerunner connections and the whole calendar must be based on these connections. The second necessity is that the timetable should be founded

on lengths which are figured from asset accessibility and work gauges.



The communication within construction project management team

8. CONCLUSIONS

The significance of online improvements in the development business has expanded manifolds in the web time. Capital venture administration programming (CPMS) alludes to the frameworks that are as of now accessible that assistance capital venture proprietor/administrators, program supervisors, and development chiefs, control and deal with the immense measure of data that capital development ventures make. A gathering or arrangement of activities just makes this a greater test. These frameworks pass by various names: capital venture administration programming, development administration programming, extend administration data frameworks. Typically Construction Management can be alluded as subset of CPMS where the extent of CPMS is not constrained to development periods of venture. There are frameworks accessible from

merchants which won't just oversee capital ventures yet in addition the whole venture portfolio (Program). This work records the different components of development administration programming presently utilized by the development extend supervisors. Obtainment administration and planning are the two fundamental needs cooked by the venture administration programming. The acquisition procedure in online situation is corrupted because of absence of accessibility of aggregate assets which additionally adds to human mediation. The postponement in the development timetable can be additionally diminished with the reception of web based business. The security and arrangement through the electronic specialist is an enhanced answer for increment the effectiveness of the development. Planning procedures ought to be intended to deal with all conceivable deferrals on location and in acquisition. CPMS is a basic segment of general IT procedure for Capital venture proprietors and capital venture proprietors are acknowledging it now, like never before. The need of great importance is another product that can give dynamic planning developmental obtainment procedures to limit the consumption.

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