Daily Updates on Construction Sites Progress

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Abstract:- *Construction Production Planning application is a product that processes the allocation of all supplies that the business takes in and ensures that they are taken to the proper place and used at the proper time to manufacture products in order to satisfy the demand of the customer. Construction Production Planning tracks the creation of products from beginning to end. It coordinates the activities such as: It takes in the order placed by the customer, analyzes the materials required to create the product, predicts the number of days required to manufacture the product, cost, and maintenance and quality assurance. The traditional approach of paperwork leads to inefficient planning and undesirable products. It leads to storing inaccurate data that negatively impacts the product. This application reduces manual work and stores the customized requirements of customer, materials required, quantity of materials required in every process, and all the updates on the product. Construction Production Planning schedules the processes of requirement gathering, material analysis, and collection of required data, work force required, production rate, and quality assurance. It prepares forecasts of schedules for the above data and compares the actual events with the forecasts made. Every item is given a unique number for identification. The customer places an order along with specifications of the product required such as size and quantity and expected date of delivery. The application maintains a record of every product and the specific materials required to manufacture the product. It maintains the product name, year it is being produced, date of plan made, forecast of completion date and plan type.*

Key Words: Independent Component Analysis (ICA), Planning, Predicts, Forecasts, Maintains.

1. INTRODUCTION

Production planning may be defined as the technique of foreseeing every step in a long series of separate operations, each step to be taken at the right time and in the right place and each operation to be performed so that maximum efficiency is achieved. It helps an entrepreneur to work out the quantity of material to be used and needed, manpower usage, and money of the final product. The sequence of operations must be established and production planning ensures that this sequence is strictly followed. In small enterprises, this job is usually done by entrepreneur himself in a rather ad-hoc manner. It involves:

- An analysis of the project to determine what product to make and what materials to buy.

- To determine the quality and type of material

- Determining the manufacturing operations and their sequence of process.

- A determination of product sizes

- Cost of the final product

Scheduling: It means working out of time that should be required to perform each operation and the time it takes to deliver the final product. In this company, the processes are followed by a priority basis and unless one job is completed, the next cannot be started. For this to occur, we must have enough personal to carry out the process.

Scheduling is an important tool for manufacturing and engineering where it can have a major impact on the productivity of a process. In manufacturing, the purpose of scheduling is to minimize the production time and costs, by telling a production facility when to make, with which staff, and on which equipment. Production scheduling aims to maximize the efficiency of the operation and reduce costs [13].

Companies use backward and forward scheduling to allocate plant and machinery resources, plan human resources, plan production processes and purchase materials. Forward scheduling is planning the tasks from the date resources become available to determine the shipping date or the due date.

Backward scheduling is planning the tasks from the due date or required-by date to determine the start date and/or any changes in capacity required.

The benefits of production scheduling include Process change-over reduction, Inventory reduction, levelling, Reduced scheduling effort, Increased production efficiency, Labour load levelling, Accurate delivery date quotes, Real time information [1].

In the company, the existing system is records being handled manually. Labourers enter the company, log in their entry time in notebooks. These figures may also be entered wrongly. Regarding materials, inventory was maintained by book keeping and accounts. The material manager and labour manager had no interaction as to know what is happening in the company. Any process that occurs in order to assemble the product had no means to be monitored. It made the labourers inefficient. They started slacking off which increased wastage of materials also. In order to resolve such issues, production planning is computerized.

Production Planning is a method to plan out the process of production in a company from the beginning to end. The goal of the company should be to deliver the product within the estimated time to the customer [4].

2. RELATED WORK

In the year of 2018, the authors "MU-EN WU et al [1]" proposed a title "A Novel Approach of Option Portfolio Construction Using the Kelly Criterion", in that they described such as: Cash the board is a standout amongst the most critical issues in monetary exchanging. Numerous abilities of cash administrations depend on the Kelly rule, which is a hypothetical enhancement of offering an ideal division for position measuring. In this paper, we structure an alternative exchanging methodology through Kelly basis.

In the year 2018,the authors "Paritosh Giri et al [2], have proposed Microwave close field imaging methods have been effectively utilized for the nondestructive testing of development materials in common infrastructures. The proposed framework comprises of a novel incorporated detecting unit with two laser dislodging sensors and a solitary microwave receiving wire that consequently pursues the shape of the material under test at a steady standoff remove and produces microwave pictures. The challenge errand is keeping up the steady standoff remove amid the checking procedure is a testing undertaking.

In the year of 2018,the authors "Li Dejun [3]",proposed a paper title "New Ways and Applications of Cancellation Toll to City Highway" in that they described such as:It is the first run through at home that expressway toll gathering is nullified along these lines how to remunerate toll accumulation misfortunes turns into an issue. In this situation, a pay mode dependent on the recognized traffic is advanced. As per the two genuine toll gathering modes, both a virtual open traffic identifying plan and a virtual shut traffic recognizing plan are proposed.

In the year of 2018, the authors "Mohamed Saad Bajjou et al [4], in that they described such as: Customary development the board methods are condemned by its powerlessness to convey development extends on time, with the quality asked for by the client, and without cost invade. Lean Construction (LC) is a compelling way to deal with structure creation frameworks to reduce exercise in futility, of materials, and exertion just as producing the greatest conceivable measure of significant worth.

In the year of 2018, the authors "Patrick Dallasega et al [5], in that they described such as: Industry 4.0 will positively change the assembling business however it will likewise affect the development business and its associated supply chains. ETO development provider organizations reliably comprise of off-site and on location creation components. On location development forms are inclined to high changeability and flightiness. This vulnerability makes production network synchronization for keeping up development advance troublesome. Thus, development supply chains are described by large amounts of middle of the road supports and long lead-times.

In the year of 2017, the authors "Jun Li, et al " proposed a paper titled "Simulation and Safety Analysis for Frame-type Movable Highway Barriers of Median Opening [6]", in that they described the vital plan to guarantee the typical activity of expressways.Lately, mishaps happened at the interstate of middle opening in some cases, and brought about more prominent setbacks and property misfortunes. In this manner, it turns out to be more and increasingly essential to stay away from accident for parkway boundaries of middle opening. This paper introduces a sort of casing type crash boundary on the limited component reproduction examination and the well being execution assessment so as to guarantee the traffic wellbeing.

In the year of 2017,the authors "Xinrong Liang et al [7]",in that they described such as: A composite control technique dependent using a loan task cerebellar model verbalization controller (CACMAC) and relative vital subordinate (PID) controller is connected to interstate thickness control. Right off the bat, a plainly visible traffic demonstrate is built up to portray the advancement procedure of thruway traffic stream precisely. Thirdly, street thickness controllers dependent on CACMAC-PID

compound control are planned by joining the thruway traffic display and a non linear criticism technology. CACMAC-PID compound controllers can expel interstate traffic clog and balance out mainline traffic stream.

In the year of 2017, the authors "Xinrong Liang et al [8]", in that they described such as: We utilize a plainly visible traffic model and RBF neural system to address expressway thickness control issue. This control framework is a nonlinear input shut circle framework. Right off the bat, a prominent traffic demonstrate called the LWR (Lighthill-Whitham-Richards) demonstrate is detailed. Furthermore, a direct RBF neural system control for discrete-time nonlinear frameworks is presented. The control calculation is moreover clarified. Thirdly, a traffic thickness controller dependent on the LWR show and the direct RBF neural system is planned.

In the year of 2016, the authors "Guilherme Guerreiro et al [9]", have proposed strong and versatile capacity framework.The transportation division, and in especially keen transportation frameworks, create expansive volumes of realtime information that should be overseen, conveyed, translated, collected, and broke down. To this end, creative enormous information handling and mining just as enhancement systems need to be created and connected so as to help ongoing decision making abilities. Towards this end, this paper exhibits an ETL (extricate, change and burden) design for astute transportation frameworks, tending to an application situation on dynamic toll charging for thruways.

In the year of 2015, the authors "B.H Solanke et al [10]" proposed a title "Impacts of E-Commerce on Construction Materials Procurement for Sustainable Construction", in that they described as: The adoptability of e-acquisition in materials acquisition by development experts have been upgraded by relating the advantages of e-acquirement in manageable building construction. E-Commerce has been broadly recognized to break the limits of time and separation; extend and alter the extent of business tasks; and increment the dimension of competiveness among building temporary workers by radically diminishing the expense of building generation.

In the year of 2013, the authors "Dong Zhao et al [11]" proposed a title "Building Information Modelling-enhanced Team based Learning in Construction Education", in that they described such as: Development industry has encountered an assortment of changes as far as activity and association, which bring about higher necessities to the development instruction. Current innovations, for example, the building data displaying (BIM), are a significant driving component to these changes. This inquire about goes for recognizing the business desire and fulfillment for development graduates and finding an proper instructive approach. The joining of BIM and TBL is accepted to raise the showing adequacy of development learning in science, innovation, the board, coordinated effort and practice.

In the year of 2013, the authors "Norshakila Muhamad Rawai et al", proposed a paper title "Cloud Computing for Green Construction Management" [12], in that they described such as: The headway of distributed computing innovation offers development associations extraordinary potential for building up a synergistic and coordinated condition for development management. The advantage of utilizing distributed computing innovation for development joint effort will lessen both vitality utilization and CO2 outflows; without a doubt, it is more towards a green mission as it likewise gives both a money related return and a substantial natural benefit.

In the year of 2013, the authors "Zulhabri Ismail et al [13]", in that they described as: Malaysian development industry is enduring issue of delivering high wastage and low profitability. Lean development is a methodology which is attainable to adapt to the circumstance and it will be progressively critical to be connected by all players in Malaysian development industry. It was discovered that lean development parts include standards, criteria and instruments.

In the year of 2008, the authors "Huawang Shi et al [14]", proposed a new way to deal with development venture hazard assesment dependent on unpleasant set and data entropy is proposed. Right off the bat, the development venture chance assessment record framework is set up, and after that the records are diminished with no data misfortune through harsh set methodology. Furthermore, hazard factor loads are subjectively portrayed with data entropy. Thirdly, the subjective outcomes are changed to amounts esteem and the aftereffect of assessment is worked out by utilizing unascertained number algorithm.

In the year of 2007,the authors "Suk-Won Jee et al [15]",in that they described such as : The erection of a basic steel outline in skyscraper development requires a lot of talented work what's more, is innately an exceptionally hazardous occupation. So as to determine these issues, the utilization of robots in auxiliary steel outline erection is at present being examined in Korea. Likewise, since robots comprise of numerous touchy machines, sensors, and gadgets, the improvement of a climate unaffected working space was considered. The goal of this examination is to assess the work space condition in CF by utilizing a recreation technique, for example, computational fiuid elements.

3. PROPOSED WORK

The application software production planning helped resolve such issues dealing with man, material and money. The proposed system was to create a organized structure within the company that plans, manages and controls various aspects leading to efficient delivery of the product.

Employee attendance is maintained for easy calculation of salary. Raw materials and the specific requirements for each product are maintained also. Each process that is required to assemble the product is maintained and the time required in executing that process is controlled. The delivery time of the product is maintained and the company must make all necessary operations to complete the product within that time.

ADVANTAGES:

- Effective utilization of resources

- Steady flow of production

- Coordinates all activities

- Minimize wastage

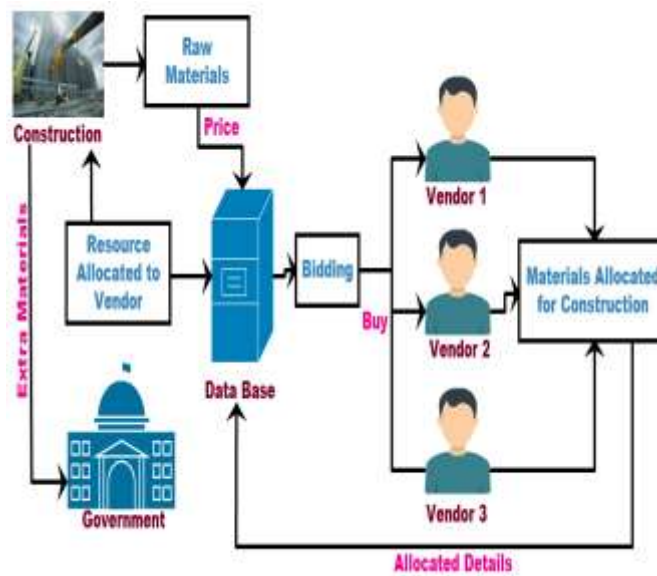- Improves labour productivity

ARCHITECTURE DIAGRAM:

Fig -1: Proposed system architecture

4. MODULES:

❖Raw Material Procurement

❖ Vendor Bid Solicitation

❖Vendor Resource Allocation

❖Dispatching Extra materials

4.1 RAW MATERIAL PROCUREMENT:

Material management is a vital function for improving productivity in construction projects. The construction site will update all the raw material information along with the price to the database server. The productivity of the construction project will be hanged if the material planning process is not implemented properly.
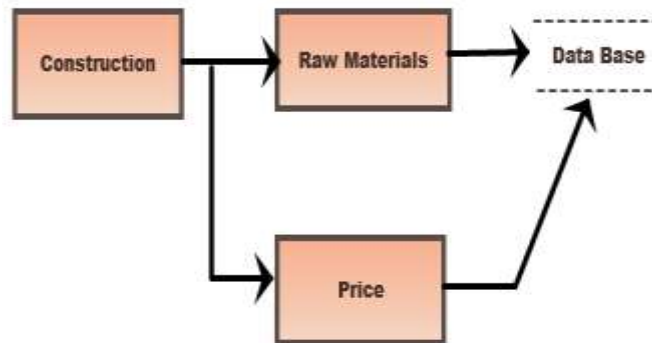
Fig -2: Raw material procurement

4.2 VENDOR BID SOLICITATION:

Bid solicitation is the process of making published construction data readily available to interested parties, including construction managers, contractors, and the public. The vendor normally raises their prices, the vendor who bids the higher prices material will be allocated for construction.
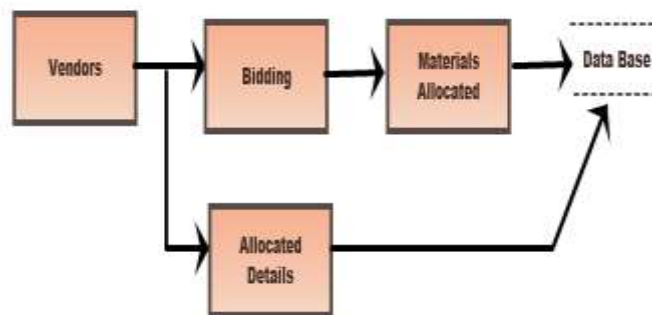

Fig -3: Vendor bid solicitation

4.3 VENDOR RESOURCE ALLOCATION:

Resources are people, equipment, place, money, or anything else that you need in order to do all of the activities that you planned for. In this project, the resources are allocated to the vendor, after bidding the high price. Purchase the materials and have the services from construction to get the support of operations as the construction project from production to marketing, sales and logistics.
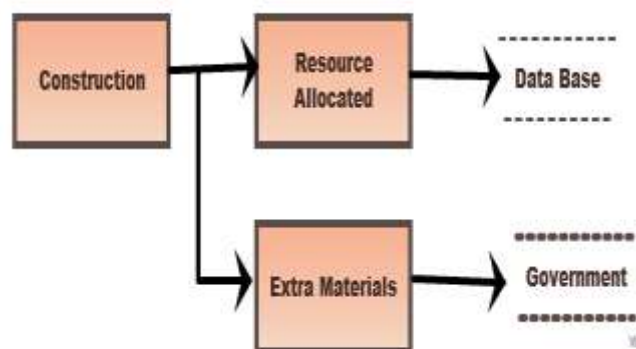

Fig -4: Vendor resource allocation

4.4 DISPATCHING EXTRA MATERIALS:

The materials will be allocated to the vendor, after that there may be extra materials. The extra materials will be dispatched to the government back.
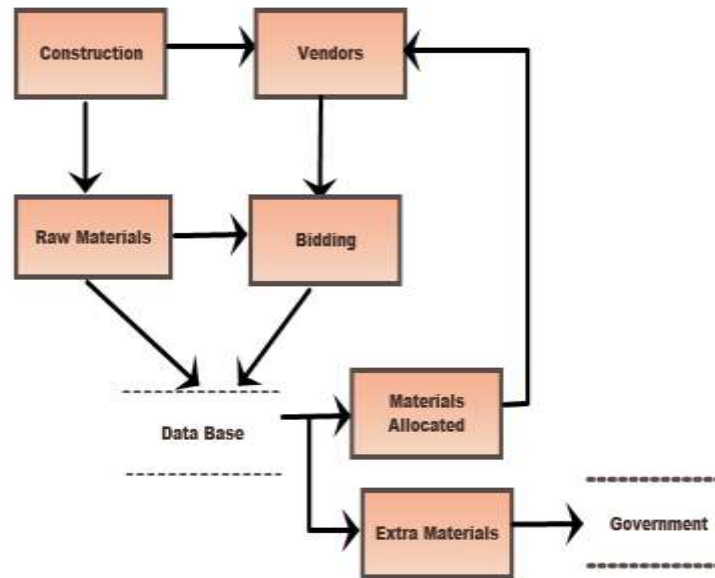

Fig -5: Dispatching extra materials

5. ALGORITHM:

Independent component analysis (ICA) is a way to get certain hidden information out of a signal. Experts define it as a "multivariate data model" that brings non-Gaussian and mutually independent elements out of a combined signal. ICA is a much more powerful technique that is capable of finding the underlying factors of sources when these classic methods fail completely. Its applications include digital images, document databases, economic indicators and psychometric measurements. Now go forth and wield your understanding of algorithms to create machine learning applications that make better experiences for people everywhere.

Definition of ICA

- Two functions independent if

  $$E\{h_1(y_1)h_2(y_2)\} = E\{h_1(y_1)\}\,E\{h_2(y_2)\}$$

  - If variables are independent, they are uncorrelated

- Uncorrelated variables

  - Defined: $E\{y_1 y_2\} = E\{y_1\}\,E\{y_2\} = 0$

  - Uncorrelation doesn't equal independence

  - Ex: (0,1),(0,-1),(1,0),(-1,0)

  - $E\{y_1^2 y_2^2\} = 0 \neq \frac{1}{4} = E\{y_1^2\}\,E\{y_2^2\}$

- ICA has to prove independence

ICA estimation

- Non gaussianity estimates independent

    - Estimation of $y = w^T x$

    - let $z = A^T w$, so $y = w^T As = z^T s$

    - y is a linear combination of s_i, therefore $z^T s$ is more gaussian than any of s_i

    - $z^T s$ becomes least gaussian when it is equal to one of the s_i

    - $w^T x = z^T s$ equals an independent component

- Maximizing nongaussianity of $w^T x$ gives us one of the independent components

    - Maximizing nongaussianity by measuring nongaussiantiy

    - Minimizing mutual information

    - Maximum Likelihood

SCREEN SHOTS

Fig -6: Daily updates

Fig -7: Final order

6. CONCLUSION

Construction Production Planning contains two levels, labour management and material management. In labour management, it plans the workload to be given to the workforce, enables the reduction of labour costs and increases labour efficiency. It provides the means to record the time spent on each activity by a timer. It also manages the labour details, salary given to the labourers, address and the contact information about the labourers. The number of work hours each spends is also monitored. In materials management, construction production planning calculates the materials required to manufacture the product, the quantity required and the exact type that is required. In the end, reports are generated through the tool I-report. There are three types of reports maintained. Attendance Report, Sales Invoice and Delivery Report. Attendance Report lets you view details of attendance of the employees by selecting an employee ID and the time period of the details that are required. Sales invoice generates an invoice depending on the employee ID, customer name or order ID that is provided. Details of the order placed are displayed in a PDF file. The delivery report provides the details of the order and the number of days it took to deliver that product to the customer and the final delivery date. It also displays whether the product has been delivered or not. This helps to simplify the process of planning and scheduling work. It provides a user friendly method to maintain records of the work that is to be done and the work completed. It helps minimize wastage of raw materials and ensures quality work.

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