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PROJECT PLANNING AND SCHEDULING IN GIS

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ABSTRACT
Civil engineering is particularly important to project management as it affects construction supervision and planning. Construction requires very careful planning, scheduling and site supervision. Line of Balance (LOB) is used to plan recurring construction projects, while Critical Path Method (CPM) is often used for non-recurring construction projects. Because there is no connection between geometric aspects and recurring schedules, it is difficult to check lesson plans for missing activities or logic problems. GIS can connect the repetitive programs and geometric elements of a construction project. CAD drawings and flowcharts can be integrated into the platform in place of outdated manual processes, allowing users to create 4D views using GIS. Keywords: QGIS, work breakdown structure, Autocad.

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INTRODUCTION

Whether infrastructure or real estate, the construction industry is essential to the prosperity of any country. The second largest employer in our country is generally considered to be the construction sector. It is therefore important that this sector continues to function smoothly at all levels. GIS supports project planning and scheduling for effective construction planning. With the right data, cross-platform access and enhanced visualization, project managers and clients can leverage his GIS. Track the flow of activities and costs at each stage of the project. GIS can be used for:
1. 3D data analysis in construction progress monitoring system
2. Data comparison
3. Track planning and construction progress with 3D visualization GIS enables project managers and more people from different backgrounds to participate in projects. Get reliable project and activity monitoring information.

GIS-BASED CONSTRUCTION PLANNING AND PROCESS

CAD-based design tools for construction Lack of reflective environments with site, facility, and space constraints prevent designers from creating run plans, cost estimates, or 4D simulations. GIS is commonly used to support the architectural design process, consider the environment, and perform a variety of geospatial analyses. There are several techniques to fill out development plans that support geographic data analysis in GIS, such as constraints and the spatial site facilities/utilities that the proposed building depends on. Integrating the building into the surrounding landscape defines the spatial connections between the many components of the building, which are created according to the architectural plan that is preserved. Currently only certain architectural areas are being investigated.

METHODOLOGY

A computerized tool called Geographic Information Systems and GISand#41. It can be used to collect, store, analyze, query, and display geographic data. His modern GIS technology is based on digital information generated through various digital data creation techniques. Digitization, the conversion of printed maps and survey plans into digital form using CAD applications and georeferencing, is the most common method of generating data.
Step 1: An AutoCAD drawing is created. In step 1, a design for the construction project is created using AutoCAD and only standard floor plans are used for calculations, from which the survey area is taken into account.

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Step 2: Creating the work breakdown structure (W.B.S.) is the second step. For efficient and manageable project management,you should create a WBS for your project.
Step 3: The beginning of the planning process is step 3. The project was planned based on the WBS activities mentioned in Step 3.
Step 4: Convert the AutoCAD design to GIS format in step 4 after creating the AutoCAD drawing.
Step 5: Prepare and update the schedule in step 5. In order to update project status in real time and communicate it to all stakeholders, schedules need to be updated instantly when changes occur.
Step 6: Linking the schedule to his 4D model is his sixth step. This link may be further updated as activity schedules change.

- **Preparation of architectural drawings**: Creating a project plan is in the early stages. Creating a better model requires design at different levels of the project. B. Various plans such as base level, base level, base level. For this project, MicroStation was used to create plans at various levels. These plans can also be created in AutoCAD. The accuracy of the 3D model increases with the number of plans.
- **Work breakdown structure:** There are different approaches to the WBS identification process for different projects. The HOS for the current project has the work planes for foundation PCC, foundation, foundation, foundation beam, floor, column, bottom of wall, top of wall, and roof. These heights are determined based on the height of the component. Shows how the project's task breakdown structure was created. A task structure was created to make project management effective and manageable. The first section includes earthwork such as ditching, foundation pouring, foundation frame walls, backfilling, soil compaction, and concrete floor slab construction. The second section focuses on superstructures, including tasks related to kitchen and bathroom fixtures, doors and windows, flooring, and exterior and interior partitions. Construction-related work is included in Parts 3 and 4, including electrical and plumbing work. In his ArcView module of ArcGIS software, each of these components is tracked as a separate view.
- **Start the planning process:** Critical Path Method (CPM) is used to plan tasks. A project schedule was created using the activities outlined in Phase 2 of the work breakdown structure. This project was planned using Primavera (P3), which shows start and finish dates, identifies activity critical paths and flex times, and shows the sequence and relationships between activities. A project's schedule must use a work breakdown structure to define activities. Site leveling, foundation PCC, foundation reinforcement, foundation formwork, foundation/foundation RCC, shaped masonry, RCC for foundation beams, shaped steel columns, interior plaster, VDF flooring, exterior plaster, carpentry fixtures, painting, cleaning, and Takeover is included in the list of activities.
- **Modeling 3D views in ArcScene:** At this point, the MicroStation drawing's levels are exported to ArcScene. First, define a projected coordinate system based on the Indian coordinate system. MicroStationdrawings are then converted to ESRI shapefiles based on the planned coordinate system. Base height and extrusion are calculated using already determined height information. Adding a level to ArcScene provides an extrusion (the 3D height of the object) and a base height (the height of the object above the ground).
- **Fourth Dimensional Integration:** A key step in this process is integrating the schedule into the 3D model of the project. Schedules and their details are exported to P3 as a database using the export option. Both are then connected using activity codes and level IDs to temporally activate each level in the project.
- **Simulation output:** Project simulation is the final step. This technique uses the time function of spatial data. The start and end times of each promotion are linked. After changing the timezone, the required time offset is selected. A simulation is created as a result.

FUTURE SCOPE

Geographic information system applications save a lot of resources as the software oversees, manages and monitors the construction process and tries to complete the project on or ahead of schedule. Governments and businesses around the world are increasingly using GIS to map and analyze geographic data to provide accessible information for better management of resources and services. In a new era of globalization and economic liberalization, planning, managing and executing infrastructure projects in the construction industry requires new skills, approaches and technologies. GIS can get enough information from the spatial interface.

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CONCLUSION

GIS improved his LBP computer implementation, hitherto considered a major impediment to practical use. Important information can be overlooked when creating execution plans using various forms of fragmented data from different tools. A GIS brings together various types of graphical and non-graphical information into a single platform that can be reliably used to plan and schedule a wide variety of tasks. Any change in graphical or non-graphical input data in the GIS will update the design immediately. The limitations of this study, namely the need for further automation in this area, may be considered in future studies. Despite the many advantages of using his 4D method for project planning and scheduling, the industry continues to rely on traditional approaches. Traditionally, CPM schedules do not provide details about the spatial characteristics, context, and complexity of various construction project components. Therefore, when interpreting progress data, project participants typically look at 2D drawings and mentally associate linked components with activities. When analyzing CPM schedules, different project stakeholders may come to different conclusions about the schedule. This often causes confusion and usually makes it difficult for project participants to communicate effectively. For successful roadmap communication, project progress must be visible to all stakeholders. The system should run regularly throughout the project. Customers, civil engineers, and project managers all benefit from this method. Project managers receive updates on order status, which is helpful when managing large project sites. The project manager is informed of the funds incurred or expended and the amount of materials used on site for day-to-day activities.

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