



Figure 1 – CIMC MENOW 1600B potato harvester



Figure 2 – Hongzhu 4U-90LH potato combine harvester

At present, the pace of R&D and innovation of domestic potato harvester is accelerating, with an increasing number of models and constantly optimized equipment. However, the following problems remain:

1. Research on the potato conveying and lifting device needs deeper exploration of the mechanical-potato interaction and soil sieving mechanism.
2. Issues include incomplete handover, dropping during lifting, and suboptimal speed and angle.
3. The harvester's device targets low damage, smoother operation, and complete soil separation.
4. Advanced technology transformation for practical application.

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## **ENGINEERING CONSTRUCTION COST CONTROL BASED ON BIM TECHNOLOGY**

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**Summary.** *The construction industry is a pillar industry of the national economy, and the scale of the construction industry has expanded rapidly in recent years. However, there is a problem of poor profitability in the construction industry. It was found that the main reason for the poor profitability of the construction industry is the problem of project cost management, and the main expenditure of project costs lies in the construction phase of the project. Therefore, cost management during the construction phase of the project will effectively improve the profitability of the construction industry. level. Using building information model BIM and through the three stages of pre-construction control, in-process control, and post-construction control, we can effectively detect the construction design plan, conduct construction collisions, and simulate the entire construction process. This will shorten the construction period, save project construction costs, optimize the design and construction plan, and improve the efficiency of construction cost management.*

The role of BIM technology in construction cost management: Construction cost management is to use various means such as technology, informatization, and

economy to carry out design, management, and construction combinations to minimize the meaningless waste of resources such as excessive consumption of raw materials such as steel, wood, and concrete . At present, there are loopholes in traditional project cost management, such as: serious construction cost overruns caused by construction delays, hard-to-check errors in paper data records, errors in total cost accounting, waste of construction materials, low efficiency in the use of construction equipment, and even damage compensation. And due to the lag and continuity of this type of traditional project cost management, even if errors are found in subsequent verifications, it is extremely difficult to correct the relevant data in a short period of time, which ultimately leads to errors in project cost accounting and cost control. Increase construction costs.

Using BIM technology to dynamically manage construction, we can conduct 3D modeling, CAD drawing proofreading, collision detection of construction design plans, and construction material list verification for construction projects. We can also plan the division of labor and job responsibilities of personnel, arrange for the arrival of materials, and formulate Construction equipment, construction process, etc. Construction cost management is carried out through three stages: pre-construction control, during-construction control and post-construction control. Ultimately, BIM technology and construction management are combined, and BIM technology is used to assist construction cost management to achieve the purpose of shortening the construction period, saving project construction costs, optimizing the design and construction plan, and improving the efficiency of construction cost management.

Application of BIM technology in construction cost management: Based on the characteristics of the construction industry and BIM technology characteristics, it can be seen that the application of BIM in the construction industry has its necessity and basic conditions. Improve construction deployment and simplify construction management processes through BIM technology. The traditional construction deployment flow chart and the BIM technology construction management process are as follows:

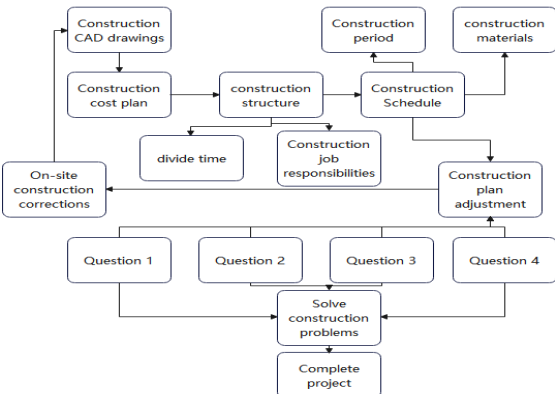


Figure 1 – Traditional construction management flow chart

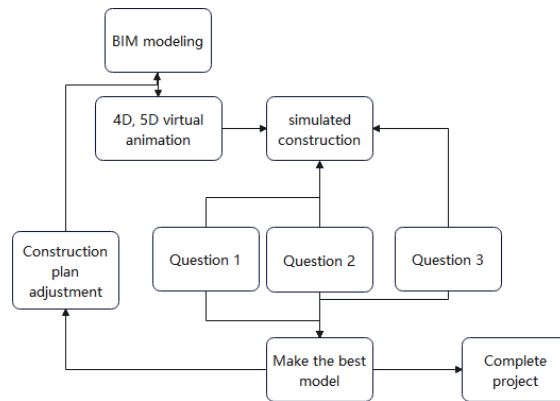


Figure 2 – BIM technology construction management flow chart

BIM technology converts two-dimensional drawings into three-dimensional real-life models using software such as Glodon, REVIT, and 3DMAX, and simulates construction through 4D and 5D virtual animations to detect construction problems, make optimal models, and adjust the original construction plan, and finally construct the 1:1 BIM optimal model, and use it to dynamically manage the construction site. And the BIM central database stores various information related to the project, including construction period, price, contract, change visa and other information, which facilitates information sharing and calling by all parties involved in the project. When the project using the BIM information model is completed, the construction personnel can obtain the project construction cost through the BIM central database, and conduct related work such as auditing the project cost and checking the project cost.

The use of BIM modeling avoids the inability to conduct final project settlement due to problems such as missing paper data and incorrect calculation of project costs. It also reduces traditional completion settlement work such as completion drawings, project visas, and design changes, improving completion efficiency, saving project construction costs. Moreover, the visualization features of BIM technology can assist project engineering quantity calibration, efficiently and accurately calculate construction costs and engineering quantities, ensure the integrity of engineering data while ensuring work efficiency, and pave the way for subsequent project construction cost work.

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**Summary.** *Dc arc discharge plasma technology with extremely high evaporation temperature and ultra-fast cooling speed can overcome the mixing enthalpy restriction between immiscible components and obtain highly miscible high-entropy alloy nanomaterials. With the aid of external electromagnetic field, the catalytic degradation mechanism of dyes under the action of external*