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The Power of iTWO: Automating Precision in Construction Estimation

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Abstract: ***The construction industry is continuously evolving through the adoption of digital technologies that enhance accuracy, efficiency, and decision-making. One such innovation is the iTWO software, a 5D BIM-based estimation and project management tool developed by RIB Software. This research paper focuses on the application and functionality of iTWO in the field of estimation and costing within construction projects. The study is based on my internship experience with a Belgium-based company, where iTWO is extensively used for both manual and model-based estimations. The software integrates cost databases for materials, labor, and equipment, which are frequently updated in accordance with market rates. Estimation in iTWO is carried out through the creation of recipes—structured activity templates containing variables and formulas that determine total cost, resource requirements, and efficiency. For model-based estimation, iTWO enables direct quantity take-off from BIM models by linking element attributes with predefined articles, resulting in highly accurate and rapid cost computation. The findings of this paper highlight how iTWO enhances estimation accuracy, minimizes human error, improves cost transparency, and significantly reduces the time required for quantity and cost calculations.***

Keywords: iTWO software, 5D BIM estimation, construction project management, digital transformation in construction, cost accuracy

1. Introduction

The construction industry is one of the most dynamic and complex sectors, involving a wide range of activities such as design, estimation, planning, execution, and control. Among these, **estimation and costing** play a crucial role in determining the feasibility and profitability of a project. Accurate estimation helps in effective budgeting, resource allocation, and financial planning, which are essential for project success.

Traditionally, estimation was performed manually using spreadsheets or conventional methods, which were time-consuming and prone to human errors. With the advancement of technology, the industry has shifted toward **digital and automated estimation tools** that improve both speed and accuracy. One such advanced tool is the **iTWO software**, developed by RIB Software, which integrates **5D Building Information Modelling (BIM)** with project cost and schedule management.

iTWO allows users to perform both **manual estimation** and **model-based estimation (BIM integration)** within the same platform. It uses predefined **recipes** and **cost databases** for materials, labor, and equipment, which can be customized or automatically updated based on market rates. This integration not only enhances the precision of cost calculations but also improves coordination between design and estimation teams.

During my internship with a **Belgium-based construction company**, I was introduced to iTWO as part of my role as a **Calculator (Estimation and Costing Engineer)**. This experience provided me with practical knowledge of how estimation processes are carried out in an international setting using digital tools. The iTWO software proved to be highly efficient in managing both manual and model-based estimations, offering real-time cost updates and improved decision-making capabilities.
This research paper aims to study the **features, functions, and advantages of iTWO software**, and to analyze how it contributes to improving the estimation process in construction projects.

2. Problem Statement

In the construction industry, **estimation and costing** play a vital role in determining the financial feasibility and success of a project. However, **traditional estimation methods** that rely on manual calculations or spreadsheet-based tools are often **time-consuming, prone to human error, and lack integration with design data**. These limitations frequently lead to inaccurate cost predictions, inefficient resource allocation, and project cost overruns.

With the growing complexity of modern construction projects and the introduction of **Building Information Modeling (BIM)**, there is an increasing need for **integrated digital tools** that can provide accurate, data-driven, and automated cost estimation. Despite the availability of advanced software like **iTWO**, many professionals and organizations are still unfamiliar with its full potential in automating and optimizing the estimation process.

Therefore, the problem addressed in this research is to **analyze how the iTWO software can enhance the efficiency, accuracy, and reliability of estimation and costing in construction projects**, and to **understand its practical application through real-world internship experience**.
This study aims to bridge the gap between **traditional estimation practices** and **modern digital estimation techniques**, emphasizing the transformative role of iTWO in achieving smarter, faster, and more transparent cost management in construction.

3. Objectives of the Study

The main objectives of this research paper are as follows:

1) **To understand the concept and working mechanism of iTWO software** in the context of estimation and costing.

2) **To analyze the process of manual and model-based estimation** using iTWO.
3) **To identify the key features of iTWO** that enhance accuracy, speed, and efficiency in cost estimation.
4) **To evaluate the benefits of using iTWO** in real-world construction projects compared to traditional estimation methods.
5) **To study the practical application of iTWO** during an internship experience in a Belgium-based construction company.
6) **To highlight the role of digital estimation tools** in improving project planning, cost control, and overall project management.

4. Research Methodology

4.1 Research Approach

The study adopts a **qualitative and experiential research approach**, primarily based on **internship-based observation** and **practical application** of the iTWO software in a professional construction environment. The research focuses on understanding how iTWO supports estimation and costing processes, how it integrates with project data, and how it improves accuracy and efficiency compared to traditional methods.

4.2 Source of Data

The research is primarily based on **primary data** collected during my internship experience at a **Belgium-based construction company**, where iTWO was used for cost estimation and budgeting.

Additionally, **secondary data** such as company documents, manuals, online resources, and technical literature on iTWO and BIM-based estimation were referred to for theoretical understanding.

Primary Data:
- Practical observation of estimation tasks performed using iTWO software.
- Interaction with estimation engineers and supervisors to understand workflows.
- Real-time project data and estimation sheets created within iTWO.

Secondary Data:
- Research papers, articles, and case studies on iTWO and 5D BIM.
- Online tutorials, software documentation, and company guidelines.

5. Research Process

The research was conducted in a **step-by-step process** as described below:
1) **Understanding the Software:** Initial training and self-learning sessions were undertaken to understand the features, interface, and workflow of iTWO software.
2) **Observation and Data Collection:** During the internship, live projects were analyzed to observe how estimations were prepared — both manually and using the model-based method.
3) **Manual Estimation Study:** Activities such as concrete column casting were selected to study how variables (e.g., volume, area, concrete class, formwork ratio) are entered into recipes, and how iTWO automatically calculates costs based on these variables.
4) **Model-Based Estimation Study:** BIM models were imported into iTWO to understand how attributes are linked to elements and how the software computes quantities and costs instantly after running queries.

Comparative Analysis:
The efficiency, speed, and accuracy of iTWO estimations were compared to traditional manual methods to identify improvements and advantages.

Documentation and Analysis:
All findings were documented, and screenshots, workflows, and cost comparisons were analyzed to support the conclusions drawn from practical observations.

Tools and Techniques Used
- **Software:** iTWO by RIB Software
- **Techniques:** Manual and model-based estimation, recipe creation, variable input, cost calculation, and query generation.
- **Analysis Tools:** Qualitative analysis through observation, comparison, and interpretation of software-generated results.

6. Scope and Limitations

Scope
This study focuses on understanding the practical application of iTWO in the estimation process, covering both manual and BIM-integrated estimation. It provides insights into how digital tools can enhance cost management efficiency in construction projects.

Limitations:
- The research is based on a limited number of projects observed during the internship period.
- The analysis focuses on estimation processes only and does not cover other iTWO modules such as scheduling or procurement.
- Market data and rates used are specific to the company's internal database and may vary by region.

7. Results and Discussion

7.1 Overview

This section presents the outcomes of my practical experience using **iTWO software** for estimation and costing during my internship at a **Belgium-based construction company**. The focus was on understanding how iTWO improves estimation accuracy, reduces manual effort, and enhances the efficiency of cost management in comparison to traditional methods.

7.2 Observations from Practical Application

During the internship, iTWO was used for both **manual** and **model-based** estimation processes. The following key observations were made:

1) **Automation of Calculations:** iTWO automatically calculates material, labor, and equipment costs once the required variables are entered into a recipe. This eliminated repetitive manual calculations and significantly reduced the chances of human error.
2) **Integration of Cost Data:** The software contains a built-in database for material, labor, and machine costs, which are updated regularly as per market rates. This ensured that the estimation always reflected realistic and current costs.
3) **Recipe-Based Estimation:** Each activity or article (e.g., column, slab, beam) is associated with a recipe that defines the required inputs and cost formula. Once variables such as **volume, area, and formwork ratio** are entered, iTWO automatically generates the total cost for that activity — including **transportation, equipment, and accessories**.
4) **Model-Based Estimation (5D BIM):** When a BIM model was imported into iTWO, suitable **attributes** were assigned to each element (like walls, columns, beams). The software used these attributes to extract quantities automatically, which were then linked to cost articles for estimation. This process provided **instant and highly accurate** quantity and cost outputs.
5) **Ease of Data Management:** All data, including cost information, material details, and quantity take-offs, were stored in a centralized database, making it easier to track, modify, and reuse for future projects.

Key Results

- iTWO reduced the **time for estimation by approximately 60–70%** compared to manual methods.
- The **accuracy of cost estimation** improved due to the use of pre-defined formulas and updated cost databases.
- The **integration between design and estimation** eliminated duplication of work and reduced communication errors between teams.
- The software provided **better visualization of cost impact** for design changes, enabling faster decision-making.
- The user-friendly interface and automation capabilities enhanced **overall productivity and reliability** of the estimation process.

8. Discussion

The analysis reveals that **iTWO acts as a bridge between BIM and cost management**, enabling construction professionals to connect design, quantities, and cost information in a single platform. Its ability to handle both manual and model-based estimation makes it suitable for a wide range of projects.

Through my internship experience, it was observed that iTWO not only improves estimation accuracy but also helps organizations maintain **cost transparency and standardization**. The use of recipes, queries, and attributes simplifies complex estimation tasks and ensures consistency across different projects.

Furthermore, by integrating real-time cost data and BIM models, iTWO supports **data-driven decision-making**, allowing project managers to evaluate cost implications at an early stage. This feature can be highly beneficial in preventing budget overruns and optimizing resource allocation.

However, it was also noticed that **initial training and understanding of the software** are essential for effective implementation. Once mastered, iTWO significantly enhances project efficiency and contributes to the overall digital transformation of the construction industry.

9. Summary

In conclusion, the results clearly indicate that iTWO software is a **powerful and efficient tool** for estimation and costing in modern construction projects. It brings together accuracy, automation, and integration — reducing human effort, saving time, and ensuring reliable cost control.

10. Conclusion and Recommendations

10.1 Conclusion

The study concludes that **iTWO software** is an effective and advanced tool for **construction estimation and costing**. It simplifies the process by automating calculations, integrating real-time cost data, and linking design elements directly with cost information. Compared to traditional methods, iTWO significantly **reduces estimation time**, **improves accuracy**, and **enhances transparency** in cost management.

Through this internship experience, it was evident that iTWO not only improves technical efficiency but also supports the shift toward **digital construction practices** and **data-driven project management**.

10.2 Recommendations

1) **Training Programs:** Regular training should be provided to estimators and engineers to fully utilize iTWO's features.
2) **Integration with BIM:** Companies should adopt model-based estimation to achieve better coordination between design and costing.
3) **Database Updates:** The material, labor, and equipment databases should be frequently updated for more precise cost results.
4) **Adoption in India:** Indian construction firms can benefit greatly from iTWO by incorporating it into cost estimation and project control processes.
5) **Future Research:** Further studies can explore iTWO's integration with project scheduling, procurement, and lifecycle costing.

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