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Advanced project Management

Instructions:

- اخر موعد للتسليم هو يوم الخميس 2021-05-20 في تمام الساعة ٩ مساءً.
- الإجابة متاحة باللغة الإنجليزية أو اللغة العربية مع مراعاة أن تكون المصطلحات العلمية باللغة الانجليزية.
- يتم تسليم المشروع في صيغة ملف . pdf مع الالتزام نموذج الجامعة ولن تقبل أي مستندات أخرى.
- يجب مراعاة أقسام البحث الرئيسية (مقدمة Introduction، دراسات علمية سابقة Literature Review، طريقة البحث Methodology، النتائج والمناقشة Results and Discussion ، وأخيراً المراجع References . وان كان هناك ملحقات Appendices يتم إضافتها)
- يجب الالتزام بـ Theme موحد كما يلي:
- حجم الخط 12.
- نوع الخط Arial.
- لون الخط أسود.
- المسافة بين الأسطر 1.5 line spacing
- عدد صفحات البحث (لا يقل عن ثلاث صفحات ولا يزيد عن ست صفحات).

1.Introduction

I work in a large development program consisting of several projects linked to one goal and my role is to monitor and follow up the progress of projects, analyze data, develop reports, and solve problems, if any. I chose a point to describe how progress will be monitored. This point is important, especially in mega projects, to be aware of the project's inputs and outputs in professional ways, and this point is the nucleus of productivity and decision-making.

2.Literature Review.

Construction industry realized the urgent need for providing the opportunity to understand the current project status easy, rapid, and accurate [1]. Rapid project assessment further identifies discrepancies between the as-built and asplanned progress, and facilitates decision making on the necessary remedial actions [2]. Currently, manual visual observations and traditional progress monitoring based on field personnel's interpretation are time-consuming, errorprone, and infrequent [3] [4]. Consequently, investigation on new methodologies that allow automatic recognition of as-built performance and visualization of construction progress is vital. In response to this need, significant progress towards automating detection and visualization of as-built status of a project has been achieved in recent years. The advancement in automatic field data acquisition systems will enable more accurate collection of data and knowledge about processes and operations on site. These technologies include Image-based technologies, Laser Scanning (LS), Radio Frequency Identification (RFID), Ultra-Wideband (UWB), Global Positioning System (GPS) and wireless sensor networks (WSN). The purpose of this study is to investigate the impact of FDCT, in combination with BIM on ACPPM.

2.1. BIM in Project Progress Monitoring

BIM is a rich source of information for performing ACPPM. It describes the as-planned project shape in terms of 3D geometry and combines it with the as-planned construction schedule. The resulting 4D model combines all relevant information for the complete construction process [2] [5]. Application of these models during the construction phase can be increased if further potential added values from integrating BIMs with as-built models [6]. Therefore, the planned state at any time can be derived and compared with the actual construction state. Consequently, BIM can serve as a powerful baseline for progress tracking and in the visualization of discrepancies.

2.2. Field Data Capturing Technologies for ACPPM

In the last decade, the capabilities of FDCT for ACPPM have significantly increased. Early detection of performance deviations in field construction activities with minimum human input is critical as it provides an opportunity for project management to avoid them or minimize their impacts [7]. Integration of BIM-based models and real-time field data acquisition systems can increase the degree of automation in all parts of project progress monitoring and control such as architectural, structural and MEP. Furthermore, updates, analysis and reporting can be made more frequently, regularly, and accurately along the work progress. Table 1 shows the summary of the previous researches which used the integration of different FDCT and BIM for ACPPM. Table 1: Advanced Automated BIM-based Data Capturing Technologies.

3. Methodology

3.1. Sampling The study focused on contracting and engineering consulting firms dealing with Civil Works, Infrastructure, Construction projects operating in the Middle East, Mid-Asia, Europe, North America, and Far East. The list consisted of a total of 326 contracting and engineering consulting firms. The sample includes only large firms.

3.2. Data Collection During the survey administration, a total of 500 firms were contacted to participate in the study and 326 completed questionnaires (one respondent from each firm) were received, giving a high response rate of 65 percent. The respondents were asked to rate the extent of agreement with each statement based on a five point Likert scale of 1 (strongly disagree) to 5 (strongly agree). Contact personnel in the firms for the questionnaire survey were either the top management or senior management. Table 2 shows the percentages of the respondents of the survey from different regions of the world having different professions.

Table 2. Distribution of the stakeholders according to the type of regions and different professions.

Regions/Countries	Stakeholders' Profession		
	Contracting Firm		Engineering Consulting Firm
	Project Manager (34.95%)	Construction Manager (33%)	Civil Engineer (32%)
Middle East	4.60%	3.9%	3.6%
UAE	8	7	6
IRAN	7	6	6
Mid-Asia	4.29%	4.4%	3.9%
AZERBAIJAN	7	8	7
KAZAKHSTAN	7	7	6
Europe	12.26%	11.6%	11.9%
UK	10	9	10
GERMANY	10	10	10
FRANCE	10	9	19
TURKEY	10	10	10
North America	6.75%	6.4%	6.1%
CANADA	11	10	10
USA	11	11	10
Far East	7.05%	6.7%	5.8%
JAPAN	12	11	10
S. KOREA	11	11	9

4.Results and Discussion

In recent years, significant progress towards automating field data capturing real-time information from real-life physical project processes and visualization of as-built status of a project using BIM has been achieved. This paper investigates the impact of FDCT, in combination with BIM on ACPPM within contracting firms and consulting firms operating in the construction sectors of different countries from the Middle East, Mid-Asia, Europe, North America, and Far East. Based on an evaluation of the findings, 3D Laser Scanning, Image-based, and Radio Frequency Identification (RFID) in combination with BIM were found as the most effective technologies for ACPPM. Finally, a conceptual framework and managerial implications are demonstrated with a sample statement focusing on requirements, processes and benefits. The study approves the significance of using BIM-based FDCT in enhancing ACPPM factors performance. It also highlights the need for further exploration of the role of the BIM-based FDCT in improving ACPPM.

Reference

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