

BUILDING INFORMATION MODELING
(BIM) ADOPTION AMONG LIBYAN
CONSTRUCTION ORGANIZATIONS:
THE MODERATING EFFECT OF
ORGANIZATIONAL CULTURE

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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at University Malaysia Pahang Al-Sultan Abdullah or any other institutions.

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AN INTEGRATED MODEL FOR BUILDING INFORMATION MODELING
(BIM) ADOPTION AMONG LIBYAN CONSTRUCTION ORGANIZATIONS:
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ABSTRAK

Pemodelan Maklumat Bangunan (BIM) terkenal dalam sektor pembinaan sebagai peralatan yang penting untuk meningkatkan prestasi organisasi. Pelaksanaan penggunaan BIM di sektor pembinaan di seluruh dunia sedang berkembang pesat, namun perkara ini tidak berlaku pada kadar yang sama di Libya. Walaupun BIM telah wujud lebih daripada 20 tahun, organisasi pembinaan di Libya masih menghadapi kesukaran untuk menerima pakai teknologi BIM yang bersepadu. Terdapat banyak kajian sebelum ini yang telah mengupas faktor-faktor yang mempengaruhi penggunaan teknologi secara amnya, walaubagaimanapun masih terdapat kebimbangan yang belum dikaji sepenuhnya dan harus ditangani. Ini termasuklah faktor-faktor yang mempengaruhi penggunaan BIM telah memberikan keputusan yang tidak muktamad daripada kajian terdahulu dan kurangnya kajian dilakukan terhadap faktor-faktor yang mempengaruhi penggunaan BIM dalam firma pembinaan. Matlamat kajian ini adalah untuk menutup jurang kajian dengan mengenal pasti pembolehubah yang memberi impak kepada penggunaan teknologi BIM di Libya. Budaya organisasi telah digunakan untuk memahami kesan sederhana antara faktor pengaruh dan penggunaan BIM. Model penyelidikan bersepadu telah dibina berdasarkan teori Organisasi Teknologi Alam Sekitar (TOE) untuk menerangkan kesan relatif tujuh faktor yang diketahui. Maklumat itu diperolehi melalui soal selidik yang dibuat ke atas 411 buah firma pembinaan Libya. PLS-SEM (Partial Least Squares-Structural Equation Modelling) telah digunakan untuk menganalisis data, menilai model pengukuran dan struktur, dan menguji hipotesis. Berdasarkan data yang dianalisa, sektor pembinaan Libya dilihat sebagai tidak menggunakan teknologi yang canggih, dan mereka terus menggunakan teknologi sedai ada seperti 2D CAD. Hasil analisis laluan yang dijalankan menunjukkan bahawa faktor teknologi (Tanggapan Kelebihan Relatif dan Keserasian) berhubungkait secara positif dengan penggunaan BIM, manakala factor Kerumitan berkaitan secara negatif kepada penggunaan BIM. Faktor organisasi (Sokongan Pengurusan Atasan) juga mempunyai hubungkait yang positif dengan faktor persekitaran (Tekanan Paksaan) terhadap penggunaan BIM. Selain itu, faktor Budaya Organisasi didapati mempunyai kesan sederhana terhadap hubungan antara faktor persekitaran (Tekanan Normatif) dan penggunaan BIM dalam firma pembinaan di Libya. Penemuan kajian ini memberikan gambaran yang signifikan mengenai faktor-faktor penting yang dapat meningkatkan tahap penggunaan BIM. Secara ringkasnya, integrasi model penyelidikan memberikan penjelasan yang komprehensif untuk penggunaan BIM dalam organisasi. Penggunaan BIM juga dilihat boleh menjadi asas untuk teknologi baru yang akan muncul di dalam organisasi.

ABSTRACT

Building Information Modelling (BIM) is well-known in the construction sector as an important tool for improving organizational performance. In this sense, worldwide BIM adoption is rapidly expanding, however this new phenomenon is not growing at the same rate as in Libya. Despite the fact that BIM has been existed for over 20 years, construction organizations in Libya are still struggling to adopt integrated BIM technology. Although previous studies have looked at the factors that influence technology adoption, there are still crucial concerns that have not been completely investigated and must be addressed. They include: (1) Previous research on the factors that influence BIM adoption has yielded inconclusive results. As a result, further study is needed to investigate potential moderators in the processes of a firm experiencing, interpreting, and controlling internal and external important factors. Investigating the moderating influence of organizational culture may assist in resolving inconsistencies in prior studies. (2) Despite BIM processes requiring organization-wide adoption, However only few study sought to integration of variables of the most important theories at organisations level such as TOE , DOI and INT, the constructs of these of theories have not clearly identified the factors that influence BIM adoption in construction organisations , especially in Libya construction organisations. As a result, the aim of this study is to close these gaps by identifying the variables impacting BIM technology adoption in Libya. Organizational culture has been applied to understand the moderating effect between influential factors and BIM adoption. An integrated research model was constructed based on the Technology Organization Environment (TOE) theory to explain the relative effect of seven known factors. The information was gathered through a survey of 411 Libyan construction organization. PLS-SEM (Partial Least Squares-Structural Equation Modelling) was used to analyse the data, evaluate the measurement and structural model, and test the hypotheses. According to the data, Libyan construction enterprises are not technological sophisticated, and they continue to use common technologies such as 2D CAD. The path analysis results demonstrated that the technological factors (Perceived Relative Advantage and Compatibility) related positively to BIM adoption, while Complexity related negatively to BIM adoption. Organizational factors (top management support) also related positively with environmental factors (Coercive Pressure) on the adoption of BIM. Organizational culture was also found to have a moderating effect on the relationship between environmental factors (Normative pressure) and the adoption of BIM in Libyan construction organizations. The study's findings provide significant insight into important factors that might increase the level of BIM adoption. In summary, the integration of the research model gave a comprehensive explanation for BIM adoption in organizations. The adoption of BIM could serve as a base for future research in other emerging technology adoptions in organizations.

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