

Theoretical Perspective of Critical Influential Factors (CIFs) Model to Curb Time Overrun in UAE Oil and Gas Industry

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ABSTRACT

One of the pertinent issue in the oil and gas industry is the time devoted for projects completion. Completing an oil and gas industry projects within the time specified is required in oil and gas industry in UAE. The funds allocated for the projects are usually not properly utilised. Nonetheless, little exertion has been made to overcome the phenomenon. The objective of this paper is to propose theoretical Critical Influential Factors (CIFs) model to curb time overrun in oil and gas industry projects in UAE. The causes that affect the successful completion of oil and gas industry project within the time limit have been gathered and identified from the previous research works via literature review. This CIF model is expected to aid the successful completion of oil and gas project in UAE. The study implication is expected to reduce time overrun prevalent in oil and gas industry projects and opening new avenue for future research.

Keywords

Project management, Time overrun, Oil and gas projects, Organizational theory, UAE.

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Introduction

Time overrun is a global phenomenon in projects involving the oil and gas industry. In other words, quite seldom are works completed within the accepted scheduled date in this type of industry. While time overrun is a problem that exists in almost all projects, its effect on projects varies. [1]; [2]; [3] and [4] all claim that approximately one-third of UK customers complain that their projects usually outperformed due to work completion overtime. While time overrun is reported to be a problem in a developed country such as the UK, research has shown that time overrun occurs extensively in developing countries. For example, [5] report that in projects the issue of overrun time often exceeds 100 percent of the expected time. Similarly, [6] estimate that nine out of ten projects were faced with time problems.

In addition, studies conducted to assess causal relationships between influential factors that causes time overrun in projects has proven to be significant[7-8]. This provides an opportunity for the author to adopt a Structural Equation Modeling (SEM) approach to address causal-effect relationships among the factors. Further, time overrun also results in conflicts between the project owner and contractor when issues arise that lead to additional project costs [9];[10];[11].

According to [12], project execution time overrun has the potential to result in productivity loss, loss of time, cost increases, lawsuits or sometimes contract termination. When time-overrun happens, this endangers the project's goals and results in more time allocation and additional overheads which will ultimately increase the overall project cost [13]. It should be remembered that there are huge losses for governments, corporations and individuals in delayed projects. The losses to all sectors involved can lead to the loss of revenue, the inability of oil and gas companies to fully utilize their resources and the increase use of the courts to resolve disputes [14]. Any project's main control features (time, price, quality and safety) are adversely affected by the impact of such time overrun [4]. Likewise, according to [15], time overrun in projects has many after-effects including: time extension, cost overrun, conflicts, arbitration and litigation. Time overrun factor is therefore key to the viability of most oil and gas projects.

Like the reports on the impact of time overrun on completion of the project, there are also reports on its causes. According to [13], some of these include: slow customer decision, weak labor productivity, architects ' inability to alter and rework due to implementation errors. Furthermore, in all projects, [16] cited factors associated with investors or managerial

constraints as one of the most fundamental and important causes of time overrun. There is a trend that time overrun affects all project participants including owners, development technicians, professionals, users and others [17]. For both the project manager and the project holder, the time allowed to project success is an important consideration. To ensure that projects are completed within the budgeted period, it is important to recognize the causes for time overrun so that once such factors become apparent, stakeholders can take constructive steps to avoid these circumstances [18]; [19]. [20] argues that little effort has been made to curtail time overrun in the execution of projects, especially in the oil and gas sector. Time overrun of the oil and gas sector in developing countries (like the UAE) is a common occurrence. A trio of performance indicators that is time, price, and value are used to assess project progress [20]. While critical influential factors affecting the successful completion of oil and gas industry projects have been established and evaluated over the past decade, a deeper understanding of the existence of these critical influential factors itself is still required [14].

In the UAE, the completion of projects in the oil and gas industry within the specified time and dedicated cost is very rare. It is therefore imperative to identify the critical influential factors that cause time overrun. This study will identify the critical influential factors that cause time overrun in oil and gas industry projects as well as the significance of the critical influential factors that influences successful project completion. This study is carried out through the Critical Influential Factors (CIFs) model. Therefore, the crucial influential factors affecting the completion of oil and gas projects in the UAE must be defined as well as the degree to which these influential factors influence successful completion within the time limit of the schedule. In addition, it is necessary to determine the effect of variables contributing to the CIF on completion of the project and how these time-overrun issues can be solved to complete the project on time. It is also important to examine the reasons influencing the completion of the project and thereafter to establish a clear understanding between professionals in the oil and gas industry. Further, this study focuses on proposing the Critical Influential Factor (CIF) model as the dominant

approach to curb overrun time in all oil and gas projects in the UAE. This proposed work is believed to be able to strengthen the structure of the oil and gas project sectors and add value to the UAE economy.

Challenges of Abu Dhabi's Oil and Gas Projects

Oil and gas industry is generally divided into upstream and downstream. The upstream sector is exploring crude oil and gas from natural resources. The downstream sector is refining petroleum crude oil and the purifying of raw natural gas that are received from the upstream sector. The downstream sector also provides products ready for distribution using pipelines and pumping systems [21]. About 94% UAE reserves oil is owned by Abu Dhabi with an average of 3.5 million barrels per day in 2016. Oil and gas projects are interrelated tasks that require to be performed and delivered under constraints to meet the technical performance requirements over a fixed period of time. Oil and gas projects are also capital intensive with an average of six years from planning, commission and hand-over [23]. These projects are also labour intensive that require many workers of various skills and requires a huge amount of project materials such as concrete, structural steel, electrical cables, and thousands of instruments [24]. These large financial and technical responsibilities need substantial commitments and are also a major challenge to project stakeholders. It is very likely to cause time and cost overruns. Hence, it requires close coordination and teamwork between the project stakeholders and workers which is essential to achieve successful project objectives.

Oil and gas project stakeholders have the interests to ensure successful completion of the project. Main oil and gas project stakeholders are:

- i. *Project owner*: responsible for securing the financial resources. The project owner is the Abu Dhabi National Oil Company (ADNOC).
- ii. *Project management team (PMT)*: responsible for managing the project on behalf of the project owner.
- iii. *Project management consultant (PMC)*: responsible for providing expert assistance and help to the project management team.
- iv. *Contractor*: dedicated in the design, architecture and evaluation of the project.

- v. *Sub-contractor*: expert in the installation of the essential systems.
- vi. *End-user*: the end-user of the project differs based on the project industry.
- vii. *Equipment vendors and suppliers*: responsible for providing materials and equipment.
- viii. *Insurance institute*: responsible for costs incurred due to incidents that may happen
- ix. *Financial institute*: local and international banks needed to provide loans

The number stakeholders differ and based on the type, size and complexity of the projects. According to [25] the stakeholders may influence the completion of the project and be able to identify the success factors such as;

- a. Project stakeholder identification at an early stage.
- b. Analysis of the level of interests, involvement and possible influence on project completion.
- c. Regular review and update early assessment.
- d. Proper manage the relationships between the stakeholders to avoid unexpected mistakes.

The relationships between the stakeholders are based on the legal agreement. It is important to understand the types of contracting strategies for effective implementation which are considered managerial tasks to ensure the success of the project.

Applicable Theories to the Framework Development

Past literatures have revealed a good number of theories that are related to successful completion of projects. Effort is made in this section to itemize applicable theories and made emphasis on the most related theory by justifying their relevance. Organisational theories try to give people ways of interpreting, predicting and influencing actions in an organisation by incorporating versatile structures that can describe hierarchical organizations in a dynamic environment. Organisation is seen as a mechanism for organising people and processes to turn environmental inputs into outputs. To ensure that the organisation's components work optimally, the organisation should pick and motivate people, and assess and adjust people in order to optimize the organization's productive capacity. The principle

is deemed relevant to the proposed research in that Oil and Gas Company in production must be regarded as an entity that must leverage any variable in order to deliver results within the stated timeframe. The research seeks to explain the relevant factors related to an oil and gas project's success. Based on this theory, there is a need to emphasize that the research intends to dwell more on the organizational theory, since the research is expected to cover the factors contributing the time overrun in oil and gas industry projects. The effort is expected to further dig deep into the fundamentals of the concepts in the areas of principles, historical background, and scope of application, relevance to the study, their strengths and weaknesses.

A concept can be defined as an idea on a group of objects or abstractions, which can enable human minds to identify, and indicate [26]. Concept was also defined by [27] as a mental symbol. Therefore, a theory of concepts is considered as part of a representational theory of mind and is expected that the theory must fit present and a true picture of what mental symbols thought. However, definition given to concept can take different forms based on the discipline concerned. The disciplines concerned with studies of concept include, anthropology, cognitive, neurobiology, intellectual history, linguistics, philosophy, psychology and sociology among others. For example, when [28] a physiological psychologist, wrote about concepts he is mainly concerned with identifying neural structures as a basis to what psychologists refer to [29]. Concept is viewed by [30] as a social entity which some scholars could reject both psychological and sociological meanings that require both theoretical and empirical analysis of subject [31]. Therefore, conceptual framework is a guiding map that integrates together previous theories of the research work [32].

Project Time Overrun Framework

A sustainable framework on construction project completion strategy is developed to formulate Critical Influential Factors (CIFs) model. After a critical review was made on several researches, ten elements were identified affecting successful project completion which are: *support from senior management, skilled designers, skilled project managers, troubleshooting, project team motivation, commitment of all project*

participants, strong/detailed plan effort in design and construction, adequate communication channels, effective feedback and adequate financial budget [33]. Similarly, it was identified factors that hinder performance of project found by previous researchers [30]. However, this paper intended to formulate the conceptual model of factors influencing the successful project delivery, hence the propose model is as Fig.1.

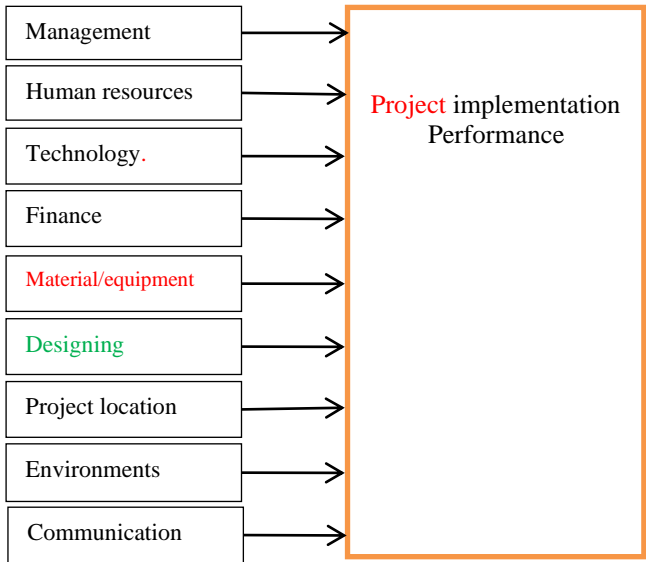


Fig.1 – proposed conceptual model

From another perspective, a conceptual model of time overrun factors affecting government construction include owner related factors, consultant related factors, contractor related factors, project conditions related factors, contract related factors, and external factors [35]. These factors that negatively affect successful projects completion efficiently, causes time and cost overrun, initiation of litigation and abandonment. If these factors are properly dealt with at every level, successful project completion could be ensured. The paper confirms that those factors have causal effect on project completion according to scheduled date, dedicated cost and approved technical specification. The framework formulated in this study believed that the government programmes are geared towards minimizing project’s time overrun is seen as a real attempt towards finding a solution. The framework of the study is summarised in Fig.2.

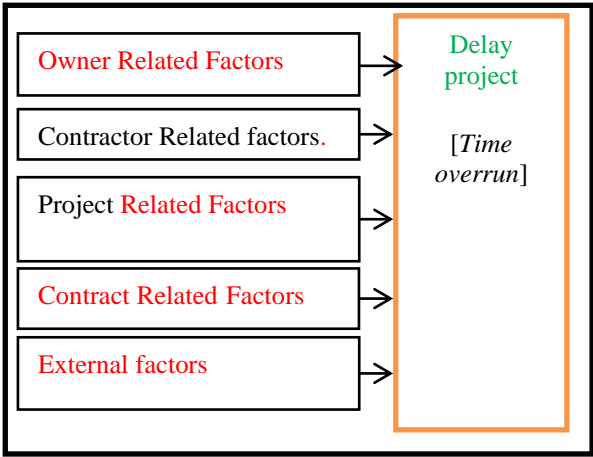


Fig.2 - Conceptual Model adopted from [35]

By referring to Fig.2, the existing framework is related to factors affecting project completion, this present research believes in proposing a framework that would improve any shortfall which are not identified in the previous researches. Similarly, [35] used owner and contractor related factors only on project completion.

However, this proposes an integrating and modelling of the critical influential factors causing time overrun in handling projects. The aim of integrating these factors is to evaluate which factor is the dominant in measuring performance of construction sites. The proposed conceptual framework Critical Influential Factors (CIFs) framework is to determine the impact of the critical influential factors in handling the project’s success rate in terms of time, cost and quality unlike the external stakeholders. Fig.3 shows the CIFs which are independent variables of this research which are as follows: consultant critical influential factors; contractor critical influential factors; owner critical influential factors; workforce critical influential factors; designer critical influential factors; materials critical influential factors, contract and contractual relations critical influential factors, laws and regulations critical influential factors and environmental critical influential factors. From the same figure project completion time overrun is the dependent variable. These independent variables are integrated into nine hypotheses that are designated in the Fig.3.

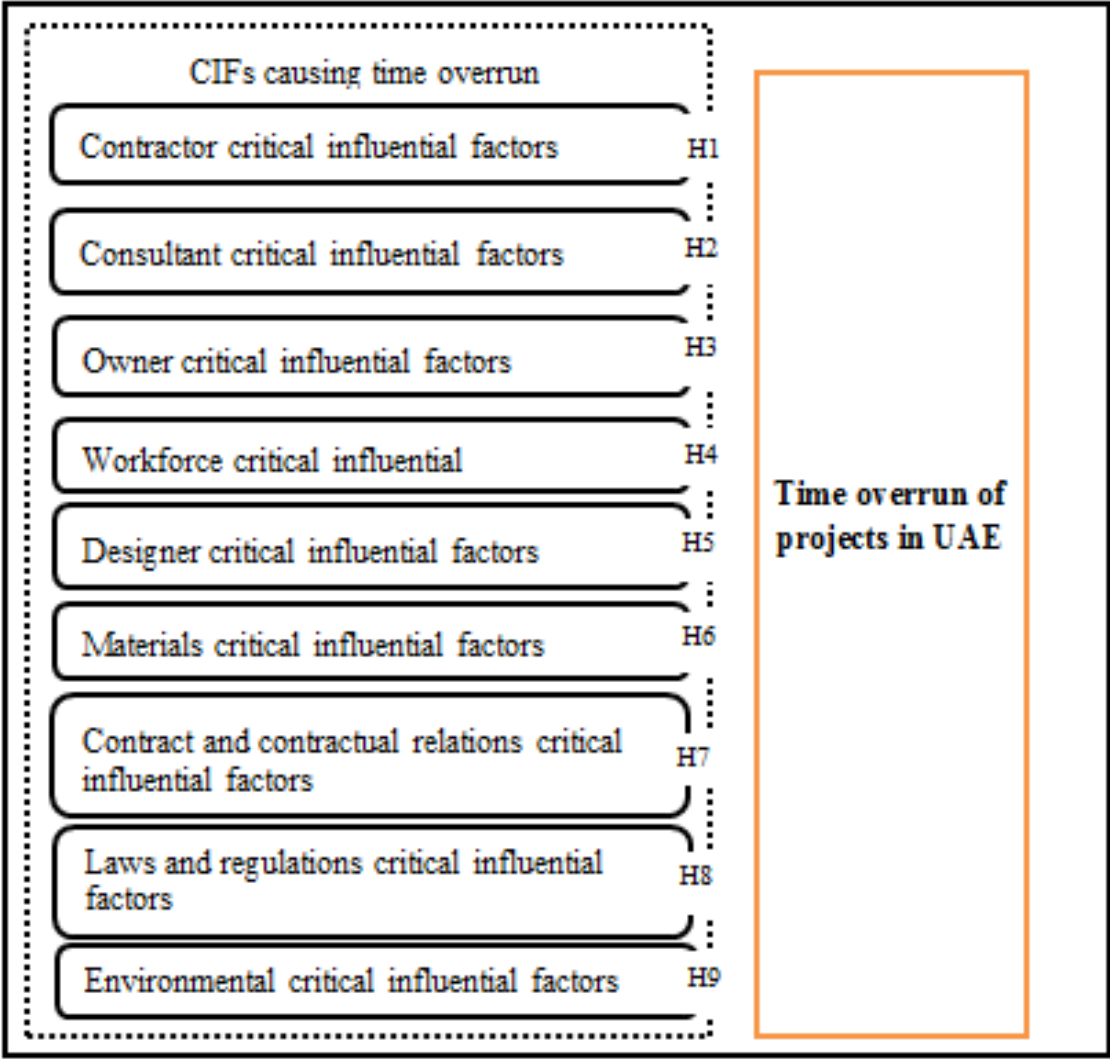


Fig.3 - Primary (CIFs) Model

Pulling all these together (Fig.2 and Fig.3) and bearing in mind the intended conceptual framework is proposed as shown in Fig. 4. The fig, shows the path diagram of CIFs model or framework that indicates the components in the construct within the framework To form this conceptual framework, nine constructs were identified from previous literatures that are related

to the objectives of this research. These variables are shown in Fig. 4.

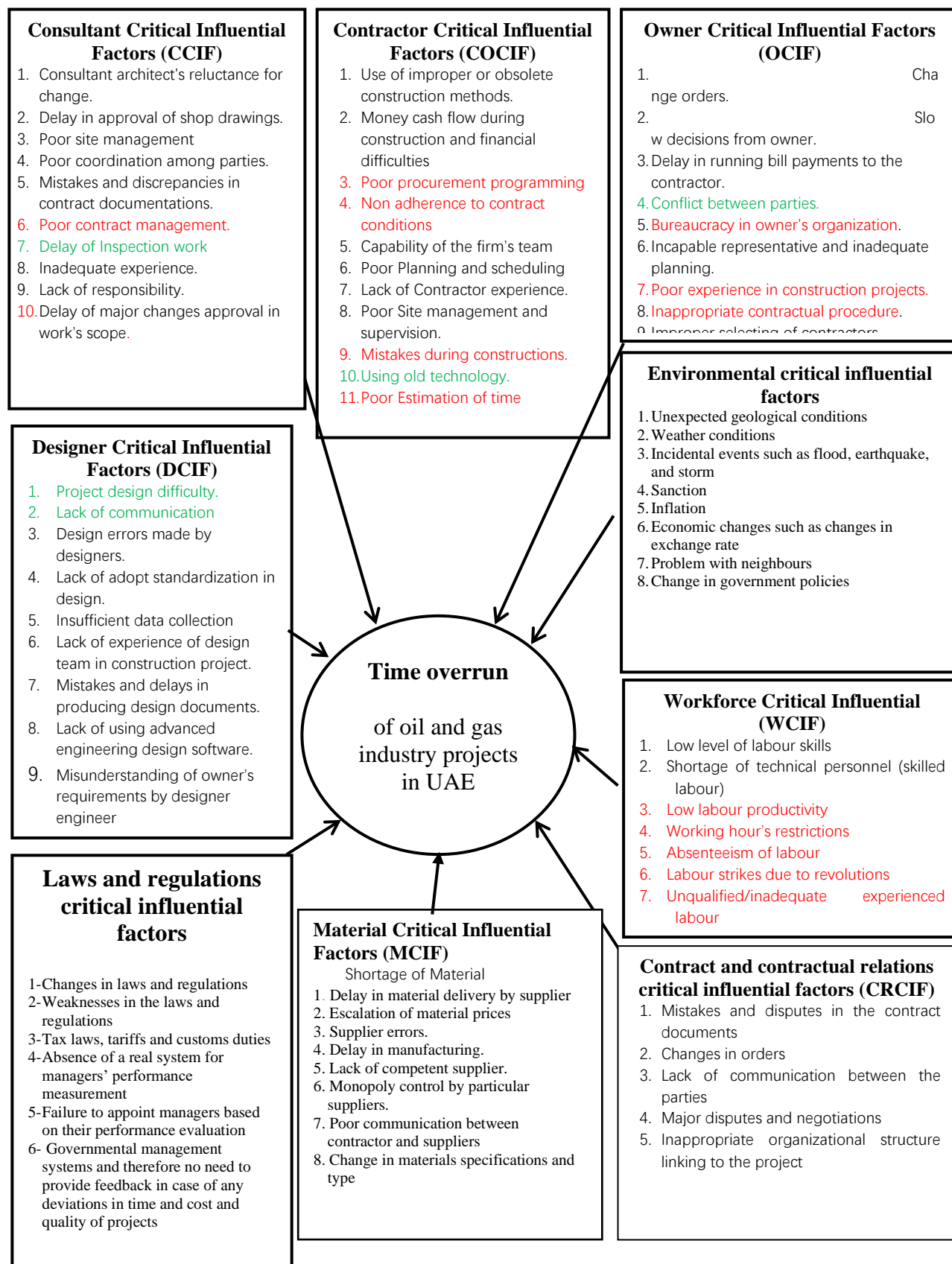


Figure 4: Proposed path diagram of CIFs causing time overrun

Conclusion

An applied model that incorporates the group of Critical influential Factors (CIF) which affect

project success completion on time has been created. It depicts nine noteworthy factors, namely contractor critical influential factors, consultant critical influential factors, owner critical influential factors, workforce critical influential, designer critical influential factors, materials critical influential factors, contract and contractual relations critical influential factors, laws and regulations critical influential factors and environmental critical influential factors influencing the project completion successfully in oil and gas companies in UAE. For future exploration, variable examination technique could be utilized to research the fundamental relationship among the factors to discover the groups that can better represent all the CIFs.

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