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*Research Article*

# Does A Contract Strategy Play A Role In Improving The Performance Delivery Of An Oil And Gas Project In Oman?

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**Abstract:** Oil and gas projects suffer from time-overrun worldwide and Oman is no different. Such Delays lead projects to miss their targets of schedule and budget which affect the country economy. One of the possible causes of time overrun is the contract strategy adopted in those projects. This paper presents empirical data to show which strategy is more likely to causes the projects miss its schedule target. Semi-Structured interviews have been conducted to increase the confidence of the results. This study revealed that more than **60%** the respondents have expressed that **EP+C** contract strategy is the strategy that is more likely to have projects miss their main targets. Also contract strategy factor has been ranked **high** important factor that causes time overrun in oil and gas projects. In addition, a questionnaire was made to evaluate the oil and gas projects that have completed on agreed schedule, and it showed that 80**%** of respondents have revealed such projects have a contract strategy of **EPC.**

**Key words**: EPC, EP+C, Contract Strategy, Time overrun. Delay, oil and gas project, Oman.

## 1. Introduction

Despite the attempts of diversification in the economy recently, Oman still depends heavily on oil production and its industries. According to the Annual Statistical bulletin from Oman national centre for statistics & information, the production of oil was averaged 970.6 K barrels per day accounting for 84% in 2014 and 78 % in 2018 of the government revenues. Therefore, improvements in economy diversification has not been made in a large scale.
Since Oman is a developing country like any other neighboring country, many projects are in progress and many of them are yet to go underway (Mughairi et al., 2019). It also struggles with same phenomenon of overruns. Mega Construction Projects in Oman of public and private sectors, suffer from time & cost Overrun. (Oyegoke & Kiyumi, 2017) listed five important projects that didn't complete on the agreed date. One of them has a delay as many as over six years. In a case study conducted by (Alnuaimi & Almohsin, 2013) in Construction Projects, the delay was around 59% in 2007-2008 period and 42 % in 2009-2010. for the years after 2011 till 2014, in 40 construction public projects, 38 % of them suffered an over run in schedule (Ruqaishi & Bashir, 2014)**.**

## 2. Literature Review

### 2.1 Time overrun

(A.Assaf & Al-Hejji, 2005) defined a time overrun in a project as: "*the time over-run either beyond completion date specified in a contract , or beyond the date that parties agreed upon for a delivery of a project*"

The most overruns on time and cost usually occurs in execution phase (Elawi, Algahtany, Kashiwagi, & Sullivan, 2015)& (Chan & Kumaraswamy, 1997) and Construction is vital part in execution phase.

### 2.2 EPC (Engineering Procurement Construction):

Two common types of contract strategies are being adopted in oil and gas projects:
EPC contract strategy type is usually are designed for those projects that involved heavy works in Electrical and Mechanical and generally Complex projects. The focal point of contractor is accountable for the whole project execution starting from the design, then procurement and ending up with the construction. EPC term is more widely in oil and Gas Projects.
Advantages of EPC:

1. There is bigger chance of a project finishing faster than another contract strategy since there is only one point of contract, (one contractor). The phases of the project come all together, and no need to do another bidding between those phases (Engineering, Procurement, construction) (supported by (Jergeas & Fahmy, 2006); (Hossain et al., 2020).
2. Communication is more effective (Hossain et al., 2018): since the one contractor is responsible, there is no need to communicate with engineering firm separately than the construction contractor, or the procurement department that might be another subcontractor.
3. Documentation is less in those type of contracts and that the result of the second point (Communication).
4. Claims in construction is none since the contractor is the only responsible party for the design and engineering, while other strategies of contract like EP+C, the owner is likely to get a high court of claims. The reason is that the oil and gas projects tend to have some modification and changes in design, and

that is the responsibility of the client. When those changes take place, the construction contractor will implement those changes with charges and fees, to be as claims. Therefore, EPC contracts values are well known unlike other types.

5. The construction team is heavily involved in the design stage where has its fruits at executing the construction with less errors and timely manner (Anumba & F.O.Evuomwan, 1997); (Hossain et al., 2020).

Disadvantages of EPC as mentioned in (Anumba & F.O.Evuomwan, 1997) when talking about DB, which is close to EPC:

1. The lump sum value of the EPC value is higher than EP+C.
2. The quality of the engineering is a bit lower.
3. Still there are times of design change imposed by the client.

**2.3 Oil and Gas EPC contracts in Oman**

The disadvantage that the researcher sees in EPC contracts in O&G in Oman that the number of contractors that excel in those strategies are very few if none at all. Whenever a contractor wins an EPC contract Project, they usually subcontract the engineering and procumbent part to another contractor which is usually an international one. This get us back to square one in terms of interfaces.

It did happen that several oil and gas projects in Oman, had been won by international Companies and awarded an EPC one. This company has its own engineering and procurement department, which fits the real EPC contract. Nevertheless, when some international companies win an EPC contract, they subcontract the construction contract for couple of reasons. One is to meet the country requirement of ICVs (in country Value and social responsibility and Omanization, second to reduce the cost of the project. The researcher found similar case in Vietnam, and it would appear that is because Oman and Vietnam are both developing countries (Pham & Hadikusumo, 2014).
In the above article the authors revealed that even when an international company wins an EPC contract in oil and gas, there are still issues getting advantage of an EPC contract in Vietnam. Although Engineering is under the international company responsibility, they still need data about the local standard and procedure, along with the local conditions in the country. Likewise, in procurement, the international company faces challenges in transports and logistics (Khaled et al., 2019; Hossain et al., 2020). And last not least, for the construction part, which is subcontracted for a local construction contractor, the international company cannot be fully confident of the this local company manpower competence according to (Pham & Hadikusumo, 2014) which eventually affects project delivery targets.

**2.4 EP+C (Engineering Procurement One contractor, Construction contractor is another):**

Just like the example of Vietnam, since there is limited number of companies that can run the whole show in the oil and gas projects in Oman (i.e could perform engineering, procurement, construction). As results some projects have assigned to be EP+C, where engineering and procurement have been awarded one contractor and construction is given to different contractor. In this, the first two phases the contractor is more specialized in design and material procurement, and also the construction is awarded to a core construction experienced contractor. However, this type of contract strategy creates different issues like, higher number of claims, ineffective communication…etc.

## 3.0 Research Methodology

This thesis adopted a mixed method of research to improve the level of credibility of the study. It adopts both quantitative and qualitative approaches which starts in a questionnaire and end up with semi-structured interviews with the concerned personnel
In this research, the population are those Management level who work in Mega Oil and Gas Projects in Oman, from the Client, Engineering and Main Construction Contractors stakeholders who play a vital role in project.

## 5.0 Findings & Analysis

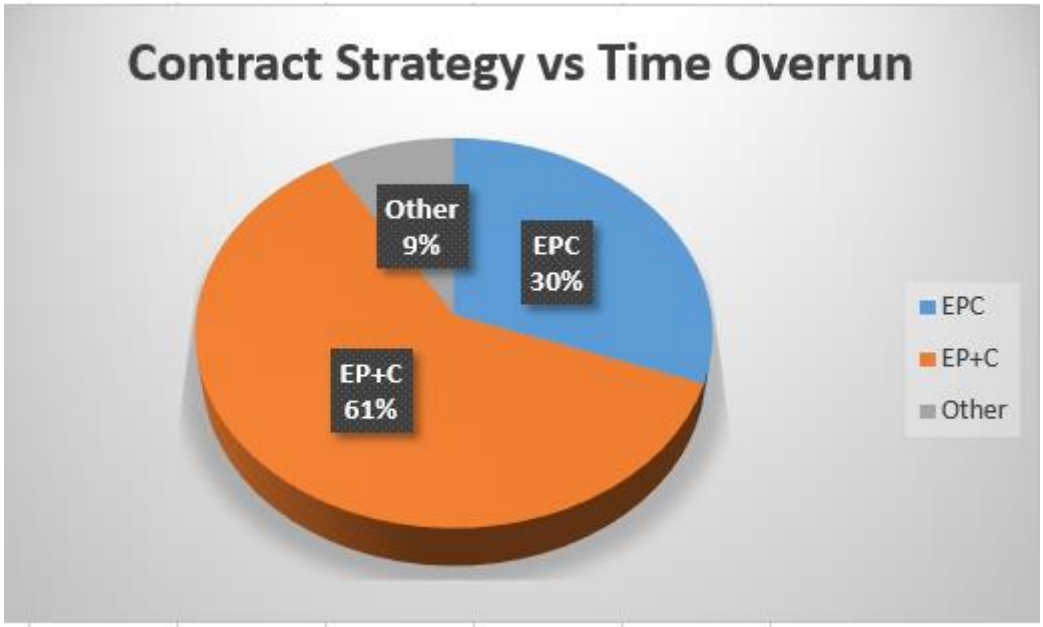
**5.1 Importance level of Contract strategy type**

One of the 77 potential factors listed in a questionnaire where the three main stakeholders were asked to mark its importance, contract strategy has been ranked important with a mean of **3.84**. Five Likert scale was used in this questionnaire (not important, slightly important, Moderate important, Important, Very important) with Mean and standard deviation as analysis tools.

| Factor that causes time overrun in O&G Project | Mean | SD | Level of Importance |
|---|---|---|---|
| Contract strategy type | 3.84 | 1.096 | HIGH |

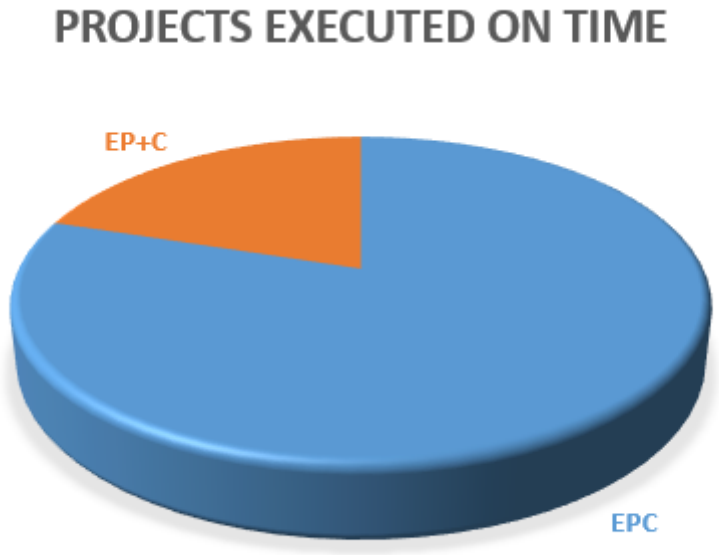
**5.2 Which contract strategy is more likely to suffer from time overrun?**

Out of a more comprehensive questionaries' whose response rate was 80% there was this question listed: Which contract strategy is more likely to suffer from time overrun?




As shown in the above table, more than **60**% the respondents have expressed their opinion that EP+C contract strategy is the strategy that is more likely to have projects miss their main targets. In other words, the respondents based on their experience have revealed that EPC contracts are safer and have the best chance to complete project on time and budget. In EP+C strategy, the client awards engineering and procurement contract to one contractor while the construction contract is given to different contractor. EPC contract is awarded to one contractor and the owner is dealing with single contractor.

**5.3 Contract strategy relationship with performance of Oil and Gas Project delivery**:



In the same questionnaires, respondents were asked to highlight the performance of other projects they were involved (time overrun percentage from the original plan). different percentages were answered however the **highest** delay percentage was 71-80% and amazingly the contractor strategy for those projects were **EP+C.**

On the other hand, there were some oil and gas projects that have completed on agreed schedule of the project, and it was found that **80**% of respondents have revealed such projects have a contract strategy of **EPC (the above graph)**. In summary, delays could occur to both EPC and EP+C projects with different percentages and periods, however, EP+C tends to suffer a higher percentage. Also based on this study, the chances of EP+C projects is completing on time is less than those EPC O&G projects in Oman.

In terms of cost overrun, those projects that have completed within the its approved budget, all of them were **EPC.**

**5.4 Interviews**

There were two professionals from the client and one from each engineering and construction contractors interviewed to investigate this matter.

It has been concluded that **theoretically**, EP+C contract strategy is faster to be executed for the following reason: a fast track project execution philosophy. In other words, the engineering phase starts, and before it ends, procurement process already got started, and before EP finish all its deliverables, main construction contractor has been appointed and the construction activities can commence. There is overlap between all main phases of the execution of the project, Engineering, Procurement and Construction.

However, what happens in Oman oil and gas Projects, the different stakeholders (engineering firms and main construction contractor, vendors) seem that they are still in the learning curve to manage the interfaces between the project stages properly. The Construction contractor will not have full confidence in the engineering firm and start construction unless it all drawing are approved for construction (AFC). In addition, blame and pointing fingers are a lot in those EP+C projects in Oman when there is an error or an issue, the engineering will try blame the construction contractor, and vice versa. Both engineering & main construction contractor stakeholder interviewees explained that when an issue arises at site, the first thing to be done is find out whose fault it is (to decide who is going to pay), instead of finding the solution or the way forward to the issue, in order to avoid a waste of time.

In terms of construction personnel involvement in design stage, it is less likely to happen in EP+C contract or comes only at end of the design phase, the EP is one company while Construction contractor is another company. The benefit of the early involvement is that the construction crew becomes well aware of what is coming up, and as result, less mistakes and better understanding will in construction phase. Besides, the construction team will have contributed their valuable inputs to the design document so that constructability is done smoothly.

In other words, these engineering and construction contractors don't have the right experience and concretization to execute EP+C projects in order to complete them on time and on budget. In terms of Cost in EP+C contracts, in theory, there is save of money because the long lead items in Mega O&G projects are expensive, so the client tend to intervene and have this responsibility on himself. Therefore, the client goes and does the procurement of those long lead items to have the budget of the project controlled. However, what really happens now, is that no real evidence that there is real savings. This might be because additional charges come into the picture later on in the execution phase of the project. In EP+C contracts in Oman, there has been a high number of claims that has been rightfully raised to the client especially from the main construction contractor. Those claims are mostly because of design changes, discrepancies and contract & scope clarity. Such claims are piled up to the level that whatever saving is done from the long lead items is diminished. It is necessary to note that claims are not only a threat to the budget of the project, but also it is a threat to the overall schedule, since claims are time consuming process.

Instead, what happens there is high tendency that those EP+C projects are missing their schedule and cost targets, which is not expected theoretically. From the same principal, although there is one single focal point, EPC contracts takes longer time to finish theoretically because the overlap between the project execution phases are less. In addition, as one of the interviewees put it, the client has less control over this EPC contractor whom already got his lump sum money so the motivation to finish on time is not intriguing. (most of the time lump sum contracts, is given to the EPC contractor). Besides, In EPC Contracts there is less incentives compared to EP+C contract strategy.

Moreover, in most of the oil and gas projects, when the contractor is pushing to get an EPC contract, as one entity, most of the time, he uses such to win the project bid, being the lowest bidder. When he wins the contract, issues within the contractor arises at the surface and the client start to predict that this contractor will for sure miss the project targets. In this situation, the Contractor starts to complain to the client that he needs support like Project management expertise and financial support. The client will not have choice but help the contractor to get in his feet to save the project from slippage. So in general, if there is experienced contractor in every phase (E,P,C) in Mega oil and gas projects, the owner gives it EPC contract. What is understandable in some of the projects in

Oman, when there is less experienced contractor, the client tends to have the project strategized with EP+C, one because again theoretically wants to save time and money, two is because he knows that the contractor is not to the right experienced level. The client doesn't want to let the project risks into the hand of the contractor that is, eventually, not meeting the substantial completion date of the project or the budget.
In summary, EP+C contract is supposed to be faster in execution, and a saver in money, but in Oman oil and gas projects they are not, EP+C projects experienced by all three main stakeholder interviewees, is more likely to suffer from time and cost overrun.

## 6.0 Conclusions:

The contract strategy of Mega oil and gas projects in Oman shouldn't be neglected as this study showed such strategies does have an impact on delivering projects on time (Al Qalhati et al., 2020; Alkaabi et al., 2020; Alshamsi, et al., 2020). This study showed that EP+C contracts have more tendency to cause time overrun although in theory it should not as the client is present at all times of the execution phase. However, in mega oil and gas Oman projects, most of the EP contractors and Main construction contractors are not matured enough to handle the interface (Mughairi et al., 2019). Client should give only EP+C contracts for those contractors who have successful oil and gas projects in the past. Less experienced contractors already carry the risk of not meeting the project targets, you add this strategy of contract and that will make it worse. The main construction contractor will not start any activity at site till they have Full AFC (approved for construction) drawings, and if those drawings have some minor errors, they might be ignored. This will lead to a change order by the client, then a rework and eventually might affect the completion date of the project. Alternatively, it is highly recommended to look into the bidding process to have the best bidder wins the contract rather than the lowest bidder.

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