Development of Agile Project Management Framework in Oil and Gas Companies in Kuwait

Abdullah MMF Aliasser[1*], Erry Y. T. Adesta[2]

Department of Manufacturing Engineering,
International Islamic University Malaysia, Kuala Lumpur, Malaysia
[2]Industrial Engineering Department, Faculty of Engineering,
Universitas Putra Indonesia (UPI) YPTK Padang, Indonesia
[2]Department of Manufacturing Engineering,
International Islamic University Malaysia, Kuala Lumpur, Malaysia

*Corresponding author: abdullahaliasser@gmail.com

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Abstract— The Petroleum industry requires construction and renovation of 'upstream' and 'downstream' facilities. Kuwait Oil Company is dealing with the exploration and manufacturing of crude oil & natural gas. EPC projects perform an essential role in the technology of new physical amenities to keep or decorate production. Project administration has developed incredibly over time due to several strategies to deal with building activities. Schedule and Budget are the two most important concerns required to be optimised all through execution. Therefore, a very excellent & efficient challenge management system is wished and has to be framed to deal with the fundamental capital construction projects. In effect, help the organisation makes have an impact on the country's economy.

Keywords: *Information Systems Project management, Critical Success Factors*

1. INTRODUCTION

With the oil recovering fee, many oil and gas (O&G) corporations international are launching new capital tasks to pursue growth. But due to the fact many tasks now are competing with renewables, success will require retaining expenses down and keeping timetables better than in the past. According to a 2017 McKinsey Global Institute report, the extend in productiveness in the O&G development sector lags in the back of the manufacturing and retail sectors.

O&G businesses can use administration practices and digital technologies deployed through different industries to increase capital-project productivity. Project Production Management (PPM), digitising processes, advanced analytics, and agile ways of working can all yield huge improvements. But in reality, copying such practices won't be enough because O&G tasks are unusual in some essential respects. In particular, no O&G mission is equal to the one that preceded it, and lead times are incredibly long. Moreover, group personnel frequently change with the project. Consequently, each new venture brings a new set of challenges and a new mastering curve, for that reason limiting the potential for boosting performance.

Suppose O&G groups can adapt these practices to meet the needs of their special environment. In that case, widespread enhancement is possible: by way of our estimate, and We can decrease improvement time by myself with the conceivable to supply 15 to 30 percent in price savings. As extraordinary installations and applied sciences grow to be extra commoditised, O&G players that don't revamp their approach to capital projects now may additionally be pressured into ever greater technically specialised—and regularly costlier—projects. The possible advantages could be well worth billions.

The Agile Manifesto was first defined in 2001 by a group of independent software developers [1, 2]. As per Schneider [3], the Agile mindset is all about building the right solution today and acknowledging that this might not be the right solution tomorrow. Compared to the waterfall approach, it is rapid and iterative. Agile focuses on

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quality while applying continuous improvement principles. The literature review identified that the vast majority of sighted artefacts recommended an agile project management approach for big data analytics projects. On the contrary, only one interview confirmed this and another interview stated that a hybrid approach of waterfall and agile was applied.

Agile Project Management is a paradigm shift from the everyday plan-then-execute-project paradigm that embraces the fundamentals of the everyday four-stage (initiate, plan, execute, close-out) mission life-cycle phases to a new five-phase (envision, speculate, explore, adapt, close) undertaking lifestyles cycle, as described via Highsmith [4]. Traditional PMMs aim to forestall alternate by using the usage of considerably planning and documenting as lots as viable earlier than the gadget is developed, at the same time as APM accepts that alternate is inevitable and that it is now no longer to be averted then once more managed [5]. "Agile Project Management lets software application software program mission managers and personnel alike adapt to altering circumstances, as an alternative than to decorate inflexible formal controls as in common linear enhancement methods" [6].

2. AGILE PROJECT MANAGEMENT VALUES AND PRINCIPLES

The three core APM values [7] summarise the Agile Software Development Manifesto and Declaration of Interdependence headquartered via the use of using the Agile Project Leadership Network (Highsmith, 2010:14)[8]. The Declaration of Interdependence (Highsmith, 2010:14) will be first, after which the three core APM values will be provided:

- We make a large return on funding via making the non-stop flow of fees our focus.
- We supply dependable penalties by way of fascinating customers in regular interactions and shared ownership.
- We matter on uncertainty and control for it with the aid of capacity of iterations, anticipation, and adaption.
- We unleash creativity and innovation with the aid of recognising that humans are the closing supply of value and developing a surrounding the location they can make a difference.
- We bring up average overall performance with the aid of group accountability for penalties and shared accountability for crew effectiveness.
- We enhance effectiveness and reliability by way of situationally distinct strategies, processes, and practices."

The three core APM values (Highsmith, 2010:14–17) embody the following:

i. Delivering cost above assembly constraints: This value presents "a focal point for rethinking how we measure overall performance on projects" (Highsmith, 2010:27). Traditional mission managers core of interest on handing over in accordance to the time, charge and gorgeous requirement constraints as defined in the assignment scope, at the same time as agile assignment managers middle of interest on turning in rate and "constantly asking questions about whether or no longer or no longer special renditions of scope are nicely well worth the value they deliver" (Highsmith, 2010:27).

ii. Leading the crew above managing tasks: "Agile leaders lead teams, non-agile ones manipulate tasks" (Highsmith, 2010:47). The fundamental focal factor of APM is to construct self-organising firms and to manipulate them with a "lead-by-serving mentality". There are four (4) predominant troubles related to growing teams:

iii. organising self-organising venture teams;

iv. leadership;

v. collaborative teamwork (including decision-making); and

vi. client collaboration.

vii. Adapting to trade above conforming to plans: Traditional project managers see the "plan as the goal" and middle of interest on "following the sketch with minimal changes", even as agile assignment managers see "client price as the goal" and middle of hobby on "adapting effectually to inevitable changes"

(Highsmith, 2010:63). The project layout turns into the capacity to reap positive wishes now, not the purpose itself, when super and consumer fees are the most critical objectives[8]. Although the constraints described in undertaking plans are very important, project plans are no longer sacred; "they are supposed to be flexible; they are supposed to be guides" that do now no longer restrain the crew (Highsmith, 2010:63). Agile Project Management requirements derived from the adaptive precept statements are summarised as (Highsmith, 2010:64):

viii. Accept alternate (uncertainty) and reply as a choice rather than learn about historical college plans.

ix. Adapt strategies and practices as necessary.

2.1 Agile business enterprise framework

Agile computer improvement methodologies have to go well with and modify to notable organisational constructions that consist of precise levels. The agile business organisation framework breaks an organisational shape down into attainable administration tiers that would cater to the acceptance of ASDMs into an organisation. This is proven in Fig.1. Source: Highsmith (2010:78)

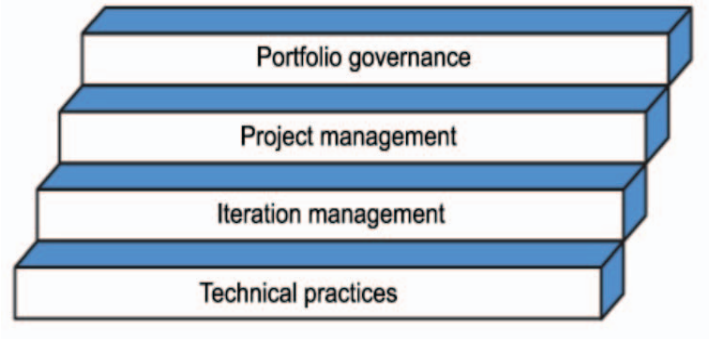

Fig.1. The agile agency framework

In this framework, ASDMs can be placed for each stage as this helps organisations develop hybrid ASDMs to adapt to every project, organisational environment, and requirement. The structure in addition, motivates a lot less adaptability and flexibility at the higher portfolio governance diploma and large at the lower technical practices level. At the portfolio governance level, agencies reflect on consideration on whether or not initiatives address the two vital issues of authorities sponsors, namely, funding and hazard (Highsmith, 2010:79). Governing frameworks and mechanisms can be created to address these two predominant concerns in order to make certain that treasured tasks are furnished to the sponsors with a return on funding interior desirable uncertainty and hazard tolerance levels.

2.1.1. Agile project management model and delivery framework

The APM transport framework is developed to useful resource an organisation's industrial organisation objectives; it "emphasises execution and it is explanatory as a replacement than deterministic" (Highsmith, 2010:82). In order to reap organisation objectives, the framework has to (Highsmith, 2010:81):

- support a disciplined and self-organising mission team;
- promote consistency and reliability as some distance as possible, given the stage of uncertainty there would maybe exist in the project;
- support an adapt, envision and discover culture;
- incorporate practices that help every undertaking phase;
- incorporate learning;
- be adaptable;
- support an obvious view into the process; and
- supply checkpoints for administration for evaluation.

The APM transport framework as shown in Fig. 2 demonstrates the 5 phases of APM. The phases ought to be viewed as one phase flowing into the subsequent and now not like encapsulated separated phases – "the APM terms have been chosen to mean iterative evolution" (Highsmith, 2010:87).

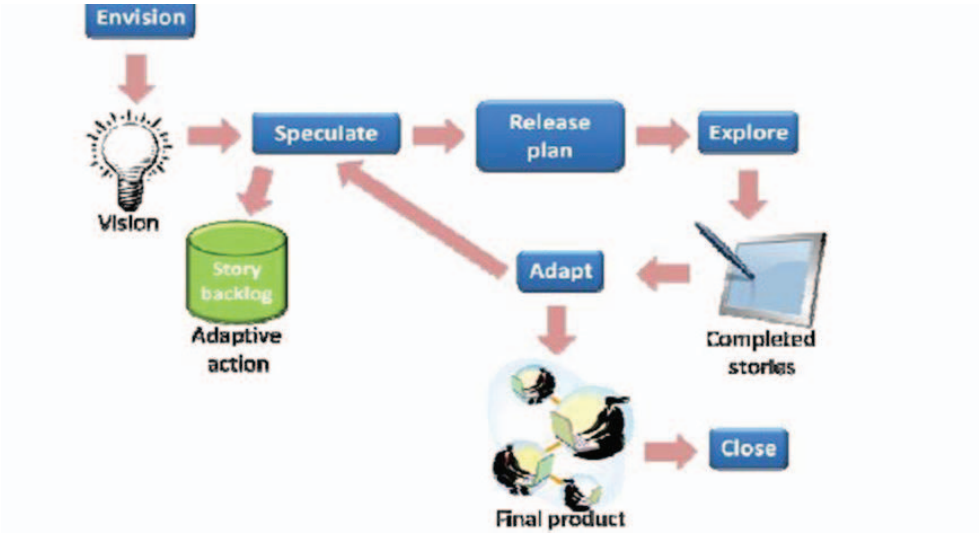

Fig. 2. The APM transport framework

3. METHODOLOGY ANDCONCEPTUAL MODEL

The initial section of the lookup graph carried out the study of literature about the required variables and looking for the hole of lookup as the theoretical basis; The next step is to acquire information of time and fee of land drilling project with depth under 2000 meter, Kemudiaan made risk management venture acceleration analysis with the aid of the use of AHP (Analytical Hierarcy Process) by getting input from specialists to get a clear thinking about threat matrix and danger register prioritisation by using the usage of agile framework [9].

In the risk register, we discussed with the know-how with greater than 10 years' experience to finalise threat matrix and its reference from OSHA, ISO 15001 and ASA4306, then based on literature related to task listing activities, we conduct the different survey from the professional with 10 years journey in venture management oil and gas to select undertaking priority-based totally on every branch with AHP

3.1 Project Management

According to PMBOK (Project Management Book of Knowledge), project management is the application of science and techniques to prepare a project before and during implemented. Project management is divided into five process groups: initiation, preparation, implementation, monitoring, review, and accomplished the project. Managing projects includes identifying stakeholders needs, concerns, and expectations. It designed to be sustainable, intensify management and integrate complex activities to achieve specific goals or add it is recognised as the key enabler of business change and an important contributor to a successful business future (Project Management Institute, 2013).

Project Scope refers to the company's targets in drilling preparation, starting from the annual work plan discussed internally by the company and through government institutions. In this case, Scope management ensures to have the same understanding of drilling, which is conducted. Activities included in project scope management are:

a. The activity of authorising a company to start a project or switch to a subsequent project with the result of an initiation process is a contract agreement which is a key document that formally recognises the existence and provides extensive coverage of a project.

b. Scope planning develops useful documents as the basis for future decision-making, including the criteria for determining whether the project or phase is complete.

c. Definition of scope, deliverables in priority and easy in kelolad.

d. Ensuring project scope and contractor.

e. Control, make corrections, control and monitor project work. In this case, the authority is SKK Migas related to project approval from the technical side, cost and time, after which the company aims to prepare the project schedule and stages clear from the social side, government issues, subsurface issues, operation, safety and also environment[10].

3.1.1 Project Schedule and Cost Management

The main activities that are part of the project schedule management are:

a. Makes sure the activities are aligning with the project goals and target

b. A series of activities align with the support document

c. Estimated time of activity, estimating the number of working periods

d. Developing a schedule, analysing a series of activities, estimating the duration of the activity, and the need for resources to establish a project schedule.

e. Controlling schedules, controlling and managing changes to project schedules.

It includes the activities required to ensure the project is completed in accordance with the approved Budget. The project manager must ensure that the project is well defined, has accurate time and cost estimates, has a realistic cost at the time the approval is made. There are 4 (four) main activities in project cost management, namely:

a. Resource planning, estimating resources (human, equipment, or materials) as well as the number of resources to be used for project activities.

b. Estimate costs, develop approaches or cost estimates of the resources needed to complete the project.

c. Budget cost, allocating overall cost estimates to build a baseline to manage performance on the work unit. Cost control, controlling changes in project budgets.

4. RESULTS AND DISCUSSIONS

An indicative number of significant projects undertaken by KOC during the considered period of 10 years, i.e. 2008 – 2018, segregated under the above-stated categories, can be seen in Fig. 3. The types of projects have been depicted in the graph in the colour code, as shown in the legend. There are many megaprojects underway beyond the stated period.

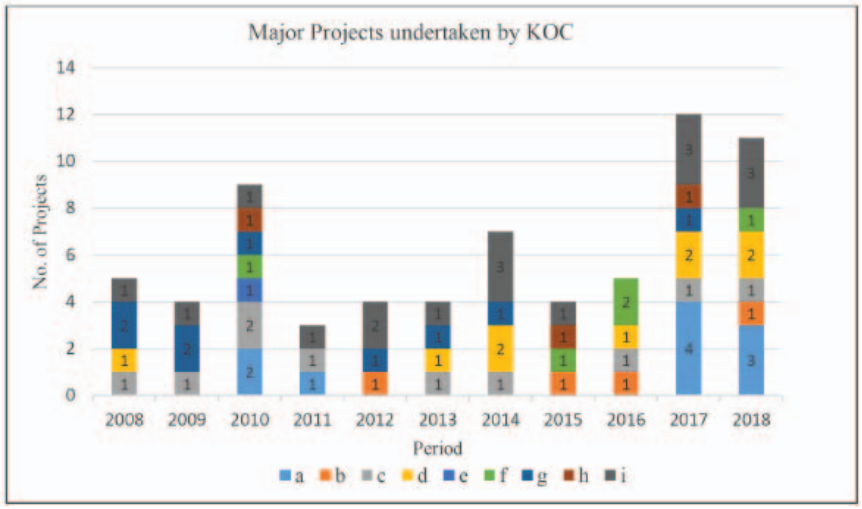

Fig.3. No of the significant project completed

As described above in the individual process elements, there are magnitudes of benefits that can be derived by the suitable implementation of these elements in projects. It can also be seen that some benefits are tangible while others may be intangible in nature, but eventually, they all can have positive impacts on the project performances. These benefits support the project's time, cost, and project management to be more agile to adapt to project needs variations. Historical data from several past projects have been collected to conduct analysis in terms of schedule for the time taken with respect to the current and earlier approaches and utilised to compare with the standard times for these approaches. It can be realised from Fig.4 and 5 that a considerable reduction in time can be achieved after implementing the stated innovative and strategic practices.

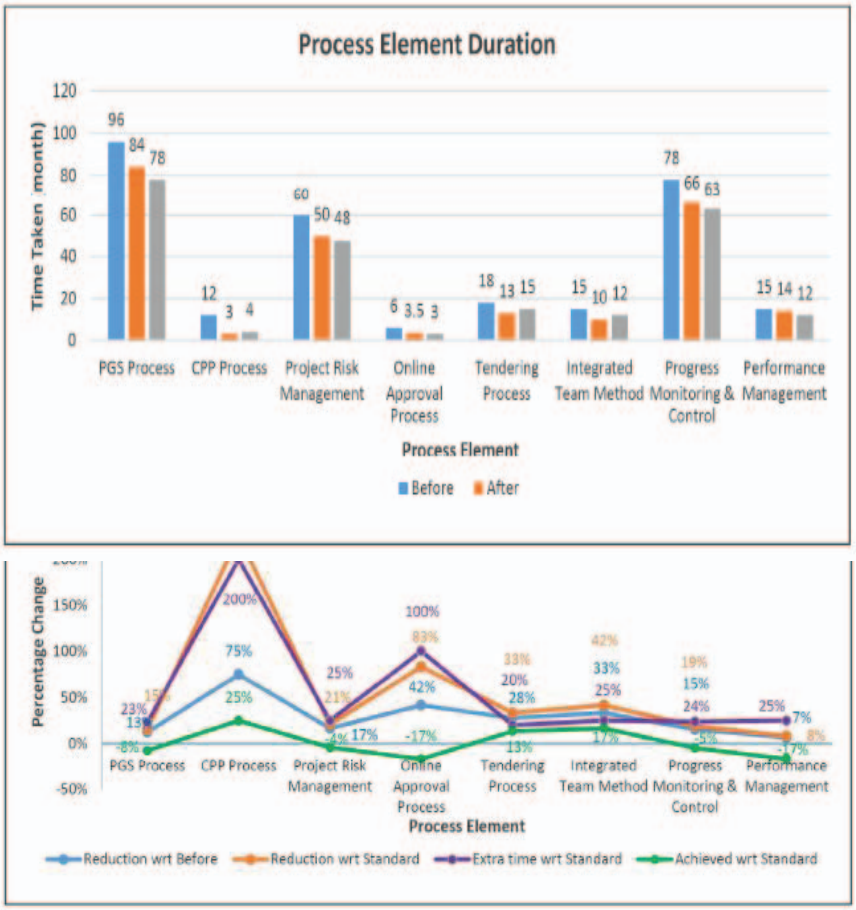

Fig.4. Process elements duration

5. CONCLUSION

This research made sense why the ability to cope with uncertainty is relevant for business organisations in the oil and gas industry, especially as the nature of their operations is, by default, challenged by a diverse set of hazards and risks. Thus, this study had two-fold aims. First, it proposed to explore whether specific factors affect ERM implementation. Secondly, it probed the findings that emerged from data analysis to develop an implementation framework applicable to Oil and Gas organisations. By relating to the last 20 years, ERM had progressed significantly, impacting organisations' differentiated identity by affecting the particular governance processes. It has been argued that despite this progress, all contributions made to the literature relating to ERM have only been descriptive, being mainly visionary rather than implementational.

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