HIGH PERFORMING TEAM FRAMEWORK FOR OIL AND GAS ENGINEERING CONSTRUCTION PROJECTS IN MALAYSIA

DAVENDREN VEREYA

UNIVERSITI TEKNOLOGI MALAYSIA

HIGH PERFORMING TEAM FRAMEWORK FOR OIL AND GAS ENGINEERING CONSTRUCTION PROJECTS IN MALAYSIA

DAVENDREN VEREYA

A dissertation submitted in partial fulfilment of the
requirements for the award of the degree of
Doctor of Engineering (Engineering Business Management)

Razak Faculty of Technology and Informatics
Universiti Teknologi Malaysia

MAY 2021

DEDICATION

This dissertation is dedicated to my father, Mr Vereya Vellu, who taught me that a man can be as great as he wants to be. If you believe in yourself and have the discipline, determination, perseverance, patience, righteousness, willing to sacrifice the little things in life and pay the price for the things that are worthwhile, it can be done!

ACKNOWLEDGEMENT

This dissertation would not have been possible without the guidance and the help of several individuals who in one way or another contributed and extended their valuable assistance in the preparation and completion of this study.

First and foremost, I praise the omnipresent God, for answering my prayers and giving me the strength and good health to complete this journey.

I would like to express my deepest gratitude to my supervisor, Assoc. Prof. Ts. Ir. Dr. Syuhaida Ismail, for her excellent guidance, quick feedback, caring, patience, and providing me with an excellent atmosphere for conducting this study. Special thanks to Dr. Jeffrey Lawrence D'Silva from Universiti Putra Malaysia (UPM), for guiding and helping to answer my doubts throughout completing the Statistical Package for the Social Sciences (SPSS) data analysis section of this study.

I would like to thank my industrial supervisors and mentors; Ir. Dzulaidin Tasrin Othman and Mr Kamaleshwaran Ragavan for all the help, advice and guidance provided to me throughout this journey. I would also like to thank all my oil and gas industrial friends who has helped me in coordinating data collection from their respective organisation.

I would like to thank my fellow researchers in Assoc. Prof. Ts. Ir. Dr. Syuhaida Ismail's supervision group, who were always there, willing to help and share stories as we went through the same journey. Many thanks to other faculty members at Razak Faculty of Technology and Informatics, UTM, most importantly Dr. Faizir Ramlie and Dr. Noor Hamizah Hussain for providing necessary and timely information for my study. My research would not have been possible without their help.

I would also like to thank my wife, Dr Karthini Ramachandren. She was always there taking extra responsibilities to clear some space for me to complete my dissertation on time, cheering me up and stood by me through the good times and bad times, and our lovely children, Siddharthan, Aishwarya and Abhinaya.

Finally, I would like thank my parents; Mr Vereya Vellu and Mrs. Saraswathy for instilling deep values and guiding me in the right direction in life, and my dearest family members; Kasturi, Ganesh Kumar, Jajendren, Thulasi and Amiel for always supporting and encouraging me with their best wishes.

ABSTRACT

Oil and gas industry faces one of its toughest periods from a prolonged drop in oil prices, which began in June 2014 until the recent Coronavirus Disease 2019 (COVID-19) pandemic. Oil and gas industry must now collectively shape and execute a decisive and potentially transformative response while engaging with the key project stakeholders efficiently to improve existing relationships between the construction team project members. Hence, creating a high performing team is seen as one of the solutions to enhance the overall productivity and eventually produce high-end project outcomes that exceed standards. Therefore, this study aims to appraise high performing team for oil and gas engineering construction projects in Malaysia with the objectives of identifying the concepts of team integration, investigating the characteristics of high performing team, assessing the high performing team integration practices and proposing a framework of high performing team characteristics and integration practices for oil and gas construction project in Malaysia. It is found that the concepts of team integration are about bringing together members of different disciplines by merging goals, aligning process and work culture while being mutually supportive, cohesive, and holding unified responsibility to satisfy internal and external customer's expectation during the life cycle of an oil and gas construction project. The high performing team characteristics and high performing team integration practices identified from the literature review contributed to the development of a conceptual framework and questionnaire respectively which guided a survey on 418 oil and gas industry personnel in Malaysia. Commitment, trust between team members and cohesion were amongst 14 high performing team characteristics in combination with no blame culture, creation of a single co-located team, leadership facilitation and single team focus were amongst 16 high performing team integration practices that formed the conceptual framework. The primary data gathered was then analysed via Statistical Package of Social Sciences (SPSS). In addition, the framework consisting of 25 most significant high performing team characteristics, such as commitment, clear roles and clear purpose, and 14 most significant high performing team integration practices, such as communicating effectively, commitment from top management and leadership facilitation, was validated via simplified Delphi Method involving five experts. The Engineering, Procurement and Construction (EPC) unique project complexity elements such as scope definition, cost of changes and market conditions were added to the validated framework as elements that can hinder the overall performance of the project. From the discussion, definition for each of the components in their model and the adaptability to the EPC oil and gas construction project were also added to the validated framework of high performing team for oil and gas engineering construction project in Malaysia. The framework proposed by this study is expected to improve the oil and gas construction project delivery team and eventually enhance the performance of the oil and gas engineering construction projects in Malaysia.

ABSTRAK

Sektor minyak dan gas sedang mengharungi satu tempoh kritikal berpunca daripada kejatuhan harga minyak, bermula sejak Jun 2014 sehinggalah ke pandemik wabak Coronavirus 2019 (COVID-19) baru-baru ini. Sektor minyak dan gas harus membentuk dan melaksanakan satu tindak balas yang tegas serta transformatif dalam menarik minat pihak berkepentingan secara efektif untuk memperbaiki hubungan sedia ada antara satu sama lain. Justeru, pembentukan satu pasukan yang berprestasi tinggi dilihat sebagai salah satu jalan penyelesaian dalam meningkatkan produktiviti secara keseluruhan dan secara tidak langsung akan menghasilkan hasil projek yang berprestasi tinggi yang melangkaui jangkaan. Sehubungan dengan itu, kajian ini bermatlamat untuk menilai pasukan dalam pembinaan kejuruteraan minyak dan gas yang berprestasi tinggi, dengan objektif mengenal pasti konsep integrasi pasukan, menyiasat ciri-ciri pasukan berprestasi tinggi, nilai amalan integrasi, serta mencadangkan usul rangka kerja untuk ciri-ciri pasukan ini, serta integrasi amalan projek pembinaan untuk industri minyak dan gas di Malaysia. Kajian mendapati bahawa konsep integrasi dalam pasukan bertujuan untuk merapatkan jurang di antara ahli yang berlainan disiplin dengan menyatukan matlamat, menyelaraskan proses dan budaya kerja sambil saling menyokong di antara satu sama lain, bersatu padu, dan memegang tanggungjawab untuk memuaskan kehendak pelanggan luaran serta dalaman sepanjang kitar hayat projek pembinaan minyak dan gas. Ciri-ciri pasukan berprestasi tinggi dan amalan integrasi pasukan ini dikenal pasti melalui kajian sebelumnya yang menyumbang kepada penghasilan konsep rangka kerja dari kajian soal selidik dari tinjauan terhadap 418 pegawai dalam industri gas dan minyak di Malaysia. Komitmen, kepercayaan antara ahli pasukan, dan perpaduan adalah antara 14 ciri pasukan berprestasi tinggi, dengan tiadanya budaya menyalahkan satu sama lain, wujudnya pasukan -lokasi tunggal, serta pemudahcaraan kepimpinan dan fokus pasukan tunggal merupakan 16 amalan integrasi pasukan berprestasi tinggi yang telah membentuk konsep rangka kerja. Pengumpulan data utama kemudiannya dianalisis menggunakan perisian Statistical Package of Social Sciences (SPSS). Selain itu, rangka kerja ini merangkumi 25 ciri pasukan berprestasi tinggi yang paling signifikan, termasuklah komitmen, peranan dan matlamat yang jelas, serta 14 amalan integrasi pasukan berprestasi tinggi, seperti berkomunikasi secara berkesan, komitmen pengurusan tertinggi, dan pemudahcaraan kepimpinan yang telah disahkan menggunakan Kaedah Delphi yang melibatkan lima pakar. Elemen-elemen unik projek Kejuruteraan, Perolehan, dan Pembinaan (EPC) seperti definisi skop, kos perubahan, dan keadaan pasaran telah dimasukkan ke dalam rangka kerja sebelum ini yang telah disahkan sebagai elemen penghalang kepada pencapaian projek secara keseluruhan. Daripada perbincangan, definisi setiap komponen dalam model tersendiri dan kesesuaian kepada projek pembinaan minyak dan gas EPC di Malaysia juga telah ditambah ke dalam rangka kerja yang disahkan ini. Rangka kerja yang telah diusulkan dari kajian ini dijangka akan memperbaiki pasukan penyudah projek minyak dan gas, akhirnya meningkatkan pencapaian projek pembinaan kejuruteraan minyak dan gas di Malaysia.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

bbl	-	Barrel
boe	-	Barrel of oil equivalent
BEM	-	Board of Engineers Malaysia
BDE	-	Brooke Dockyard and Engineering
CPP	-	Central Processing Platforms
CompTIA	-	Computing Technology Industry Association
COVID-19	-	Coronavirus disease 2019
CPI	-	Cost Performance Index
CV	-	Cost Variance
ETP	-	Economic Transformation Programme
EPC	-	Engineering, Procurement and Construction
EPCI	-	Engineering, Procurement, Construction and Installation
EPCM	-	Engineering, Procurement, Construction and Management
EPCIC	-	Engineering, Procurement, Construction, Installation and Commissioning
FPS	-	Floating Production Storage
FPSO	-	Floating Production Storage and Offloading
FSO	-	Floating Storage and Offloading
FEED	-	Front-End Engineering Design
HSE	-	Health, Safety and Environment
ICT	-	Information and Communication Technologies
I-P-O	-	Input, Process and Output
IEM	-	Institution of Engineers, Malaysia
LNG	-	Liquefied Natural Gas
MMHE	-	Malaysia Marine Heavy Engineering
MIDA	-	Malaysian Investment Development Authority
mmbpd	-	Million barrels of oil per day
mmstb	-	Million stock tank barrels
mmbbl	-	One million barrels
PEMANDU	-	Performance Management and Delivery Unit

PETRONAS	-	Petroliam Nasional Berhad
PMI	-	Project Management Institute
SEFY	-	Sapura Energy Fabrication Yard
SPSS	-	Statistical Package of Social Sciences
THHE	-	TH Heavy Engineering
TOPP	-	Norwegian Productivity Program
WHP	-	Wellhead Platforms

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Malaysian oil and gas industry faces one of its toughest periods in recent memory reeling from a prolonged drop in oil prices, which began in June 2014 (PwC, 2016) and increased competition from the renewables (Haynes, 2020). On top of this, the Coronavirus Disease 2019 (COVID-19) pandemic has made the situation much more challenging with price per barrel of crude dropped from USD 63 in early 2020 to below zero in beginning of the second quarter (Haynes, 2020). This has since activated a surge of cost reduction policies among oil and gas companies. Global oil and gas companies lowered capital expenditures by about 40 percent, and projects that were not cost-effective were either cancelled or postponed (MIDA, 2018). Thus, despite the worldwide trends in the oil and gas industry, it continues to play a notable role in the economic development of Malaysia.

Therefore, a total of 32 oil and gas projects with investments of RM25.18 billion were sanctioned by Malaysian Investment Development Authority (MIDA) in 2016 (MIDA, 2018). Within the year 2020, national oil and gas company, Petroliam Nasional Berhad (PETRONAS) was also expecting to develop 13 Wellhead Platforms and one Central Processing Platform (PETRONAS, 2017). The industry must now collectively shape and execute a decisive and potentially transformative response (PwC, 2016). Certainly, in this 'new normal' of low oil price environment, oil and gas companies have to prepare themselves for optimised operations, improved efficiency, and lowered project costs so as to sustain profitability (MIDA, 2018).

The oil and gas industry has seen an increase in capital project cost of more than 200 percent from the early 2000 (Mckinsey, 2014). More than 60 percent of this increase is due to inefficient practices (Mckinsey, 2014). It was indicated that by

Mckinsey (2014) that 40 to 50 percent of all construction projects around the globe are behind schedule. It was also highlighted that the biggest costs impacting factor in construction projects is the inefficiencies on project execution (Mckinsey, 2014). Gorgon Project, being one of Australia's largest offshore oil and gas projects doubled the initial estimated cost reaching over USD 57 billion (Meyers, 2014) in cost. Meyers (2014) also reported that another project in Australia, the Wheatstone project had similar fate with a cost escalation of 13 percent.

As for Malaysia, in the year 2016, oil and gas construction giant TH Heavy Engineering (formerly known as Ramunia Fabricators) suffered heavy loss of RM11.69 million stating lower realised margin on ongoing jobs and slower construction activities as the main reason (Zeng, 2016). Another local oil and gas construction giant Malaysia Marine Heavy Engineering (MMHE) suffered its third consecutive net loss of RM22.9 million based on its 2018 third quarter ending financial report, stating higher cost provisions for ongoing projects as the main cause (MIDF, 2018).

This is where in this post-downturn economic environment, oil and gas companies need to be certain that their existing and new projects are successful, benefits are realised and productivity levels are sustainable. Certainly, the current environment provides a unique opportunity for oil and gas companies to tackle a host of inefficiencies and improve their performance (Consultancy, 2016). Failure to effectively deliver oil and gas projects on time and budget or within environmental/regulatory requirements as oil and gas projects continue to become larger and more complex will have major repercussions on an oil and gas company's revenue performance and the willingness of investors to participate in future ventures (Preis et al., 2014).

Conventionally, the oil and gas industry landscape is segmented into two main key areas; upstream and downstream. Upstream refers to exploration and production, and associated with the business activities such as searching for source of gas or crude fields while downstream refers to processing of the gas and crude obtained from the upstream phase. The business activities involved in the downstream will be refining

and commercial distribution in the usable forms such as natural gas, petrol, gasoline, jet fuel and other type of petrochemicals. The oil and gas construction industry falls under the upstream category and involves the main three activities; engineering, procurement and construction (Baron, 2010). Engineering designs the facility, produces all required list, datasheets and drawings to be used for construction at site. Procurement uses the information from engineering and purchases all the materials and equipment while construction installs all purchased as per the fabrication drawing produced from engineering (Baron, 2010).

Engineering, Procurement and Construction (EPC) type of contracts is the most common type of contract used to manage oil and gas construction projects, which means the same contractor carries out the front-end engineering design to the construction stage (Hatmoko and Khasani, 2019). Other type of contract will be Engineering, Procurement, Installation, and Commissioning (EPIC), Engineering, Procurement, Construction and Management (EPCM) and Engineering, Procurement, Construction, Installation and Commissioning (EPCIC). EPC type of contract permits the engineering and construction activities to be executed simultaneously to allow faster completion time as compared to other type of contracts (Hatmoko and Khasani, 2019). Timely and effective engagement of EPC engineering project resources at Front-End Engineering Design (FEED) stage contributes significantly to meet challenges of fast-track mode with an accelerated project schedule to achieve early production (Subramanian et al., 2019).

EPC type contracts provide a single point of responsibility with the main contractor as the responsible party to fix any problem covering design, engineering, procurement, construction, commissioning and testing activities (McNair, 2016). EPC type contract also usually agreed to a fixed contract price with the high risk of cost overruns (McNair, 2016). EPC type contract also consist of a fixed guaranteed completion date (McNair, 2016). Another feature of the EPC type contract is that it is usually guarantees performance with includes performance liquidated damages payable by contractor if it fails to meet agreed performance (McNair, 2016).

More importantly, to minimize the risk of project failures due to the complexity of the EPC contract feature and to realise improvement opportunities, oil and gas project owners are expected to engage with the key project stakeholders efficiently. Furthermore, early integration between project owners, EPC contractors and subcontractors will often improve price discovery process, increase transparency, promote the willingness to share risks and opportunities from all sides. Critical in this engagement, is an effort to improve the relationships between the operator, engineering consultant and construction team to develop trust and a true "one team" mentality in bid to develop a high performing team (Ernst&Young, 2016). A team that combines both excellent characteristics and integration practices can then be referred to as a high performing team. While every oil and gas construction team is different, there are common characteristics and integration practices that high-performing teams share.

A clear understanding of teams will enable to appropriate application of high performing team characteristics and high performing team integration practices to realise the benefits of bringing people together to work towards a common goal. An integrated team comprises multi-functional disciplines working together such as in the oil and gas engineering construction projects can improve productivity and contribute significantly to the performance of companies that implement them but that must be done with a good understanding of the concept of teamwork (Baiden et al., 2003a). Thus, it is important for oil and gas construction project owner to increase awareness on the concept of team, team integration, high performing team characteristics and high performing team integration practices prior to new oil and gas construction project commencement. Project owner's expectation on the project performance and efficiency of the delivery has also increased. Hence, it is significant to complement that increased importance by presenting a high performing team framework comprising of high performing team characteristics and high performing team integration practices for oil and gas engineering construction projects in Malaysia.

1.2 Problem Statement

The construction industry of which includes oil and gas construction industry has been widely criticised for its fragmented approach to project delivery and its failure to form effective teams (Baiden et al., 2006). Construction project owners stated that they felt their project controls were unsatisfactory, quoting project-management teams as one of the most critical aspect requiring improvement (Thomsen et al., 2009). This claim is proven as 65 percent of oil and gas construction project failures were found due to softer aspects, such as people, organisation and governance (Preis et al., 2014). OGA (2017) further supports this claim by indicating that there is a strong relationship between the project execution efficiency, the people who are employed to deliver it, and how well they are organised. Hence, this study perceives that projects success rely to a great extent on the team characteristics and team integration practices which includes leadership, behaviours, skills, and competences of those involved in an oil and gas construction project.

Baiden and Price (2011) revealed that teams with different levels of integration had the same or similar levels of team effectiveness. Thus, whilst integration is desirable, it is not the only requirement or condition for improved team within the context of an oil and gas construction project. Baiden and Price (2011) suggest that the role and importance of integration in project teams is vague relative to other performance improving methods. Rebentisch (2017) claimed that by addressing critical integration challenges, leads to removing barriers so team members could perform better. Regrettably, it is observed by this study, that the factors and conditions that influence and causes direct impact on integration for construction project team were not identified and researched further. Clearly, this indicates that there is a dire need to review the concepts of team integration and identifies its application for the oil and gas engineering construction projects in Malaysia.

Typically, any offshore oil and gas facility projects expected to cost a significant capital investment as the engineering and construction process is very complicated and contains high risk factor (Hatmoko and Khasani, 2019). Furthermore, if the project to be executed via an EPC type contracts with a single point of

responsibility it requires detailed planning with controlled execution as the main contractor is responsible to fix any problem covering design, engineering, procurement, construction, commissioning and testing activities (McNair, 2016). The execution of the three stages of an EPC project by a single contractor, requires a comprehensive knowledge, understanding and capability to run the whole process of engineering, procurement and construction. It is a common practise in Malaysia for the contractor to collaborate with other partners for example in the Kikeh Truss Spar construction project, engineering consultant Technip was awarded with the full scope of engineering, procurement, and construction by Murphy Sabah Oil Company. Malaysian Marine Heavy Engineering (MMHE) were awarded with the responsible to construct it. However, as contractors can collaborate with other partners, they require a very good team characteristics and team integration practices among the parties. Lack of good interaction among the parties in EPC type contracts is identified as one of the major risks in oil and gas projects in the Gulf Cooperation Council Countries which eventually lead to other delay risks to the project (Ruqaishi and Bashir, 2015).

By the nature of oil and gas construction projects, it involves forming multiple teams at different geographical location to be able to utilise the best talent of the industry (Bodych, 2012). Another main challenge for EPC contract type projects in an oil and gas construction project is that typically the engineering will be performed in different location than where the construction will take place. For example the key contractors for Gumusut-Kakap field development are MISC Berhad, FMC Technologies, Malaysia Marine and Heavy Engineering, Atwood Oceanics, JP Kenny, Sapura Acergy, Technip Geoproduction (Shell, 2014). Multiple teams were formed in multiple location depending on the project scope and phase based on certain key team characteristics. Bodych (2012) claimed that team integration is one of the most difficult tasks to handle when team members are situated at different geographical locations, having uneven talent pool and follows ineffective communication protocols. Hence, it is necessary to analyse the critical high performing team characteristics for oil and gas engineering construction projects in Malaysia to ensure the effectiveness and the performance of the team formed is at optimum.

The common traits of an ineffective team are absence of trust, fear of conflict, failure to commit, avoiding accountability and not focused on results (Lencioni, 2005a). Complementary to this, one of main challenges for EPC type contracts is identified as the lack of trust between the many partners engaged for the project (Wagner, 2019). One of the must have characteristics for integration practice for EPC type contracts for oil and gas construction projects, are getting the mindsets aligned with the natural way team approaches their daily routine task and how the interact with each other, contractors and other stakeholders (Wagner, 2019). Construction projects that adhered to upright integration principles experienced 17 percent stronger performance related to cost, schedule and client satisfaction (Rebentisch, 2017). Baiden and Price (2011) support the position that integration helps to improve team effectiveness. It further highlights that practices that meet the various requirements of integration either complement or increase the likelihood of fulfilling the key elements of effective team. In addition, (Mesa et al., 2016) found that integration, as seen through the improvement of communication, alignment of interest and objectives, trust and gain/pain sharing, improved the potential for better construction project performance. Rebentisch (2017) claims that companies which lacks strong integration practices finds it challenging to deliver projects successfully. As the oil and gas engineering construction projects are growing in complexity and forms larger team members, it is essential to identify the critical high performing team integration practices for oil and gas engineering construction projects in Malaysia.

The oil and gas industry worldwide is plagued by a persistent record of cost overruns, deferred schedules, and missed targets for peak production and reserves (Court and Hughes, 2013). Merrow (2011) found that 78 percent of oil and gas upstream megaprojects faced either cost overruns or delays, where 50 percent of the projects were over budget or late and identifies poor project management as the highest contributing factor. A similar study was conducted in the 2014 reflecting the same, where in Asia Pacific, 68 percent of oil and gas projects face cost over-run whilst 80 percent projects are facing schedule delay (Preis et al., 2014). Yang et al. (2011) examine whether the impact of teamwork on project performance was moderated by the data class variables of industry sector, total installed cost, owner regulation, initial site, team size, complexity, project type, and international involvement, where the results indicate that teamwork exhibits statistically significant influence on project

performance. Having such a huge impact potential, it is then necessary to understand the effect of the team characteristics and the team integration practices poses on the overall oil and gas construction project performance in Malaysia.

In addition, based from a study conducted on 25 major global oil and gas companies to identify leading trends and best practices in managing capital projects across their entire life cycles, it was found that 60 percent of oil and gas projects have more than a 10 percent overrun on costs and schedules (Zeranski et al., 2016). On top of this, nearly one third have more than 25 percent overrun on costs, where the finding has been similar from 2011 (Zeranski et al., 2016). This concludes that broadly, there has been no performance improvement over the past five years. Furthermore, the world energy demand is predicted to increase by up to 50 percent over the next 30 years, and oil and gas will continue to be a major part of the mix (Court and Hughes, 2013). Petroliam Nasional Berhad (PETRONAS) has openly stated its determination to restructure the Malaysian oil and gas environment so that the oil and gas companies that function locally will be more competent, with the magnitude and economies of scale that will also make them more robust and competitive internationally (PETRONAS, 2017).

In the year of 2011, owner Sime Darby sold two of its oil and gas construction companies for cash after suffering major losses in 2010 and exited the oil and gas business (Risen, 2011). Teluk Ramunia fabrication yard was sold for RM296mil to Petroliam Nasional Berhad (PETRONAS) and Sime Darby Pasir Gudang fabrication yard was sold for RM399mil to Malaysian Marine Heavy Engineering (MMHE) (Risen, 2011). Currently, there are only four major oil and gas construction companies in Malaysia; Sapura Energy Fabrication Yard (SEFY), Malaysian Marine Heavy Engineering (MMHE), TH Heavy Engineering (THHE) and Brooke Dockyard and Engineering (BDE) (PEMANDU, 2010). TH Heavy Engineering suffered heavy loss of RM11.69 million stating lower realised margin on ongoing jobs and slower construction activities as the main reason (Zeng, 2016). Another local oil and gas construction giant Malaysia Marine Heavy Engineering (MMHE) suffered its third consecutive net loss of RM34.3 million on its 2019 fourth quarter ending financial report, stating higher cost provisions for ongoing projects as the main cause (MHB,

2019). On the other hand, based on a report by PEMANDU (2010), none of the four has the requisite scale to powerfully compete with major global players. One of the key reasons is whilst local work is tendered on a multi-contract basis, international work is commonly put out to tender as one solitary contract. This means that domestic construction companies are less capable of winning and managing the main full-fledged contract. Even in the event of acquiring an international work, they are less likely to be able to execute as efficiently or profitably. Industry players acclaim that there is a necessity for integration within the industry to match the scale and efficiency of major global construction industry players (PEMANDU, 2010). Thus, it is necessary to study ways to improve the team performance for oil and gas construction projects, hence enabling Malaysia to be more competitive and respond positively to the world energy demand.

1.3 Aim and Objectives of Study

This study aims to appraise high performing team for oil and gas engineering construction projects in Malaysia. In order to justify the aim of this study, four main objectives have been identified. Those research objectives are further detailed as follows:

a) To identify the concepts of team integration applicable for oil and gas engineering construction projects.

b) To determine the characteristics of high performing team in oil and gas engineering construction projects.

c) To determine the integration practices of high performing team in oil and gas engineering construction projects.

d) To propose a framework of high performing team for oil and gas engineering construction projects.

1.4 Research Question

To realise the aim and objectives of the study, and to satisfy the needs from the problem statement, this study is conducted accordingly to answer the following research questions:

a) What are the concepts of team integration applicable for oil and gas engineering construction projects in Malaysia?

b) What are the characteristics of high performing team in oil and gas engineering construction projects in Malaysia?

c) What are the integration practices of high performing team in oil and gas engineering construction projects in Malaysia?

d) How can the framework of high performing team in oil and gas engineering construction projects can improve the team performance for future oil and gas engineering construction projects in Malaysia?

1.5 Scope and Limitations of Study

This study is conducted within Malaysian oil and gas industry and covers the scope of upstream segment of the oil and gas industry particularly limited to the development of offshore fixed and floating facilities. The major activities involved in this development of offshore fixed and floating platforms involves engineering, procurement and construction. The development of the offshore and floating platforms also includes the substructures, inter-platform bridges, booms, well head topside platform, central processing platforms, compression platforms, living quarters, process skids and modular compression skids as they form important elements of the platform depending on the requirement of the project.

The study also limits the scope Engineering, Procurement and Construction (EPC) type of contracts which is the most common type of contract used to manage oil and gas construction projects. In this contract type, the same contractor carries out the front-end engineering design up until the construction stage. Data is collected project team members from main industry players, namely operator-owners, engineering consultant and construction-fabricators. Notable projects owners in Malaysia will be PETRONAS, ExxonMobil, Shell, Murphy and Repsol. Main contractors will be such as Sapura Energy, MISC and MMHE while engineering consultants will be companies such as Technip Geoproduction, Aker Solutions, McDermott and RanhillWorley. Service providers and suppliers are companies such as FMC, Dialog Group, KNM and Muhibbah Engineering. It is significant to gather information from these groups of individuals since they have first-hand information and experience in the oil and gas industry engineering construction projects.

In addition, due to high competition in the oil and gas project bidding and execution, financial data are not discussed in this study. Considering the wide scope of oil and gas projects and the difference in oil and gas project environment, this study does not cover other upstream activities such as exploration and production. The discussion on this study also does not cover other type of oil and gas facilities such as onshore facilities and pipelines.

This study's main concern is to improve the team performance for oil and gas engineering construction projects in Malaysia via the development of a framework of the high performing team. The main theme of the study discusses on high performing team characteristics and high performing team integration practices.

1.6 Research Methodology

This study is interested in exploring the concept of the team integration of the construction project team members in Malaysian oil and gas construction project. The unit of analysis for this study is the oil and gas engineering and construction project team members. This study is exploratory and interpretative in nature. Explanation

require the development of concepts and generalisable characteristics and integration practices associated with the unit of analysis.

The study approach involves four main phases as shown in Figure 1.1. Phase one of the study includes the project problem statement, aim and objective determination and literature review. A preliminary thorough literature review focuses on concept of team integration, high performing team characteristics, high performing team integration practices and project performance dimensions. With high performing team characteristics and high performing team integration practices being the main theme of the study, there is a need to review on project performance dimensions as well to relate to the concept of performance management in the context of high performing team. Secondary data is gathered initially through books, library research, journal databases, conference proceedings, company financial reports, industry reports, academic thesis, as well as other documents available in the public domain. From the literature review conducted, a conceptual framework is developed consisting of all the high performing team characteristics and high performing team integration practices.

Phase two includes activities, such as questionnaire design, data collection and data analysis. From the first phase literature review, data are compiled for questionnaire survey development. The questionnaire is then modified to suit Malaysian oil and gas construction projects. The questionnaire survey is conducted to gather primary data from the sample amongst operator-owners, engineering consultant and construction-fabricators in the oil and gas industry in Malaysia. The gathered data is then analysed via Statistical Package of Social Sciences (SPSS) and Microsoft Excel.

Phase three involves the framework development and framework validation. From the data analysed, results are used in the development of the pre-validated framework of high performing team for oil and gas engineering construction projects in Malaysia. The pre-validated framework is then further reviewed through simplified Delphi method for expert validation purpose. From the results of the expert validation using Interrater Reliability Analysis, the validated framework of high performing team

for oil and gas engineering construction projects in Malaysia is developed. The final phase is the writing of the dissertation, which concludes the study. The study's key activities are as summarised in Figure 1.1.

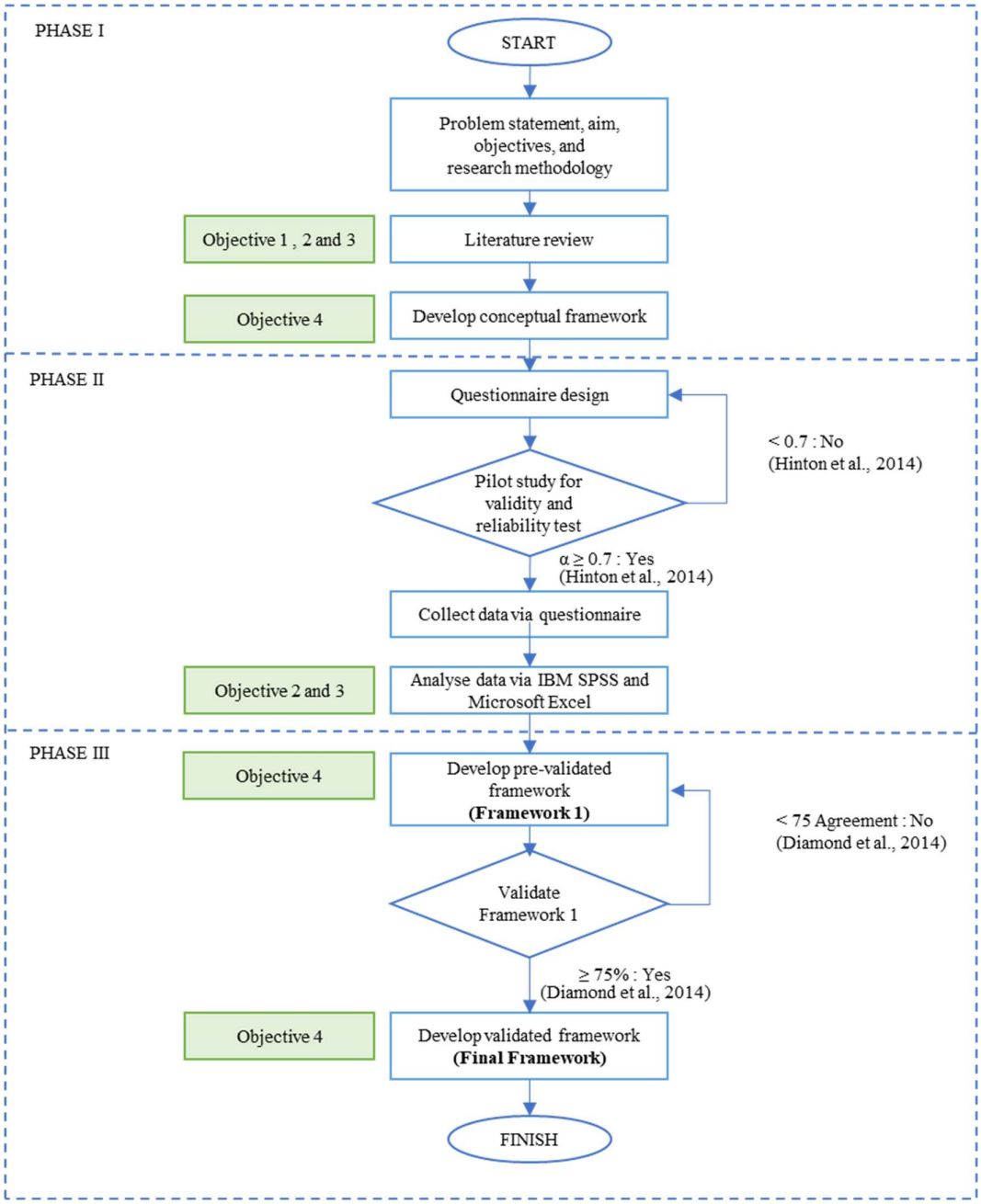


Figure 1.1 Research key activities

1.7 Significance of Study

The deteriorating global crude oil price, which began in 2014 up to the recent Coronavirus Disease 2019 (COVID-19) pandemic has triggered a surge of cost reduction policies among oil and gas industry businesses. Worldwide oil and gas companies lowered capital expenditures by about 40 percent, and projects that were not cost-effective were either cancelled or delayed (MIDA, 2018). Crude oil price is projected to remain volatile in the future with annual oil price estimated to be in the range of USD 50 to USD 60 per barrel (PETRONAS, 2017). With this low oil price environment, oil and gas companies have to embrace themselves by optimised operations, improved efficiency, and reduced project costs to sustain profitability (MIDA, 2018). It is always the main concern in conducting this study that it will have positive impacts on oil and gas industry in line with the new strategy of optimisation.

This study contributes to the body of knowledge relating to oil and gas project management, specifically on high performing team characteristics and high performing team integration practices. Besides focusing on the theoretically aspects of the high performing team for oil and gas construction projects, it is also predicted to assist key stakeholders in EPC type project setup in understanding what factors contribute to create a high performing team.

There are four main aspects of contribution expected, namely the concept of team integration in construction project, the high performing team characteristics, the high performing team integration practices, the impact of high performing team characteristics and high performing team integration practices on project performance and the improvement of team performance in oil and gas construction projects. Firstly, this study provides an important opportunity to advance the understanding of the concept of team integration in oil and gas construction projects. With an in-depth understanding of the concept, it is hoped that the factors and conditions that influence the direct impact of team integration effectiveness within the oil and gas construction project teams can be identified.

Secondly, this study intends to highlight the high performing team characteristics and high performing team integration practices in oil and gas construction projects. Since the agenda of optimising the efficiency of the oil and gas industry is a priority in this rebound period, proper improvement can be implemented with formation of strong team bundled with high performing characteristics and high performing team integration practices. Lastly, the proposed framework expected to improve the team performance of oil and gas construction project team. A fundamental aspiration for Malaysia's economic growth, articulated in both the Economic Transformation Programme (ETP) and the 11th Malaysia Plan (11MP), is for the state to become an oil and gas hub in Asia-Pacific (PETRONAS, 2017) by improving the oil and gas construction project team, and eventually enhancing the performance of the oil and gas construction projects. This will enable Malaysian oil and gas industry players to be more competitive and driven to achieve the goal of both ETP and 11MP.

1.8 Key terms and Concepts

For the purpose of this study, there are various terms and concepts discussed. The definition of the key terms and concepts are outlined here to organize the thoughts and be exact on the meaning of the key terms used. The key terms are listed as follow:

a) High performing team – a team composed of individuals with specialised expertise and complementary skills producing outstanding results (Katzenbach and Smith, 2015). A team that combines both excellent characteristics and integration practices.

b) Team characteristics - noticeable quality or traits the team it possess from the member, work method and the environment (Milliken and Martins, 1996).

c) Team integration practices- team integration practices are often referred to as the habitual and regular activity a team performs in how it executes the task related to the project (Merriam-Webster, 2020).

d) EPC - Engineering, Procurement and Construction type of contracts which is the most common type of contract used to manage oil and gas construction projects, where the same contractor carries out the front-end engineering design to the construction stage (Hatmoko and Khasani, 2019).

1.9 Structure of Dissertation

This study covers all the research details obtained pertaining to the topic of high performing team for oil and gas engineering construction projects in Malaysia. The total number of chapters will be seven covering introduction, literature review, research methodology, data analysis and findings, framework validation, discussion and conclusion.

Chapter 1: Introduction – This chapter is on the brief introduction to the whole study. It covers some background information, problem statement, research aim and objectives, research questions, brief research methodology, significance of the study and the structure of the study outlining brief content of each chapter.

Chapter 2: Literature Review – This chapter discusses the literature review of oil and gas industry landscape in Malaysia, concept of team integration, high performing team characteristics, high performing team integration practices and oil and gas engineering construction projects team performance. This chapter also outlines the conceptual framework developed from the literature review findings.

Chapter 3: Research Methodology – This chapter reviews the research methodology that is used to complete the study, including data collection, data analysis, framework development and framework validation. All of the analysis method and acceptable values considered for this study are outlined in this chapter.

Chapter 4: Data Analysis and Findings – This chapter presents the data analysis and the results of the findings from the primary data collected via questionnaire survey. This chapter identifies the significant high performing team characteristics, significant high performing team integration practices and the relationship between the two. This chapter also outlines the pre-validated framework developed from the analysis findings.

Chapter 5: Framework Validation – This chapter discusses on the findings of the expert validation conducted based on the pre-validated framework developed from the analysis findings. This chapter also presents the validated framework developed from the validation process.

Chapter 6: Discussion – This chapter summarises and discusses the findings of this study based on all of the analysis statistically and the framework validation from the previous chapter in accordance to the project objectives.

Chapter 7: Conclusion – This chapter summarises the overall finding of the study as well as outlines the contribution of the findings to the book of knowledge and industry, limitations of the study and recommendation for further study.

REFERENCES

Abd Rahman Sabri, H. (2018). Turnomachinery Project Management Framework in Oil and Gas Industry in Malaysia. (Ph.D), Universiti Teknologi Malaysia, Kuala Lumpur. (CP 035193 ra)

Abd Rahman Sabri, H., Abdul Rahim, A., Kuan Yew, W., and Ismail, S. (2016). *Turbomachinery Project Execution for High CO2 Gas Field: Challenges and Obstacles* (Vol. 6).

Abudi, G. (2013). *Managing communications effectively and efficiently*.

Allen, N. J., and Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organisation. *Journal of occupational psychology,* 63(1), 1-18.

Amason, A. C., Thompson, K. R., Hochwarter, W. A., and Harrison, A. W. (1995). Conflict: An important dimension in successful management teams. *Organisational Dynamics,* 24(2), 20-35.

Anumba, C. J., Baugh, C., and Khalfan, M. M. (2002). Organisational structures to support concurrent engineering in construction. *Industrial management & data systems*, 102(5), 260-270.

Armstrong, M. (2006). Performance management: Key strategies and practical guidelines.

Asif, M., Fisscher, O. A., de Bruijn, E. J., and Pagell, M. (2010). Integration of management systems: A methodology for operational excellence and strategic flexibility. *Operations Management Research,* 3(3-4), 146-160.

Atkinson, R. (1999). Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. *International Journal of Project Management,* 17(6), 337-342.

Aubé, C., and Rousseau, V. (2005). Team Goal Commitment and Team Effectiveness: The Role of Task Interdependence and Supportive Behaviors. *Group Dynamics: Theory, Research, and Practice,* 9(3), 189.

Austin, S. A., Baldwin, A. N., and Steele, J. L. (2002). Improving building design through integrated planning and control. *Engineering, Construction and Architectural Management,* 9(3), 249-258.

Baccarini, D. (1999). The logical framework method for defining project success. *Project Management Journal,* 30(4), 25-32.

Badiru, A. B., and Osisanya, S. O. (2016). *Project management for the oil and gas industry: a world system approach*: CRC Press.

Baiden, B. K. (2006). *Framework for the integration of the project delivery team.* Bernard Kofi Baiden,

Baiden, B. K., and Price, A. D. (2011). The effect of integration on project delivery team effectiveness. *International Journal of Project Management,* 29(2), 129-136.

Baiden, B. K., Price, A. D., and Dainty, A. R. (2003a). Exploring the use of team types for performance improvement. *Postgraduate Researchers, 99*.

Baiden, B. K., Price, A. D., and Dainty, A. R. (2003b). Looking beyond process: human factors in team integration.

Baiden, B. K., Price, A. D., and Dainty, A. R. (2006). The extent of team integration within construction projects. *International Journal of Project Management,* 24(1), 13-23.

Baker, D. P., and Salas, E. (1996). Analyzing team performance: In the eye of the beholder? *Military Psychology,* 8(3), 235-245.

BambooHR. (2016). Reward and Recognition - What's Really Driving Employee Engagement and Career Advancement. In RRInfographic.pdf (Ed.), (pp. Survey result for more than 1,000 U.S.-based, full-time employees: to find out what works for reward and recognition programs so HR and business leaders could navigate them more easily). https://www.bamboohr.com/blog/reward-and-recogntion-survey: BambooHR. (Accessed: 10 September 2016)

Banning, E. B. (2020). Summarizing Data: Descriptive Statistics. In *The Archaeologist's Laboratory* (pp. 17-21): Springer.

Barkley, B., and Saylor, J. H. (1994). *Customer-driven project management: A new paradigm in total quality implementation*: McGraw-Hill Companies.

Barlow, J. (2000). Innovation and learning in complex offshore construction projects. *Research policy,* 29(7-8), 973-989.

Barnes, M. (1988). Construction project management. *International Journal of Project Management,* 6(2), 69-79.

Barni, D. (2015). Relative importance analysis for the study of the family: Accepting the challenge of correlated predictors. *TPM: Testing, Psychometrics, Methodology in Applied Psychology,* 22(2).

Baron, H. (2010). *The oil and gas engineering guide*: Editions Technip.

Bartz, A. E. (1971). *Basic descriptive statistics for education and the behavioral sciences*: Minneapolis, Minn: Burgess Publishing Company.

Beadnall, S., and Moore, S. (2016). *Offshore construction: Law and practice*: Informa Law from Routledge.

Beecham, S., Hall, T., Britton, C., Cottee, M., and Rainer, A. (2005). Using an expert panel to validate a requirements process improvement model. *Journal of Systems and Software,* 76(3), 251-275.

BEM, (2019). *Board of Engineers Malaysia - Annual Report 2018*. Retrieved from Kuala Lumpur Malaysia: http://bem.org.my/annual-report1(Accessed: 20 October 2020)

Bergman, J. Z., Rentsch, J. R., Small, E. E., Davenport, S. W., and Bergman, S. M. (2012). The shared leadership process in decision-making teams. *The Journal of social psychology,* 152(1), 17-42.

Bernoni, M., et al. (2015). Proven practices in construction management for industrial plant projects.

Betts, M., Fischer, M., and Koskela, L. (1995). The purpose and definition of integration. *Integrated construction information, 1*.

BMI, R. G. (2016). *Malaysia Oil and Gas Report* (1748-4103). Retrieved from London, UK: https://www.marketresearch.com/Business-Monitor-International-v304/Malaysia-Oil-Gas-Q2-11620402/(Accessed: 30 November 2018)

Bodych, M. A. (2012). *Integrated project management in the organisation*.

Bolden, R. (2011). Distributed leadership in organisations: A review of theory and research. *International Journal of Management Reviews,* 13(3), 251-269.

Bond-Barnard, T. J., Fletcher, L., and Steyn, H. (2018). Linking trust and collaboration in project teams to project management success. *International Journal of Managing Projects in Business*.

Bragg, T. (1999). Turn around an ineffective team. *IIE solutions,* 31(5), 49-52.

Bratvold, R. B., and Begg, S. H. (2006). *Education for the real world: equipping petroleum engineers to manage uncertainty.* Paper presented at the SPE Annual Technical Conference and Exhibition.

Bromley, S., Worthington, J., and Robinson, C. (2003). The impact of integrated teams on the design process. *London: Construction Productivity Network*.

Brooke, D. (2018). Brooke Dockyard and Engineering Works Corporation Project Experience. Retrieved from http://www.brookedockyard.com(Accessed: 07 December 2018)

Bryman, A. (2016). *Social research methods*: Oxford university press.

Cambridge, D. (Ed.) (2020) Cambridge Dictionary. Cambridge University Press, Cambridge, UK.

Camp, W. (2001). Formulating and evaluating theoretical frameworks for career and technical education research. *Journal of Vocational Education Research,* 26(1), 4-25.

Carron, A. V., and Brawley, L. R. (2000). Cohesion: Conceptual and measurement issues. *Small group research,* 31(1), 89-106.

Cewinska, J., and Krasnova, A. (2017). Cooperation and Competition in Project Teams 1. *PM World Journal, VI*.

Chi, H.-L., Wang, J., Wang, X., Truijens, M., and Yung, P. (2015). *A Conceptual Framework of Quality-Assured Fabrication, Delivery and Installation Processes for Liquefied Natural Gas (LNG) Plant Construction* (Vol. 79).

Chin, R., and Lee, B. Y. (2008). *Principles and practice of clinical trial medicine*: Elsevier.

Clark, D., Gill, D., Prowse, V., and Rush, M. (2017). *Using goals to motivate college students: Theory and evidence from field experiments*.

Clift, M. (2003). Life-cycle costing in the construction sector. *Industry and environment, 26*(2), 37-40.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences New York. *NY: Academic*.

Connelly, L. M. (2008). Pilot studies. *Medsurg Nursing,* 17(6), 411.

Construction, S. F. f. (2003). *The integration toolkit guide: Integrated project team*.

Consultancy.uk. (2016). 10 performance improvement areas for Oil & Gas industry. Retrieved from https://www.consultancy.uk/news/3170/10-performance-improvement-areas-for-oil-gas-industry (Accessed: 12 March 2018)

Council, C. L. (2004). Driving performance and retention through employee engagement. *Washington, DC: Corporate Executive Board,* 32.

Court, T., and Hughes, P. (2013). Using Technology and Collaboration To Drive a Step Change in Value. *Oil and Gas Megaprojects - CISCO*. Retrieved from https://www.cisco.com/c/dam/en_us/about/ac79/docs/mfg/Capital-Projects.pdf (Accessed: 22 October 2018)

Cragan, J., Wright, D. W., and Kasch, C. (2008). *Communication in small groups: Theory, process, and skills*: Nelson Education.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *psychometrika,* 16(3), 297-334.

D'Amour, D., Ferrada-Videla, M., San Martin Rodriguez, L., and Beaulieu, M.-D. (2005). The conceptual basis for interprofessional collaboration: core concepts and theoretical frameworks. *Journal of interprofessional care,* 19(sup1), 116-131.

Dainty, A. R., Briscoe, G. H., and Millett, S. J. (2001). Subcontractor perspectives on supply chain alliances. *Construction Management & Economics,* 19(8), 841-848.

Dainty, A. R., Millett, S. J., and Briscoe, G. H. (2001). New perspectives on construction supply chain integration. *Supply chain management: An international journal,* 6(4), 163-173.

Davies, R. (1995). Integrating individuals and organisations: an introduction to team management systems for career professionals. *Librarian Career Development,* 3(3), 4-9.

de Jong, B., T. Dirks, K., and Gillespie, N. (2016). *Trust and Team Performance: A Meta-Analysis of Main Effects, Moderators and Covariates* (Vol. 101).

De Meuse, K. P. (2009). Driving team effectiveness. *A comparative analysis of the Korn/Ferry T7 model with other popular team*.

De Wit, A. (1988). Measurement of project success. *International Journal of Project Management,* 6(3), 164-170.

Dechant, S., and McFadyen, M. K. (2008). *Kikeh Development: Project Execution Model.* Paper presented at the Offshore Technology Conference.

Dehghan, R., and Ruwanpura, J. (2011). The mechanism of design activity overlapping in construction projects and the time-cost tradeoff function. *Procedia Engineering, 14*, 1959-1965.

Diamond, I. R., et al. (2014). Defining consensus: a systematic review recommends methodologic criteria for reporting of Delphi studies. *Journal of clinical epidemiology,* 67(4), 401-409.

Discenza, R., and Forman, J. (2007). *Seven causes of project failure: How to recognize them and how to initiate project recovery.* Paper presented at the annual North American meeting of the Project Management Institute, Atlanta, GA.

Doody, T. A., and Salama, M. M. (1986). *Important Considerations For Successful Fabrication Of Offshore Structures*. Paper presented at the Offshore Technology Conference, Houston, Texas. https://doi.org/10.4043/5348-MS

Egwunatum, S. (2017). *A Review of Construction Project Performance Estimators* (Vol. 3).

EIA. Energy Information Administration (2017). *Country Analysis Brief : Malaysia*. Retrieved from https://www.eia.gov/international/content/analysis/-countries_long/Malaysia/malaysia.pdf (Accessed: 03 December 2018)

Emiliani, B. (2008). The equally important "Respect for people" principle. *REAL LEAN: The Keys to Sustaining Lean Management, Volume Three, The CLBM, LLC, Wethersfield, CT, available at: www. bobemiliani. com/goodies/respect_for_people. pdf (accessed August 15, 2011)*.

Ernst&Young. (2014). Spotlight on Oil and Gas Megaprojects. *EY Oil and Gas*. Retrieved from *https://www.ey.com/en_my/oil-gas* (Accessed: 09 December 2018)

Ernst&Young. (2016). Project efficiency in oil and gas. *EY Oil and Gas*. Retrieved from https://www.ey.com/en_my/oil-gas (Accessed: 05 November 2020)

Evans, M. (2007). Recent research (2000–2006) into applied linguistics and language teaching with specific reference to L2 French. *Language Teaching, 40*(3), 211-230.

Fellows, R. F., and Liu, A. M. (2015). *Research methods for construction*: John Wiley & Sons.

Fisher, C. (2010). *Researching and writing a dissertation: an essential guide for business students*: Pearson Education.

Flick, U. (2015). *Introducing research methodology: A beginner's guide to doing a research project*: Sage.

Frankl, V. E. (1985). *Man's search for meaning*: Simon and Schuster.

Franz, B., Leicht, R., Molenaar, K., and Messner, J. (2017). Impact of team integration and group cohesion on project delivery performance. *Journal of construction engineering and management, 143*(1), 04016088.

Gadirajurrett, H., Srinivasan, R., Stevens, J., and Jeena, N. (2018). Impact of Leadership on Team's Performance.

García, d. Y. P. M., Rodríguez, S. F., and Carmona, O. L. (2009). Validation of questionnaires. *Reumatología clínica, 5*(4), 171.

Gass, S. I. (1983). Decision-aiding models: validation, assessment, and related issues for policy analysis. *Operations Research, 31*(4), 603-631.

Gratton, L., and Erickson, T. J. (2007). Eight ways to build collaborative teams. *Harvard Business Review, 85*(11), 100.

Hackman, J. (1987). The design of work teams. Inj. w. lorsch (ed.), Handbook of organisational behavior (pp. 315-342). In: englewood cliffs, nj: prentice-hall.

Hackman, J. R. (1995). The design of work teams. *Psychological Dimensions of Organisational Behavior: 2d Edition. Ed. Barry M. Staw. New Jersey: Prentice Hall, Inc*.

Hackman, J. R., and Hackman, R. J. (2002). *Leading teams: Setting the stage for great performances*: Harvard Business Press.

Hakim, C. (1987). *Research design: Strategies and choices in the design of social research*: Allen and Unwin.

Hallowell, M. R., Hinze, J. W., Baud, K. C., and Wehle, A. (2013). Proactive construction safety control: Measuring, monitoring, and responding to safety leading indicators. *Journal of construction engineering and management, 139*(10), 04013010.

Harald, R., and Pål, I. (2004). *Perceptions of a project team performance*. Paper presented at the PMI® Global Congress 2004, North America, Anaheim, CA.

Hatmoko, J. U. D., and Khasani, R. (2019). *Mapping delay risks of EPC projects: a case study of a platform and subsea pipeline of an oil and gas project.* Paper presented at the IOP Conference Series: Materials Science and Engineering.

Haynes, B. (2020). *LLP Oil Patch Bankruptcy Monitor* . Retrieved from *https://www.haynesboone.com/-/media/Files/Energy_Bankruptcy_Reports/Oil_Patch_Bankruptcy_Monitor* (Accessed: 02 November 2020)

Hendrickson, C., Hendrickson, C. T., and Au, T. (1989). *Project management for construction: Fundamental concepts for owners, engineers, architects, and builders*: Chris Hendrickson.

Hinton, P. R. (2014). *Statistics explained*: Routledge.

Hirschhorn, L., and Gilmore, T. (1992). The new boundaries of the "boundaryless" company. *Harvard Business Review,* 70(3), 104-115.

Hopkins, P., and Unger, M. (2017). What is a'subject-matter expert'? *Journal of Pipeline Engineering,* 16(4).

Horosz, W. (1975). The crisis of responsibility: Man as the source of accountability.

Hossain, M., and Chua, D. (2014). Overlapping design and construction activities and an optimization approach to minimize rework. *International Journal of Project Management,* 32(6), 983-994.

Ike, D., Anthony, A., Abdulkareem, A., and Analysis, L. (2013). Impact of ICT in Oil and Gas Exploration : A Case Study Type (Method/Approach). *International Journal of Computers & Technology,* 10, 1830-1835.

IOGP. (2018). *Fabrication site construction safety recommended practices*. Retrieved from https://www.iogp.org/oil-and-gas-safety/construction/ (Accessed: 02 December 2018)

Ibrahim, C. K. I. C., Costello, S. B., and Wilkinson, S. (2018). Making sense of team integration practice through the "lived experience" of alliance project teams. *Engineering, Construction and Architectural Management*.

Izam Ibrahim, K., Costello, S. B., and Wilkinson, S. (2013). Key practice indicators of team integration in construction projects: a review. *Team Performance Management: an international journal,* 19(3/4), 132-152.

Javed, S. (2015). Impact of top management commitment on quality management. *International Journal of Scientific and Research Publications,* 5(8), 2250-3153.

Jha, K., and Iyer, K. (2006). Critical factors affecting quality performance in construction projects. *Total Quality Management and Business Excellence,* 17(9), 1155-1170.

Johanson, G. A., and Brooks, G. P. (2010). Initial scale development: sample size for pilot studies. *Educational and psychological measurement,* 70(3), 394-400.

Kaiser, M. J., and Snyder, B. F. (2012). Reviewing rig construction cost factors. *Offshore(Tulsa),* 72(7), 49-53.

Kassem, M. A. (2020). Using Relative Importance Index Method for Developing Risk Map in Oil and Gas Construction Projects. *Jurnal Kejuruteraan,* 32(3), 85-97.

Katzenbach, J. R., and Smith, D. K. (1993). *The wisdom of teams: Creating the high-performance organization*: Harvard Business Review Press

Katzenbach, J. R., and Smith, D. K. (2008). *The discipline of teams*: Harvard Business Press.

Katzenbach, J. R., and Smith, D. K. (2015). *The wisdom of teams: Creating the high-performance organisation*: Harvard Business Review Press.

Khan, R. A., Khushnood, M., and Manzoor, H. (2020). Relative Importance of Project key Success Factors in Country Specific Context.

Kitchenham, B., Pfleeger, S. L., McColl, B., and Eagan, S. (2002). An empirical study of maintenance and development estimation accuracy. *Journal of Systems and Software,* 64(1), 57-77.

Klein, C., et al. (2009). Does team building work? *Small group research,* 40(2), 181-222.

Kothari, C. R. (2004). *Research methodology: Methods and techniques*: New Age International.

Krejcie, R. V., and Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement, 30*(3), 607-610.

Kumar, R., Sandeep, B., Devendra, A., and Rupchand, L. (2013). Effective coordination leads pathbreaking project at Mumbai High. *OE Offshore Engineer.*

Kumaraswamy, M. M., and Thorpe, A. (1996). Systematizing construction project evaluations. *Journal of Management in Engineering,* 12(1), 34-39.

Kundu, K., and Ganguly, D. (2014). Developing the Dimensions of the Effectiveness of Team Building in the Perspective of A Business Organisation. *ASBM Journal of Management,* 7(1).

Kuok Ho, D. T., Dawal, S., and Olugu, E. (2018). *Actual safety performance of the Malaysian offshore oil platforms: Correlations between the leading and lagging indicators* (Vol. 66).

Kuok Ho, D. T., Leiliabadi, F., Olugu, E., and Dawal, S. (2017). Factors affecting safety of processes in the Malaysian oil and gas industry. *Safety Science, 92*. doi:10.1016/j.ssci.2016.09.017

Larson, C. E., and LaFasto, F. M. (1989). *Teamwork: What must go right/what can go wrong* (Vol. 10): Sage.

Leedy, P. D., and Ormrod, J. E. (2014). *Practical research: Planning and design*: Pearson Education.

Lencioni, P. (2005a). *Overcoming the five dysfunctions of a team: A field guide for leaders, managers, and facilitators* (Vol. 16): John Wiley & Sons.

Lencioni, P. (2005b). *The five dysfunctions of a team*: John Wiley & Sons.

Liu, W.-H., and Cross, J. A. (2016). A comprehensive model of project team technical performance. *International Journal of Project Management,* 34(7), 1150-1166.

Lombardo, M., and Eichinger, R. (1995). The Team Architect® user's manual. *Minneapolis, MN: Lominger Limited*.

Luse, A., Mennecke, B. E., and Townsend, A. M. (2012). Selecting a research topic: A framework for doctoral students. *International Journal of Doctoral Studies, 7*, 143.

Luthans, F., and Stajkovic, A. D. (2006). The Impact of Recognition on Employee Performance: Theory, Research and Practice. In: Citeseer. Retrieved from http://citeseerx. ist. psu. edu/viewdoc/download. (Accessed: 20 November 2018)

Marshall, G., and Jonker, L. (2010). An introduction to descriptive statistics: A review and practical guide. *Radiography,* 16(4), e1-e7.

Matthew, F. (2020). How the Covid-19 coronavirus is affecting the offshore industry. *Offshore Technology.* Retrieved from https://www.offshore-technology.com/features/coronavirus-impact-offshore/ (Accessed: 29 March 2021)

McGrath, J. E. (1964). *Social psychology: A brief introduction*: Holt, Rinehart and Winston.

McHugh, M. L. (2012). Interrater reliability: the kappa statistic. *Biochemia medica: Biochemia medica,* 22(3), 276-282.

Mckinsey, C. (2014). *Meeting the challenge of increasing North Sea costs*. Retrieved from UK: https://www.mckinsey.com/industries/oil-and-gas/our-insights/meeting-the-challenge-of-increasing-north-sea-costs (Accessed: 02 December 2018)

McNair, D. (2016). EPC Contracts in the Oil and Gas Sector. 2016. *PwC Australia*.

Merriam-Webster, D. (Ed.) (2020) Merriam-Webster.

Merriam, S. B., and Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*: John Wiley & Sons.

Merrow, E. W. (2011). *Industrial megaprojects: concepts, strategies, and practices for success* (Vol. 8): Wiley Hoboken, NJ.

Mesa, H. A., Molenaar, K. R., and Alarcón, L. F. (2016). Exploring performance of the integrated project delivery process on complex building projects. *International Journal of Project Management,* 34(7), 1089-1101.

Mesmer-Magnus, J. R., and DeChurch, L. A. (2009). Information sharing and team performance: A meta-analysis. *Journal of Applied Psychology,* 94(2), 535.

Meyers, R. (2014). Cost Overruns, delays may hinder future Australian LNG projects. *Fuelfix*. Retrieved from https://fuelfix.com/blog/2014/09/02/cost-overruns-delays-may-hinder-future-australian-lng-projects/ (Accessed: 02 December 2018)

MHB. (2018). Overview of Past Fixed Platform Construction. Retrieved from https://mhb.com.my/solutions/offshore/ (Accessed: 25 March 2021)

MHB. (2019). *Annual Report*. Retrieved from https://mhb.com.my/wp-content/uploads/2020/03/For-Website-MHB-AR2019.pdf (Accessed: 25 March 2021)

Michan, S., and Rodger, S. (2000). Characteristics of effective teams: a literature review. *Australian Health Review,* 23(3), 201-208.

MIDA. (2018). Oil and Gas. Retrieved from http://www.mida.gov.my/home/oil-and-gas/posts/ (Accessed: 26 October 2018)

MIDA. (2019). Meet Malaysia Investment opportunities in Asia's oil and gas hub. Retrieved from website www. mida. gov. my. (Accessed: 19 October 2020)

MIDF. (2018). Malaysia Marine & Heavy Engineering 3QFY18 Results Review *MIDF Research*.

Mihailescu, A., and Stockley, P. (2020). Exploring the impact of Covid-19 on the oil and gas industry. *IBA Oil and Gas Committee, August 2020*.

Miller, C. J., Kim, B., Silverman, A., and Bauer, M. S. (2018). A systematic review of team-building interventions in non-acute healthcare settings. *BMC health services research, 18*(1), 1-21

Milliken, F. J., and Martins, L. L. (1996). Searching for common threads: Understanding the multiple effects of diversity in organisational groups. *Academy of management review,* 21(2), 402-433.

MOCA. (1990). MOCA - About Us. Retrieved from https://moca.org.my (Accessed: 30 November 2018)

MOF, M. M. o. F. (2018). *Tinjauan Fiskal dan Anggaran Hasil Kerajaan Persekutuan 2019*. Retrieved from Malaysia: https://www.treasury.gov.my/ (Accessed: 09 December 2018)

Mohammadi, A., Tavakolan, M., and Khosravi, Y. (2018). Factors influencing safety performance on construction projects: A review. *Safety Science, 109*, 382-397. doi:https://doi.org/10.1016/j.ssci.2018.06.017

Molnau, D. (2013). High-performance Teams: Understanding Team Cohesiveness. In.

Mullen, B., and Copper, C. (1994). The relation between group cohesiveness and performance: An integration. *Psychological bulletin,* 115(2), 210.

Nunnally, J. (1978). Psychometric methods. In: New York: McGraw-Hill.

Ochieng, E. G., and Price, A. (2010). Managing cross-cultural communication in multicultural construction project teams: The case of Kenya and UK. *International Journal of Project Management,* 28(5), 449-460.

OGA. (2017). *Lessons Learned from UKCS oil and gas projects 2011-2016*. In (pp. 30).

Oliveira, A. B. d. F., and Giacaglia, M. E. (2018). Collaborative or adversarial production and BIM: a method for better understanding of contracting types, based on BPMN. *INTERNATIONAL CONFERENCE OF THE IBEROAMERICAN SOCIETY OF DIGITAL GRAPHICS*.

Panas, A., and Pantouvakis, J. (2010). Evaluating research methodology in construction productivity studies. *The Built & Human Environment Review,* 3(1), 63-85.

Parker, G. M. (2011). *Team players and teamwork: New strategies for developing successful collaboration*: John Wiley & Sons.

PEMANDU. (2010). *Economic Transformation Programme Powering the Malaysian Economy with Oil, Gas and Energy*.

PETRONAS. (2017). *Petronas Activity Outlook 2018-2020*. Retrieved from https://www.petronas.com/sites/default/files/downloads/PETRONAS-Activity-Outlook-2018-2020.pdf (Accessed: 30 November 2018)

PETRONAS. (2020a). Petronas Activity Outlook 2020-2022. Retrieved from https://www.petronas.com/sites/default/files/downloads/PETRONAS-Activity-Outlook-2020-2022.pdf (Accessed: 20 October 2020)

PETRONAS. (2020b). Procedures and Guidelines for Upstream Activities (PPGUA 4.1). In *Volume 6 - Field Development*. Malaysia.

PMI. (2017). *Project management body of knowledge (PMBOK) 6th Edition*: Project Management Institute.

Poh, N. (2017). *Framework of Project Management Key Performance Indicators for Medium-Sized Building Construction Industry in Malaysia.* (Engineering Doctorate), Universiti Teknologi Malaysia Kuala Lumpur,

Ponton, R. (2019). Shattering the 'glass ceiling' in oil and gas companies. *News Straits Times*.

Popat, N., et al. (2018). *Development, Adoption and Implementation of Fabrication Site Construction Safety Recommended Practices*. Paper presented at the SPE International Conference and Exhibition on Health, Safety, Security, Environment, and Social Responsibility, Abu Dhabi, UAE. https://doi.org/10.2118/190581-MS

Preis, A., Burcham, D., and Farrell, B. (2014). Spotlight on oil and gas megaprojects. *EY Oil and Gas, 16*.

Provera, B., Montefusco, A., and Canato, A. (2010). A 'no blame'approach to organisational learning. *British Journal of Management, 21*(4), 1057-1074.

Punch, K. F. (2013). *Introduction to social research: Quantitative and qualitative approaches*: sage.

PwC. (2016). Challenging Times but Fundamental Intact. *The Malaysian Oil and Gas Industry*.

Ramanujam, R. (2003). The effects of discontinuous change on latent errors in organisations: The moderating role of risk. *Academy of management journal,* 46(5), 608-617.

Rands, S. A. (2010). Self-improvement for team-players: the effects of individual effort on aggregated group information. *PLoS One, 5*(7), e11705.

Raue, S., Tang, S.-H., Weiland, C., and Wenzlik, C. (2013). The GRPI model–an approach for team development. *White Paper Draft, SE Group*.

Rebentisch, E. (2017). UNLOCK THE POWER: Integrated Program Teams Deliver Value. *INSIGHT, 20*(3), 77-77.

Reina, D., Reina, M., and Hudnut, D. (2017). *Why Trust Is Critical to Team Success*. Retrieved from www.reinatrustbuilding.com. (Accessed: 22 November 2018)

Rico, R., Manzanares, M., Gil, F., Alcover, C.-M., and Tabernero, C. (2011). Coordination process in work teams. *Papeles del Psicólogo, 32*, 59-68.

Robbins, H., and Finley, M. (2000). *The new why teams don't work: What goes wrong and how to make it right*: Berrett-Koehler Publishers.

Rolstadås, A. (2012). *Performance management: A business process benchmarking approach*: Springer Science & Business Media.

Rooshdi, R. R. R. M., Abd Majid, M. Z., Sahamir, S. R., and Ismail, N. A. A. (2018). Relative importance index of sustainable design and construction activities criteria for green highway. *Chemical Engineering Transactions,* 63, 151-156.

Rubin, I. M. (1978). *Task-oriented Team Development: Irwin M. Rubin, Mark S. Plovnick, Ronald E. Fry*: McGraw-Hill.

Ruqaishi, M., and Bashir, H. A. (2015). Causes of delay in construction projects in the oil and gas industry in the gulf cooperation council countries: a case study. *Journal of Management in Engineering, 31*(3), 05014017.

Rui, Zhenhua, Li, Chaochun, Peng, Fei, Ling, Kegang, Chen, Gang, Zhou, Xiyu

Chang, Hanwen. (2017). Development of industry performance metrics for offshore oil and gas project. *Journal of Natural Gas Science and Engineering,* 39, 44-53. doi:https://doi.org/10.1016/j.jngse.2017.01.022

S. Badawey, A. (2017). New Paradigms in Managing Oil & Gas Projects, Research and Analysis. *Egypt Oil & Gas Newspaper*.

Salama, M., El Hamid, M., and Keogh, B. (2008). *Investigating the causes of delay within oil and gas projects in the UAE.* Paper presented at the 24th annual ARCOM conference.

Sapura. (2018). Sapura Energy Berhad. Retrieved from http://www.sapuraenergy.com (Accessed: 01 December 2018)

Sargent, R. G. (2000). *Verification, validation and accreditation of simulation models.* Paper presented at the 2000 Winter Simulation Conference Proceedings (Cat. No. 00CH37165).

Saunders, M. (2012). The practice of qualitative organisational research: Core methods and current challenges. In: London, England. Sage.

SBM. (2019). EPM Project Organisation Chart. In. SBM Offshore Mero Sepetiba.

Schramm, C., Meißner, A., and Weidinger, G. (2010). Contracting strategies in the oil and gas industry. *Pipeline Technology, 2010*(Special Edition), 33-36.

Shell. (2014). SHELL Starts Oil Production from GUMUSUT-KAKAP Deep-Water Platform in Malaysia. Retrieved from https://www.shell.com/media/news-and-media-releases/2014/shell-starts-oil-production-gumusut-kakap-deep-water-platform-malaysia.html (Accessed: 30 November 2016)

SOCSO. (2018). *Annual Report*. Retrieved from Malaysia: https://www.perkeso.gov.my/en/about-us/media-centre/annual-report.html (Accessed: 05 November 2020)

Sparkling, A. E. (2018). *Collaborative project delivery practices, goal alignment, and performance in architecture, engineering, and construction project teams* ProQuest Dissertations & Theses Global.

Spatz, D. (1998). Multidisciplinary teams aid minerals exploration: Mining engineering. *Society of Mining, Metallurgy and Exploration, Littleton, Colo*, 57-60.

Sreejesh, S., Mohapatra, S., and Anusree, M. (2014). *Business research methods: An applied orientation*: Springer.

Sterling, G. H. (2013). *Managing offshore megaprojects: Sucess is an option.* Paper presented at the SPE Annual Technical Conference and Exhibition.

Subramanian, S., Wasnik, R. V., Singh, H., Kamal, F. R., and Takieddine, O. H. (2019). *Early Engagement in FEED to Overcome Engineering Challenges–Delivering Fast Track EPC Projects.* Paper presented at the Abu Dhabi International Petroleum Exhibition & Conference.

Svalestuen, F., et al. (2015). Key elements to an effective building design team. *Procedia Computer Science, 64*, 838-843.

Tavakol, M., and Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education, 2*, 53.

Thomsen, C., Darrington, J., Dunne, D., and Lichtig, W. (2009). Managing integrated project delivery. *Construction Management Association of America (CMAA), McLean, VA, 105*.

THHE. (2018). TH Heavy Engineering Berhard Latest Projects. Retrieved from http://www.thhe.com.my/index.php/featured-projects/latest-project/ (Accessed: 07 December 2018)

Tuttle, R., and Galal, O. (2010). Oil Ministers See Demand Rising, Price May Exceed $85. *Bloomberg Business*.

UTP (2018). Research Support: PETRONAS Technical Standard (PTS).

Vincent, S. (2003). Integrating different views of integration. In *Integrated construction information* (pp. 86-102): Routledge.

Vyse, S. (2001). Fusion: a new approach to working. *London: G1axoWelleome*.

Wallo, A. (2008). The leader as a facilitator of learning at work. *A study of learning-oriented leadership in two industrial firms. Diss. Linköping: Linköping Studies in Behavioural Sciences*(137).

Webb, T., Selamat, K., Omar, N. F., Desormeaux, R. A., and Moran, P. M. (2008). *Kikeh Development: Delivering World Class Completion Performance.* Paper presented at the Offshore Technology Conference.

Wong, K. Y. (2005). A critical review of knowledge management frameworks. *International journal of information technology and management, 4*(3), 269-289.

Yang, L.-R., Huang, C.-F., and Wu, K.-S. (2011). The association among project manager's leadership style, teamwork and project success. *International Journal of Project Management, 29*(3), 258-267.

Yeo, K., and Ning, J. (2002). Integrating supply chain and critical chain concepts in engineer-procure-construct (EPC) projects. *International Journal of Project Management, 20*(4), 253-262.

Zarndt, F. (2011). Project management 101: Plan well, communicate a lot, and don't forget acceptance criteria! *OCLC Systems & Services: International digital library perspectives, 27*(3), 170-174.

Zeng, X. (2016). TH Heavy Engineering's loss widens amid claims. *Fairplay.* Retrieved from https://fairplay.ihs.com/article/4274121/th-heavy-engineering-s-loss-widens-amid-claims (Accessed: 10 September 2016) (Accessed: 03 December 2018)

Zenger, J., and Folkman, J. (2014). Your employees want the negative feedback you hate to give. *Harvard Business Review*.

Zenun, M. M. N., Loureiro, G., and Araujo, C. S. (2007). The Effects of Teams' Co-location on Project Performance. In *Complex systems concurrent engineering* (pp. 717-726): Springer.

Zeranski, O., Forrest, R., Witzemann, M., Vasconi, M., and Brown, P. (2016). Excellence in Capital Projects: A Goal Yet to Be Achieved. Retrieved from https://www.atkearney.com (Accessed: 22 October 2018)

Zhang, P., and Fai Ng, F. (2012). Attitude toward knowledge sharing in construction teams. *Industrial management & data systems, 112*(9), 1326-1347.

Appendix A Questionnaire Survey

UTM Razak Faculty of Technology and Informatics

SERIAL NUMBER : ERS162006Q101

QUESTIONNAIRE SURVEY: TEAM INTEGRATION FRAMEWORK FOR MALAYSIAN OIL AND GAS CONSTRUCTION PROJECTS

Dear Sir/Mdm,

This questionnaire is designed to collect information on the high performing team characteristics and effective team integration practises for oil and gas construction projects in Malaysia. The outcome of this survey is to develop a team integration framework for Malaysian Oil and Gas Construction Projects. It is anticipated that the findings reported via this survey could assist the planning of future strategies and guidelines for the betterment of integrated team management in the Malaysian oil and gas construction projects.

The questionnaire is divided into four (4) parts:

1) **Part A** to obtain the company's profile of respondents.
2) **Part B** to obtain the respondent's particular.
3) **Part C** To identify the high performing team characteristics, which effects the performance of oil and gas construction projects in Malaysia
4) **Part D** To assess the high performing team integration practices, which effects the performance of oil and gas construction projects in Malaysia.

Therefore, I very much value your participation in this survey that should take approximately 20 minutes. It is important that you answer each question as thoughtfully and frankly as possible. There are no right or wrong answers. Your response will be treated with the strict confidence. If you have any questions or comments, please do not hesitate to contact me at davendren.vereya@sbmoffshore.com

Your feedback is very much appreciated. I thank you in advance for your time and kind cooperation.

Yours Sincerely,

IR. DAVENDREN VEREYA
ENGINEERING DOCTORATE CANDIDATE

Part A: Company Profile Information

Instruction: Please mark (√) for your answer. If there are others, please specify.

1. Firm ownership type:

- O Government Linked Company (GLC)
- O Government Owned Company (GOC)
- O National Oil Company
- O Independent Oil Company
- O Private Limited Company
- O Public Limited Company
- O Partnership
- O Others (Please specify: _____)

2. The company's function in an oil and gas project:

- O Client
- O Owner/Shareholder
- O Design Consultant
- O Project Management Consultant
- O Equipment Supplier
- O Service Provider
- O Fabricator/Main Contractor
- O Sub-contractor/sub-supplier
- O Others (Please specify: _____)

3. Involvement of your company in oil and gas industry:

- O Less than 2 years
- O 2 -5 years
- O 6 - 10 years
- O 11 - 15 years
- O 16 years and above

4. Please choose type(s) of projects in Malaysia that your organisation was involved with? **(You may choose more than ONE (1))**

- O Fixed Structural Platform
- O Semi-Submersible
- O Drillship
- O Tension Leg Platform (TLPs)
- O Floating Production Unit (FPUs)
- O Single Point Anchor Reservoir (SPARs)
- O Subsea Stations (PLEMs, PLETs)
- O Floating Production Storage and Offloading (FPSO)
- O Floating Storage and Offloading (FSO)
- O Floating Liquefied Natural Gas (FLNG) facility
- O Pipeline (Onshore)
- O Pipeline (Offshore)

Part B: Respondent's Demographic Profile
Instruction: Please mark (√) for your answer. If there are others, please specify.

5. Experience/involvement in oil and gas construction project management:

- O 5 years
- O 6 - 10 years
- O 11 - 15 years
- O 16 - 20 years
- O 21 years and above

6. Age:

- O 21- 30 years old
- O 31 - 40 years old
- O 41 - 50 years old
- O 51 - 60 years old
- O More than 60 years old

7. Gender:

- O Male
- O Female

8. Highest education:

- O PhD / Doctorate Degree
- O Master Degree
- O Bachelor Degree
- O Diploma
- O Certificate
- O STPM / SPM
- O Others (Please specify: _____)

9. Number of oil and gas construction projects you have involved:

- O 1- 5 projects
- O 6 - 10 projects
- O 11 - 15 projects
- O 15 - 20 projects
- O More than 20 projects

10. Current position held:

- O Director / Executive Director
- O Senior Management
- O Project Manager
- O Manager / Head of Department
- O Project Engineer
- O Discipline Engineer (Mechanical/Electrical/Instrument/Control/Structural/ Process)
- O Hook Up / Commissioning Engineer
- O Operation/ Field Engineer
- O Sales / Proposal Engineer
- O System/Information Management Engineer
- O Construction Engineer
- O Site Supervisor
- O Inspector
- O Procurement / Buyer
- O Others (Please specify: _____)

11. Competency and professional qualification possessed:

- O Registered Professional Engineer
- O Project Management Competency Certification
- O Others (Please specify: _____)

12. Please choose type(s) of projects in Malaysia that you were involved in? **(You may choose more than ONE (1))**

- O Fixed Structural Platform
- O Semi-Submersible
- O Drillship
- O Tension Leg Platform (TLPs)
- O Floating Production Unit (FPUs)
- O Single Point Anchor Reservoir (SPARs)
- O Subsea Stations (PLEMs, PLETs)
- O Floating Production Storage and Offloading (FPSO)
- O Floating Storage and Offloading (FSO)
- O Floating Liquefied Natural Gas (FLNG) facility
- O Pipeline (Onshore)
- O Pipeline (Offshore)

Part C: High Performing Team Characteristics Effecting Performance of Oil and Gas Construction Projects in Malaysia

Instruction: Please mark (√) for your answer that best describes your knowledge, understanding and agreement in the given statements. Choose only ONE (1) answer for each statement. The answer is based on the following indicators.

1	2	3	4	5
Strongly disagreed	Disagreed	Neutral	Agreed	Strongly agreed

C.1.The followings are the **organisational structure characteristics** that contribute to the high performance in oil and gas construction projects that you have involved:

Organisational Structure Characteristics		**Strongly disagreed**	**Disagreed**	**Neutral**	**Agreed**	**Strongly agreed**
13	Clear purpose	O	O	O	O	O
14	Clear roles	O	O	O	O	O
15	Clear work assignment	O	O	O	O	O
16	Recognition	O	O	O	O	O
16	Reward	O	O	O	O	O
17	Relevant members	O	O	O	O	O
18	Set performance oriented task-goal	O	O	O	O	O
19	Adequate resource	O	O	O	O	O
20	Appropriate culture	O	O	O	O	O
21	Clear goal	O	O	O	O	O
22	Collaboration between leaders	O	O	O	O	O
23	Common interest	O	O	O	O	O
24	Common goals	O	O	O	O	O
25	Common strategy	O	O	O	O	O
26	Contract model	O	O	O	O	O
27	Established performance standard	O	O	O	O	O
28	External relations	O	O	O	O	O
29	Former relation between team members	O	O	O	O	O

Organisational Structure Characteristics		Strongly disagreed	Disagreed	Neutral	Agreed	Strongly agreed
30	Determination on how difficult to reach the goal	O	O	O	O	O
31	Involvement in goal setting process	O	O	O	O	O
32	Leadership	O	O	O	O	O
33	Management support	O	O	O	O	O
34	Mix of complementary skill	O	O	O	O	O
35	New information feed	O	O	O	O	O
36	Specific task	O	O	O	O	O
37	Style diversity	O	O	O	O	O
38	Suitable leadership	O	O	O	O	O
39	Team building sessions	O	O	O	O	O
40	Team diversity	O	O	O	O	O
41	Smaller team	O	O	O	O	O
42	Experienced team member	O	O	O	O	O
43	Empowered key position	O	O	O	O	O

C.2.The followings are the **team process characteristics** that contribute to the high performance in oil and gas construction projects that you have involved:

Team Process Characteristics		Strongly disagreed	Disagreed	Neutral	Agreed	Strongly agreed
44	Cohesion	O	O	O	O	O
45	Effective communication	O	O	O	O	O
46	Agreed behaviour	O	O	O	O	O
47	Performance feedback	O	O	O	O	O
48	Shared leadership	O	O	O	O	O
49	Civilised disagreement	O	O	O	O	O
50	Conflict management	O	O	O	O	O
51	Consensus decision	O	O	O	O	O
52	Cooperation	O	O	O	O	O
53	Coordination	O	O	O	O	O
54	Decision making	O	O	O	O	O
55	Focus on team development	O	O	O	O	O
56	Absence of formality within team	O	O	O	O	O
57	Initial impression on team	O	O	O	O	O
58	Learning sessions	O	O	O	O	O
59	Mutual accountability	O	O	O	O	O
60	Shared values	O	O	O	O	O
61	Social relationship	O	O	O	O	O
62	Spend time together	O	O	O	O	O

C.2.The followings are the **individual contribution characteristics** that contribute to the high performance in oil and gas construction projects that you have involved:

Individual Contribution Characteristics		Strongly disagreed	Disagreed	Neutral	Agreed	Strongly agreed
63	Commitment	O	O	O	O	O
64	Trust between team members	O	O	O	O	O
65	Continual improvement	O	O	O	O	O
66	Effort	O	O	O	O	O
67	Elite feeling	O	O	O	O	O
68	Flexibility	O	O	O	O	O
69	Individual responsibilities	O	O	O	O	O
70	Listens to other team members	O	O	O	O	O
71	Participation	O	O	O	O	O
72	Self-assessment	O	O	O	O	O
73	Self-knowledge	O	O	O	O	O

74. If there are **other** characteristics of high performing team for oil and gas construction projects, please specify.

_____

_____

Part D: High Performing Team Integration Practices Effecting Performance of Oil and Gas Construction Projects in Malaysia

D.1.The followings are the **organisational structure integration practices** that contribute to the high performance in oil and gas construction projects that you have involved:

	Organisational Structure Integration Practices	Strongly disagreed	Disagreed	Neutral	Agreed	Strongly agreed
75	Creation of a single co-located team	O	O	O	O	O
76	Seamless operation with no organisationally defined boundaries	O	O	O	O	O
77	Unrestricted cross-sharing of information	O	O	O	O	O
78	Creation of client care team	O	O	O	O	O
79	Commitment from top management	O	O	O	O	O
80	Effective management of occupational health and safety (OSH)	O	O	O	O	O
81	Encouragement for initiatives	O	O	O	O	O
82	Integrated information and communication technology (ICT) system	O	O	O	O	O
83	Leadership facilitation and support	O	O	O	O	O
84	Members' affinity to the team	O	O	O	O	O
85	Team competency	O	O	O	O	O

D.1.The followings are the **team process integration practices** that contribute to the high performance in oil and gas construction projects that you have involved:

	Team Process Integration Practices	**Strongly disagreed**	**Disagreed**	**Neutral**	**Agreed**	**Strongly agreed**
86	Single team focus	O	O	O	O	O
87	Single team objectives	O	O	O	O	O
88	Mutually beneficial outcomes	O	O	O	O	O
89	Team flexibility to change	O	O	O	O	O
90	Team responsiveness to change	O	O	O	O	O
91	Equal opportunities for project input	O	O	O	O	O
92	Increased time predictability	O	O	O	O	O
93	Increased cost predictability	O	O	O	O	O
94	Effectiveness of team meeting	O	O	O	O	O
95	Empathy based working environment	O	O	O	O	O
96	Existence of systemised decision making	O	O	O	O	O
97	Existence of function evaluation process	O	O	O	O	O
98	Innovation	O	O	O	O	O
99	Improvement	O	O	O	O	O
100	Strict management of changes	O	O	O	O	O
101	Continuous dialogue sessions	O	O	O	O	O

D.1.The followings are the **individual contribution integration practices** that contribute to the high performance in oil and gas construction projects that you have involved:

	Individual Contribution Integration Practices	**Strongly disagreed**	**Disagreed**	**Neutral**	**Agreed**	**Strongly agreed**
102	No blame culture	O	O	O	O	O
103	Equitable team relationship for all	O	O	O	O	O
104	Equitable respect for all	O	O	O	O	O
105	Collective understanding	O	O	O	O	O
106	Effective communication	O	O	O	O	O
107	Functional relationship between the individual	O	O	O	O	O
108	Functional relationship between the team	O	O	O	O	O

109. If there are **other** integration practices of high performing team for oil and gas construction projects, please specify.

_____

_____

END OF THE QUESTIONS. THANK YOU FOR YOUR KIND RESPONSES.

Appendix B Pilot Questionnaire Survey

QUESTIONNAIRE SURVEY: TEAM INTEGRATION FRAMEWORK FOR MALAYSIAN OIL AND GAS CONSTRUCTION PROJECTS

Dear Sir/Mdm,

This questionnaire is designed to collect information on the high performing team characteristics and effective team integration practises for oil and gas construction projects in Malaysia. The outcome of this survey is to develop a team integration framework for Malaysian Oil and Gas Construction Projects. It is anticipated that the findings reported via this survey could assist the planning of future strategies and guidelines for the betterment of integrated team management in the Malaysian oil and gas construction projects.

The questionnaire is divided into four (4) parts:

1) **Part A** to obtain the company's profile of respondents.
2) **Part B** to obtain the respondent's particular.
3) **Part C** to identify the characteristics of high performing team in oil and gas construction projects in Malaysia.
4) **Part D** to assess the effective team integration practices in project delivery team which effects performance of oil and gas construction projects in Malaysia.

Therefore, I very much value your participation in this survey that should take approximately 20 minutes. It is important that you answer each question as thoughtfully and frankly as possible. There are no right or wrong answers. Your response will be treated with the strict confidence. If you have any questions or comments, please do not hesitate to contact us at davendren.vereya@sbmoffshore.com

Your feedback is very much appreciated. I thank you in advance for your time and kind cooperation.

Yours Sincerely,

IR. DAVENDREN VEREYA
ENGINEERING DOCTORATE CANDIDATE

Part A: Company Profile Information
Instruction: Please mark (√) for your answer. If there are others, please specify.

1. Firm ownership type:

- O Government Linked Company (GLC)
- O Government Owned Company (GOC)
- O National Oil Company
- O Independent Oil Company
- O Private Limited Company
- O Public Limited Company
- O Partnership
- O Others (Please specify: _____)

2. The company's function in an oil and gas project:

- O Client
- O Owner/Shareholder
- O Design Consultant
- O Project Management Consultant
- O Equipment Supplier
- O Service Provider
- O Fabricator/Main Contractor
- O Sub-contractor/sub-supplier
- O Others (Please specify: _____)

3. Involvement of your company in oil and gas industry:

- O Less than 2 years
- O 2 -5 years
- O 6 - 10 years
- O 11 - 15 years
- O 16 years and above

4. Please choose type(s) of projects in Malaysia that your organisation was involved with? **(You may choose more than one)**

- O Fixed Structural Platform
- O Semi-Submersible
- O Drillship
- O Tension Leg Platform (TLPs)
- O Floating Production Unit (FPUs)
- O Single Point Anchor Reservoir (SPARs)
- O Subsea Stations (PLEMs, PLETs)
- O Floating Production Storage and Offloading (FPSO)
- O Floating Storage and Offloading (FSO)
- O Floating Liquefied Natural Gas (FLNG) facility
- O Pipeline (Onshore)
- O Pipeline (Offshore)

Part B: Respondent's Demographic Profile

Instruction: Please mark (√) for your answer. If there are others, please specify.

5. Experience/involvement in oil gas construction project management:

- O 5 years
- O 6 - 10 years
- O 11 - 15 years
- O 16 - 20 years
- O 21 years and above

6. Age:

- O 21- 30 years old
- O 31 - 40 years old
- O 41 - 50 years old
- O 51 - 60 years old
- O More than 60 years old

7. Gender:

- O Male
- O Female

8. Highest education:

- O PhD / Doctorate Degree
- O Master Degree
- O Bachelor Degree
- O Diploma
- O Certificate
- O STPM / SPM
- O Others (Please specify: _____)

9. Number of oil and gas construction projects you have involved:

- O 1- 5 projects
- O 6 - 10 projects
- O 11 - 15 projects
- O 15 - 20 projects
- O 15 - 20 projects
- O More than 20 projects

10. Position held:

- ○ Director / Executive Director
- ○ Senior Management
- ○ Project Manager
- ○ Manager / Head of Department
- ○ Project Engineer
- ○ Discipline Engineer (Mechanical/Electrical/Instrument/Control/Structural/Process)
- ○ Hook Up / Commissioning Engineer
- ○ Operation/ Field Engineer
- ○ Sales / Proposal Engineer
- ○ System/Information Management Engineer
- ○ Construction Engineer
- ○ Site Supervisor
- ○ Inspector
- ○ Procurement / Buyer
- ○ Others (Please specify: _____)

11. Competency and professional qualification possessed:

- ○ Registered Professional Engineer
- ○ Project Management Competency Certification
- ○ Not applicable
- ○ Others (Please specify: _____)

12. Please choose type(s) of projects in Malaysia that you were was involved in? **(You may choose more than one)**

- ○ Fixed Structural Platform
- ○ Semi-Submersible
- ○ Drillship
- ○ Tension Leg Platform (TLPs)
- ○ Floating Production Unit (FPUs)
- ○ Single Point Anchor Reservoir (SPARs)
- ○ Subsea Stations (PLEMs, PLETs)
- ○ Floating Production Storage and Offloading (FPSO)
- ○ Floating Storage and Offloading (FSO)
- ○ Floating Liquefied Natural Gas (FLNG) facility
- ○ Pipeline (Onshore)
- ○ Pipeline (Offshore)

Part C: Characteristics of high performing team in oil and gas construction projects in Malaysia

Instruction: Please mark (√) for your answer that best describes your knowledge, understanding and preference in the given statements. Choose only one answer for each statement. The answer is based on the following indicators.

1	2	3	4	5
Strongly disagreed	Disagreed	Neither disagreed nor agreed	Agreed	Strongly agreed

C.1 High performing team in oil and gas construction project in Malaysia shall have following characteristics in the **organisational structure**:

Characteristics		**1** **Strongly disagreed** **1**	**2** **Disagreed** **2**	**3** **Neither disagreed nor agreed** **3**	**4** **Agreed** **4**	**5** **Strongly agreed** **5**
13	Clear purpose	○	○	○	○	○
14	Clear roles and work assignment	○	○	○	○	○
15	Recognition and reward	○	○	○	○	○
16	Relevant members	○	○	○	○	○
17	Set Performance oriented task-goal	○	○	○	○	○
18	Adequate resource	○	○	○	○	○
19	Appropriate culture	○	○	○	○	○
20	Clear goal	○	○	○	○	○
21	Collaboration between leaders	○	○	○	○	○
22	Common interest, goals and strategy	○	○	○	○	○
23	Contract model	○	○	○	○	○
24	Established performance standard	○	○	○	○	○
25	External relations	○	○	○	○	○
26	Former relation between team members	○	○	○	○	○
27	How difficult to reach the goal?	○	○	○	○	○
28	Involvement in goal setting process	○	○	○	○	○
29	Leadership	○	○	○	○	○
30	Management support	○	○	○	○	○

Characteristics		1 Strongly disagreed 1	2 Disagreed 2	3 Neither disagreed nor agreed 3	4 Agreed 4	5 Strongly agreed 5
31	Mix of complementary skill	○	○	○	○	○
32	New information feed	○	○	○	○	○
33	Specific task	○	○	○	○	○
34	Style diversity	○	○	○	○	○
35	Suitable leadership	○	○	○	○	○
36	Team building	○	○	○	○	○
37	Team diversity	○	○	○	○	○
38	Smaller team	○	○	○	○	○
39	Experienced team member	○	○	○	○	○
40	Empowered key position	○	○	○	○	○

C.2 High performing team in oil and gas construction project in Malaysia shall have following characteristics in the **team process**:

	Characteristics	Strongly disagreed 1	Disagreed 2	Neither disagreed nor agreed 3	Agreed 4	Strongly agreed 5
41	Cohesion	○	○	○	○	○
42	Communication	○	○	○	○	○
43	Agreed behaviour	○	○	○	○	○
44	Performance feedback	○	○	○	○	○
45	Shared leadership	○	○	○	○	○
46	Civilized disagreement	○	○	○	○	○
47	Conflict management	○	○	○	○	○
48	Consensus decision	○	○	○	○	○
49	Cooperation	○	○	○	○	○
50	Coordination	○	○	○	○	○
51	Decision making	○	○	○	○	○
52	Focus on team development	○	○	○	○	○
53	Informality	○	○	○	○	○
54	Initial Impressions	○	○	○	○	○

	Characteristics	Strongly disagreed 1	Disagreed 2	Neither disagreed nor agreed 3	Agreed 4	Strongly agreed 5
55	Learning activities	○	○	○	○	○
56	Mutual accountability	○	○	○	○	○
57	Shared values	○	○	○	○	○
58	Social relationship	○	○	○	○	○
59	Spend time together	○	○	○	○	○

C.3 High performing team in oil and gas construction project in Malaysia shall have following characteristics by **individual contribution**:

	Characteristics	Strongly disagreed 1	Disagreed 2	Neither disagreed nor agreed 3	Agreed 4	Strongly agreed 5
60	Commitment	○	○	○	○	○
61	Trust between team members	○	○	○	○	○
62	Continual improvement	○	○	○	○	○
63	Effort	○	○	○	○	○
64	Elite feeling	○	○	○	○	○
65	Flexibility	○	○	○	○	○
66	Individual responsibilities	○	○	○	○	○
67	Listening	○	○	○	○	○
68	Participation	○	○	○	○	○
69	Self-assessment	○	○	○	○	○
70	Self-knowledge	○	○	○	○	○

71. If there are **other** characteristics of high performing team for oil and gas construction projects, please specify.

_____
_____
_____
_____

Part D: Effective team integration practices in project delivery team which effects performance of oil and gas construction projects in Malaysia

Instruction: Please mark (√) for your answer that best describes your experience and knowledge in the given statements. Choose only one answer for each statement. The answer is based on the following indicators.

1	2	3	4	5
Strongly disagreed	Disagreed	Neither disagreed nor agreed	Agreed	Strongly agreed

D.1. Following are the effective integration practise which can improve the **performance** of oil and gas construction project in Malaysia.

	Practises	Strongly disagreed 1	Disagreed 2	Neither disagreed nor agreed 3	Agreed 4	Strongly agreed 5
Organisational Structure						
72	Creation of a single co-located team	○	○	○	○	○
73	Seamless operation with no organisationally defined boundaries	○	○	○	○	○
74	Unrestricted cross-sharing of information	○	○	○	○	○
75	Creation of client care team	○	○	○	○	○
76	Commitment from top management	○	○	○	○	○
77	Effective management of health & safety	○	○	○	○	○
78	Encouragement for initiatives	○	○	○	○	○
79	Integrated ICT system	○	○	○	○	○
80	Leadership facilitation and support	○	○	○	○	○
81	Members' affinity to the team	○	○	○	○	○
82	Team competency	○	○	○	○	○
Team Process						
83	Single team focus and objectives	○	○	○	○	○
84	Mutually beneficial outcomes	○	○	○	○	○
85	Team flexibility and responsiveness to change	○	○	○	○	○
86	Equal opportunities for project input	○	○	○	○	○

	Practises	Strongly disagreed 1	Disagreed 2	Neither disagreed nor agreed 3	Agreed 4	Strongly agreed 5
87	Increased time and cost predictability	○	○	○	○	○
88	Effectiveness of team meeting	○	○	○	○	○
89	Empathy based working environment	○	○	○	○	○
90	Existence of systemized decision making and function evaluation process	○	○	○	○	○
91	Innovation and improvement	○	○	○	○	○
92	Strict management of changes	○	○	○	○	○
93	Continuous dialogue sessions	○	○	○	○	○
Individual Contribution						
94	No blame culture	○	○	○	○	○
95	Equitable team relationship and respect for all	○	○	○	○	○
96	Collective understanding	○	○	○	○	○
97	Effective communication	○	○	○	○	○
98	Functional relationship between the individual and the team	○	○	○	○	○

99. If there are **other** effective integration practise which can improve the performance of oil and gas construction project in Malaysia, please specify.

_____
_____
_____

END OF THE QUESTIONS. THANK YOU FOR YOUR KIND RESPONSES.

Appendix C Expert Validation Questionnaire

EXPERT FOCUS GROUP INTERVIEW:

VALIDATING A FRAMEWORK OF HIGH PERFORMING TEAM FOR MALAYSIAN OIL AND GAS CONSTRUCTION PROJECTS

Dear Sir/Mdm,

This expert focus group interview is designed to validate a framework of high performing team for oil and gas construction projects in Malaysia, consisting of characteristics and effective team integration practices. The experts are guided via semi-structured questionnaires and are required to answer based on Figure 1. It is anticipated that the findings reported via this expert focus group interview could assist the planning of future strategies and guidelines for the betterment of integrated team management in the Malaysian oil and gas construction projects.

Therefore, I very much value your participation in this survey that should take approximately 20 minutes. It is important that you answer each question as thoughtfully and frankly as possible. There are no right or wrong answers. Your response will be treated with the strict confidence. If you have any questions or comments, please do not hesitate to contact me at davendren.vereya@sbmoffshore.com

Your feedback is very much appreciated. I thank you in advance for your time and kind cooperation.

Yours Sincerely,

IR. DAVENDREN VEREYA
ENGINEERING DOCTORATE CANDIDATE

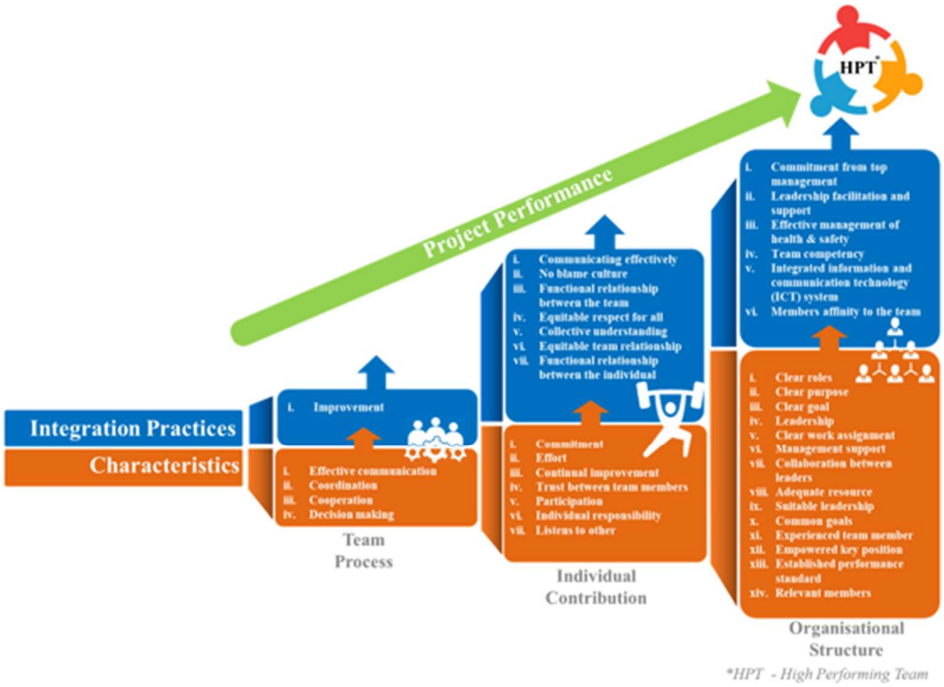


Figure 1 Proposed Framework of High Performing Team for Malaysian Oil and Gas Construction Projects

Figure 1 illustrates the proposed framework of high performing team for Malaysian oil and gas construction projects as agreed by the previous 418 respondents amongst oil and gas construction organisations via a questionnaire survey. Based on Figure 1, please indicate your opinion to each question below.

Part A: High performing team characteristics

1. How relevant are the characteristics, which have been identified as the most significant team process characteristics of the high performing team affecting oil and gas project performance?
   Why?

Very Relevant	Relevant	Fairly relevant	Slightly Relevant	Not at all relevant
☐	☐	☐	☐	☐
Justification :				

2. How relevant are the characteristics, which have been identified as the most significant individual contribution characteristics of the high performing team affecting oil and gas project performance?
   Why?

Very Relevant	Relevant	Fairly relevant	Slightly Relevant	Not at all relevant
☐	☐	☐	☐	☐
Justification :				

3. How relevant are the characteristics, which have been identified as the most significant organisational structure characteristics of the high performing team affecting oil and gas project performance?
   Why?

Very Relevant	Relevant	Fairly relevant	Slightly Relevant	Not at all relevant
☐	☐	☐	☐	☐
Justification :				

4. Are there any characteristics (other than listed in the framework) that you think should be included in this framework? Why?

Answer	
Justification :	

Part B: High performing team integration practices

1. How relevant are the integration practices, which have been identified as the most significant team process integration practices of the high performing team affecting oil and gas project performance?
   Why?

Very Relevant	Relevant	Fairly relevant	Slightly Relevant	Not at all relevant
☐	☐	☐	☐	☐
Justification :				

2. How relevant are the integration practices, which have been identified as the most significant individual contribution integration practices of the high performing team affecting oil and gas project performance?
   Why?

Very Relevant	Relevant	Fairly relevant	Slightly Relevant	Not at all relevant
☐	☐	☐	☐	☐
Justification :				

3. How relevant are the integration practices, which have been identified as the most significant organisational structure integration practices of the high performing team affecting oil and gas project performance?
   Why?

Very Relevant	Relevant	Fairly relevant	Slightly Relevant	Not at all relevant
☐	☐	☐	☐	☐
Justification :				

4. Are there any integration practices (other than listed in the framework) that you think should be included in this framework? Why?

Answer	
Justification :	

Part C: General

1. Do you agree with the overall arrangement of this framework?

Yes	Moderately Yes	No
☐	☐	☐
Comments		

2. Do you understand the general idea and intention of this framework?

Yes	Moderately Yes	No
☐	☐	☐
Comments		

3. Do you agree that this framework will provide useful information and guidelines for your organisation to develop high performing team for Malaysian oil and gas construction projects?

Yes	Moderately Yes	No
☐	☐	☐
Comments		

4. Do you agree that this framework will help other organisations in successfully management of high performing team for Malaysian oil and gas construction projects?

Yes	Moderately Yes	No
☐	☐	☐
Comments		

5. Do you have any suggestion in improving the proposed framework of high performing team integration for Malaysian oil and gas construction Projects? If yes, please state.

Answer	
Justification :	

Appendix D Expert Panel's Curriculum Vitae

Ir. SHAZLAN RAHMAN PMP PEng CEng MICE MIEM

Project Manager

Kuala Lumpur, Malaysia
+60 (0) 17 275 7750 shazlan.rahman@outlook.com www.linkedin.com/in/shazlan-rahman

PROFILE

I have 15 years of working experience, primarily in project management and structural engineering of offshore oil & gas projects.

CAREER SUMMARY

EPCI Project Manager
TechnipFMC
2019 – ongoing Kuala Lumpur, Malaysia

- Managing engineering, procurement, construction and installation (EPCI) of subsea wellheads projects.

EPC Project Manager
Aker Solutions
2017 – 2019 Port Klang, Malaysia

- Managed engineering, procurement and construction (EPC) projects involving subsea wellheads, control systems and well jumper kits.

Senior Structural Engineer
Aker Solutions
2013 – 2016 Kuala Lumpur, Malaysia

- Involved in various international offshore oil & gas projects, ranging from conceptual to detailed designs of topsides and jacket structures.
- Spearheaded LEAN initiatives to optimise Aker Solutions procedures.

Structural Integrity Engineer
Atkins – Oil & Gas Division
2011 – 2012 London, UK

Structures Team Leader
Atkins – Highways Division
2004 – 2011 Manchester, UK

PROFESSIONAL QUALIFICATIONS

Project Management Professional (PMP)
Project Management Institute, USA (PMI)

Chartered Engineer (CEng)
Engineering Council, UK

Professional Engineer (PEng)
Board of Engineers, Malaysia (BEM)

Corporate Member of ICE (MICE)
The Institution of Civil Engineers, UK (ICE)

Corporate Member of IEM (MIEM)
The Institution of Engineers, Malaysia (IEM)

MOST PROUD OF

Engineering Achievement
I graduated with 1st class engineering degree and received several academic awards. Throughout my career, I have obtained major professional qualifications in Malaysia, the UK and USA.

Improving Team Efficiency
I optimised the work processes at Aker Solutions and was awarded as the Winner for their Global Improvement Competition 2016.

Voluntary Works
I spend my spare time promoting engineering at schools, universities and among my engineering peers. I also act as mentor to graduate engineers on obtaining their professional qualifications.

Cultural Diversity
I have worked at and travelled to various countries around the globe. I enjoy learning and adapting to other cultures.

KEY STRENGTHS

Project Management	●●●●●
Structural Engineering	●●●●●
Leadership	●●●●○
LEAN & Quality Improvement	●●●●○

LANGUAGES

Malay	●●●●●
English	●●●●●

EDUCATION

MEng in Civil Engineering
UMIST, Manchester, UK
Sep 2000 – Jul 2004

- 1st Class with Honours
- Excellent Performance in 4th Year Design Project
- Consolation Prize for UK Bridge Design Competition 2003/2004
- Top Student Awards for Second Year & Third Year

SELECTED PROJECTS

(refer to Appendix A for full list of projects)

Sabah & Sarawak Exploratory Subsea Wells

for Petronas Malaysia

Sep 2019 – Ongoing | TechnipFMC, Kuala Lumpur

Contract Value (EPCI): *Classified*

- Appointed as Project Manager for the delivery and installation of subsea wellheads. Lead a team of 20 people on engineering, procurement, fabrication and installation activities.
- Also responsible for providing valuable advice in the daily operational meeting with Petronas during their drilling campaign.

Dalia Ph. 3 – Subsea Production System (SPS)

for Total E&P Angola

Jul 2018 – Aug 2019 | Aker Solutions, Port Klang

Contract Value (EPC): *Classified*

- Appointed as Work Pack Manager for Wellheads and Controls Systems - led a team of 30 people on engineering, procurement and fabrication activities.
- Also responsible for managing and monitoring our Controls Systems team in the UK. I prepared their scope of work and monitored their progress.

Clov 1 & Dalia D3P37 – Subsea Well Jumper Kits

for Total E&P Angola

Mar 2017 – Jun 2018 | Aker Solutions, Port Klang

Contract Value (EPC): *Classified*

- Appointed as Project Manager – Led a team of 25 people in this EPC project.
- This was my first time in managing subsea project, and I was able to complete the project on time and within budget.

Sao Vang CPP and Dao Nguyet WHP - FEED

for Idemitsu Oil & Gas Vietnam

Aug 2016 – Feb 2017 | Aker Solutions, Kuala Lumpur

Contract Value (Engineering): *Classified*

- Appointed as Structural Engineer - Carried out the spectral fatigue, transportation and on-bottom stability analyses of the jacket structures.

Bassein CPP & LQ Platforms - Detailed Design

for ONGC India

Sep 2015 – Nov 2016 | Aker Solutions, Kuala Lumpur

Contract Value (Engineering): *Classified*

- Main Structural Engineer and Model Controller for the LQ jacket structure.
- Carried out in-place, fatigue and lifting analyses of the jacket structure.

Optimisation of Structural Drawing Production

for Aker Solutions (in-house project)

May 2015 – Aug 2015 | Aker Solutions, Kuala Lumpur

- Appointed as Project Manager – responsible for reducing the time taken in producing structural drawings by adopting LEAN Methodology.
- This initiative improved the efficiency of our drawing production by 30%; and was awarded as Winner for Aker' Global Improvement Competition 2016.

TECHNICAL SKILLS

General

Design | Construction | Inspection | Quality, Safety & Environment

Project Management

Leadership | Delivery to Time, Budget & Scope | Customer Interface | Commercial Awareness

Offshore Structural Engineering

Topsides | Jacket | Pile Foundation | In-Place | Spectral Fatigue | Deterministic Fatigue | Boat Impact | Loadout | Transportation | Lifting | On-Bottom Stability

Design Codes

British Standards | Euro Codes | DMRB | API | AISC | ISO | Petronas PTS

SOFT SKILLS

Oral Presentation | Communication | Writing (Technical & Non-Technical)

IT SKILLS

MS Office Suites	●●●●●
SACS	●●●●●
SAP	●●●●○
MathCAD	●●●●○
AutoCAD	●●●○○

COURSES ATTENDED

Course Name	Duration	Date
1. Technical		
• SACS Training Course – Advance	3 days	Mar 2013
• SESAM Finite Element Modelling	2 days	May 2012
2. Project Management		
• Crucial Conversation	2 days	Nov 2018
• Project Management Professional (PMP) Certification Preparation	5 days	May 2018
• LEAN Approach – Value Stream Mapping and 'A3' processes	2 days	May 2015
3. Health and Safety		
• Health, Safety and Environment in the Marine Industry	1 day	Oct 2013
• BEM Safety and Health at Work	2 days	May 2013

LECTURES

Route to Professional Engineer in Malaysia (1-hr lecture)

May 2020 — **TechnipFMC**, online webinar

- I gave a 1-hr online lecture on how to obtain Professional Engineering (PEng) Qualification
- Among the topics covered were the various routes to sit for the PEng exam; and the pros and cons of each routes.

Offshore Structures in the Oil & Gas Industry (2-hrs lecture)

April 2018 — **IEM**, Petaling Jaya

- I gave a 2 hrs lecture on the offshore structure of the oil & gas industry
- Among the topics covered were the various type of structures in the oil & gas industry and the installation procedures for fixed offshore structure.

Introduction to Oil & Gas Industry (1-day course)

Aug 2016 — **Aker Solutions**, Kuala Lumpur

- I was one of the three lecturers in this 1 day-course.
- I gave a 2 hrs lecture on the infrastructure of the oil & gas industry from the mid-19th century until now.

PUBLICATIONS

1. Shazlan Rahman; Talk on 'Effect of Environmental Forces on Offshore Structure Decommissioning Operation'; Jurutera, Nov 2019.
2. Shazlan Rahman; the Design of Oil & Gas Fixed Offshore Platform; Jurutera, Nov 2017.
3. Shazlan Rahman; Finite Element Analysis on Offshore Structures; Jurutera, Nov 2015.
4. Shazlan Rahman; Technical Talk on Floating Production, Storage and Offloading (FPSO) Vessel; Jurutera, Sep 2015.

VOLUNTARY WORKS

IEM Committee Member

Aug 2013 – Ongoing

- Organise engineering activities such as technical visits, training courses and competition for IEM members and the public.
- Give lectures on engineering subjects at IEM and universities.
- Mentoring graduate engineers on obtaining their Professional Qualifications

ICE UK – Registered Mentor

Sep 2017 – Ongoing

- Mentoring graduate civil engineers on obtaining their Chartership Qualification from ICE UK.

AWARDS

Aker Solutions Global Improvement Competition 2016

Winner

- A global competition organised by Aker Solutions to identify the best improvement initiative within the organization.
- My LEAN improvement project was selected as the winner which helped my Structural Team saved 6000 man-hours in our drawing production.

The Institution of Engineers Malaysia (IEM) Essay Competition 2014

Third Place

- Essay title: Would IEM be Relevant and Sustainable to Serve its Current and Future Members in the Light of Global Engineering Challenges?

HOBBIES & INTERESTS

- Reading
- Writing / Blogging
- Travelling
- Running
- Swimming
- Promoting STEM Activities

DRIVING LICENSE

- Full Malaysia Driving License

Mobile: +6019-6503861, Email: afandimajid69@gmail.com

Ir. Ts. Hj. Afandi Majid CEng, CCPM,

PROJECT MANAGER

EDUCATION

- **Candidate for Master of Occupational Safety and Health Risk Management (MOSHRM),** Open University Malaysia (OUM) Kuala Lumpur, to be graduated by Early 2021
- **Bachelor of Engineering (Hons) in Chemical Engineering**, University of Strathclyde, Glasgow Scotland, United Kingdom, 1992
- **Diploma in Chemical Engineering,** Universiti Teknologi Malaysia, Kuala Lumpur, 1990

PROFESSIONAL AFFILIATIONS

- Board of Engineers Malaysia (P.E. Registration No: P119784)
- Chartered Engineer (CEng) with Engineering Council UK, Registration No: 590523
- Chartered Marine Engineer (CMarEng) with IMarEST, Registration No: 8012223 and MIMarEST
- Associate Member of Institute of Chemical Engineer UK, AMIChemE Membership No: 351962
- Member of Society of Petroleum Engineer, SPE Member No: 3554520
- Professional Technologist from MBOT (No Perakuan: PT20100014)
- Certified Construction Project Manager (CCPM) by CIDB Malaysia, Aug 2020 (No: 211345)
- Associate Member of Institute of Materials, Malaysia, (IMM No: 0-9717)
- Student Member of Malaysian Society for Occupational Safety & Health, MSOSH (Reg no: 7647)
- Member of International Project Management Association, (MIPMA No:0074)

SUMMARY EXPERIENCES

Since graduation in 1992, Afandi has been working for twenty-eight (28) years in Oil and Gas, Steel Making and Industrial Gases Industries.

He had worked for Lion Group of Companies for thirteen (13) years with last position held as Engineering/Project Manager, with RNZ Integrated (M) Sdn Bhd for thirteen (13) years with last position as Project Manager and Wood Group Engineering Sdn Bhd for one (1) year as Engineering Manager and currently with Maju Integrated Engineers Sdn Bhd (MIE) since September 2019 as a Project Manager.

He has more than fifteen (15) years working experiences in oil and gas industry, involved in various stage of engineering design such as Concept Select, Pre-Conceptual, Conceptual, Pre-FEED, FEED, Detailed Design and Follow on Engineering for Greenfield and Brownfield projects in Oil and Gas Industry. He has involved in EPCC of NG pipelines and MRS projects, EPCC of Air Separation Plants, Industrial Gases Pipelines, Offshore platform design and de-bottlenecking, upgrading, infill drilling, onshore oil and gas terminals, equipment skids and brownfield FIP projects.

He has strong background in project management, technical procurement, sourcing and negotiation, ASU plant operation and maintenance, HSE implementation, business development, proposal/bidding management, customer services and engineering interface management. He is very good in permitting and liaison with local authorities.

Familiar with relevant international codes and standards including ASME, ANSI, API, PTS and others.

WORK EXPERIENCES

Sept 2019-Presents — **MAJU INTEGRATED ENGINEERS SDN BHD – Energy Division**
PROJECT MANAGER

1) **Owner/Client: EnQuest Petroleum Production Malaysia Ltd**

Project Title: Provision of Engineering Study for Seligi A Compressor Train D Rejuvenation Project (Concept Selection Study and FEED)

2) **Owner/Client: PETRONAS CARIGALI SDN BHD**
Project Title: Facilities Improvement Proposal (FIP) and Plant Change for PETRONAS (PCSB SK-Oil Sarawak, Malaysia) for all work orders, from 2019 to 2022
   i. Provision of FEED and Detailed Design for PL323 Pipeline Replacement Project
   ii. Provision of FEED and Detailed Design for PL221/218 Pipeline Replacement Project
   iii. Provision of FEED and Detailed Engineering Design for PL220, PL238 & PL337 Chemical Injection
   iv. Baram A Fuel Gas System
   v. Feasibility Study for Installation of Condensate Recovery System (CRS)/ Liquid Recovery System (LRS) at D18 MP-A
   vi. Feasibility Study for Tukau Timur/Laila Condensate Evacuation to Bintulu Crude Oil Terminal
   vii. Feasibility Study, Conceptual Design and FEED for Installation of Security Gates at Tukau Asset
   viii. Feasibility Srud and Conceptual Design for Improvement at Boat landing Area for Swing Rope Replacement at D35
   ix. Feasibility Study and Conceptual Design for Modification of Boat landing Elevation and Toilet Installation at D35JT-C
   x. Provision of Detailed Engineering Design for MCOT Culvert Bridge PL106
   xi. Provision of Feasibility Study for D12DR-A Boat Landing Modification
   xii. Provision of Engineering design for CCTV installation at MCOT

3) **Owner/Client: MALAYSIAN REFINING COMPANY SDN BHD (MRCSB) or Petronas Penapisan Melaka**
Project Title: Basic Engineering Design for Effluent Management at Source (EMAS) Project and preparation of EPCC SOW packages.

4) **Owner/Client: MALAYSIAN REFINING COMPANY SDN BHD (MRCSB) or Petronas Penapisan Melaka**
Project Title: Provision of Engineering Services for MRCSB Refinery Asset Rejuvenation Tiga (RESET) Project (Feasibility study of Marine Loading Arm, Fire Safety, Desalter Upgrade, Transformer Cooling, Over Head Crane Electrical Control Room, HVAC for Sub Stations and HVAV for UF Building, Dynamic Simulation for CCR compressor and RCFA study for GTGs)

5) **Owner/Client: CARIGALI-PTTEPI Operating Company Sdn Bhd (CPOC)**
Project Title: Provision of Engineering Call Out Services for Block B-17 & C-19 and Block B-17-01 (Umbrella Contract) from 2019 to 2022. WO for piping modification at TJA, ADA and ADB platforms.

6) **Owner/Client: ROC Oil Malaysia (Holdings) Sdn Bhd**
Project Title: BED/Pre-FEED Study for J4DP-A Surface Power Requirement Design for D35/D21/J4 Fields Re-Development Project. Conceptual study of four options power generation at J4DP-A Platform and FEED for the selected option.

7) **Owner/Client: Petronas Dagangan Berhad (PDB)**
Project Title: Provision of FEED/BED Services for PDB Kota Kinabalu Aviation Fuel Terminal Expansion Project. Additional on 4Mi litre Jet A1 storage tank, MOV, filling system, instrument and control, electrical, mechanical, piping, safety and civil scope.

8) **Engineering Proposal Supports** for organising technical and manhours inputs according to CTRs and Scope of Work (SOW) of Assumptions/Exclusion list, Project Execution Plan (PEP or Methodology of scope execution), third party SOW, internal manhours, participate in internal challenge sessions, response to bid clarifications, participate in Technical Clarification Meetings (TCM), Participate in Technical Clarification and Commercial Meetings (TCCM) etc.

ADDITIONAL INFORMATION

COURSE ATTENDED

- Attending CIDB Certified Facility Management Manager (CFMM) online course conducted by Mega Jati Academy Sdn Bhd & University Malaysia Perlis (UNIMAP) from 16 to 30 Nov 2020
- Completed Halal Training by Islamic Food Research Centre (IFRC) Hong Kong, Selangor Darul Ehsan, Malaysia 13th Nov 2020.
- Attended five days course and been competent for TM002-Basis Training Methodology for Instructors by Centre for Instructor and Advanced Skill Training (CIAST) which organised by Mega Jati Academy Sdn Bhd (MJA), Oct 2020
- Attended five days (8 hours) Train The Trainer (TTT) Course – Level I by Mr Atul Sharman, www.oasisoflearning.com, Oct 2020, (Cert no: 202010222)
- Attended ten days course and been Certified Facility Management Executive (CFME) conducted by Construction Industrial Development Board (CIDB) Malaysia, University Institute Technology Mara (UiTM) Perak and Maju Jati Academy Sdn Bhd (MJA), Sep 2020
- Attended a 3 days Mini Course on Commissioning and Startup by www.commissioningAndStartup.com, Mr Paul Turner P.Eng, PMP, Aug 2020
- Attended ten days course and been Certified Construction Project Manager (CCPM) organised by Construction Industrial Development Board (CIDB) Malaysia, University Malaysia Pahang (UMP) and Mega Jati Academy Sdn Bhd (MJA), Jun 2020 (cert No:211345)

Mobile: +6019-6503861, Email: afandimajid69@gmail.com

Ir. Ts. Hj. Afandi Majid CEng, CCPM,

PROJECT MANAGER

- Certificate in Safety and Health Officer, NIOSH, Bangi, 2010
- Edward de Bono's Six Thinking Hats course, November 1994
- Basis Financial Management Course, June 1994
- Supervisory Skills Appreciation Course, June 1994,
- Performance Planning and Control Course, Jun 1995
- Productivity Improvement Techniques Course, August 1995
- Problem Solving & Decision-Making Course, December 1994
- Total Quality Management Course, November 1994
- ISO 9000 Documenting the Quality System, May 2000
- ISO 9000 Internal Auditor Training, June 2000

PROFILE

https://www.linkedin.com/in/ir-ts-afandi-majid-c-eng-uk-ccpm-cfme-peng-ptech-ong-amicheme-91140532/

JAMES YII YANG HO

Wilayah Persekutuan Labuan • 019-8212233 • jamesyii@petronas.com

PROFESSIONAL EXPERIENCE

June 2019 – Present
Organization Coach • **PETRONAS**

- Led the establishment of new work processes in the organization. The work processes are aimed to achieve better efficiency and effectiveness at work. The work processes cover; plant operation, plant maintenance, reliability & integrity management, technology improvement and production planning.
- Developing organization culture of accountability and empowerment in areas such as HSE, Innovation, Work Process and Problem Solving/Decision Making.
- Advises on capability development and knowledge management (technical and soft-skills).
- Provides individual and team coaching on work performance improvement.
- Coaches teams on improvement projects; Lean Six Sigma, ICC, etc.

June 2018 – December 2019
Head of Process Safety • **PETRONAS**
Head of Project Management • **PETRONAS**

- Helmed both the Process Safety and Project Management department.
- Recorded significant improvement in Process Safety performance resulted from the Process Safety R2C2 program initiated in 2016.
- Won the IChemE Malaysia Award 2019 with Process Safety R2C2.
- Pacesetter for PETRONAS Chemicals Group by piloting several groupwide initiatives – EMOC 2.0, Bow Tie Adequacy Study (ALARP Demonstration) at the facility, Leak Detection and Repair (LDAR), Joint Integrity certification and Gas Cloud Imaging camera.
- 7 projects worth a total of RM 14.6 mil was completed during tenure, on time without variation order or major rework and recorded safe-manhours of 250,000.
- Reviewed and enhanced the QAQC procedures for plant turnaround 2018.
- Led several root cause analyses using Tripod-Beta, Fault Tree Analysis and E&CF chart.

2016 – 2018
Process Safety Executive • **PETRONAS**

Open

- Established the Process Safety R2C2 which is a 3-years transformation journey. It aims to take a quantum leap to achieve the next level of process safety performance and culture excellence in PETRONAS Chemicals Methanol Sdn Bhd. Process Safety R2C2 was designed based on the Influence Model to effectively drive and sustain the organizational culture change. A combination of best practices was implemented as a single ecosystem to make this ambitious endeavor possible.
- Enhance Process Safety practices across various aspects: - Process Safety Information, Process Hazard Analysis, Management of Change, Safe Operating Envelope, Pre-Activity Safety Review, Design Integrity, Safety Critical Element and Operating Procedure.
- Spearheaded Process Safety Audit Protocol at the facility for deep dive audit into process safety system.
- Part of team in application with DOSH for Special Scheme Inspection. Reduces Turnaround cost and duration.
- Team member for Foam System project. Reviewed safety design and developed commissioning and operating procedures.
- Developed INTREPID program to enhance facility P&ID updating effort.
- Designed and commissioned the Engineering Data Management System as our digital solution for engineering document.
- Led several root cause analyses using Tripod-Beta, Fault Tree Analysis and E&CF chart.

2011 – 2016
Production Executive • **PETRONAS**

- Supervises unit operations covering steam generation, gas reforming, methanol synthesis and distillation.
- Manage plant safety issues to comply with HSE and Process Safety policies and technical standards.
- Develop Pre-Incident Action Plans to anticipate possible emergency situations and its intervention strategies.
- Lead unit operation shutdowns and start-ups to ensure safe and timely operations.
- Production planning – Managing gas supply from offshore platforms and planning shipping schedule to prevent demurrage.
- Planning the Plant Turn-Around activity which involves operation readiness, contract management and material purchasing.
- Team member in new catalyst technical review, changeout and commissioning.
- Led the upgrading project of the Centralized Control Building.
- Team member in plant change projects:
  - Steam condensate recovery
  - Electrolysis unit for Sodium Hypochlorite injection to seawater cooling system.
- Led Quality Improvement Team projects:
  - Lock Out-Tag Out (LOTO) System Improvement
  - Methanol Recovery at Distillation Units (RM 1.35 million/yr)
  - Boiler Feed Water Quality Improvement
  - Equipment Defects Management

2008 – 2011
Business Process Improvement • **PETRONAS**

▼ PAPER PRESENTATIONS

Challenges in Promoting Process Safety Culture - Bridging the Power Distance
Nov 25-26, 2020
Hazards 30
Manchester Central Convention Complex, Manchester, United Kingdom

The Hofstede survey puts Malaysia at the top in the Power Distance Index (PDI). This raised the question to our own culture change initiative if we have adopted sufficient measures to address the wide disparity of perceived authority. Whether the PDI and the other cultural dimensions by Hofstede can be used accurately to draw conclusions on process safety culture will always be debatable. However, they can be used as a yardstick to understand better the community cultural dimensions and allow the organization to reevaluate their culture change management program. The challenges to creating a new culture are unique to each organization taking into accounts the demographics and cultural backgrounds. A well designed change management program should take into these cultural dimensions into considerations so that the most suitable approaches can be adopted.

Establishing an Ecosystem to Support Sound Process Safety Culture
Sep 24-25, 2019
Hazards Asia Pacific Symposium
DoubleTree by Hilton Hotel, Kuala Lumpur, Malaysia

Process safety culture is defined as the combination of group values and behaviors that determine the manner in which process safety is managed[1]. Many catastrophic events such as the Columbia Space Shuttle incident, Flixborough case and Piper Alpha disaster are attributed to weaknesses in process safety culture as one of the main root causes. Taking lessons from these events, PC Methanol embarked on a transformation journey in 2017 to invigorate the process safety culture in the organization. This paper provides a brief evaluation of the process safety background in PC Methanol and discusses the process safety transformation strategy adopted by the organization. The strategy employed by PC Methanol is not to reinvent the wheel but to reassess the needs and realign available resources for a more cohesive approach in establishing an ecosystem to support sound process safety culture.

Technical Experience Sharing Forum
Swiss Garden Resort, Kuantan, Pahang, Malaysia

Energy Saving and Product Recovery Using Statistical Approach
Nov 5, 2008
Lean Six Sigma Summit for Government Linked Company
Sunway Lagoon Resort, Subang Jaya, Selangor, Malaysia

▼ AFFILIATIONS

Board of Engineers Malaysia – Graduate Member

Institution of Chemical Engineers – Associate Member (AMIChemE)

Institut Teknologi Petroleum PETRONAS – Skill Group Trainer

Ir Mohd Azwira Bin Mohd Azmi (PE No. C113094)

Position: Engineering Project Manager / Head of Department / Offshore Company Site Representative (CSR)

EDUCATION	**B. Eng (Hons) in Mechanical and Material Engineering** Universiti Kebangsaan Malaysia 1998-2001
BRIEF INTRODUCTION	**Ir. Mohd Azwira** is Engineering Project Manager for Malaysia Marine and Heavy Engineering (MHB), a subsidiary of MISC. His main strengths and functions are mainly in managing Engineering Detailed Design Consultant and Design section during proposal and projects execution. He also acts as Offshore Company Site Representative for Transportation & Installation phase. He has 19 years of experience in oil and gas industry with first 10 years as Mechanical/Piping Engineer and another 9 years as Engineering Project Engineer/Manager. Currently holding position as Engineering Project Manager for BOKOR CPP EPCIC project since 2017. Previously he was the head of Department for FEED and detail design in MMHE. He Involved in various offshore facility development projects particularly in Engineering, Procurement, Construction, Installation and Commissioning of FPSO/FSO, Turret system, offshore Wellhead and Central Processing platforms. Work area including leading and managing engineering project or engineering department including manpower planning, manhours estimation, preparing project specification, facilities layout design, offshore facilities and project engineering. Able to interface between engineering and estimating with corporate commercial requirements in tailoring cost effective solution for the project. His knowledge and skills acquired from his experiences has enabled him to be versatile and have an apt in both strategy and engineering management nature of jobs. His achievement in project including providing the unprecedent solution for pile refusal remedial work for BOCPP-A project including leading the team from engineering work until offshore installation. He also appointed MMHE offshore Company Site Representative (CSR) offshore installation activity of project. Currently he has led 2 offshore installation campaign in MMHE.

WORK EXPERIENCE	**Engineering Project Manager / Design Manager, Engineering, HEO, MMHE** Jun 2014 – Present	
	BOCPP EPCIC Project – Bokor Central Processing Platform	**Project Engineering Manager** for Petronas BOCPP EPCIC project. ▪ Stationed in detail design consultant office overseeing the detail design produced and ensuring the schedule is met for the project. ▪ Roll over to construction to monitor the fabrication engineering work to support construction and commissioning. ▪ Responsible in leading the engineering team in detail design and fabrication engineering. ▪ Coordinate MMHE engineering resources for review, verify, and manage detailed design Subcontractor work during EPCIC phase ▪ Offshore Company Site Representative for Jacket Installation and Pile Refusal Remedial work for BOCPP-A project.
	Head of Department for FEED and Detail Design Engineering (FDDE)	▪ Lead in technical evaluation for selected market survey and proposal for technology oriented or concept selection facilities. Lead the multidiscipline engineering teams for producing the analysis, drawings, deliverables documents for the proposed concept. ▪ Strategize, lead and manage FDDE Team's capability to produce quality-engineering deliverables within budget and on schedule to ensure on-time project delivery and cost-effectiveness. ▪ Coordinate FDDE resources for review, verify, and manage detailed design work during EPCIC phase. ▪ Provide leadership, direction and guidance to motivate and nurture potential qualified leaders in Engineering Team for breakthrough performance to take MMHE to greater heights. ▪ Develop frame agreement with reputable marine and topsides engineering consultant in Malaysia allowing MMHE to engage the consultant faster with agreed manhours rate upfront. ▪ Develop and maintain networking with detail design consultants, manufacturers, client, Institute Engineer Malaysia, MOGSC and relevant authorities (e.g. DOSH) regarding design matters to keep abreast with new industry developments in order to facilitate Management decision-making.

	SK316 Project – Central Processing Platform & Wellhead Platform	**Engineering Coordinator** for MMHE FDDE (Feed & Detail Design Team) team in SK316 project. ▪ Perform detailed design verification and assurance role, ensuring quality and timely maturity of detailed design, vendor data incorporation and assist procurement to deliver equipment and materials as per schedule.
WORK EXPERIENCE	**Engineering, SBM Malaysia Sdn Bhd** Nov 2006 – May 2014	
	N'Goma FPSO Project	**Topsides Deputy Engineering Project Manager** ▪ Assisting Topsides Engineering Project Manager in daily task and coordination. ▪ Responsible in preparing multidiscipline Design Change, Design Review, Engineering instruction to site etc. ▪ Site representative for SBM Offshore in Keppel Shipyard during fabrication period.
	ASENG FPSO - Turret Project	**Turret Lead Piping Engineer** ▪ Provide deliverables, planning, manhours during start of the project. ▪ Involved in Technical bid Evaluation to procure piping items. ▪ Checker for piping specification and documents such as isometric drawings, G.A drawings etc. ▪ Interface with other discipline for the project especially with structure and mechanical department for swivel design and equipment.
	Sunrise Gas FPSO – Turret/Mooring/Riser Engineering Study	**Engineering Project Manager.** ▪ Provide deliverables, planning, manhours during start of the project. ▪ Responsible in budget, documents and completion of the project. ▪ Prepared Turret Mooring System EPC project Execution plan and Turret Mooring System Technical Description for Sunrise Gas FPSO. ▪ Coordination with Client, Lead Engineers etc.
	Benita FPSO – Bidding and proposal	**Piping engineer.** ▪ Responsible in Turret Layout, piping MTO and piping equipment.

Contact

www.linkedin.com/in/azrol-syazli-a-63268a17 (LinkedIn)

Top Skills

Engineering
Oil/Gas
Project Management

Azrol Syazli Aziz

Operation Improvement Analyst at PETRONAS
Kuala Lumpur

Summary

Experience

PETRONAS
10 years 3 months

Operation Improvement Analyst
November 2013 - Present (7 years 3 months)
Kuala Lumpur, Malaysia

Operation Improvement includes change management; performance and productivity study; management system design, framework, requirement, manual and procedures enhancement; operational excellence learning platform; and project execution intervention

Business Development-Group Technical Solution
November 2010 - Present (10 years 3 months)
Kuala Lumpur

Portfolio Management covering analysis, planning and implementation monitoring for Oil and Gas Engineering Services, Operation Improvement, Process Safety and Optimization, Asset Integrity and Reliability.

Siemens Malaysia Sdn Bhd

Account Manager (Technical)
January 2008 - September 2010 (2 years 9 months)
Petaling Jaya, Malaysia

Account Management in Power Ultilities and Oil&Gas Industries for Medium Voltage Power Distribution Equipment.

Emerson Process Management Sdn Bhd

Senior Engineer, Project Pursuit
August 2007 - January 2008 (6 months)
Subang Jaya, Malaysia

Project Pursuit for Instrumentation and Control System business.

Sime Darby Engineering Sdn Bhd
Senior Engineer
September 2002 - August 2007 (5 years)

Project Pursuit and Project Engineer for Electrical Power Distribution and Control System for Offshore and Onshore project.

Sharp Electronics Malaysia Sdn Bhd
Electrical Engineer
November 2000 - September 2002 (1 year 11 months)
Sungai Petani, Kedah

Design, Proto-typing, Testing and Pre-production of Audio Visual Electronic Equipment.

Education

Universiti Teknologi Malaysia
Master, Business Administration in Strategic Management · (2008 - 2010)

Multimedia University
Bachelor, Electronic Engineering · (1996 - 2000)

Appendix E Expert Panel's Detailed Response

Part	No	Question	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
High performing team characteristics	1	How relevant are the characteristics, which have been identified as the most significant team process characteristics of the high performing team affecting oil and gas project performance? Why?	**Very Relevant.** It's the first component for HPT	**Very Relevant.** Every project is unique and very much differences with the project scopes, planning phase, execution phase, handover phase, stakeholders expectations, management of 4M's, PMT, contract structural, contractors, vendors, authority approval which involves various parties and requirements. Thus, the characteristic mentioned above are very much needed to ensure the projects are executed as per contract that meet expectations/requirements of duration, quality and budget.	**Very Relevant.** To ensure the project objective is being met within budget and schedule	**Very Relevant.** Team process requires these characteristics	**Relevant.** To add functional competent

Part	No	Question	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
	2	How relevant are the characteristics, which have been identified as the most significant individual contribution characteristics of the high performing team affecting oil and gas project performance? Why?	**Very Relevant.** It's the second component for HPT	**Very Relevant.** The individual with high performance characteristics personnel is required in the high performing team in achieving the Oil and Gas project. I would rather put in difference perspectives; this is part of self-leadership quality. Having those characteristics means that you possess good quality leadership within your good self in leading the motivated team execute the projects with best project team interaction and communication.	**Very Relevant.** To ensure the selected team member can deliver the project together with other members	**Relevant.** However, seems like some of the characteristics stated are closely related in terms of meaning e.g. Commitment=Effort= Participation. For individual responsibility, I would use individual accountability instead. For "Listens to other", I would say Listening Skill or Active Listening.	**Relevant.** As listening is important, communicate effectively also important

Part	No	Question	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
	3	How relevant are the characteristics, which have been identified as the most significant organisational structure characteristics of the high performing team affecting oil and gas project performance? Why?	**Very Relevant.** It's the third component for HPT	**Very Relevant.** All those 14 characteristics are important and shall be available and implemented in projects. If looking from opposite word, eg. Instead of clear roles, becomes undefined roles; instead of clear purpose becomes unspecified objectives which these only two characteristics would very much negatively impact the project team roles and their project delivery. .	**Very Relevant.** To ensure the project objective is being met within budget and schedule.	**Relevant.** However, 1. Clear roles, 5. Clear work assignment and 14. Relevant members seems like the same.	**Fairly relevant.** Depend on Organisation maturity and cycle of project completed.
	4	Are there any characteristics (other than listed in the framework) that you think should be included in this framework? Why?	**No.**	**Yes.** In overall, the high performance team characteristics should possess relevance Skill Sets, suitable knowledge, multi experiences and utmost importance is the right attitudes.	**Yes.** Tools (i.e. software, system, procedure)	**Yes.** Robust enterprise system e.g. database, procedures etc.	**No.**

Part	No	Question	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
High performing team integration practices	1	How relevant are the integration practices, which have been identified as the most significant team process integration practices of the high performing team affecting oil and gas project performance? Why?	**Very Relevant.** It's the first component for HPT	**Very Relevant.** Yes, integration practices are very much relevant as the project involves various project stakeholders and requires a well plan communication and integration practices to ensure Clients, contractors, vendors, operation, etc are inline and focus in implementing the project, identifies the issues, close the gaps by prevention or mitigation and documented the process.	**Fairly relevant.** Integration will happens once the corporate organisation integrated. Not relevant to projects. Should start from company's organisation.	**Relevant.** Perhaps add regular interface or communication e.g. scrum or weekly updates.	**Relevant.** Widening perspective during work delivery and decision making

Part	No	Question	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
	2	How relevant are the integration practices, which have been identified as the most significant individual contribution integration practices of the high performing team affecting oil and gas project performance? Why?	**Very Relevant.** It's the second component for HPT	**Very Relevant.** Yes, these elements are must have for better integration practices. The project personnel aware of these, the leader in the pack would create the environment that implementing all these elements in harmony and result objectives situation.	**Very Relevant.**	**Relevant.** I think 3. Functional relationship between the teams and 7. Functional relationship between the individuals- mean the same	**Fairly relevant.** No blame culture important. it's not a major – it's should be replace with "Individual responsibility and accountability" blaming is outcome of having not clear role and responsibility. e.g. The captain of the ship should take up accountability of the ship, the engineer should take up accountability of the engine performance and etc.
	3	How relevant are the integration practices, which have been identified as the most significant organisational structure integration practices of the high performing team affecting oil and gas project	**Very Relevant.** It's the third component for HPT	**Very Relevant.** Yes, in my opinion this is the most important aspect in project to involve commitment from top management, leadership, HSE, competency, ICT etc. Which the industry aware of these importance elements, for eg all ISO standards having	**Very Relevant.** To ensure the vision and objective of company is inline with the project's objective.	**Relevant.** You can also refer to Organisational Project Management Maturity Model by PMI	**Fairly relevant.** To also include scope of organisational structure and characteristic for infrastructure?

Part	No	Question	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
		performance? Why?		these elements as part of their requirement. The organisational structure team commitment and leadership should be top down approaches.			
	4	Are there any integration practices (other than listed in the framework) that you think should be included in this framework? Why?	**No.**	**Yes.** All the elements almost there, however good to include effective Planning and QAQC would also contributes to high performing team integration. Which the planner and check as reminder to flag any potential issues with look ahead.	**No.**	**No.**	**Yes.** Honest Leaders and follower
Presentation and Usefulness	1	Do you agree with the overall arrangement of this framework?	**Yes.** Need individual, team and org. contribution to achieve HPT	**Yes.** Yes, very much agree with the overall framework arrangement. The proposed framework of high performance characteristics having all elements of	**Yes.** Set the characteristic/action to ensure the result.	**Moderately Yes.** It is difficult to judge without reading the background of this framework. Looking at the illustration, I cannot really say if	**Yes.** Good for start phase application, it need to adjust time to time for prioritization what is important characteristic of HPT in term of leadership, followership tailored

Part	No	Question	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
				Knowledge/Experiences, Skills and Attitudes.		the arrangement is right	to match project performance matrix.
	2	Do you understand the general idea and intention of this framework?	**Moderately Yes.** Not clear, what is the aim of `Integration practices group' and `characteristic group'. A description of this will be useful.	**Yes.** This framework is to identify the best characteristics should be possessed by individual and also project team members in ensuring meeting better performance in oil and gas project implementation and delivery. Definition of integration practice and characteristics to be added.	**Yes.** This characteristic identified to have a guideline to improve the project performance.	**Moderately Yes.** I can guess that the objective is to achieve HPT.	**Moderately Yes.** To add deliverables or end in mind in the framework
	3	Do you agree that this framework will provide useful information and guidelines for your organisation to develop high performing team for oil and gas engineering	**No.**	**Yes.** Agreed. almost all the characteristics were in pipeline of execution, however the gap in understanding would available which need awareness/ training and also differences in degree of implementation and as well personnel	**Yes.** Improvement is required due to fast change of project management method. Only challenge to ensure the project team is ready to adapt.	**Moderately Yes.** Need to understand better the context of this framework. At a glance, the content is relevant when read as individual items. However, collectively, the items are not very distinctive from each other.	**Yes.** Other organisation using working culture tools, some using Business Work Process however for project, since it unique endeavour, it depend on project complexity

Part	No	Question	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
		construction projects in Malaysia?		paces adaptation as cultures should be improved			
	4	Do you agree that this framework will help other organisations in successfully manage high performing team for oil and gas engineering construction projects in Malaysia?	**No.**	**Yes.** I believes that many organisation having these frameworks. However, good to sharpen the Knowledge/Experiences, Skills and Attitudes. through awareness and trainings.	**Yes.** This similar approach is being practice in Petronas. However, it is company oriented, not project oriented.	**Moderately Yes.** Need to understand better the context of this framework. At a glance, the content is relevant when read as individual items. However, collectively, the items are not very distinctive from each other.	**Moderately Yes.** Subject to organisation maturity, how long the team soak together may play major role in outcome of project although we have High Performing Team

Part	No	Question	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
	5	Do you have any suggestion in improving the proposed framework of high performing team integration for Malaysian oil and gas construction Projects? If yes, please state.	**Yes.** There are too many sub points / requirements in each components. A framework should be much simpler and more focus	**Yes.** The high performance team should look beyond construction project, must consider operation and maintenance, modification, upgrading and decommission of the facilities.	**Yes.** To separate on Integrated information and communication technology (ICT) system. Tools to be in Separate group. It is essentials.	**Yes.** Need to use more concise and distinct meaning words.	**Yes.** Working culture vs individual culture. i.e. Project Team member from Iraq, south Africa, Malaysia, Vietnam. HPT should considered this culture differences and effect to project performance in Malaysia.

Appendix F Statistical Package for the Social Sciences (SPSS) Analysis Results

Pilot - High performing team characteristics

Reliability

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.985	.986	32

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	4.057	3.433	4.467	1.033	1.301	.062
Inter-Item Covariances	.716	.355	1.163	.808	3.275	.021

Summary Item Statistics

	N of Items
Item Means	32
Inter-Item Covariances	32

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.976	.976	19

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	3.898	3.433	4.333	.900	1.262	.071
Inter-Item Covariances	.675	.310	1.021	.710	3.289	.026

Summary Item Statistics

	N of Items
Item Means	19
Inter-Item Covariances	19

Reliability

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.973	.974	11

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	4.097	3.300	4.367	1.067	1.323	.087
Inter-Item Covariances	.803	.238	1.031	.793	4.333	.036

Summary Item Statistics

	N of Items
Item Means	11
Inter-Item Covariances	11

Pilot - High performing team integration practices

Reliability

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.960	.964	11

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	4.079	3.767	4.467	.700	1.186	.063
Inter-Item Covariances	.670	.352	.933	.582	2.654	.008

Summary Item Statistics

	N of Items
Item Means	11
Inter-Item Covariances	11

Reliability

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.976	.977	16

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	4.054	3.867	4.267	.400	1.103	.011
Inter-Item Covariances	.682	.363	.994	.631	2.737	.011

Summary Item Statistics

	N of Items
Item Means	16
Inter-Item Covariances	16

Reliability

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.980	.980	7

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	4.248	4.133	4.333	.200	1.048	.005
Inter-Item Covariances	.748	.648	.841	.193	1.298	.003

Summary Item Statistics

	N of Items
Item Means	7
Inter-Item Covariances	7

Actual - High performing team characteristics

Reliability

Case Processing Summary

		N	%
Cases	Valid	418	100.0
	Excluded[a]	0	.0
	Total	418	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.990	.990	32

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	3.956	3.373	4.196	.823	1.244	.029
Inter-Item Covariances	.860	.552	1.094	.542	1.982	.010

Summary Item Statistics

	N of Items
Item Means	32
Inter-Item Covariances	32

Reliability

Case Processing Summary

		N	%
Cases	Valid	418	100.0
	Excluded[a]	0	.0
	Total	418	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.975	.976	11

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	4.019	3.407	4.227	.821	1.241	.049
Inter-Item Covariances	.857	.560	.984	.424	1.758	.014

Summary Item Statistics

	N of Items
Item Means	11
Inter-Item Covariances	11

Reliability

Case Processing Summary

		N	%
Cases	Valid	418	100.0
	Excluded[a]	0	.0
	Total	418	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.982	.982	19

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	3.904	3.572	4.191	.620	1.173	.032
Inter-Item Covariances	.791	.590	1.037	.447	1.757	.007

Summary Item Statistics

	N of Items
Item Means	19
Inter-Item Covariances	19

Descriptives

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Char_OS_Clear_roles	418	4.20	1.079	1.165	-1.638	.119	2.232	.238
Char_OS_Clear_purpose	418	4.19	1.091	1.191	-1.654	.119	2.255	.238
Char_OS_Clear_work_assignment	418	4.17	1.075	1.155	-1.579	.119	2.105	.238
Char_OS_Recognition	418	3.96	1.068	1.140	-1.254	.119	1.274	.238
Char_OS_Reward	418	3.92	1.068	1.140	-1.049	.119	.797	.238
Char_OS_Relevant_members	418	4.00	1.065	1.134	-1.345	.119	1.606	.238
Char_OS_Perf_oriented_task_goal	418	3.99	1.047	1.096	-1.296	.119	1.466	.238
Char_OS_Adequate_resource	418	4.04	1.102	1.214	-1.399	.119	1.540	.238
Char_OS_Appropriate_culture	418	3.95	1.084	1.175	-1.157	.119	1.017	.238
Char_OS_Clear_goal	418	4.18	1.091	1.190	-1.636	.119	2.209	.238
Char_OS_Collab_between_leaders	418	4.13	1.073	1.152	-1.483	.119	1.861	.238
Char_OS_Common_interest	418	3.88	1.067	1.139	-1.135	.119	1.060	.238
Char_OS_Common_goals	418	4.03	1.080	1.167	-1.405	.119	1.669	.238
Char_OS_Common_strategy	418	3.99	1.078	1.163	-1.288	.119	1.291	.238
Char_OS_Contract_model	418	3.86	1.067	1.138	-1.049	.119	.868	.238
Char_OS_Performance_standard	418	4.00	1.030	1.060	-1.427	.119	1.990	.238
Char_OS_External_relations	418	3.78	1.054	1.110	-.999	.119	.774	.238
Char_OS_Former_relation	418	3.71	1.057	1.117	-.686	.119	.030	.238
Char_OS_Determination_on_goal	418	3.85	1.044	1.089	-1.105	.119	1.075	.238

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Char_OS_Involv_in_goal_setting	418	3.92	1.034	1.070	-1.308	.119	1.624	.238
Char_OS_Leadership	418	4.17	1.092	1.192	-1.564	.119	1.974	.238
Char_OS_Management_support	418	4.14	1.109	1.231	-1.553	.119	1.867	.238
Char_OS_Mix_of_complementary_skill	418	3.96	1.051	1.104	-1.340	.119	1.609	.238
Char_OS_New_information_feed	418	3.91	1.011	1.023	-1.144	.119	1.280	.238
Char_OS_Specific_task	418	3.88	1.022	1.044	-1.133	.119	1.136	.238
Char_OS_Style_diversity	418	3.79	1.067	1.139	-1.052	.119	.803	.238
Char_OS_Suitable_leadership	418	4.03	1.080	1.167	-1.427	.119	1.718	.238
Char_OS_Team_building_sessions	418	3.80	1.099	1.208	-.930	.119	.444	.238
Char_OS_Team_diversity	418	3.78	1.065	1.134	-1.002	.119	.690	.238
Char_OS_Smaller_team	418	3.37	.984	.968	-.349	.119	-.068	.238
Char_OS_Experienced_team_member	418	4.02	1.067	1.139	-1.413	.119	1.739	.238
Char_OS_Empowered_key_position	418	4.01	1.089	1.187	-1.289	.119	1.265	.238
Char_TP_Cohesion	418	3.95	.985	.971	-1.360	.119	2.021	.238
Char_TP_Effective_communication	418	4.19	1.053	1.110	-1.663	.119	2.474	.238
Char_TP_4_behaviour	418	3.89	1.038	1.078	-1.219	.119	1.342	.238
Char_TP_Performance_feedback	418	3.97	1.014	1.028	-1.394	.119	1.961	.238
Char_TP_Shared_leadership	418	3.88	1.086	1.180	-1.205	.119	1.097	.238
Char_TP_Civilised_disagreement	418	3.87	1.025	1.052	-1.137	.119	1.189	.238
Char_TP_Conflict_management	418	3.85	1.066	1.136	-1.154	.119	1.048	.238
Char_TP_Consensus_decision	418	3.83	1.017	1.035	-1.077	.119	1.162	.238
Char_TP_Cooperation	418	4.13	1.040	1.082	-1.597	.119	2.431	.238
Char_TP_Coordination	418	4.14	1.066	1.137	-1.616	.119	2.338	.238

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Char_TP_Decision_making	418	4.11	1.049	1.099	-1.560	.119	2.248	.238
Char_TP_Team_development	418	3.98	1.016	1.033	-1.279	.119	1.623	.238
Char_TP_Absence_of_formality	418	3.57	1.084	1.176	-.673	.119	-.060	.238
Char_TP_Initial_impression	418	3.59	1.000	1.000	-.721	.119	.352	.238
Char_TP_Learning_sessions	418	3.92	1.001	1.003	-1.315	.119	1.838	.238
Char_TP_Mutual_accountability	418	3.98	.996	.992	-1.371	.119	2.046	.238
Char_TP_Shared_values	418	3.96	1.016	1.032	-1.389	.119	1.976	.238
Char_TP_Social_relationship	418	3.75	1.023	1.046	-.906	.119	.676	.238
Char_TP_Spend_time_together	418	3.62	1.009	1.019	-.696	.119	.376	.238
Char_IC_Commitment	418	4.23	1.031	1.063	-1.745	.119	2.875	.238
Char_IC_Trust_	418	4.13	1.056	1.115	-1.561	.119	2.197	.238
Char_IC_Continual_improvement	418	4.14	1.028	1.057	-1.590	.119	2.435	.238
Char_IC_Effort	418	4.18	1.038	1.076	-1.693	.119	2.741	.238
Char_IC_Elite_feeling	418	3.41	1.188	1.412	-.466	.119	-.545	.238
Char_IC_Flexibility	418	3.99	.998	.995	-1.403	.119	2.175	.238
Char_IC_Individual_responsibility	418	4.09	1.025	1.050	-1.536	.119	2.337	.238
Char_IC_Listens_to_other	418	4.02	1.044	1.091	-1.452	.119	1.978	.238
Char_IC_Participation	418	4.11	1.052	1.106	-1.591	.119	2.374	.238
Char_IC_Self_assessment	418	3.94	1.034	1.068	-1.307	.119	1.621	.238
Char_IC_Self_knowledge	418	3.99	1.050	1.103	-1.382	.119	1.781	.238
Valid N (listwise)	418							

Frequencies

Statistics

		Char_OS_Clear_roles	Char_OS_Clear_purpose	Char_OS_Clear_work_assignment	Char_OS_Recognition	Char_OS_Reward
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		4.20	4.19	4.17	3.96	3.92
Median		4.00	4.00	4.00	4.00	4.00
Mode		5	5	5	4	4
Std. Deviation		1.079	1.091	1.075	1.068	1.068
Sum		1754	1752	1741	1656	1638

Statistics

		Char_OS_Relevant_members	Char_OS_Perf_oriented_task_goal	Char_OS_Adequate_resource	Char_OS_Appropriate_culture	Char_OS_Clear_goal
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		4.00	3.99	4.04	3.95	4.18
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	5	4	5
Std. Deviation		1.065	1.047	1.102	1.084	1.091
Sum		1673	1669	1689	1653	1748

Statistics

		Char_OS_Collab_between_leaders	Char_OS_Common_interest	Char_OS_Common_goals	Char_OS_Common_strategy	Char_OS_Contract_model
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		4.13	3.88	4.03	3.99	3.86
Median		4.00	4.00	4.00	4.00	4.00
Mode		5	4	4	4	4
Std. Deviation		1.073	1.067	1.080	1.078	1.067
Sum		1725	1621	1683	1669	1613

Statistics

		Char_OS_Performance_standard	Char_OS_External_relations	Char_OS_Former_relation	Char_OS_Determination_on_goal	Char_OS_Involv_in_goal_setting
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		4.00	3.78	3.71	3.85	3.92
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4
Std. Deviation		1.030	1.054	1.057	1.044	1.034
Sum		1674	1578	1551	1611	1637

Statistics

		Char_OS_Leadership	Char_OS_Management_support	Char_OS_Mix_of_complementary_skill	Char_OS_New_information_fed	Char_OS_Specific_task
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		4.17	4.14	3.96	3.91	3.88
Median		4.00	4.00	4.00	4.00	4.00
Mode		5	5	4	4	4
Std. Deviation		1.092	1.109	1.051	1.011	1.022
Sum		1743	1729	1655	1634	1623

Statistics

		Char_OS_Style_diversity	Char_OS_Suitable_leadership	Char_OS_Team_building_sessions	Char_OS_Team_diversity	Char_OS_Smaller_team
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		3.79	4.03	3.80	3.78	3.37
Median		4.00	4.00	4.00	4.00	3.00
Mode		4	4	4	4	3
Std. Deviation		1.067	1.080	1.099	1.065	.984
Sum		1585	1685	1587	1578	1410

Statistics

		Char_OS_Experienced_team_member	Char_OS_Empowered_key_position	Char_TP_Cohesion	Char_TP_Effective_communication	Char_TP_4_behaviour
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		4.02	4.01	3.95	4.19	3.89
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	5	4
Std. Deviation		1.067	1.089	.985	1.053	1.038
Sum		1679	1675	1650	1752	1625

Statistics

		Char_TP_Performance_feedback	Char_TP_Shared_leadership	Char_TP_Civilised_disagreement	Char_TP_Conflict_management	Char_TP_Consensus_decision
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		3.97	3.88	3.87	3.85	3.83
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4
Std. Deviation		1.014	1.086	1.025	1.066	1.017
Sum		1659	1622	1616	1609	1600

Statistics

		Char_TP_Cooperation	Char_TP_Coordination	Char_TP_Decision_making	Char_TP_Team_development	Char_TP_Absence_of_formality
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		4.13	4.14	4.11	3.98	3.57
Median		4.00	4.00	4.00	4.00	4.00
Mode		4[a]	5	4	4	4
Std. Deviation		1.040	1.066	1.049	1.016	1.084
Sum		1726	1730	1720	1663	1493

Statistics

		Char_TP_Initial_impression	Char_TP_Learning_sessions	Char_TP_Mutual_accountability	Char_TP_Shared_values	Char_TP_Social_relationship
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		3.59	3.92	3.98	3.96	3.75
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4
Std. Deviation		1.000	1.001	.996	1.016	1.023
Sum		1502	1637	1662	1657	1568

Statistics

		Char_TP_Spend_time_together	Char_IC_Commitment	Char_IC_Trust_	Char_IC_Continual_improvement	Char_IC_Effort
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		3.62	4.23	4.13	4.14	4.18
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	5	5	5	5
Std. Deviation		1.009	1.031	1.056	1.028	1.038
Sum		1512	1767	1726	1731	1746

Statistics

		Char_IC_Elite_feeling	Char_IC_Flexibility	Char_IC_Individual_responsibility	Char_IC_Listens_to_other	Char_IC_Participation
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		3.41	3.99	4.09	4.02	4.11
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4
Std. Deviation		1.188	.998	1.025	1.044	1.052
Sum		1424	1667	1709	1681	1716

Statistics

		Char_IC_Self_assessment	Char_IC_Self_knowledge
N	Valid	418	418
	Missing	0	0
Mean		3.94	3.99
Median		4.00	4.00
Mode		4	4
Std. Deviation		1.034	1.050
Sum		1647	1666

a. Multiple modes exist. The smallest value is shown

Actual - High performing team integration practices

Reliability

Case Processing Summary

		N	%
Cases	Valid	418	100.0
	Excluded[a]	0	.0
	Total	418	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.974	.974	11

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	3.962	3.749	4.132	.383	1.102	.018
Inter-Item Covariances	.819	.679	.939	.260	1.383	.004

Summary Item Statistics

	N of Items
Item Means	11
Inter-Item Covariances	11

Reliability

Case Processing Summary

		N	%
Cases	Valid	418	100.0
	Excluded[a]	0	.0
	Total	418	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.984	.984	16

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	3.925	3.847	4.036	.189	1.049	.003
Inter-Item Covariances	.831	.736	1.061	.325	1.441	.002

Summary Item Statistics

	N of Items
Item Means	16
Inter-Item Covariances	16

Reliability

Case Processing Summary

		N	%
Cases	Valid	418	100.0
	Excluded[a]	0	.0
	Total	418	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.982	.982	7

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	4.045	4.000	4.136	.136	1.034	.002
Inter-Item Covariances	.881	.844	.923	.079	1.093	.001

Summary Item Statistics

	N of Items
Item Means	7
Inter-Item Covariances	7

Descriptives

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Prac_OS_Single_co-located_team	418	3.80	1.079	1.165	-.922	.119	.447	.238
Prac_OS_Seamless_operation_	418	3.75	1.035	1.071	-.956	.119	.729	.238
Prac_OS_Unrestricted_information_sharing	418	3.86	1.059	1.121	-1.051	.119	.791	.238
Prac_OS_client_care_team	418	3.81	1.043	1.087	-.998	.119	.777	.238
Prac_OS_Commitment_top_management	418	4.13	1.039	1.079	-1.505	.119	2.119	.238
Prac_OS_Effective_management_OSH	418	4.07	1.017	1.034	-1.460	.119	2.165	.238
Prac_OS_Encouragement_for_initiatives	418	3.98	1.007	1.014	-1.439	.119	2.196	.238
Prac_OS_Integrated_ICT_system	418	4.05	1.000	1.000	-1.441	.119	2.200	.238
Prac_OS_Leadership_facilitation_and_support	418	4.08	1.018	1.037	-1.569	.119	2.517	.238
Prac_OS_Members_affinity_	418	4.00	1.012	1.024	-1.446	.119	2.187	.238
Prac_OS_Team_competency	418	4.06	1.032	1.064	-1.480	.119	2.155	.238
Prac_TP_Single_team_focus	418	3.85	1.055	1.113	-1.069	.119	.923	.238
Prac_TP_Single_team_objectives	418	3.85	1.076	1.158	-1.083	.119	.877	.238
Prac_TP_Mutually_beneficial_outcomes	418	3.92	.977	.955	-1.258	.119	1.798	.238
Prac_TP_Flexibility_to_change	418	3.94	1.005	1.011	-1.331	.119	1.873	.238
Prac_TP_Responsiveness_to_change	418	3.99	.996	.993	-1.399	.119	2.123	.238
Prac_TP_Equal_opportunities_for_input	418	3.91	1.014	1.029	-1.282	.119	1.655	.238

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Prac_TP_Increased_time_predictability	418	3.94	1.024	1.049	-1.257	.119	1.561	.238
Prac_TP_Increased_cost_predictability	418	3.89	1.032	1.065	-1.138	.119	1.178	.238
Prac_TP_Effectiveness_of_team_meeting	418	3.99	1.017	1.033	-1.338	.119	1.859	.238
Prac_TP_Empathy_based_work_environment	418	3.87	1.010	1.021	-1.107	.119	1.224	.238
Prac_TP_systemised_decision_making	418	3.96	.983	.967	-1.312	.119	1.907	.238
Prac_TP_function_evaluation_process	418	3.94	.999	.999	-1.251	.119	1.613	.238
Prac_TP_Innovation	418	3.94	1.052	1.107	-1.280	.119	1.468	.238
Prac_TP_Improvement	418	4.04	1.042	1.085	-1.415	.119	1.898	.238
Prac_TP_Strict_management_of_changes	418	3.89	1.069	1.142	-1.076	.119	.847	.238
Prac_TP_Continuous_dialogue_sessions	418	3.89	1.032	1.065	-1.085	.119	1.046	.238
Prac_IC_No_blame_culture	418	4.06	1.028	1.056	-1.391	.119	1.846	.238
Prac_IC_Equitable_team_relationship	418	4.01	1.001	1.002	-1.355	.119	1.905	.238
Prac_IC_Equitable_respect_for_all	418	4.04	.997	.994	-1.429	.119	2.190	.238
Prac_IC_Collective_understanding	418	4.02	.989	.978	-1.483	.119	2.432	.238
Prac_IC_Effective_communication	418	4.14	1.007	1.015	-1.605	.119	2.616	.238
Prac_IC_Functional_relationship_individual	418	4.00	.977	.954	-1.457	.119	2.400	.238
Prac_IC_Functional_relationship_team	418	4.04	.972	.946	-1.450	.119	2.369	.238
Valid N (listwise)	418							

Frequencies

Statistics

		Prac_OS_Single_co-located_team	Prac_OS_Seamless_operation_	Prac_OS_Unrestricted_information_sharing	Prac_OS_client_care_team	Prac_OS_Commitment_top_management
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		3.80	3.75	3.86	3.81	4.13
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	5
Std. Deviation		1.079	1.035	1.059	1.043	1.039
Sum		1587	1567	1612	1594	1727

Statistics

		Prac_OS_Effective_management_OSH	Prac_OS_Encouragement_for_initiatives	Prac_OS_Integrated_ICT_system	Prac_OS_Leadership_facilitation_and_support	Prac_OS_Members_affinity_
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		4.07	3.98	4.05	4.08	4.00
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4
Std. Deviation		1.017	1.007	1.000	1.018	1.012
Sum		1701	1665	1692	1705	1671

Statistics

		Prac_OS_Team_competency	Prac_TP_Single_team_focus	Prac_TP_Single_team_objectives	Prac_TP_Mutually_beneficial_outcomes	Prac_TP_Flexibility_to_change
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		4.06	3.85	3.85	3.92	3.94
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4
Std. Deviation		1.032	1.055	1.076	.977	1.005
Sum		1695	1608	1610	1637	1647

Statistics

		Prac_TP_Responsiveness_to_change	Prac_TP_Equal_opportunities_for_input	Prac_TP_Increased_time_predictability	Prac_TP_Increased_cost_predictability	Prac_TP_Effectiveness_of_team_meeting
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		3.99	3.91	3.94	3.89	3.99
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4
Std. Deviation		.996	1.014	1.024	1.032	1.017
Sum		1668	1636	1645	1627	1667

Statistics

		Prac_TP_Empathy_based_work_environment	Prac_TP_systemised_decision_making	Prac_TP_function_evaluation_process	Prac_TP_Innovation	Prac_TP_Improvement
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		3.87	3.96	3.94	3.94	4.04
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4
Std. Deviation		1.010	.983	.999	1.052	1.042
Sum		1617	1654	1646	1649	1687

Statistics

		Prac_TP_Strict_management_of_changes	Prac_TP_Continuous_dialogue_sessions	Prac_IC_No_blame_culture	Prac_IC_Equitable_team_relationship	Prac_IC_Equitable_respect_for_all
N	Valid	418	418	418	418	418
	Missing	0	0	0	0	0
Mean		3.89	3.89	4.06	4.01	4.04
Median		4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4
Std. Deviation		1.069	1.032	1.028	1.001	.997
Sum		1627	1627	1698	1678	1687

Statistics

		Prac_IC_Collective_understanding	Prac_IC_Effective_communication	Prac_IC_Functional_relationship_individual	Prac_IC_Functional_relationship_team
N	Valid	418	418	418	418
	Missing	0	0	0	0
Mean		4.02	4.14	4.00	4.04
Median		4.00	4.00	4.00	4.00
Mode		4	4	4	4
Std. Deviation		.989	1.007	.977	.972
Sum		1682	1729	1672	1689

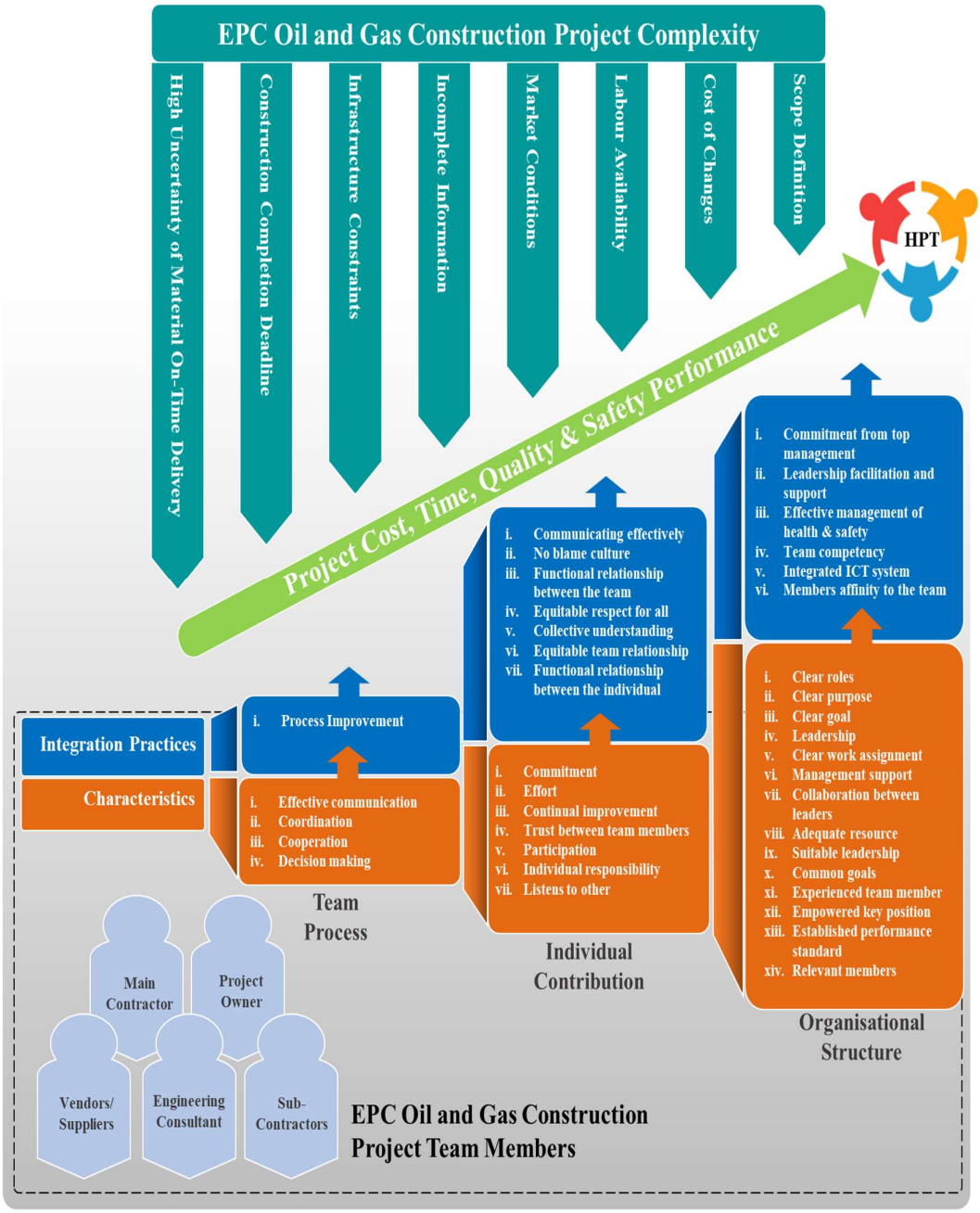
Correlations

		Prac_OS_Commitment_top_management	Prac_OS_Effective_management_OSH	Prac_OS_Integrated_ICT_system	Prac_OS_Leadership_facilitation_and_support	Prac_OS_Members_affinity_	Prac_OS_Team_competency
Char_OS_Clear_roles	Pearson Correlation	.734**	.741**	.742**	.747**	.714**	.761**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418
Char_OS_Clear_purpose	Pearson Correlation	.784**	.773**	.787**	.793**	.765**	.802**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418
Char_OS_Clear_work_assignment	Pearson Correlation	.739**	.773**	.751**	.768**	.713**	.755**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418
Char_OS_Relevant_members	Pearson Correlation	.739**	.713**	.781**	.760**	.712**	.753**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418
Char_OS_Adequate_resource	Pearson Correlation	.746**	.734**	.756**	.762**	.718**	.753**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418
Char_OS_Clear_goal	Pearson Correlation	.777**	.778**	.781**	.792**	.728**	.765**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418
Char_OS_Collab_between_leaders	Pearson Correlation	.721**	.730**	.732**	.748**	.731**	.756**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418
Char_OS_Common_goals	Pearson Correlation	.743**	.712**	.747**	.772**	.755**	.745**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000

		Prac_IC_No_blame_culture	Prac_IC_Equitable_team_relationship	Prac_IC_Equitable_respect_for_all	Prac_IC_Collective_understanding	Prac_IC_Effective_communication	Prac_IC_Functional_relationship_individual	Prac_IC_Functional_relationship_team
Char_IC_Commitment	Pearson Correlation	.808**	.791**	.813**	.811**	.829**	.795**	.804**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418	418
Char_IC_Trust_	Pearson Correlation	.806**	.785**	.800**	.798**	.813**	.818**	.798**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418	418
Char_IC_Continual_improvement	Pearson Correlation	.818**	.802**	.826**	.829**	.850**	.802**	.819**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418	418
Char_IC_Effort	Pearson Correlation	.817**	.813**	.822**	.823**	.853**	.809**	.818**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418	418
Char_IC_Individual_responsibility	Pearson Correlation	.806**	.796**	.793**	.829**	.813**	.803**	.827**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418	418
Char_IC_Listens_to_other	Pearson Correlation	.774**	.759**	.773**	.798**	.804**	.766**	.804**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418	418
Char_IC_Participation	Pearson Correlation	.793**	.784**	.799**	.814**	.815**	.786**	.809**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
	N	418	418	418	418	418	418	418
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	418	418	418	418	418	418	418

		Prac_TP_Improvement
Char_TP_Effective_communication	Pearson Correlation	.767**
	Sig. (2-tailed)	.000
	N	418
Char_TP_Cooperation	Pearson Correlation	.779**
	Sig. (2-tailed)	.000
	N	418
Char_TP_Coordination	Pearson Correlation	.786**
	Sig. (2-tailed)	.000
	N	418
Char_TP_Decision_making	Pearson Correlation	.780**
	Sig. (2-tailed)	.000
	N	418
Prac_TP_Improvement	Pearson Correlation	1
	Sig. (2-tailed)	
	N	418

Appendix G Final Framework (enlarged)




HPT
High performing team members regarded as an extension of the regular team but having a higher sense of commitment towards the objective.
Characteristics
Characteristics refers to typical and noticeable quality of the team.
Integration Practices
Integration practices refers to carrying out or performing a particular activity, method, or custom habitually or regularly.
Individual Contributions
Individual contribution refers to different levels of individual experience and skills within teams
Organisational Structure
Organisational structure refers to coordination and control of the team.
Team Process
Team process refers to aspects of interaction and patterns of transforming input into output.
Scope definition
Poorly defined scope leads to considerable changes and disputes among the key stakeholders
Cost of changes
At the stage of construction, the cost of changes is highest and the ease of performing the change is very low with limited improvement or correction options.
Labour availability
Smaller pool of highly skilled oil and gas construction workers.
Market conditions
Global supply and demand, highly volatile prices and increasingly stringent environmental regulations and pandemics.
Incomplete information
High possibility of incomplete information due to overlapping of activities between engineering, procurement and construction.
Infrastructure Constraint
Constraints in terms of construction facilities, installations, and equipment required to perform engineering and construction.
Construction completion deadline
Imperative to meet the deadline of construction completion, as the load out schedule will be fixed in accordance to the tide restriction
High uncertainty of material on time delivery
Risk associated with equipment and materials with long lead delivery time by placing order for these at early stage of the EPC phase with preliminary info
Process improvement
EPC project team practices of identifying, analysing and improving existing business processes to optimize performance.
Communicating effectively
Individual EPC project team members practices understanding the emotion and intentions behind the information, listen in a way that gains the full meaning of what is being said and makes the other team members feel heard and understood.
No blame culture
Individual EPC project team members practices a culture of admitting and openly discuss errors and mistakes, allowing team to capture as lesson learn and ultimately improving company process.
Functional relationship between the team
Individual EPC project multidisciplinary team members practices sharing specific responsibility in the project in providing equal value to the completion of the overall project
Equitable respect for all
Individual EPC project team members practices fair and impartial respect with the rest of the project team members.
Collective understanding
Individual EPC project team member practices to foster the need for common understanding by collective discussions, reflections, questioning, and understanding
Equitable team relationship
Individual EPC project team member practices in being objective and unbiased during team task execution and treating everyone equally.
Functional relationship between the individual
Individual EPC discipline team members practices different responsibilities but all works to perform the same function of a discipline.
Commitment from top management
EPC project organisations practices participant of top management in getting adequate resources, approve unique project needs, get cooperation from other parts of the organisation, and provide support as a mentor and coach to key team members.
Leadership facilitation and support
EPC project organisations practices providing continuous facilitation and support to leaders in dealing with dynamic changes and improvements in project team by means of special training and counselling.
Effective management of health and safety
EPC project organisations practices reducing the risk of incidents, injuries, and fatalities through data-driven measurements and improvements involving every project team member in sharing responsibility.
Team competency
EPC project organisations practices measurement of team ability to work with others toward a shared goal, participating actively, sharing responsibility and rewards, and contributing to the capability of the team.
Integrated ICT system
EPC project organisations practices adoption of ICT to improve the efficiency and effectiveness of information management using ICT tools to communicate, create, disseminate, store, and manage information.
Members affinity to the team
EPC project organisations practices having a strong relationship or bonding with project team members with common goal in mind.
Effective communication
EPC project team has the characteristics of being able to convey information to another team member effectively and efficiently.
Coordination
EPC project team has the characteristics of day-to-day management of tasks within discipline to streamline the workflow of the tasks.
Cooperation
EPC project team has the characteristics of working together for the benefit of the project while reducing the desire of team members to compete against each other.
Decision Making
EPC project team has the characteristics of structured decision-making techniques implemented in task execution..
Commitment
Individual EPC project team members has the characteristics of being fully present in the moment, making the decision of the moment, and standing by the consequences of the decisions made.
Effort
Individual EPC project team members has the characteristics of increased effort in going beyond their normal responsibilities.
Continual Improvement
Individual EPC project team members has the characteristics of bringing gradual, ongoing improvement to their contribution in project through constant review, measurement, and action.
Trust between team members
Individual EPC project team members has the characteristics of feeling safe with other team members, comfortable to open up, take appropriate risks, and expose weaknesses.
Participation
Individual EPC project team members has the characteristics of actively speak up openly during team meetings and participate in discussions as much as possible..
Individual responsibility
Individual EPC project team members has the characteristics of taking responsibility for their actions on each task assigned as the subject matter expert..
Listen to others
Individual EPC project team members has the characteristics of taking responsibility for their actions on each task assigned as the subject matter expert.
Clear roles
EPC project organisations have the characteristics of good clarity on their individual roles and the work assignment.
Clear purpose
EPC project organisations have the characteristics of good clarity on the purpose of the team formation.
Clear goals
EPC project organisations have the characteristics of good clarify on what is it to be achieved in each task, each milestone and overall project..
Leadership
EPC project organisations have the characteristics of assigning strong leaders who team numbers feel comfortable talking to and can guide to perform better.
Clear work assignment
EPC project organisations have the characteristics of good clarity on what task they are expected to do and why.
Management Support
EPC project organisations have the characteristics of line manager's support and commitment to the project and the agreed allowable time for project meetings, discussions and agree on actions to ensure the team member is able to perform effectively..
Collaboration between leaders
EPC project organisations have the characteristics of shared vision, mutual respect, and in-depth understanding of each leader's role with the goal of achieving common project goal.
Adequate resource
EPC project organisations have the characteristics of having enough resources it needs to do the job and meet the targets it has been set.
Suitable leadership
EPC project organisations have the characteristics of effective and appropriate leadership within the team.
Common Goals
EPC project organisations have the characteristics of sharing the same goal and knows what they need to do as part of the team to achieve it.
Experienced team member
EPC project organisations have the characteristics of having good mix of experienced team members who has come across most of the hassles and obstacles and learned various techniques to tackle any difficulties.
Empowered key position
EPC project organisations have the characteristics of providing team members with the resources, authority, opportunity, and motivation to do their work and holding them accountable for their actions.
Established performance standard
EPC project organisations have the characteristics of established organizational or system standards, targets, and goals to improve project team performance.
Relevant Members
EPC project organisations have the characteristics of hiring the right people for the job, which may include technical skills as well as the relevant soft skills

LIST OF PUBLICATIONS

1. **Davendren Vereya and Syuhaida Ismail** (2019). High Performing Team Characteristics for Malaysian Oil and Gas Construction Projects. Test Engineering and Management Journal. ISSN: 0193-4120 Page No. 882 -894. Volume 81 Page Number: 882 – 894. Publication Issue: November-December 2019. Published by: The Mattingley Publishing Co., Inc. **SCOPUS indexed.**