
Achieving Agility and Dynamic Capabilities on Sustainable Performance: Evidence from the Upstream Oil and Gas Sector

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Abstract:

Purpose: This paper aims to seize the understanding of the effect of TMT commitment (TMC), leadership agility development (LAD), field agile leader (FAL), and operational capabilities (OC) on the field unit performance (FUP) in Indonesia oil and gas sector.

Design/methodology/approach: Research instruments were developed and distributed throughout field operation units in the Indonesian oil and gas sector, resulting in 175 data from field operation leaders across Indonesia's operating oil and gas companies. Structural equation modeling (SEM) LISREL were used to examine the developed hypotheses.

Findings: This research finds that TMT commitment and leadership agility development on field agile leaders, directly and indirectly, play a significant role in the Indonesian oil and gas sector. Leadership agility development has a strong influence on the field of an agile leader. Furthermore, field agile leaders influence operational capabilities, which then affects unit performance significantly.

Practical Implications: The findings have several implications for professionals in the oil and gas sector. The finding of this research also describes the pivotal role of leadership agility development to make the leader more resilient and agile.

Originality/value: The proposed model will describe the input-process-output phases in creating value. This research also contributes to how leadership agility can be promoted and organizational agility and development.

Keywords: TMT commitment, leadership agility development, field agile leader, operational capabilities, unit performance.

JEL codes: O14, O21.

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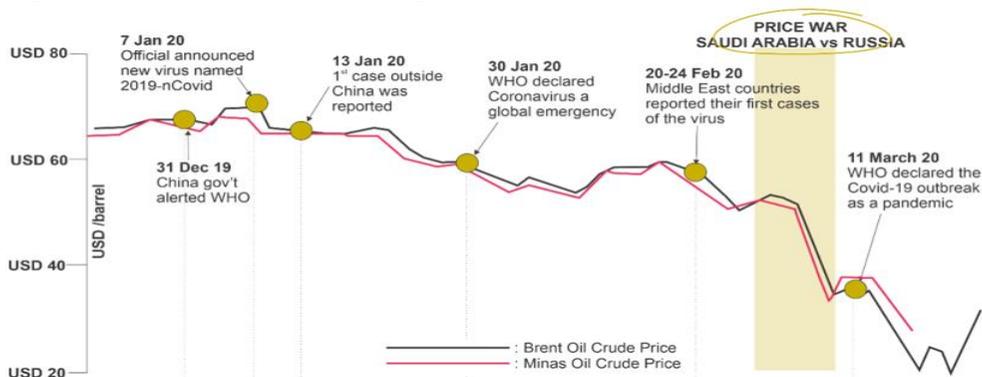
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1. Introduction

The oil and gas sector is still the primary energy source globally and has a significant impact on the global economy as one of the essential indicators (Welfens, Perret, and Erdem, 2011; Khatib, 2012). As the primary source of energy globally, oil and gas are becoming a crucial role in the 21st century. The oil and gas sector also suffers in the wake of Covid-19 (Figure 1). Oil prices have decreased since January 2020, when many countries on lockdown significantly less of all activities, and make the demand for oil and gas has fallen spectacularly.

Figure 1. Correlation between Oil price Fluctuation and COVID-19



Source: Processed from Trading Economics, 2020.

The oil and gas business has many challenges on each element of the oil business chain, including this pandemic; it requires a proper acceptance of this industry (Schweitzer, 2010). Price instability is not only a significant challenge for the oil and gas industry (Regnier, 2007). They force the managers to increase the value creation as an alternative of output due to low returns (Ramos, Taamouti, Veiga, and Wang, 2017; Pociovalisteanu *et al.*, 2010).

A survey conducted by Fraser Institute in 2017 found several indicators that prevent the investor from coming to Indonesia, including the complexity and uncertainty in field operations. Several studies (Zhao and Hsu, 2007; Phene and Almeida, 2008) argue that external learning sources are more effective in facing uncertain conditions. This forces the managers to increase the value creation as an alternative of output due to low returns (Ramos, Taamouti, Veiga, and Wang, 2017).

2. Literature Review

The oil and gas business characteristic has many resources, including the capital, high technology, and complex activities and uncertainty showed by increased safe production and reserves (Bayerl and Lauche, 2010). The uncertainty, ambiguity, and turbulence characterize in oil and gas business environments allow the corporation to respond rapidly and efficiently to market disruptions (Shafer, Dyer, Kilty, Amos,

and Ericksen, 2001; Dyer and Shafer, 2003). This research aims to advance the inquiry of an agile leader toward orchestrating, which connects various resources by integrating multiple capabilities, as well, as to how the role of a field agile leader can influence field activities (Dutton *et al.*, 2001; O'Brien *et al.*, 2012). A leader at the oilfield needs to understand strategic planning in the integrated approach in managing turbulence, uncertainty, and dynamics (Bolisani and Bratianu, 2017).

Thao (2012) conducted a study on the agile organization focusing on developing and exploring a causal model when an organization operates in a relatively unstable environment. Stekelenburg (2012) found that an organization could become agile by improving individual competence in organization. Studies have proven that leadership capability development integrates various capabilities and how the role of a field agile leader can influence field activities (Dutton *et al.*, 2001; O'Brien's, 2012).

The commitment of top management encourages executing a strategic plan (Aragon-Correa *et al.*, 2004; Ng and Wyrick, 2011) in improving leadership performance in the field (Prabhu and Robson, 2000). To improve leadership agility, developing prospective company leaders by transforming and exploiting new knowledge for the company's strategic goals going forward (Zahra and George, 2002), including in increasing the capacity of agility as initial capital for prospective leaders.

Hypothesis 1 (H1): TMT Commitment has a positive effect on Leadership Agility Development.

In the managerial capability dynamic concept, managerial human capital refers to improving skills, competence, and knowledge, which must be possessed by every leader (Adner and Helfat, 2003). Sirmon and Hitt (2009) highlighted how leaders are identified, recruited, organized, and even maintained to achieve harmony as a company strategy in facing environmental changes. Chang *et al.* (2011) discussed several factors that can improve innovation through human capital management practices, selection, and training processes.

According to Lengnick-Hall *et al.* (2011), there are several dimensions of capacity for resilient agility, including cognitive, behavioral, and contextual. The program for developing the leaders with cognitive abilities possessed by a leader can contribute to agility and resilience, including collaborating with various functions with different skills that allow for core values to develop amid uncertainty due to crisis. The contextual dimension programs can have leaders who can develop personal connections and supply lines of resources that can act quickly. Broadly information and knowledge sharing include (a) partners with employees and teams and networks, (b) user-friendly, accessible, and integrated information, (c) empowerment, (d) results-based assessment, and (e) open communication (Lengnick-Hall *et al.*, 2011).

Hypothesis 2 (H2): Leadership Agility Development has a positive effect on Field Agile Leader.

Top management commitment is the commitment from management through actions (Staw, 1976) with a tendency towards support, business, and real actions (Shah, 1996; Chowdhury *et al.*, 2007). Top management support at corporate is formed towards critical resources for the organization's sustainability in the field. The top management commitment towards the vision, planning, and strategy implementation (Chowdhury *et al.*, 2007) correlated positively with the clarity of the company vision and involvement in making strategic decisions (Cowling and Sugden, 1998) in order to the field agile leader formulate strategic execution and implementation at field including project management, drilling, and operations activities.

The commitment of top corporate management includes supporting the leader on activities, considerations towards suitable choices, idea stimulations, and improvements in field leaders' motivations (Hopkins and Hopkins, 1997), including in how field leaders communicate and interact with their team members in the field (Powell, 1992). Besides, a strategic commitment results in greater field agility, causing the leaders to act more expediently when faced with opportunities to prioritize their tasks according to the strategic plan (Breu *et al.*, 2002).

Bayerl and Lauche (2010) wrote that coordination is needed because it is spread out naturally and not because of business decisions. In implementing this coordination, managers need top management's support and commitment to be successful (Vecchio and Gobdel, 1984). Top management's commitment will help field leaders coordinate in maintaining long-term efficiency and effectiveness (Van Der Vegt *et al.*, 2015). By committing management, especially top management, operational projects, and drilling can be carried out effectively to fulfill the stakeholders' targets, including increasing company profit (Miller and Pazgal, 2002).

It is not easy to do this because the commitment must be real, consistent, and seen at every level (Sakthivel, 2007), whether in the form of effort or resources (Shah, 1996; Chowdhury *et al.*, 2007). The commitment of top management at a corporation is a vital factor in influencing field leaders to implement a strategic project so that its implementation runs effectively in the field (Floyd and Wooldridge, 1992; Shah, 1996).

Hypothesis 3 (H3): TMT Commitment has a positive effect on field agile leader.

The top management commitment at corporate is in the form of management support in conducting a job (Shah, 1996) by allocating all its resources (Chowdhury *et al.*, 2007). Without a commitment from top management, the planning process, coordination, and project implementation could fail (Shah, 1996). Important tasks from the top management team are to allocate resources, appoint leaders, develop organizational capabilities, and observe performance.

Agility is a concept in the context that is predominantly about flexible operations systems (Christopher and Towill, 2002). Agility in an organization refers to an

organization's capability to capture the prospects, threats, and returns by assembling the needed organizational resources with rapidity (Overby *et al.*, 2006). Research conducted by Joiner (2009) revealed that agile leaders' behaviors are attached to a distinct set of mental and emotional capacities that can be learned and developed.

According to Teece, Peteraf, and Leih (2016), the risk, complexity, and uncertainty are recognized; therefore, agility is needed to achieve a more favorable outcome concerning becoming flexibility and efficiency. Therefore, based on the above arguments, we hypothesize that:

Hypothesis 4a (H4a): TMT Commitment has a positive effect on operational capability.

Hypothesis 4b (H4b): Leadership agility development has a positive effect on operational capability.

Hypothesis 4c (H4c): Field agile leader has a positive effect on operational capability.

Operational capability integrates a series of complex activities carried out by a company to improve the performance to be more efficient (Dutta *et al.*, 1999; Hayes *et al.*, 1988). Cepeda and Vera (2007) regarded operational capabilities as part of dynamic capabilities. An operation can be made superior by improving its efficiency in the operational process to reach a competitive advantage (Day, 1994).

The impact of dynamic capabilities on financial performance is realized by improving a firm's operational routines (Zott, 2003). These routines manifest as competitive capabilities such as quality, reliability, and process innovation. Even though the dominant logic supports the mediated impact of dynamic capabilities on financial performance by improving competitive operational capabilities, some evidence is available to affect the competitiveness of cost-effectiveness directly. Based on the above elaboration, it is reasonable to hypothesize:

Hypothesis 5 (H5): Operational capability has a positive effect on field unit performance.

3. Research Methodology

This study's data is that of middle-level managers who serve as field leaders. The collected sample data are then analyzed using two methods, i.e., descriptive analysis and analysis measurement using structural equation modeling (SEM). This study adopted a systematic probability technique with the respondents from the oil and gas sector fields. The respondents were selected based on several specific related profiles, such as operations manager, project manager, and drilling manager or superintendent. The sample was selected from a population with particular standards. Data from 175 respondents were gathered through an online questionnaire by accepting a maximum likelihood sampling with a range of 50–100 respondents (Hair *et al.*, 2010) to achieve SEM's numerical requirements (Table 1).

Table 1. Research variables, dimensions, and indicator codes

Variables	Dimensions	Number of Indicators	References
Top Management Team Commitment	Internal Commitment	8 (TMCIN1-TMCIN8)	Fattouh & Darbouche, 2010; Sheikhzadeh <i>et al.</i> , 2012; Acha & Finch, 2005; Haque <i>et al.</i> , 2004; Chowdhury <i>et al.</i> , 2007; Shah, 1996
	Working Environment	6 (TMCWE1-TMCWE6)	
	External Commitment	7 (TMCEX1-TMCEX7)	
Leadership Agility Development	Cognitive Development	7 (LADCG1-LADCG7)	Lengnick-Hall <i>et al.</i> , 2011; Chatman <i>et al.</i> , 2005.
	Behavior Development	7 (LADBV1-LADBV7)	
	Contextual Development	7 (LADCT1- LADCT7)	
Field Agile Leader	Sensitivity	6 (FALSE1-FALSE6)	Sharifi & Zhang, 2001; Sambamurthy <i>et al.</i> , 2003; Teece <i>et al.</i> , 1997; Zott, 2003
	Flexibility	6 (FALFL1- FALFL6)	
	Speed	6 (FALSP1-FALSP6)	
Internal Operational Capability	Capability to Govern the Business Process	5 (IOCBP1-IOCBP5)	Jugdev <i>et al.</i> , 2007; Keegan & Turner, 2002; Soderlund, 2004; Zott, 2003
	Team Capability	7 (IOCTC1-IOCTC7)	
	Capability to Plan, Control & Evaluation	7 (IOCPC1-IOCTC7)	
Field Unit Performance	Accomplishment	7 (FUPAC1-FUPAC7)	Asrilhant <i>et al.</i> , 2006; Stonham, 2000; O'Dea & Flin, 2001; Collins, 1971; Eweje, 2006
	Cost-Effectiveness Social Impact	5 (FUPCE1-FUPCE5) 6 (FUPCE1-FUPCE6)	

Source: Own study.

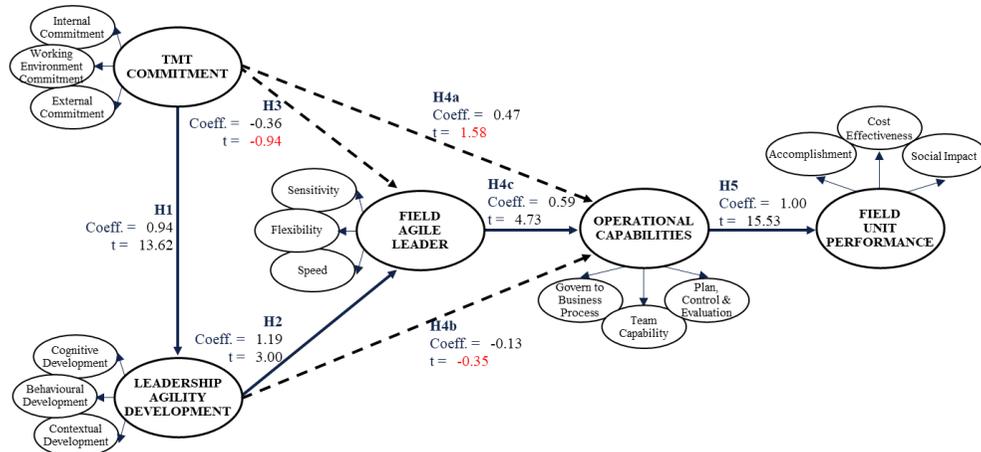
3.1 Measures

Figure 1 shows the research model, which consists of 5 research variables: TMT commitment (TMC), leadership agility development (LAD), field agile leader (FAL), internal unit capabilities (IOC), and field unit performance (FUP). These research variables were expanded further by adding measurement dimensions as well as indicators. Definitions of the research variables and their dimensions are listed in Table 1.

Data were analyzed using SEM with a sample size of 175. One of the main reasons for using SEM is that it provides an appropriate and most efficient approximation techniques for a series of separate multi-regression equations estimated concurrently (Hair *et al.*, 2013), and the variables in the model of research as LVs cannot be calculated directly but through indicators or observed variables. It is known as a model of measurement 1 in SEM. The other reason is that relationships among LVs

are quite involved in the form of simultaneous equations. It is known as a structural model in SEM (Hair *et al.*, 2013).

Figure 1. Research model: The second-order approach



Source: Own study.

4. Results

An assessment of the validity of indicators on their dimensions (1st Order CFA) is executed by analyzing these indicators' standardized factor loading (SFL). If the SFL of an indicator is ≥ 0.50 , the indicator is regarded as valid. If the SFL is < 0.50 , then the indicator is not valid and excluded or dropped from the measurement model. The results show that the indicators in Table 1 had an SFL of higher than 0.50; thus, they all were valid indicators/measurements of their stated dimensions. A similar procedure was applied to evaluate the validity of dimensions for their related research variables.

The results show that all dimensions were valid measurements of their associated variables. An evaluation of the reliability of the measurement model of the dimensions (1st Order CFA) and research variables (2nd Order CFA) was executed by testing the variance extracted (VE) and construct reliability (CR). If a measurement model had $VE \geq 0.50$ and $CR \geq 0.70$, then the measurement model had good reliability (Wijanto, 2015).

All measurement models of the dimensions had $CR \geq 0.70$, whereas some had VE slightly < 0.50 . However, in general, these dimensions had good reliability. Meanwhile, all five measurement models of the research variables had $VE \geq 0.50$ and $CR \geq 0.70$. It means that all research variables had good reliability. Thus, it can be concluded that the measurement models of the research variables have good validity and reliability. After a valid and reliable measurement model was obtained, the next step was to calculate the latent variable score (LVS) of the dimensions and four research variables (Jöreskog and Sörbom, 2006). Bentler and Chou (1987)

suggested a rule of thumb related to the minimum sample size required by SEM, five units of analysis for each model indicator (Table 2).

Table 2. *Summary of estimation results and overall model fit*

Path	Coefficient	t-value*	Conclusion
TMC ≥ LAD	0.94	13.62	Significant Positive
LAD ≥ FAL	1.19	3.00	Significant Positive
TMC ≥ FAL	-0.36	-0.94	Not Significant
TMC ≥ IOC	0.47	1.58	Not Significant
LAD ≥ IOC	-0.13	-0.35	Not Significant
FAL ≥ IOC	0.59	4.73	Significant Positive
IOC ≥ FUP	1.00	15.53	Significant Positive
GOFI: RMSEA ($\leq 0.08^{**}$) = 0.074; CFI ($\geq 0.90^{**}$) = 0.99; IFI ($\geq 0.90^{**}$) = 0.99; NFI ($\geq 0.90^{**}$) = 0.98			

Source: *Own study.*

Table 3 describes the research hypotheses, where H₁, H₂, H_{4c}, and H₅ have significant positive results. Therefore it can be concluded that they supported the hypotheses.

Table 3. *Test Results of Research Hypotheses*

Hypotheses of Research	Results	Conclusion
H ₁ : TMT Commitment has a positive effect on Leadership Agility Development	Significant Positive	H1 Supported
H ₂ : Leadership Agility Development has a positive effect on Field Agile Leader	Significant Positive	H2 Supported
H ₃ : TMT Commitment has a positive effect on Field Agile Leader	Not Significant	H3 Not Supported
H _{4a} : TMT Commitment has a positive effect on Operational Capability	Not Significant	H4a Not Supported
H _{4b} : Leadership Agility Development has a positive effect on Operational Capability	Not Significant	H4b Not Supported
H _{4c} : Field Agile Leader has a positive effect on Operational Capability	Significant Positive	H4c Supported
H ₅ : Operational Capability has a positive effect on Field Unit Performance	Significant Positive	H5 Supported

Source: *Own study.*

The results are presented in Table 3. The data support only four out of seven hypotheses. As shown in Table 2, the coefficients of TMC are 0.94 for LAD and -0.36 for FAL. Meanwhile, the remaining significant coefficients are 1.19 for LAD to FAL, 0.47 for FAL to IOC, and 1.00 for IOC to FUP. The simplified research model has significantly affected when t-value more than 1.96 (Figure 4), except for TMC to FAL (-0.94), TMC to IOC (1.58), and LAD to IOC (-0.35), which signifies the insignificant relationship.

5. Discussion

This research finds that TMT commitment and leadership agility development on field agile leaders, directly and indirectly, play a significant role in the Indonesian oil and gas sector. Simultaneously, the top management team commitment also influences leadership agility development as a mediating role to the agile leader. This has aligned with Lengnick-Hall *et al.* (2011), who discovers that agile leaders being developed through cognitive, behavior, and contextual approaches.

It is interesting to find that the top management commitment does not influence the agile leader and operational capabilities. In upstream oil and gas industry in Indonesia is quite complicated, uncertain, and volatile. It has required a strong leader with strong capabilities to handle the kind of situation. The leaders in the fields believe that the top management no directly helps them on the day to day operations. From this perspective, so this result is not surprising as the middle-level manager has no directly interacted with top management in headquarter. Interaction of contact between top management and the managers only by regular messages thru emails or town hall meetings quarterly. The field managers feel no direct impact on their routine activities, which is maybe exciting for future research. In this regard, the study finds that top management's corporate commitment is in the form of management support (Shah, 1996). It is achieved by allocating all of its resources (Chowdhury *et al.*, 2007). However, not directly to develop the leadership agility.

The study also finds that operational capability is the internal factor that influences the field unit performance. According to Cepeda and Vera (2007), it is known as operational capability, as the result of dynamic capabilities and to bridge the dynamic capabilities and knowledge management fields. An operation can become superior by improving its efficiency in the operational process and reaching a competitive advantage (Day, 1994). The contemporary references stress the crucial role of the integrative method in combining various operational abilities to reach its desired goals (Dutta *et al.*, 1999).

Teece *et al.* (1997) regarding dynamic capabilities, states that the increase in company performance is influenced by integrating, building, and reconfiguring company resources from external sources, positively related to positive performance improvements over time. In the oil and gas sector, all of the activities (drilling, project, and production operations) of oil and gas companies can explore exploration opportunities. They can look for new oil reserves, increase their established field oil and gas production performance, engage in operational efficiency, and have operational effectiveness (Sundewall *et al.*, 2010). This research has some limitations. First, this study is cross-sectional research. Thus, it is suggested that future research be conducted on a longitudinal basis to get deeper insights into the oil and gas sector dynamics. Second, this research's respondents are primarily from the upstream oil and gas sector, affecting more than 80% of Indonesia's gross domestic product (GDP).

It is suggested that future research be conducted that includes other midstream and downstream sectors that can have a more significant impact on oil and gas development. Third, the context of this empirical study is too limited to the -specific area.

It is suggested that future research be conducted to extend to other energy sectors like power and renewable energy that have a more significant impact on the country.

6. Conclusion

Overall, this study's output provides theoretical contributions and managerial contributions, especially for oil and gas field operations. This study demonstrates the main issues of field agile leaders' role when satisfied with IOC. In mediating by operational capability, field agile leaders lead to unit organization performance.

Since this study examined the impact factors of unit organization in the Indonesian oil and gas sector, future research must replicate the study in other industries and check the new further validate the research model. This study contributes to empirical research using the strategic agility framework of input-process-output suggested by Hitt *et al.* (2011) from the strategic management perspectives. The current leadership agility framework is a comprehensive framework to answer the challenges of robustness, broader scope, multilevel, and more dynamic models. Besides, detailed operational capabilities concepts as developed will enrich the agility in various contexts, which is applied in strategic management. Also, this study is one of the strategic management studies that examine strategic management.

The study provides suggestions for the corporates:

1. The corporation should strengthen the leaders' agility development as front-liner in managing the complexity and uncertainty of the oil and gas sector.
2. Top management will encourage the middle-level manager to improve operational capabilities through business process governance, team capability, planning, controlling, and evaluation.
3. To keep developing an agile leader to ensure a leader in the field has specific characteristics in managing oil and gas challenges.

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