Conceptualizing the Roles of Psychological Safety, Caring Management and Inclusiveness in Safety Culture Maturity in Malaysia's Oil and Gas Industry

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Abstract

The number of recent studies related to safety culture maturity in the context of oil and gas industry in Malaysia is rather limited, considering the fact that the oil and gas is a high-risk industry. A few existing studies on safety culture maturity in Malaysia were conducted in other context such as maritime. Thus, it leads to the research question of this study which is 'what constitutes safety culture maturity in the context of oil and gas industry in Malaysia?'. This qualitative study was geared towards conceptualizing safety culture maturity in Malaysia's oil and gas industry. It involved 9 informants from a project management team. Conducted focus group discussion and thematic analysis identified psychological safety, caring management and inclusiveness as significant domains of safety culture maturity. Technology-wise, this study implies that by leveraging technologies to facilitate better communication, organizations can create a mature safety culture, that protects, empower and lead to overall performance and well-being of employees.

Keywords: Safety Culture Maturity, Psychological Safety, Caring Management, Inclusiveness, Oil and Gas

Introduction

Safety culture is about organizational collective practices and is a characteristic of groups and of organizations (Hopkins, 2018). Meanwhile, safety culture maturity refers to the progressive development of safety practices and attitudes within an organization. Being an inherently high-risk industry, it definitely necessitates the oil and gas industry to have stringent safety measures to prevent accidents and ensure the well-being of workers.

Recent years were still witnessing incidence of workplace accidents in the oil and gas industry in Malaysia. One example is the explosion that killed one and left two employees injured when they were operating alongside the pipeline's right-of-way, the constrained area of land surrounding the pipeline at the Petrochemical plant in Lawas, Malaysia. It is quite impossible to eliminate the risk and hazard for this industry. Thus, in Malaysia, the development of a mature safety culture is paramount to sustaining industry growth and safeguarding employees.

There have been interesting debates on the overemphasis on cultural aspects of safety culture (eg. shared norms and values), that would shift the focus away from systemic analysis of accidents causes. The concept itself is characterized by evolutionary process. Maturation involves shifts in attitudes, behaviors, and organizational practices toward a proactive safety stance. Safety culture maturity can be categorized into several stages: (a) Pathological (Safety is viewed as a burden), (b) Reactive (Safety is managed reactively after incidents), (c) Calculative (Systems are in place to manage safety, but they are not fully integrated into operations), (d) Proactive (Safety is actively managed, and continuous improvement is sought), and (e) Generative (Safety is fully integrated into every aspect of the organization, with a continuous commitment to improvement).

However, there is little research on safety culture maturity based on Malaysia context. Most studies on safety culture have always been based on Western environment (Guldenmund, 2000), and Middle East (Ali et al.,2023). It is deemed as high time to conceptualize safety culture maturity within the context of Malaysia's oil and gas sector in the era of digitalization. And this study has taken place in an oil and gas company which 1,900 of its employees are not site-based, but rather working based on digital platforms, focusing on safety applications and digital solutions for safety.

The motivation of this study is the identification on the challenges of achieving higher levels of safety culture maturity due to organizational and behavioral factors. Traditional approaches to safety culture have largely focused on rules, procedures, and enforcement. There is growing recognition that psychological safety, inclusive leadership, and caring management can enhance employee participation and trust, which are crucial for safety compliance and proactive reporting.

The study proposes a novel conceptual framework that integrates psychological safety, caring management, and inclusiveness as key drivers of safety culture maturity. This framework offers a deeper understanding of how human-centric factors complement traditional safety practices. The findings of this study can guide organizations in the Malaysian oil and gas industry toward implementing leadership practices that enhance psychological safety and inclusiveness, ultimately advancing safety culture maturity. The research provides actionable insights for improving safety performance through leadership development, policy design, and employee engagement strategies.

Literature Review

Safety Culture Maturity

In 2002, Lardner proposed a safety culture maturity model which aims to facilitate organizational management to establish safety culture level of maturity, so that appropriate actions could be taken to improve the safety culture. This is because the likelihood for accidents to happen is not only accountable on employees' behavior but also the ways and culture are being embraced in organizations. A critical review study by Goncalves Filho and Waterson (2018) on 41 publications found that most studies focused on providing a descriptive account of safety culture using maturity models and make limited attempts to assess the reliability/validity of outcomes from their use.

According to Hudson, the use of maturity models in safety culture in terms of a continuum ranging from organisations that have unsafe cultures ('pathological' organisations) through to those who manage safety proactively ('generative' organisations) and those who are an intermediate stage of development ('bureaucratic' organisations) (Goncalves Filho, Andrade and de Oliveira Marinho, (2010).

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Psychological Safety and Safety Culture

Psychological safety refers to a shared belief amongst individuals as to whether it is safe to engage in interpersonal risk-taking in the workplace (Edmonson, Dillon & Rollof, 2007; Edmonson & Lei, 2014). It is the belief that one can speak up, make mistakes, or share concerns without fear of punishment or humiliation. Psychological safety is crucial for a mature safety culture as it encourages open communication, error reporting, and collaborative problem-solving. In Malaysia's oil and gas industry, fostering psychological safety can lead to more effective hazard identification and risk mitigation. Among essential strategies to enhance psychological safety include leadership training, establishment of clear feedback mechanisms for both employers and employees to voice out their safety concerns and team-building activities that promote trust and cohesion among workers.

Caring Management and Safety Culture

Caring management can significantly influence safety culture by building trust and loyalty among employees. When workers feel valued and supported, they are more likely to adhere to safety protocols and engage in behaviors that promote a safe working environment. Thus, strategies such as regular check-ins where managers regularly interact with employees to understand their concerns and needs, employee development programs, and health and wellness initiatives would be helpful in nurturing safety culture.

Inclusiveness and Safety Culture

Inclusiveness refers to creating a work environment where all employees feel respected, valued, and included, regardless of their background or role within the organization. Inclusiveness ensures that diverse perspectives are considered in safety practices, leading to more comprehensive risk assessments and innovative solutions. It also fosters a sense of belonging, motivating employees to actively participate in safety initiatives. Initiatives such as diversity training to educate employees on the importance of diversity and inclusiveness, introduction of inclusive policies to promote equal opportunities and respect for all employees, as well as establishment of employee resource or support groups that represent various employee demographics to ensure their voices are heard would be remarkable strategies to inculcate safety culture maturity.

Methodology

This qualitative study employed focus group discussion (FGD) as the data collection method because it allows in-depth exploration by having the participants sharing detailed personal experiences and insights. In the oil and gas industry, where safety culture is deeply rooted in daily practices and personal perceptions, this depth is invaluable. Secondly, the interactive nature of FGDs encourages participants to build on each other's ideas, leading to a richer understanding of safety culture.

Thirdly, safety culture in the oil and gas industry is influenced by various contextual factors such as organizational policies, management practices, and operational environments. FGDs allow researchers to explore these contextual elements in detail, providing a nuanced understanding of how they contribute to safety culture maturity. Finally, FGDs can help identify gaps in safety culture by highlighting discrepancies between stated policies and actual practices. Participants can discuss barriers to implementing safety procedures and suggest improvements, offering practical insights that might be overlooked in individual interviews or surveys.

A total of 9 informants from a project management team of an oil and gas company were involved in the focus group discussion (FGD). Their job positions ranged from executive to managerial levels. All participants were serving at the oil and gas company's headquarters and agreed to participate voluntarily, providing consent for the recorded discussion. Due to flexible work arrangement practices, the FGD was conducted in a hybrid mode.

Three of the informants attended virtually via Microsoft Teams, while the other six participated physically. Three of the informants were women, and the rest were men. Age-wise, they ranged between their 20s and 40s. Heterogeneity is very encouraged in FGD conduct as it opens the pathway to broader range of insights and solutions, gives comprehensive understanding as it uncovers issues that may not be visible in homogenous surrounding, and increases validity.

Two researchers acted as the facilitator moderated the whole two hours and 30 minutes session, guided by an interview protocol. The set of questions in the interview protocol was built based on reviewed literature on safety culture maturity. Among the included questions were (1) what constitute a good safety culture?, (2) what constitutes the safety culture maturity in your organization?, and (3) At what stage is the safety work culture maturity stage

of your organization? For question number two, informants were requested to select one from 25 cards to help them describe their safety work culture. Each of the cards was printed with terms identified as dimensions of safety culture maturity in reviewed literature.

Then, the recorded FGD was transcribed into verbatim transcripts. The verbatim transcripts which were then analyzed using thematic analysis approach. Thematic analysis of the qualitative data identified patterns were then converted into initial codes. The initial codes were relevant to the research question of this particular study which is 'what constitutes safety culture maturity in the context of oil and gas industry in Malaysia?'.

Findings and Discussion
As mentioned above, based on the thematic analysis results, three themes of safety culture maturity were inductively captured. They were psychological safety, caring management and inclusiveness. Further content of this section shall be narrating direct quote and verbatim transcripts of the informants which represented each of them identified themes.

Psychological Safety
The sharing of the informants clearly indicated how personal experiences and interactions of the employees around their workplace actually build their perception towards safety culture.

"I've seen in some organizations, the reference to authority. Despite the workers knowing the level of risk involved to proceed or not to proceed….if the highest paid person in the room say go and do it, the culture of reference to the authority would tell them 'okay we will proceed even under protest… yeah'. So that's part of the culture that's name reference to expertise yeah".

"..The leader in the room won't take no for an answer. That is the message that we are getting. There is a culture that of you wanr to get a good performance appraisal at the end of the year, you better not go against the authority..Another situation is the blaming culture.."

Caring Management
"We have a culture majority survey. Recently, we have just completed it. We also have done one two years ago. Results indicated the essence of having caring leaders. The employees could feel whether the top management really care or not about their safety and wellbeing so that's the perception. Actions shown by the leaders were observed and built employees' perceptions. Our company's top management is caring for the growth of our people compared to some other companies. This is one of the progressive feedback that we got. For example, when we do coaching, we invite along our corporate partners such as contractors to join together. Majority of our partners are contractors"
"Talking about psychological safety….is to be courageous enough to point out the things even though you are not in line with the authority".
Inclusiveness

"I would say the cohesiveness. When it comes to safety we have to hear on safety not only from the management but from those at the lowest level of job status up to the top management. We should even listen to the opinion of the laborers".

"I have my blind spots. So, reference to expertise means exactly like what my colleague mentioned just now. He or she is the person in the group of people that had spent the most amount of time or longer hours doing the job. Overseeing welding, repairing pump and so on…. So, the expertise belongs to these people. They are allowed to speak."

Another encountered challenging issue is communication with frontliners:
"Quite a number of our frontliner are from diverse. non-native English-speaking countries such as Nepal and Bangladesh. We are aware that some of them are even illiterate and cannot read any documents related to safety regulations. They relied on the verbal communication from their translators before they do their work. They do not carry safety documents with them, but they carry tools. So, they relied a lot on verbal communications from their translators. We also use lots of role-plays. We are also planning to provide more multi-lingual visual safety documents for them.

Technological Implications

Adaptation of technology could definitely facilitate fostering of safety culture maturity within the oil and gas industry. IoT devices can monitor equipment, pipelines, and work environments in real-time, detecting potential hazards (such as gas leaks, pressure buildups, or equipment failures) early. This enables immediate corrective action, reducing the risk of accidents and reinforcing a proactive safety culture. Automation minimizes human exposure to hazardous conditions by handling high-risk tasks, improving overall safety. By reducing manual interventions in dangerous environments, it fosters a safety-first mindset throughout the workforce.

By analyzing vast amounts of historical data on incidents, near-misses, and environmental conditions, companies can predict where and when safety issues might arise. This predictive capability promotes proactive safety measures and more informed decision-making, key aspects of a mature safety culture. AI can identify patterns in safety data, learning from past incidents to suggest improvements in safety protocols and training programs, further enhancing the organization's safety culture maturity. Virtual Reality (VR) and Augmented Reality (AR) provide immersive training environments where employees can practice responding to various hazardous situations in a controlled setting. These technologies allow workers to experience high-risk scenarios without real-world exposure, enhancing their understanding of safety procedures and risk awareness.

Digital training platforms make it easier to disseminate safety training programs across the workforce, ensuring that even remote workers are trained on the latest safety protocols. This helps in creating a unified and consistent safety culture across the organization. Technologies like mobile apps, cloud platforms, and team communication tools ensure that safety-related information is accessible to all employees in real time. These tools improve communication about safety risks, incidents, and best practices, encouraging transparency and collective responsibility for safety. Mobile and web-based platforms allow employees to report safety concerns and near-misses quickly and easily. This open channel for communication ensures that safety is seen as a shared responsibility, a hallmark of a mature safety culture.

Technologies that facilitate digital safety audits, inspections, and compliance tracking can streamline safety management processes. Automated systems can alert supervisors to non-

compliance in real time, ensuring that corrective actions are taken immediately and driving continuous improvement in safety practices. Wearable technology and devices such as smart helmets, glasses, or clothing equipped with sensors can monitor workers' health and environmental conditions (e.g., temperature, gas levels). By alerting workers and supervisors to potential hazards before they become critical, these wearables help maintain a high level of safety awareness, contributing to a mature safety culture. Cloud-based systems provide a single platform for managing safety policies, training, incident reports, and audit results. These systems facilitate the sharing of lessons learned from incidents and promote continuous improvement in safety processes, reinforcing the safety culture.

Conclusion

Psychological safety, caring management and inclusiveness are indeed significant components that contribute to development of safety culture maturity in this particular context of study. Technology plays a critical role in the evolution of safety culture maturity within the oil and gas industry by enabling proactive safety management, enhancing training, improving communication, and ensuring data-driven decision-making. When fully integrated into daily operations, technology helps to embed safety into every level of the organization, ultimately fostering a more mature, resilient safety culture.

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