

Investigating Employee Onboarding Processes through Lean Six Sigma in the Oil and Gas Industry in Oman

Montaha Saud Al Habsi

Logistics, Tourism, and Service Management Department
German University of Technology in Oman
Muscat, Sultanate of Oman
muntahahabsi01@gmail.com

Abstract

This research explores employees' onboarding processes, challenges, opportunities and the potential enhancements at the oil and gas industry, with a focus of a leading oil and gas company in Oman as a case study. The applied technique is an in-depth structured interview for eleven participants with the use of thematic analysis. The main themes were generated from the interviews are IT Technical Issues, Unstructured and Unclear Onboarding, Creating Digital Platform for Onboarding, Creating a Standardized Checklist, Employee Onboarding Program at the selected organization as a case study, Employee Onboarding Experience, Best Toolset and Enablers for Effective Onboarding Process, Importance of Data-oriented Techniques, Key Factors for Effective LSS Project. Most of the recent joiners agreed that they have faced IT and technical issues during their onboarding process and had challenges of the unstructured onboarding processes that impacted on their satisfaction. The opportunities they have initiated are by creating a digital platform specialized for the onboarding process as well as creating a standardized checklist for the new hires across the organization. Notable lack of research was noticed regarding employee onboarding processes in the context of oil and gas sector in Oman. Additionally, although the adaption of Lean Methodology in leading companies in the oil and gas industry in Oman, several new employees were observed are encountering onboarding challenges impacting their productivity and performance. The significance of this research is mainly for four stakeholders, including: Employees, oil and gas companies, government and its national strategies, and academia.

Keywords

Employee Onboarding, Lean Six Sigma

1. Introduction

Oil and gas sector is a dynamic industry and plays a vital role of the world's countries economy and their GDP, especially Sultanate of Oman (Alshubiri, Tawfik, & Jamil, 2020). According to Al Aufer (2024), gas and oil accounted of 72 percent of the country's GDP (Al Aufer, 2024). Additionally, the oil and gas sector is one of the heaviest industries when it comes to strict safety rules and work regulations. Thus, it is crucial to adapt best practices to ensure high efficiency and productivity.

According to Meyer and Allen (1988), one of the important factors that plays a big role in raising the productivity of oil and gas organizations is adapting effective strategies in employee onboarding processes. Enhancing these processes can lead to improving the quality of employee's satisfaction, productivity, confidence, and increase performance (Meyer & Allen, 1988). Employees' onboarding defined as "A process through which new employees move from being organizational outsiders to becoming organizational insiders" (T. N. Bauer & Erdogan, 2011b). It is important to equip the newcomers to the oil and gas industry with the right tools, material, provide them with training session and involve them with ongoing coaching process (Caldwell & Peters, 2018).

Looking at this from a different aspect, Lean Six Sigma is a methodology that is used globally across many sectors such as the oil and gas industry. According to Ali, Younus, Khan, and Pervez (2020), Lean Six Sigma aims to minimize waste and improve operational efficiency (Ali, Younus, Khan, & Pervez, 2020). This methodology consists of two main components, Lean, that aims to eliminate unnecessary processes in the workflow, and Six Sigma, and its main function is to enhance the quality of the operations.

Although there are limited number of oil and gas companies in Oman that is adapting Lean methodology, there is still lack of awareness and a lack of recent studies published in the context of employee onboarding processes in the oil and gas industry in Oman compared with worldwide. Therefore, these gaps create the value of this research paper to be a milestone for further papers to be published.

1.1 Statement of the problem

It has been acknowledged the growing of the oil and gas industry in Oman, which play a key role on Oman's sustainable development (Alshubiri, Tawfik, & Jamil, 2020). according to Al Auqi (2024), the gas and oil sector contribution to Oman's GDP is 72%, however, the onboarding processes implied in this sector are unsettled. Despite the adaption of lean methodology in several oil and gas companies in Oman, many employees are still encountering challenges during their onboarding process which significantly impacted their productivity and satisfaction.

Through exploring recent published papers, there was notable lack of papers and research in the context of employee onboarding processes in the oil and gas industry in Oman. Evidence to this statement, according to Wanous (1993), although the expansion in using different training programs and orientations, there is lack of research on orientation programs.

If these processes aren't handled in the right way, it can cause serious disadvantages such as high turn-over and unemployment. And since the oil and gas is one of main players of the Oman's economy, it is crucial to adapt best practices in onboarding their workforce.

According to Klein and Weaver (2000), new hires who are supervised during their onboarding process and attending the orientation program, are more socialized from three socialization aspects, such as: people, history, and objectives (Klein & Weaver, 2000). This determines the significance of utilizing new hires for effective onboarding process and effective organizational commitment.

1.2 Objectives

- To examine employees' challenges and opportunities in on-boarding processes in the oil and gas industry in Oman.
- To highlight the best practices of employee onboarding processes through a deep analysis of the literature reviews.
- To recommend an enhancement to the on-boarding processes through lean six sigma methodology in oil and gas industry in Oman.

2. Literature Review

There is evidence that shows enhancing employee onboarding processes can lead to better business performance, increase newcomers' satisfaction, reduce cost and time and lead to higher efficiency.

In this section, the study will investigate deeply under each sub-subject from previous articles and find related theories/frameworks, applied methodologies and limitations.

Employee Onboarding

Employee onboarding is also called Organizational Socialization, and it is defined as "A process through which new employees move from being organizational outsiders to becoming organizational insiders" (T. N. Bauer & Erdogan, 2011b). Baurer and Erdogan (2011b) also stated that onboarding "Refers to the mechanism through which newcomers acquire the required knowledge, skills, and behaviours to become effective employees". Lastly, Sambare defined employee onboarding as "A way to familiarize the employee with the work environment" (Sambare, Singh, Chirag Kriplani, Kale, & Tanuj Balkhande, 2022).

Employee Onboarding Existing Theories/Models

There are many studies that has established theories and models related to employee onboarding processes. One of these models affirmed by Klein, Polin, and Leigh Sutton (2015) on onboarding process consists of four main aspects, which are:

- Phases through which the new joiner get into the onboarding process.
- Contributors, who are encountered of onboarding the new joiners.
- Practices and principles of the organisation.
- Materials and content to be taught for the newcomers (Klein, Polin, & Leigh Sutton, 2015).

From the researcher perspective, there are other aspects that should be clearly addressed in the model, for instance, job training, mentorship, social networking, and continuous performance feedback. Overall, this model can be used to be in line with the context of oil and gas organizations in Oman to further well-define the employee onboarding and enhance it.

There is a common model that some recent papers on this topic relates to, for example according to Bauer (2011) highlighted the model on successful onboarding consisting of four building blocks called the 4C's which are:

- **Compliance:** Is the basic level in this model, and which means educating employees about the organisation's rules and regulations.
- **Clarification:** The level by which the newcomer understands his/her jobs' roles, responsibilities, and expectations.
- **Culture:** Is the third level, which means the newcomer get into the organisations' cultural practices, standards, and norms.
- **Connection:** The highest level in this model and means that the employee creates networks with his/her co-workers (T. N. Bauer & Erdogan, 2011b).

This model can be significantly useful to identify each newcomer's level of onboarding and know how to support each level with the right tools in oil and gas companies. In other words, Those two models discussed can be helpful for oil and gas organization to integrate both models by defining supportive tools, materials, contributors, and processes for each block out the four building blocks.

Additionally, and with the context of this research, those models can be also integrated with Lean Six Sigma techniques such as DMAIC by analysing each supporting element in the onboarding with each phase on DMAIC model.

By integrating those models, this will ensure for oil and gas companies to effectively measure the success of employee onboarding processes considering their culture values and communication styles.

According to Caldwell and Peters (2018), published a paper to investigate on the ethical implications of employee onboarding processes treatment by suggesting a model of ten-step for creating topmost effective onboarding process from a psychological and ethical perspectives. The ten steps expressed by the author are:

1. Setting up an online relationship straight away from hiring the new employee via Skype, email, or any other software.
2. Designate a dedicated and experienced mentor coach for the newcomer.
3. Emphasize the importance of socialization and creating networks for the new hires to become familiar with the organization culture and people.
4. Set a well-improved booklet for the new employee that contains all necessary information about the organization that the newcomer needs to know, such as organization's history, mission, policies, workplace culture and mission.
5. Arrange a physical office for the new employee and provide the necessary tools such as computer or laptop and has access to the organization platform.
6. Support in the changeable logistics that the new employee needs to be aware of, such as preparing the schools for children.
7. Explain work expectations and responsibilities of the new employee upon his/her arrival to the work office.
8. Acknowledge and appreciate the new employee's efforts. This can significantly build the newcomers confident.
9. Imply for onboarding training including management and supervisors.

10. Develop a continuous coaching procedure and seek for new employee's ongoing feedback (Caldwell & Peters, 2018).

From a psychological perspective, the author collected reviews from newcomers about problems they have encountered. The results show that, usually if this was not done effectively, it can lead to negative impacts, such as underutilization of employees' skills and weak performance. This negative impact is one of lean wastes, which can be an eye-opener to consider it when it comes to enhancing employee onboarding processes. It is important to note that the author once again highlighted the four building blocks or level to identify the newcomer phase of involvement in the organization as mentioned above.

Another model that was a foundation of many recent studies is the onboarding functions model which entails:

- **Recruiting process:** Hiring and employing new employee and sending the official offer.
- **Orientation:** The process by which providing a clear understanding and view for the newcomers about their roles and responsibilities, expectations, social practices, and the organisation environment.
- **Support Processes and Tools:** Including orientation session, clarifying newcomers' roles and responsibilities, goals, milestones, and timeline.
- **Support and Coaching:** a coach is a role model who can mentor the newcomer, support, and navigate him/her about the organisation political and social aspects.
- **Training:** up-skilling newcomers, educating them with the right materials
- **Feedback tools:** Formal and informal feedback given to the newcomers about their performance and progress (Bauer & Erdogan, 2011).

When evaluating this model from the researcher perspective, it seems that the feedback tools are the most important function as it helps the organisation in continuous improvement from the newcomers' reviews and feedback, and it ensures the sustainability of the onboarding program conducted. These functions can be integrated with Six Sigma tools like DMAIC phases and SIPOC. Starting from Recruiting Process function, Lean Six Sigma can be useful to eliminate wastes and hire the best candidates for the positions provided, and reduce waiting time for selected candidates during their onboarding process. Similar to Orientation function, lean six sigma can be highly used to prevent any miscommunications or for introducing newcomers to their roles and responsibilities and to prevent any issues during their post-onboarding phase. Lastly, for the Feedback tools, using data-oriented techniques for gathering feedback from the newcomers are crucial for effective continuous improvements. For example: it can help the onboarding specialists to see the satisfaction rate of the newcomers and adjust the onboarding accordingly. This is a crucial model in which can help in defining each of its element for any employee onboarding program produced.

Employee Onboarding Challenges, Opportunities and Best Practices

According to Sambare (2022), published a research on onboarding employee best practices. This paper aimed to decrease HR workload and increasing new hires satisfaction mainly by identifying critical tasks specifically on the onboarding process and automate them as possible. As a result, more than half of the participants on the survey conducted on this research of employees agreed that they have faced delays on workstation due to HR workload. A solution was initiated for this challenge is an automated platform designed for onboarding employee that can eliminate the waste of manual handover of task and other HR workload. This platform has several tech-solutions such as Optimal Character Recognition that helps in creating employee's account, and documents verifications (Sambare et al., 2022). It is important to emphasize on employee onboarding best practices especially on the oil and gas industry, as it consists of strict safety regulations and heavy operations. Therefore, it is crucial to look for best practices on employee onboarding from different organizations that align with the organizational culture of oil and gas sector to ensure the smooth employee onboarding processes for effective overall operations in the organization and to increase employees' satisfaction.

Some potential issues that may arise for newcomers during their onboarding the weak process until they get into the organization, and these issues are aligned with the challenges discussed by Sambare which leads to increasing employee dissatisfaction and HR workload.

It is worth to say the application of Optimal Character Recognition (OCR) tech-solution can be a success factor in using Lean Six Sigma methodology as it mainly helps in reducing time wastes and overprocessing, therefore, increasing satisfaction of new hires.

According to McKelvey and Frank (2018), where they found some challenges encountered by new employees on their onboarding experience in Montana State University Library, which was negatively decreasing their productivity. In the methodology part, they have been addressed to solve this issue on developing an employee experience journey mapping. This technique was helpful for the newcomers to address any challenge they might face on progressing on their onboarding; thus, it would be easy for the co-workers to solve their challenges (McKelvey & Frank, 2018).

The utilization of Experience Journey Mapping can be a very practical tool and a best practice in ensuring a smooth onboarding processes for the newcomers to address and solve their challenges effectively, it also can be beneficial when it comes to visualisation and to increase the visibility to all to encourage discussions on these processes.

According to Alexander (2021), during COVID pandemic, many organizations shifted from traditional working environment to virtual or remote working mode, which as well impacted onboarding specialists in organization to create virtual onboardings for the new hires. The foundation of successful onboarding is building new hire's confident in using all communications software (Alexander, 2021).

The author also highlighted that virtual onboarding could create a well-managed environment and can increase accountability (Alexander, 2021). For instance, and according to Goodermote (2020), the Medical Education Office at Rochester recognized eight obtainable tasks for the newcomers to practice the new virtual platform features in its methodology, such as one-to-one check-ins, mini-tutorials, allocate self-learning modules, creating process-flow spreadsheets and communicating with their leaders regularly. The results shows that new hires were gaining better learning outcomes from their experienced colleagues especially in communication, in addition there was a smooth workflow resulted from the process-flow spreadsheets. The newcomers were confident and not feeling isolated as they were well-mentored by their supervisors' regular meetings and tutorials (Goodermote, 2020).

These actionable items can be customized in the context in the oil and gas companies in Oman to optimize the employee onboarding processes based on the organization's unique requirements, needs, culture, and communication style to the newcomers. For example: some jobs are required to be at interior areas such as oil and gas fields where employees need to be physically attending for any onboarding or training session, and vice versa to those who are working in coastal areas. Moreover, the new hires usually are from diverse backgrounds, so it is crucial to create additional learning materials and tools to ensure the smoothness of employee's onboarding process without encountering any challenge that can make delays on the workflow.

According to Carlos (2021), published research aimed to examine employee's personal experience on onboarding process through literature review on the past and current practices on the onboarding processes in virtual environment through a method called autoethnographic. The author interviewed more than 30 new employees during their onboarding process to get their feedback on the 51-h virtual onboarding experience. Overall, the new joiners were expecting in their onboarding process for building relationships, supervisors seeking for their feedback, clearly defining their roles and responsibilities (Carlos & Muralles, 2021). It is worth to mention, that this paper again highlights the importance of conducting a regular feedback and surveys from the newcomers and the significance of building relationships and team building.

According Hillebregt (2019) to One of the significant opportunities that is important for organisation to work into it is to create an "Employee first" experience. As people nowadays working hard to be competing in the work market, it is essential to make an extraordinary experience for them and look what do they need to increase their satisfaction (Hillebregt, Jill M., 2019).

According to Yarbrough and Ramos Salazar (2023), published qualitative research on virtual onboarding and socialization which aimed mainly to examine virtual onboarding processes for the new hires during COVID-19. The methodology used is an inductive approach by analysing 83 online posts published by the new hires and developing different 9 themes using thematic analysis method. The results illustrated in the research shows two categories, the first group found the virtual onboarding experienced excelled while another group found difficulties on the virtual onboarding especially the communication part (Yarbrough & Ramos Salazar, 2023).

When it comes to practical implications of this study, majority of new employees expressed that they need social communication between them and their managers and team members, therefore, the researcher suggested in creating social media communication and informal peer-to-peer forums to enhance employee's satisfaction and to build strong relationships (Yarbrough & Ramos Salazar, 2023).

This paper proposed to develop peer-to-peer and informal forums or using social media work groups for newcomers with senior employees to eliminate any dilemmas or doubts. The limitations of this paper, that reviews are collected from online platform where some participants' reviews can be biased. The study highlights again the importance of communications especially the informal communication with new hires during their onboarding processes which can help in breaking the ice between the employees and supervisors.

According to Chillakuri (2020), aims to understand the needs and expectations of Gen Z regarding the onboarding process and encourage organizations to build onboarding programs to meet their expectations. These expectations are collected from opinions and conversation as interpretive research. The result of this study is a summary of six main themes which are:

- **Meaningful Work:** It is important for the supervisor to help Gen Z employees to understand that their work is valuable to the organization.
- **Performance Management:** continuous feedback is required from co-workers. It is important to have regular conversations with management team.
- **Work-life Balance:** Flexibility should be given to Gen Z to have a balance between their personal life and professional career.
- **Personal Connect:** By creating connections with their managers and team members.
- **Understanding the Bigger Picture:** making them fully engaged, involved, and empowered and giving them the space to take challenging work.
- **Learning and Development:** Gen Z is highly depending on self-learning; thus it is crucial to provide them with the right tool to sustain their learning journey (Chillakuri, 2020).

When aligning this research paper to our context of employee onboarding, it might be limitation for this study according to the context of this research in which the hired employees in oil and gas industry are not always from Gen Z category, but it is beneficial to align these main variables with our context in employee onboarding process and to consider the needs of Gen Z newcomers to optimize their onboarding process. All in all, these variables are important to understand them well and consider them while developing onboarding programs for any category of employees to increase their productivity and show them they are valuable to the organization.

Oil and Gas Industry in Oman

According to Hakro (2019), since seventies, the discovery of oil in the Sultanate of Oman made a huge growth in the development of the country, prosperity and created a well-structured governance. This development of the field have resulted to increase the GDP sized tripled since the discovery (Hakro, 2019). For instance, the natural gas and oil accounted of 72% percent of the country's GDP (Al Aufi ,2024) . This is one of the important factors that made Oman to grow seven percent on average for more for 25 years within 13 countries worldwide only (Hakro, 2019). Therefore, this industry play a vital role in Oman's economy. Additionally, recent articles shows that Oman has progressed greatly in the field of oil and gas, for example, and according to Economist Intelligence Unit N.A. Incorporated (2022) explained that the production of oil and gas has increased significantly in 2022, and it has reached to 33.6m barrels. Not only that, but the reporter in this article also expected that the production of oil and gas will stay high from 2022 to 2024 (Economist Intelligence Unit N.A. Incorporated, 2022). This gives an indicator how huge this sector is.

Lean and Six Sigma

According to Skalli, Charkaoui, and Cherrafi (2022), Lean Six sigma definition is "LSS stands for an integrated strategy, reflecting combined and synergetic link between two powerful continuous improvement approaches, namely Lean and Six Sigma" (Skalli et al., 2022). Lean Six Sigma Methodology have five main phases called DMAIC, which are:

- **Define:** To clarify and define the problem
- **Measure:** Data collection and mapping the process.

- **Analyse:** Find out the problem root causes.
- **Improve:** Find the solution and testing it.
- **Control:** To ensure it's sustainable, by mentoring and communication.

According to Chang (2023), has published a paper investigating the challenges in the educational sector during COVID-19, where they had to shift from being on-campus environment to work-from-home setup. This shift did not only impact the students, but even the instructors' faced struggles in the communication and whole process of remote environment. The researcher has developed a scoring system that includes teaching processes, student's materials, communication channels, etc. This system is useful to track student's performance and to get their feedback continuously. The researcher as well evaluated the online lectures using DMAIC Methodology (Chang et al., 2023). The DMAIC phases in this project went like this:

- **Define:** they have defined the scope and objectives of the by improving the students experience in online classes. They created the project charter as well.
- **Measure:** Data collection phase, data collected such as student grades and feedback scores.
- **Analyse:** Analysing the data collected from the previous stage and suggesting ways of improving the students' experience.
- **Improve:** implementing suggested improvements based on the data analysis phase
- **Control:** Measuring the sustainability of the project after implementing the suggestion (Chang et al., 2023).

The project made a positive impact, for example, after implementing the continuous improvement on this experience through lean six methodology, the overall grades for undergraduate courses increased from 86.67 percent to 90 percent (Chang et al., 2023). It is worth mentioning that, LSS eight main wastes are gathered in one word which is TIMWOOD, which stands for: Transportation, Inventory, Motion, Waiting, Over-processing, Over-production and Defects. Some resources added the letter "S" that stands for Underutilized Skills.

Therefore, and in the case of this paper, we can determine that the improvement of onboarding employee processes is not related to the employee themselves, but even the leaders or recruiters need to be well-trained for these improvements. In addition to that, lean six sigma is a methodology that can significantly help in continuous improvement, and evidence to this statement is the study mentioned above in raising undergraduates' grades because of the improvements.

According to Nascimento (2019) who published a paper titled "A lean six sigma framework for continuous and incremental improvement in the oil and gas sector" has discussed the importance on implementation of Lean Production and Lean Six Sigma in the oil and gas field. The research has an aim of establishing an integration between Lean Production using PDCA method (Plan, Do, Check, Act) and DMAIC methodology to create continuous improvements in the oil and gas industry to mitigate different types of wastes such as reducing costs and time lead. The methodology used is semi-structured interviews basically in two steps: creating a conceptual framework for this integration, and the second step is by doing focus groups interviews with leaders in the oil and gas industry for an assessment study and validation of this proposed conceptual framework (Nascimento et al., 2019).

The results show that, developing conceptual framework helps in improving the oil and gas industry such as operational efficiency, reducing costs, and eliminating wastes (Nascimento et al., 2019).

The methodology presented on this paper can be very beneficial, since it is targeting the oil and gas industry as well, which it can help to eliminate its major wastes such as consuming time.

According to Kaswan and Rathi (2020), published a paper that focuses on the integration of Green and Lean Six Sigma that helps in making sustainable performances for organization by using the methodology of creating a framework that integrates Green and Lean Six Sigma with their enablers and key toolsets, and the impact of using this integration on the organizational performance from three aspects: Social, Environmental, and economical as an output. Moreover, they have defined three elements toolsets (Such as: Value Stream mapping, Impact Assessment Tools, Kaizen..etc), Implementation Methods (Such as DMAIC Approach and Continuous Improvement) and Enablers (Such as: Organizational Culture, Education and Training and Employee Engagement) (Kaswan & Rathi, 2020). The proposed conceptual framework in the methodology was done in five steps:

- Project recognition of Green Lean Six Sigma.
- Evaluation of ongoing phase of the project.
- Find out root causes of the problem.
- Suggest suitable solutions and implement the optimal solution.
- Make the best solution sustainable (Kaswan & Rathi, 2020).

The outcome from this study is a comprehensive framework using DMAIC approach in Reducing waste and environmental impact. This approach helped to draw attention to the selection of suitable projects when it comes to sustainable development in the industrial organizations (Kaswan & Rathi, 2020). The resulted framework can be implemented in the context of oil and gas sector in Oman, considering the organization's culture, requirements and policy.

According to Brown (2019), has published a paper that integrates the concept of Lean Six Sigma and human resources titled "How lean is your recruiting?" highlights the importance of applying lean concepts in recruiting as it helps in reducing useless hiring, reducing time consuming activities and waste elimination. The article introduces Lean Recruiting Canvas, which is a framework that support organizations to enhance their recruiting methodology and it is used specifically by talent acquisition team. It has two main components which are planning and outlining the steps in recruitment and adapt to new changes that might emerge to the plan (Brown, 2019). From this application, it is observable that Lean Six Sigma can be applicable and extended for multiple processes in HR, therefore, employee onboarding processes as well.

According to Tay (2021), has discussed the integration of digital transformations technologies and Lean Six Sigma for process improvement in supply chain management. Three case studies-approach were used as a methodology in this paper: Company X, Company Y and Company Z. And those case studies research are based on the explanation that basic understanding of Lean Six Sigma can be useful in digital transformation to support the operational process improvements in supply chain management. The result of this paper contains a development of conceptual framework on DMAIC approach (Define, Measure, Analyze, Improve and Control) to create process improvements in supply chain management using digital transformations especially big data. One of the outcomes as well in integrating of lean six sigma and digital transformation, is the high quality of work by eliminating several types of wastes. Additionally, there was four supporting factors that can accelerate the digital transformations such as: People (Including leaders and employees), Standards Including the 5S's (Sort, Set, Shine, Standardize and Sustain) and visual management, problem solving (such as root causes analyses) and Innovation (Such as digital readiness in the organisation) (Tay & Loh, 2021).

When defining the similarities between the discussed study and this research, it is observable that supply chain management is a complex industry as onboarding processes. therefore, the oil and gas industry as well. It is crucial to pay attention to each detail on the onboarding process to mitigate any consequences such as employee dissatisfaction, additionally, the oil and gas has a very critical operations, where it is important to focus on using Lean Six Sigma methodology with the integration of digital transformation tools to ensure a smooth process for the new employees and to decrease the HR workload. Moreover, this paper can be very helpful for our study to recommend some of digital transformation technologies and to adopting it on enhancing employee onboarding processes such as data analytics, Augmented Reality, and Artificial intelligence. In addition to that, as mentioned on this paper that data scientists need to have the knowledge of Lean Six Sigma to the best value when it comes to process improvement, and so to employee onboarding processes as well.

3. Methods

3.1 Introduction:

Considering Lean Six Sigma, this research aims to examine employees' challenges and opportunities on their onboarding processes. Thus, a qualitative method will be applied for this research. This approach is appropriate to gain better understanding and deep analysis of recent joiner's experience on their onboarding process in the oil and gas industry in Oman and their suggestions for further improvements. Moreover, Lean Six Sigma methodology was selected on this research due to its focus in ensuring high-quality procedures and reducing wastes, which are critical factors in employee onboarding processes.

3.2 Study Population

The population of this study includes different categories, such as: Recent joiners to the oil and gas industry (in the last year). Additionally, it will target individuals specialized in Talent Acquisitions, to further understand the process and strategies conducted in the oil and gas organizations on onboarding the newcomers. And lastly Lean Six Sigma Professionals including Change and Continuous Improvement management.

3.3 Sampling Technique

The sampling technique conducted is non-probability sampling, specifically the purposive sampling. This technique is practical in identifying appropriate participants in interviews with specific and unique characteristics. The number of participants will be around 10-12 participants depending on the level of saturation, so whenever the data collected starts to be repeated or the researcher reached saturation level of knowledge and understanding. From this sampling strategy, we can ensure the representativeness of sample by using the appropriate sample size including its diversity to ensure fulfilling the research objectives.

4. Data Collection

The data collection technique that will be used in this research is focus as a case study on a leading oil and gas company in Oman with an in-depth structured and one-to-one interview, this will ensure gaining better knowledge of employee's perspectives and their different view angles when it comes to onboarding processes. In addition to that, one-to-one interviews can help the researcher in shaping a complete picture of a newcomer's onboarding journey.

5. Results and Discussion

5.1 Numerical Results

Demographical results is presented in Table 1.

Table 1. Demographical results

Characteristics	Frequency	Percentage%
Gender		
Male	7	70%
Female	3	30%
Total	10	100%
Age		
25-30	1	10%
31-35	2	20%
36-40	3	30%
Over 40	4	40%
Total	10	100%

Marital status		
Single	1	10%
Engaged	1	10%
Married	8	80%
Total	10	100%
Educational level		
Bachelor	4	40%
Master	4	40%
PhD/ DPA	2	20%
Total	10	100%

5.2 Graphical Results

Onboarding Employee's challenges and opportunities

The objective of conducting interviews for this research is to deeply understand the challenges that recent joiners in the oil and gas industry in Oman are encountering and the opportunities for improvements.

The results below will cover themes beyond the new hires' challenges and opportunities. The following mind maps illustrates the results for the first research question on "What are the challenges and opportunities facing the employees on their onboarding processes in the oil and gas industry in Oman?" those mind maps are generated from the interviews particularly from the recent joiners in the oil and gas industry in Oman category.

Two main themes are generated from this question which are: Challenges and Opportunities.

Onboarding Employees Challenges:

During the interviews for the recent joiner's category, participants were asked open-ended questions to understand their onboarding journey experience. As the researcher is conducting thematic analysis using Nvivo Software, four main sub-themes under the onboarding challenges label were generated from the interview's transcripts (Figure 1 and Figure 2).

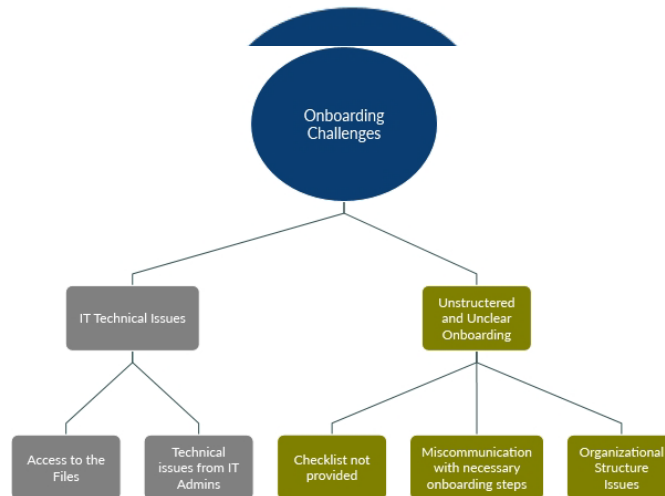


Figure 1. Onboarding employee's challenges.

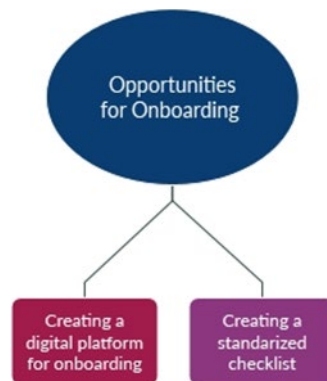


Figure 2. "Opportunities for employees onboarding."

These sub-themes are:

- 1- IT technical issues.
- 2- Unstructured and unclear onboarding.

One of the important challenges that were raised by more than a recent joiner is the IT technical issues including access to the team's files and folders, secondly is the technical issues from IT admins (access to the system, etc). Around 3 respondents faced this issue out of the six recent joiners. One of the respondents said:

"the issues we had honestly with the TV screen presenting the onboarding and the employee was going back and fore to the laptop showing us then stop, trying to work it in the TV, honestly that professional."

This issue was facing the new joiner during the orientation day from the HR team. Another respondent said: *"..Third Point sometime is the struggle with the infrastructure. So moving discs, which is your laptop, your PC"*.

and the last participant said: *"..kind of challenges it's mostly with the with the system which the new joiner is not really familiar with. So as I said, these kind of systems you will need some time to learn on them"*

These are one of relevant challenges discussed by Alexander (2021) where employees were struggling in using the communication software during COVID-19 where it led to the low level of new joiners confidence (Alexander, 2021). This issue can cause delays in the workflow and productivity of new joiners and can impact negatively on their impression of the company.

The second challenge that was heavily explained by the new joiners is unstructured and unclear onboarding including: organizational structure issue, as the organization is currently going into huge transformation when it comes to the structure and rules, understanding and coping with these changes were difficult to the new joiners. A respondent said: *"...I didn't feel I was ready. Because the new change is by itself is a change, the role was a change for me. in the organization was going through change, not just that, and within that less than a year, my line was (name). And now, he will be also (name), but we were expecting another line to be there. a lot of changes are happening on the same time.* This is one of the crucial aspect that most of oil and gas need to consider when onboarding their new hires as most of oil and gas companies are large, therefore, this would help the new hires to get into the organization's culture faster.

Another challenge that comes under the last theme was the unavailability of a checklist that includes all the tasks, trainings and courses that the new joiner must complete. A respondent said *"So they say that they have a checklist. And I was very busy doing the thing. And they were very busy doing their thing. And I didn't get the checklist."* Another one said *"Tools and materials had nothing comes to my mind actually.."* Providing a checklist and clarifying the roles and responsibilities for the newcomer is one of the essential steps when it comes to onboarding new employees as discussed by Caldwell and Peters (2018) in their model.

And the last issue that comes under this theme was miscommunication with necessary onboarding steps. A respondent explained *"when I joined the company, I have been placed to my role. And I didn't know that I have to go through a medical check. And then they told me you cannot be seated until you finish the medical check."* The respondent explained that this miscommunication caused a delay in the start on the first day joining the organization. Again, this is one of the crucial steps as discussed by Caldwell and Peters (2018) in his ten-steps model for onboarding newcomers

which is designing a booklet for the newcomers that explains the organization rules and regulations, policies, culture and more, is very important to ensure an effective onboarding process (Caldwell & Peters, 2018).

Onboarding Employee's Opportunities:

On the other hand, not all the recent joiners encountered challenges during their onboarding process, one of them joined the company last year from a Graduate Development Program where the joiner explained that the onboarding process was satisfied, well-structured and organized.

Besides that, one of the open-ended questions asked to the recent joiners is to suggest recommendations or opportunities for the challenges that they have encountered during their onboarding journey. Six different themes were generated from their explanation and illustrated in Figure 2.

- 1- Creating a digital platform for onboarding
- 2- Creating a standardized checklist

To start with, the most frequented opportunity mentioned by the participants was creating a digitized platform for all the recent joiners that includes the tasks and all-important information related to the organizational structure of the company. The participant said, *"having a very digitalized platform that can provide a comprehensive onboarding before, during and after, so that it's something I really look at it not only for me as an Omani but also from the expatriate's point of view."* This comes consistent with the importance of this digitized platform that was highlighted by (Alexander, 2021) that virtual onboarding can create a well-managed environment and can increase accountability. In addition, creating a standardized checklist for recent joiners is one of the recommendations explained by the participants. One of them said: *"And I need to get access to all folders through the team, which currently is an opportunity for the company I think."* The participant also said: *"onboarding could be actually provided in a standard way across organization. So for me, in a large organization, with the continuous improvement experience, we need to have a standard checklist for staff to move."* On other hand a respondent stated, *"having a list of online courses that is available in house will help."*

As mentioned above more, providing accessibility to the team's important files and folders for the recent joiners plays a key role in the success of the onboarding process and to speed up the productivity.

Lean Six Sigma Methodology

This theme investigates different sub-subjects that were asked for the Lean Six Sigma professionals' category. Through the interviews, they were asked mainly about best toolsets and enablers for effective onboarding process, key

factors for effective LSS project and the importance of using data-oriented techniques for employees onboarding processes. Figure 3 illustrates the most repeated answers by the participants.

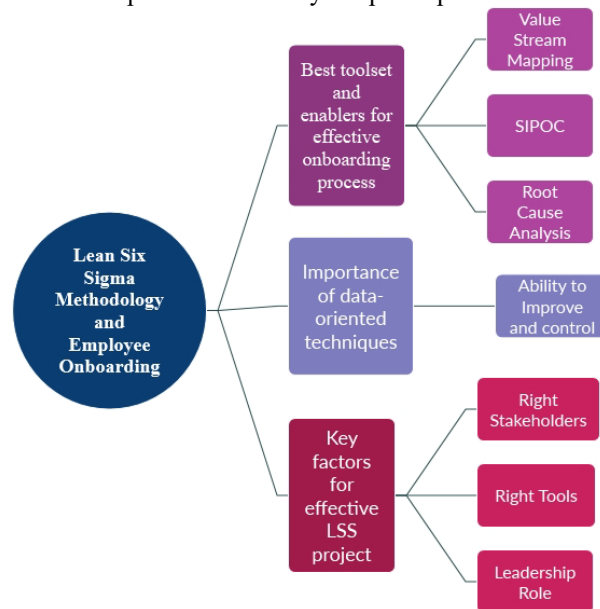


Figure 3. "Lean Six Sigma Methodology and Employee Onboarding."

To start with, the best toolsets and enablers in Lean Six Sigma for an effective onboarding process was one of the key questions for this category as Lean Six Sigma has plenty of different tools. The total number of tools suggested by LSS professionals was nine, however three of them were the most frequented tools answered by them. The first one was Value Stream Mapping tool, one of the participants explained it as following,

"Value Stream Mapping, like what is the process exactly, so what happens when you joined till leave, as of current and what would be the ultimate solutions." the second tool was Root Cause Analysis tool, explained by a participant said,

"Root Cause Analysis is very crucial I think, hence understanding from the experienced people who went through it like what is happening, so interviews is one. Fish bone and five why's another root cause analysis.."

And another explained that SIPOC can be beneficial for enhancing the onboarding process, the respondent stated, *"definitely having the SIPOC to understand the boundaries and the stakeholder of the process."* These outcomes are similar to more than one paper revised on the literature review. The first paper's results that are consistent to these outcomes are tools used for Green Lean Six Sigma project for sustainable development in industrial organizations such as Value Stream Mapping and Root Cause Analysis tools that were part a theoretical framework created on the methodology that helps the organizations on the results part in the selection of the right sustainable development projects (Kaswan & Rath, 2020). Another paper that supports the results presented, is according to Tay (2021), Root Cause Analyses is one of the problem-solving supporting factors when it comes to sustaining results and performance in integrating digital transformation (Tay & Loh, 2021).

Moving to the importance of data-oriented techniques to create areas of improvement when it comes to operational processes, the first significance is the ability to improve and control. This was the most frequented answer from all the participants. One of the participants said,

".. You will need those data to make the right decision to improve it but also you will need the data to tell you whether you are off track or on track after the improvement happens. So it's basically also for sustainability purpose to maintain the gain and to go back to the old process."

These responses come consistent with the Lean Six Sigma part in the literature review, that Improve and Control are the 3rd and 4th phases in the DMAIC Lean Six Sigma Methodology consistently according to (Chang et al., 2023). Lastly, the theme of key factors for an effective Lean Six Sigma Project where there were three top mentioned factors, the first one is the right stakeholder. A participant said “.. *So having the right stakeholders who are involved in the project with the right authority, who will be basically sign of the improvement that is also very important.*” Secondly is selecting the right tools. A participant said,

“The proper use of the tools selected for the project because we have really wide range of tools once comes to lean Six Sigma. So the right selection of the tools use them in the right way then also that will ensure a better result of the of the implementation.”

Again, as explored above in the literature many related papers in regard of implementation of Lean Six Sigma projects have selected few and the right tools actually to gain the better results.

And lastly, the engagement of leadership on these projects is one of crucial factors in the project’s success. A participant stated, *“All studies show that, 83% of success or failure of any project is in hands of the leadership. So, leadership to me is most important factor that would ensure success of any change.”* This is closely relevant to the results shared on a research by Tay & Loh (2021) when it comes the key critical factors in the success of supporting digital transformation tools which one of them is leadership that comes under the People factor.

In addition to that, the participants were asked additional questions to understand the status at the company with the implementation Lean Six Sigma methodology, and what is distinguishing this organization from other companies within the field. When it comes to the degree of LSS implementation at The organization, majority have answered that the implementation varies from one department to another, of them said, *“It’s a highly implemented with variation maybe to the degree from one department to another, but in overall sector as the company is leading compared to any other operators I would say.”* The participant added,

“.. Some operational department might have more opportunities because they will have more issues related to siting, related to the stakeholders they are dealing with contractors and it could be internally, it could be outside the company that the stakeholders are impacting”

Furthermore, the most repeated answer when it comes to what is distinguishing the company in the execution of Lean Six Sigma was the focus on the capability not the value, in other words, here are some responses,

“Employees’ capacities very competitive, capacities and competitiveness for employees in way even a new joiners they could sense that, new joiners they could feel that they are dealing with competency with different levels”

“So once it comes to the company, it's actually when we started the journey in 2009, the intention was not really to go after value 100%. The intention was to build the foundation, build capability and we were not that much basically eager into the value. We know that the value will come by nature if we have the solid foundation once it comes to people mindset, the culture, the philosophy, the operating model. So that was basically what distinguished us from the others.” The participant added, *“..for us it took us around 7 to 8 years only focusing on building capability. There is value out of those building capability definitely because they have to deal for a project. But they're really the focus on value becomes I would say after 2018 where we're basically we started to then be picky in selection of the project, be picky in validating the benefits and so on. So that's what's make us unique little bit in this implementation.”*

5.3 Proposed Improvements

based on the findings and results presented, the following recommendations are suggested to overcome the research problem and to enhance the onboarding process:

- 1- Developing comprehensive onboarding programs including **creating automated platform** that help to speed up the onboarding process for new hires. This platform can create a day-to-day agenda for the new joiner to follow since day one, for instance setting up the office or getting the checklist. This platform can also be available to access from the new joiner’s supervisor to check the new employee’s performance and progress. The platform can also consist of peer-to-peer informal forum between the

new joiners and their supervisors. Additionally, the platform has online form to get feedback from the new joiner regarding his/her onboarding process. HR team can analyse these data and feedback and find out the best directorate in creating the optimal onboarding process. Moreover, providing in-hand standardized checklists that includes all the necessary tasks, mandatory courses, and trainings. It is crucial for HR team to ensure that new hires and their supervisors are well-trained on these tools to mitigate any technical issues.

- 2- With the utilization of Lean Six Sigma various tools to mitigate the new hire's challenges on their onboarding process especially **Root Cause Analyses**. Throughout the analysis of results, and since lean six sigma professionals has suggested best toolsets in building an effective onboarding process. One of them is Root Cause analysis. This tool has several types, and one of them is the fishbone, which identifies the contributing factors for a specific problem and their corresponding causes.

The researcher used Lucid Chart Website to demonstrate the IT technical issues as a challenge for the new employees on a fishbone template and has analysed the possible causes for this challenge. The results are illustrated in Figure 4.

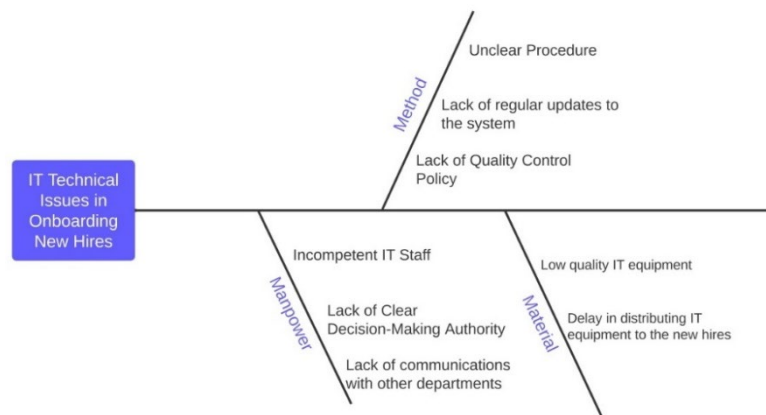


Figure 4. "Fishbone diagram for IT Technical challenge."

The research has identified three main contributor to the challenge, such as: Manpower (this can include the insufficient level of competency from IT team member, weakness on their decision-making, and lack of communication with other departments such as information of new employees are joining new team and other updates) the second contributor is Method (Including unclear procedure for IT team, lack of regular updates as the researcher has an experience on this challenges, and Lack of quality control policies) The last contributor is Material (Low quality IT equipment and delay in distribution of IT equipment to the new hires, and again, as an experience of the researcher in being trainee at The selected organization for the case study, had a delay in getting the IT equipment such as headset which decreased the researcher level of productivity).

All in all, this is an example of how Root Cause Analysis could be utilized to eliminate wastes such as waiting time and overprocessing and can be adjusted by the onboarding specialists with the coordination of IT department at the organization for accurate justification of the challenge.

- 3- Another **utilization of Lean Six Sigma tools is the SIPOC tool** that stands for: Supplier, Input, Process, Output and Customer. This tool can be beneficial to clearly understand and visualize the process of onboarding as suggested by Lean Six Sigma professionals. The researcher have identified each point

that comes under each element by the use of Visual Paradigm Website. The results illustrated in Figure 5.

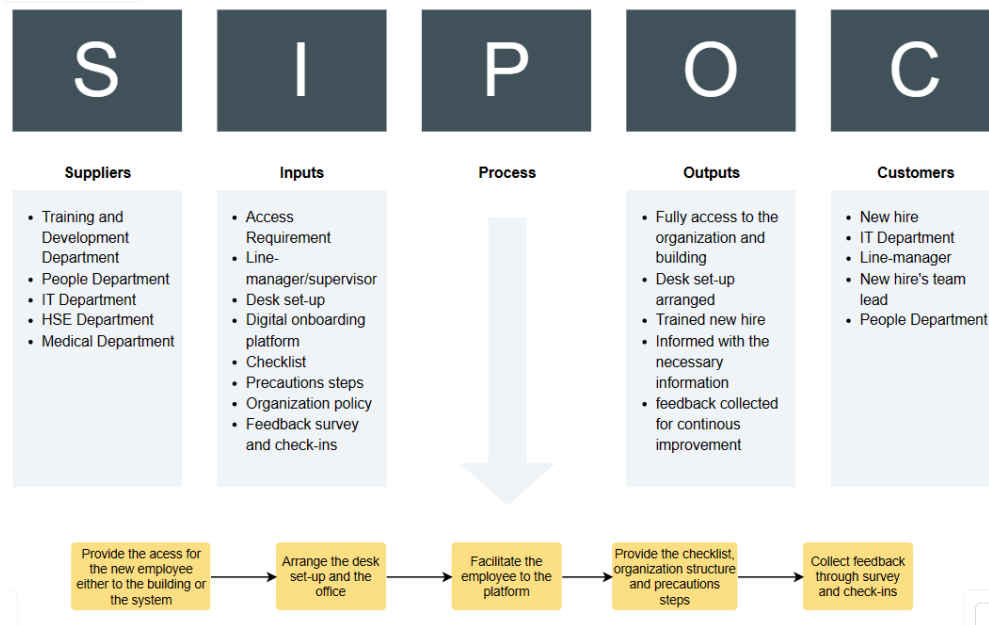


Figure 5. "SIPOC for Employee Onboarding"

After analysing the critical processes that The selected organization for the case study's onboarding team apply for onboarding the new hires from the interviews, the researcher has identified the key stakeholders that should be available for this process such as HSE and Medical facilities departments. The second element is the Inputs, where all important tools and individuals were mentioned. The third element is the process, so for all the inputs written a step was identified for it, and resulting the Output which the fourth element that create the result that we aspire for each new hire at the organization. Lastly, is the Customers, who will receive the outputs from this whole process. This is a useful tool that would help the onboarding specialists to clearly define the onboarding process including the key stakeholders, important tools to be readily available and all the steps.

6. Conclusion

All in all, this research deeply investigates challenges and opportunities for onboarding processes of oil and gas new hires. The results indicate that most of newcomers are struggling with IT technical issues and issues related to unstructured onboarding including difficulties in understanding the governance and the culture of their respective departments, as The selected organization for the case study is currently going into new organizational structure. From the opportunity's aspect, new joiners suggested to create specialized digital tools for the newcomers that helps them to speed their onboarding process, in addition to create a standardized checklist across the organization.

For the second research question, there were multiple onboarding process's best practices investigated though deep analysis such as, creating automated platform with the use of tech-solutions, building informal peer-to-peer communities using social media and utilizing Employee Journey Mapping tool to visualize the whole journey and encourage further discussions on the enhancement of onboarding processes. By utilizing these tools, employee satisfaction will increase, they will easily get integrated into the organization, and ultimately, increased their productivity.

References

Al Afi, S., Oil and Gas Driving Economic and Prosperity Rise. Ministry of Energy and Minerals in collaboration with Oman Observer. Retrieved from Ministry of Energy and Minerals in collaboration with Oman Observer website, 2024.

- Alexander, A., Virtual onboarding: lessons from the pandemic. *Public Services Quarterly*, 17(3), 208–211, 2021.
- Ali, Y., Younus, A., Khan, A. U., and Pervez, H., Impact of Lean, Six Sigma and environmental sustainability on the performance of SMEs. *International Journal of Productivity and Performance Management*, 70(8), 2294–2318, 2020.
- Alshubiri, F. N., Tawfik, O. I., and Jamil, S. A., Impact of petroleum and non-petroleum indices on financial development in Oman. *Financial Innovation*, 6(1), 2020.
- Bauer, T. N., and Erdogan, B., Organizational socialization: The effective onboarding of new employees. *APA Handbook of Industrial and Organizational Psychology, Vol 3: Maintaining, Expanding, and Contracting the Organization.*, 3(1), 51–64, 2011.
- Brown, C., How lean is your recruiting? In *The Lean Recruiting Toolkit*. Independently Published. 2019.
- Caldwell, C., and Peters, R., New employee onboarding – psychological contracts and ethical perspectives. *Journal of Management Development*, 37(1), 27–39., 2018.
- Carlos, A. R., and Muralles, D. C., Onboarding in the age of COVID-19. *IFLA Journal*, 48(1), 33–40. 2021.
- Chang, M. C., Faruqui, S. H. A., Alaeddini, A., and Wan, H., Evaluation and improvement of student learning experience in the post-COVID world: A lean six-sigma DMAIC study. *International Journal of Mechanical Engineering Education*. 2023.
- Chillakuri, B., Understanding Generation Z expectations for effective onboarding. *Journal of Organizational Change Management*, 33(7), 1277–1296., 2020.
- Economist Intelligence Unit N.A. Incorporated., Omani oil and gas production reaches new highs. *Country Report: Oman*. 2022.
- Goodermote, C., Remote onboarding and training of new program coordinators into the medical education office during Covid-19 social distance quarantine: process and recommendations. *Journal of Community Hospital Internal Medicine Perspectives*, 10(5), 399–401, 2020.
- Hakro, A. N., *Oman in the 21st century : issues and challenges*. New York: Nova Science Publishers.
- Hillebregt, Jill M., Creating a Cultural Onboarding Experience. *Policy and Practice*, 77(1). 2019.
- Kaswan, M. S., and Rathi, R., Green Lean Six Sigma for sustainable development: Integration and framework. *Environmental Impact Assessment Review*, 83, 106396, 2020.
- Klein, H. J., Polin, B., and Leigh Sutton, K., Specific Onboarding Practices for the Socialization of New Employees. *International Journal of Selection and Assessment*, 23(3), 263–283. 2015
- KLEIN, H. J., and WEAVER, N. A., THE EFFECTIVENESS OF AN ORGANIZATIONAL-LEVEL ORIENTATION TRAINING PROGRAM IN THE SOCIALIZATION OF NEW HIRES. *Personnel Psychology*, 53(1), 47–66. 2000.
- McKelvey, H., and Frank, J., Improving Onboarding with Employee Experience Journey Mapping: A Fresh Take on a Traditional UX Technique. *Weave: Journal of Library User Experience*, 1(9), 2018.
- Meyer, J. P., and Allen, N. J., Links between work experiences and organizational commitment during the first year of employment: A longitudinal analysis*. *Journal of Occupational Psychology*, 61(3), 195–209, 1988.
- Nascimento, D. L. de M., Goncalvez Quelhas, O. L., Gusmão Caiado, R. G., Tortorella, G. L., Garza-Reyes, J. A., and Rocha-Lona, L., A lean six sigma framework for continuous and incremental improvement in the oil and gas sector. *International Journal of Lean Six Sigma*, 11(3), 577–595, 2019.
- Sambare, S. S., Singh, A., Chirag Kriplani, Kale, S., and Tanuj Balkhande., Automated Platform for Onboarding Employee. 2022 6th International Conference on Computing, Communication, Control and Automation (ICCUBE), 2022.
- Skalli, D., Charkaoui, A., and Cherrafi, A., Assessing interactions between Lean Six-Sigma, Circular Economy and industry 4.0: toward an integrated perspective. *IFAC-PapersOnLine*, 55(10), 3112–3117, 2022.
- Tay, H. L., and Loh, H. S., Digital transformations and supply chain management: a Lean Six Sigma perspective. *Journal of Asia Business Studies*, 16(2), 340–353, 2021.
- Yarbrough, J. W., and Ramos Salazar, L., Virtual onboarding and socialization, an exploration of employee discussions and experiences. *Corporate Communications: An International Journal*, 28(5), 707–723, 2023.

Biography

Montaha Al Habsi is an International Business and Service Management fresh graduate at German University of Technology in Oman with a cGPA of (3.7) with (Excellent). She has received her bachelor's degree on June, 2024. She is proud to return to her university as a Quality Assurance and Planning Intern. Her research interests lie in the area of Lean Six Sigma, oil and gas industry, and human resource's best practices.