

**PANDEMIC RESILIENCE: ANALYSING THE OIL AND GAS INDUSTRY'S
RESPONSE TO COVID-19 AND ITS IMPACT ON EMPLOYEE WORK
ENVIRONMENT**

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Abstract

This research investigates the strategies and measures implemented by the oil and gas industry to bolster its pandemic resilience and the subsequent effects on the work environment of employees during the COVID-19 crisis. It also endeavors to gauge the satisfaction levels stemming from the work environment shaped by the COVID-19 pandemic. Employing a descriptive research design, data was collected through a survey method. The study focused on employees within the oil and gas sector in Gujarat, with 418 respondents participating via a structured questionnaire distributed through simple random sampling. The findings revealed a substantial part of the workforce, particularly field employees and machine operators, transitioned to remote work during the pandemic, indicating the industry's adaptability in the face of shifting work environments. While a significant number of employees received the necessary resources for remote work, there was room for improvement, especially among machine operators and employers. This highlights the need for enhanced support in specific areas. The study underscored the extensive impact of the pandemic on employees' physical and mental well-being, emphasizing the urgency of comprehensive support and initiatives within the industry. Respondents generally perceived the effective implementation of health and safety measures, signifying a positive approach to employee well-being and safety. Disruptions in the supply chain were prevalent during the pandemic, with potential implications for the industry's operational aspects, underscoring the significance of bolstering supply chain resilience. The data also indicated the pandemic's influence on employees' perceptions of job security, particularly among field employees, necessitating the development of tailored strategies to address these concerns. Furthermore, the study highlighted the industry's proactive approach to training and development related to pandemic preparedness, reflecting a commitment to employee readiness. Despite the challenges presented by the pandemic, a significant proportion of employees reported a positive sense of camaraderie and teamwork within their organizations, signifying a resilient organizational culture. Statistical analysis uncovered a significant association between respondents' designations and their satisfaction levels with communication and updates during the pandemic, emphasizing the necessity for further exploration of this relationship.

Keywords: *oil and gas industry, pandemic resilience, COVID-19, employee work environment, job responsibilities, gender imbalance, age diversity, remote work, well-being, health and safety*

measures, supply chain disruptions, job security, training and development, camaraderie, satisfaction levels, Gujarat.

Introduction

In the early months of 2020, the world was jolted by the rapid and unforeseen spread of the COVID-19 pandemic. Nations and industries were forced to adapt to a new and unprecedented global crisis. Among the sectors affected was the oil and gas industry, a cornerstone of the world's energy infrastructure. As governments implemented lockdowns, travel restrictions, and health and safety protocols, the oil and gas sector was confronted with an array of challenges, including demand fluctuations, supply chain disruptions, and workforce safety concerns. In this dynamic and evolving landscape, the industry needed to exhibit not only resilience but also adaptability to survive and thrive in the "new normal" that was emerging (Sharma, M., Joshi, S., Prasad, M., & Bartwal, S., 2023).

This research aims to investigate into the oil and gas industry's response to the COVID-19 pandemic, with a specific focus on the state of Gujarat in India. Gujarat, home to a significant share of India's oil and gas production and infrastructure, plays a crucial role in the nation's energy landscape. Understanding how the industry coped with the pandemic in this region can offer valuable insights into the broader challenges faced by oil and gas operations globally.

The pandemic-induced disruptions impacted every facet of the industry, from upstream exploration and production to downstream refining and distribution. Workforces in Gujarat, much like their counterparts around the world, encountered an entirely novel set of circumstances. Remote work became a necessity for some, while essential frontline workers had to navigate a new world of heightened safety protocols. The question of how this industry adjusted, adapted, and ultimately recovered holds a key interest.

In a world of ever-increasing uncertainties, understanding how organizations adapt and evolve in response to unprecedented disruptions is essential. This research is poised to provide valuable insights into the complex interplay between pandemic resilience, organizational response, and the work environment, and will ultimately shed light on how the oil and gas industry in Gujarat can emerge from this experience as a more robust and adaptable entity, prepared to meet the challenges of the future.

Review of Literature

The year 2020 brought with it an unprecedented global challenge that had far-reaching consequences across every aspect of human life. The COVID-19 pandemic, caused by the novel coronavirus, shook the world to its core, posing a threat to public health, global economies, and the very fabric of society (Basile, V., Capobianco, N., & Vona, R., 2021). It compelled nations, industries, and individuals to reevaluate their approaches to daily life, work, and safety. Among the sectors profoundly affected was the oil and gas industry, a vital cornerstone of the global energy infrastructure (Sarrakh, R., Renukappa, S., & Suresh, S., 2022).

The pandemic, characterized by its rapid and unpredictable spread, was a crisis of monumental proportions. It had a profound impact on every link in the oil and gas supply chain, from exploration and production to distribution and retail (KAUR, M., 2014). As governments around the world imposed lockdowns, travel restrictions, and strict health and safety protocols, the industry found itself facing an array of challenges that had never been encountered on such a scale. Fluctuations in demand, disruptions in the supply chain, workforce safety concerns, and a shifting geopolitical landscape all added to the complexity of the situation (Okeke, A., 2021).

In the face of these challenges, the oil and gas industry was forced to adapt, evolve, and demonstrate resilience in ways that were unimaginable just a short time before. It had to contend with supply and demand imbalances, navigate an evolving regulatory landscape, and safeguard the well-being of its workforce. This multifaceted challenge required strategic thinking, rapid decision-making, and innovative solutions (Yusuf, Y. Y., Gunasekaran, A., Musa, A., Dauda, M., El-Berishy, N. M., & Cang, S., 2014). Moreover, the industry had to respond to changes not only in the external environment but also within the workplace itself.

In a world characterized by uncertainty and change, understanding how organizations adapt and thrive in the face of extraordinary challenges is paramount. This research seeks to provide these insights, shedding light on the complex relationship between pandemic resilience, organizational response, and the work environment. Ultimately, the findings will serve as a guidepost for the oil and gas industry, enabling it to emerge from the COVID-19 experience as a more resilient, adaptable, and innovative entity, ready to confront the uncertainties and challenges of the future (Grasso, M., 2019).

Objectives

Evaluate the strategies and measures adopted by the oil and gas industry to enhance pandemic resilience and their subsequent impact on the work environment of employees during the COVID-19 crisis. Further the study attempts to estimate the satisfaction level from the work environment created by COVID-19 Pandemic.

Methodology

The study adopted Descriptive research design, wherein the data was collected through survey method. For the purpose of study, the data was collected from employees working in Oil and Gas industry in Gujarat were considered as the sample. Using simple random sampling technique, the data was collected from 418 respondents through structured questionnaire.

Analysis and Interpretation

This table shows the distribution of respondents based on their gender, age, and designation within the oil and gas industry.

Table No. 1: Demographic Profile of the respondents

	Frequency	Percent
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Gender	Male	335	80.1
	Female	83	19.9
	Total	418	100.0
Age	Less than 35 Years	52	12.4
	35 - 45 Years	169	40.4
	45 - 55 Years	153	36.6
	Above 55 years	44	10.5
	Total	418	100.0
Designation	Field Employee	181	43.3
	Machine Operators	152	36.4
	Employer	39	9.3
	Administrative Staff	46	11.0
	Total	418	100.0

Source: (Primary data)

Gender:

- The table indicates that a total of 418 respondents participated in the survey.
- Out of the total respondents, the majority were male, accounting for 80.1% of the respondents.
- Female respondents comprised a smaller but still significant proportion at 19.9%.

This suggests that the survey had a larger representation of male respondents in the oil and gas industry, with a notable but comparatively smaller presence of female respondents.

Age:

- The respondents' ages were categorized into four groups: "Less than 35 Years," "35 - 45 Years," "45 - 55 Years," and "Above 55 years."
- The most substantial group of respondents fell into the "35 - 45 Years" category, making up 40.4% of the total respondents.
- The second-largest age group was "45 - 55 Years," with 36.6%.
- "Less than 35 Years" accounted for 12.4% of respondents, while "Above 55 years" constituted 10.5%.

The majority of the respondents were in the age range of 35 to 55 years, indicating a mature and experienced workforce in the oil and gas industry. However, there was also a presence of younger and older employees in the survey.

Designation:

- Respondents' designations were categorized into four groups: "Field Employee," "Machine Operators," "Employer," and "Administrative Staff."
- The largest group of respondents held the designation of "Field Employee," making up 43.3% of the total respondents.
- "Machine Operators" constituted the second-largest group at 36.4%.
- "Administrative Staff" accounted for 11.0% of the respondents, and "Employers" represented 9.3%.

The data reveals a diverse mix of designations among the respondents, with a significant presence of field employees and machine operators. This suggests that the survey covered a broad spectrum of roles within the oil and gas industry, from fieldwork to administrative and managerial positions.

The data presented in Table No. 2, which provides information about the work environment during the COVID-19 pandemic within the oil and gas industry, broken down by the respondents' job designation.

Table No. 2: Work Environment During COVID – 19 Pandemic

		Did your job responsibilities change during the COVID-19 pandemic in the oil and gas industry?		Total
		Yes	No	
Designation	Field Employee	152	29	181
	Machine Operators	133	19	152
	Employer	10	29	39
	Administrative Staff	27	19	46
Total		322	96	418
		Did your organization implement remote work or telecommuting during the pandemic?		Total
		Yes	No	
Designation	Field Employee	156	25	181
	Machine Operators	137	15	152
	Employer	16	23	39
	Administrative Staff	20	26	46
Total		329	89	418
		Were you provided with the necessary tools and resources to work from home effectively during the pandemic?		Total

		Yes	No	
Designation	Field Employee	153	28	181
	Machine Operators	137	15	152
	Employer	18	21	39
	Administrative Staff	30	16	46
Total		338	80	418
		Did the COVID-19 pandemic impact your physical and mental well-being?		
		Yes	No	Total
Designation	Field Employee	161	20	181
	Machine Operators	136	16	152
	Employer	16	23	39
	Administrative Staff	21	25	46
Total		334	84	418
		Were health and safety measures effectively implemented at your workplace during the pandemic?		
		Yes	No	Total
Designation	Field Employee	151	30	181
	Machine Operators	135	17	152
	Employer	23	16	39
	Administrative Staff	22	24	46
Total		331	87	418
		Did you experience disruptions in the supply chain that affected your work during the pandemic?		
		Yes	No	Total
Designation	Field Employee	160	21	181
	Machine Operators	135	17	152
	Employer	19	20	39
	Administrative Staff	26	20	46
Total		340	78	418

		Did the pandemic impact your perception of job security in the oil and gas industry?		Total
		Yes	No	
Designation	Field Employee	157	24	181
	Machine Operators	133	19	152
	Employer	21	18	39
	Administrative Staff	23	23	46
Total		334	84	418
		Did you participate in any training or development programs related to pandemic preparedness during the COVID-19 crisis?		Total
		Yes	No	
Designation	Field Employee	159	22	181
	Machine Operators	137	15	152
	Employer	23	16	39
	Administrative Staff	23	23	46
Total		342	76	418
		Did you feel a sense of camaraderie and teamwork within your organization during the pandemic?		Total
		Yes	No	
Designation	Field Employee	161	20	181
	Machine Operators	136	16	152
	Employer	19	20	39
	Administrative Staff	27	19	46
Total		343	75	418

Source: (Primary data)

- Change in Job Responsibilities:
 - The data suggests that a significant proportion of field employees and machine operators experienced changes in their job responsibilities during the pandemic, likely due to shifts in operational requirements.
- Implementation of Remote Work:

- The results show that a significant portion of the workforce, especially field employees and machine operators, transitioned to remote work during the pandemic, indicating adaptations made to accommodate the changing work environment.
- Provision of Necessary Tools and Resources for Remote Work:
 - While a substantial number of employees received the necessary resources for remote work, it's notable that there was room for improvement, particularly among machine operators and employers.
- Impact on Physical and Mental Well-being:
 - The findings highlight the widespread impact of the pandemic on the well-being of employees, emphasizing the need for support and initiatives to address these concerns.
- Effective Implementation of Health and Safety Measures:
 - This suggests a generally positive perception of the health and safety measures implemented in the workplace during the pandemic.
- Disruptions in the Supply Chain:
 - The findings emphasize that disruptions in the supply chain were prevalent, which likely had implications for the operational aspects of the industry.
- Impact on Job Security:
 - The results underscore the influence of the pandemic on job security perceptions, especially among field employees.
- Participation in Training or Development Programs:
 - The data highlights a proactive approach to training and development related to pandemic preparedness within the industry.
- Camaraderie and Teamwork:
 - The results indicate that, despite the challenges posed by the pandemic, a significant portion of employees perceived a positive sense of camaraderie and teamwork within their organizations.

Table No. 3 presents data related to respondents' satisfaction with the communication and updates provided by their organizations during the COVID-19 pandemic in the oil and gas industry. The table also includes a correspondence table and a summary of the dimensions, including singular values, inertia, chi-square values, and confidence singular values.

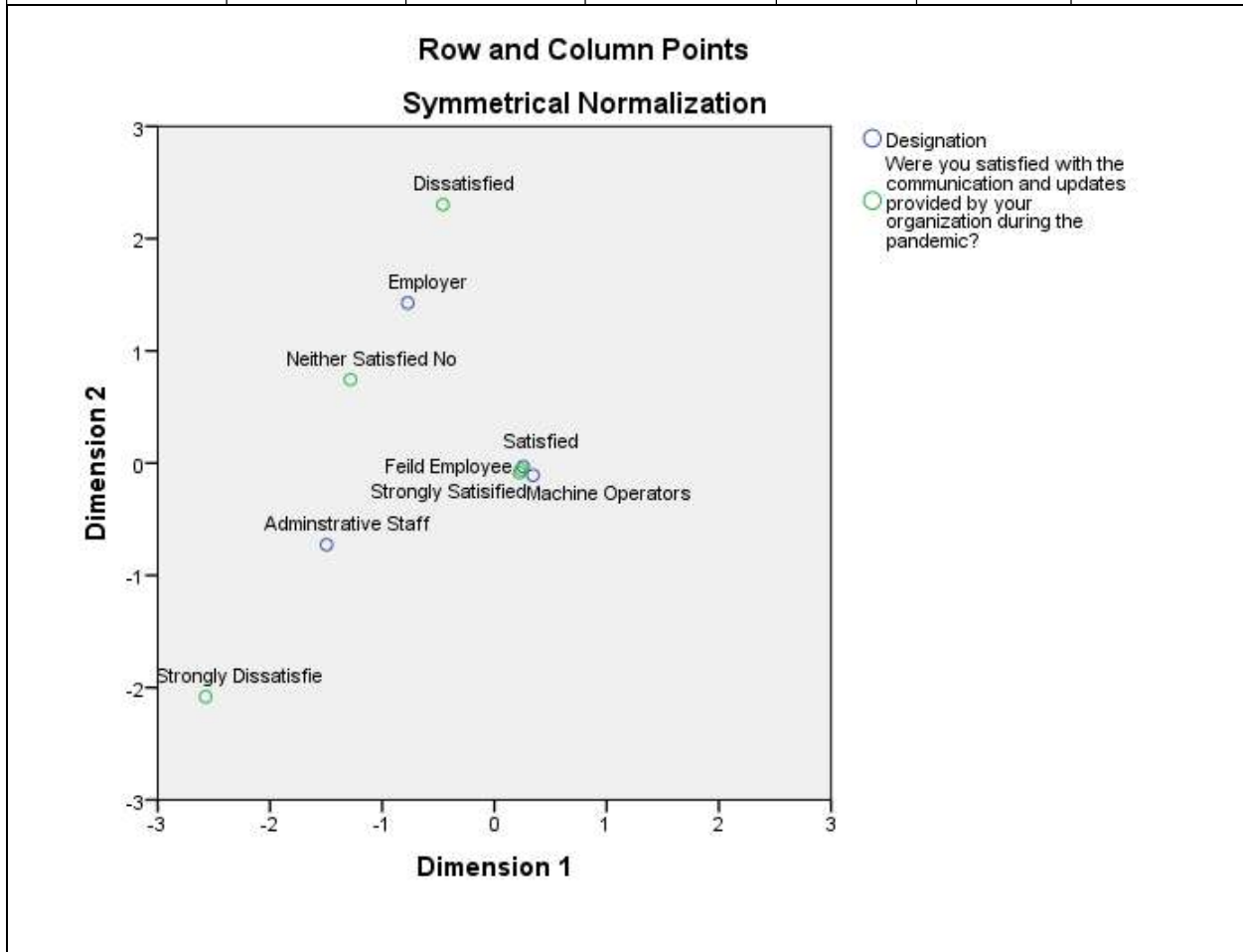
Table No. 3: Satisfaction due to Work Environment During COVID – 19 Pandemic

Correspondence Table						
	Were you satisfied with the communication and updates provided by your organization during the pandemic?					
Designation	Strongly Dissatisfied	Dissatisfied	Neither Satisfied Nor Dissatisfied	Satisfied	Strongly Satisfied	Active Margin

Field Employee	2	3	11	92	73	181
Machine Operators	1	1	8	69	73	152
Employer	0	3	12	12	12	39
Administrative Staff	7	0	11	15	13	46
Active Margin	10	7	42	188	171	418

Summary

Dimension	Singular Value	Inertia	Chi Square	Sig.	Confidence Singular Value	
					Standard Deviation	Correlation 2
1	.373	.139	87.012	.000 ^a	.062	.309
2	.253	.064			.060	
3	.069	.005				
Total		.208				



Source: (Primary data)

Correspondence Table:

- The correspondence table provides a breakdown of respondents' satisfaction levels based on their designation and their level of satisfaction with the communication and updates provided by their organizations during the pandemic.
- Satisfaction levels are categorized into "Strongly Dissatisfied," "Dissatisfied," "Neither Satisfied Nor Dissatisfied," "Satisfied," and "Strongly Satisfied."
- The "Active Margin" represents the total number of respondents in each satisfaction category across all designations.

Summary of Dimensions:

- The "Summary of Dimensions" section includes information about the analysis of the correspondence table.
- Singular Value: This represents the strength or importance of the dimension in the analysis.
- Inertia: Inertia indicates how much of the total variance in the data is explained by the dimension. In this case, the first dimension (Dimension 1) explains a significant portion of the variance (approximately 13.9%).
- Chi Square: Chi-square is a statistical test used to determine if there is a significant association between variables. In this case, the chi-square value is provided, suggesting a statistically significant association between the variables.
- Sig. (Significance): The significance value (Sig.) measures the probability that the association observed is due to chance. A very low significance value (in this case, approximately 0.000) indicates a strong association.
- Confidence Singular Value: This value represents the importance of the dimension in the analysis.

Interpretation:

- The table indicates that there is a statistically significant association between respondents' designations and their satisfaction levels with the communication and updates provided by their organizations during the pandemic. The first dimension (Dimension 1) explains a substantial portion of the variance in the data, suggesting that designations and satisfaction levels are closely related. This means that respondents' satisfaction with communication and updates during the pandemic varies significantly based on their job roles within the oil and gas industry.
- Further detailed analysis and interpretation of the specific dimension (Dimension 1) would be necessary to understand the precise nature of the relationship and any potential patterns or trends in respondents' satisfaction levels based on their designations.

Discussion

The significant adaptation of job responsibilities, particularly among field employees and machine operators, underscores the industry's agility in responding to the evolving demands of the pandemic. It raises questions about the nature of these changes, whether they were temporary or permanent, and how they impacted employee performance and satisfaction. Further analysis of the specific adjustments made and their consequences is warranted. The gender imbalance within the industry, with a significantly larger representation of male respondents, highlights a well-documented issue. This gender gap not only pertains to workforce representation but also affects various aspects of work, including opportunities for leadership and gender-specific challenges. The data calls for a deeper examination of gender-related issues in the sector. The age diversity in the survey indicates that the industry has a broad range of experience levels. The workforce's maturity is balanced by the presence of both younger and older employees. This diversity raises questions about how the industry leverages the experience of seasoned workers while integrating the perspectives and capabilities of younger professionals. The diverse mix of designations, with field employees and machine operators dominating the sample, reflects the complexity of roles within the industry. It prompts discussions on the unique challenges faced by different job categories, as well as the need for tailored strategies to enhance employee performance and well-being across designations.

The substantial shift to remote work, especially among field employees and machine operators, showcases the industry's adaptability to a rapidly changing work environment. The data invites exploration of the long-term implications of remote work on productivity, job satisfaction, and the industry's operational landscape. While many employees received the necessary resources for remote work, the gaps in support for machine operators and employers indicate the need for more comprehensive remote work strategies. This highlights the importance of providing the right tools and resources to enable employees to perform effectively from remote locations. The pandemic's wide-reaching impact on employees' physical and mental well-being is a critical concern. This underscores the need for robust well-being programs, mental health support, and strategies to mitigate the effects of prolonged crises on employees.

The generally positive perception of effective health and safety measures suggests that the industry prioritized employee well-being during the pandemic. However, further examination is required to identify the specific measures that garnered the most favorable responses and how they can serve as best practices for the future. The disruptions in the supply chain reveal vulnerabilities within the industry. Discussion should center on enhancing supply chain resilience and contingency planning to ensure continuity during unforeseen disruptions. The pandemic's influence on employees' perceptions of job security, particularly among field employees, necessitates a discussion on how the industry can address these concerns. Strategies to enhance job security and communication around it are crucial. The industry's proactive approach to training and development related to pandemic preparedness is commendable. This discussion should focus on the effectiveness of these programs, their impact on employee preparedness, and potential areas for improvement. The positive sense of camaraderie and teamwork within organizations during

the pandemic is a testament to the industry's resilience. This emphasizes the significance of fostering a collaborative and supportive workplace culture, even in challenging times. The statistical analysis revealing an association between job designation and satisfaction levels with communication and updates during the pandemic warrants further exploration. This discussion should delve into the specific factors contributing to this association and how it can inform strategies for more tailored communication and support.

Findings and Conclusion

The data indicates that a significant portion of field employees and machine operators had to adapt to changes in their job responsibilities during the pandemic. This adjustment was likely a response to shifting operational requirements within the industry. The survey included a larger representation of male respondents, comprising 80.1% of the participants, compared to a smaller but still significant presence of female respondents at 19.9%. This highlights a gender imbalance within the oil and gas industry. The majority of survey participants were aged between 35 and 55 years, suggesting a mature and experienced workforce in the sector. However, there was also a notable presence of both younger and older employees, showcasing a diverse age range. The survey captured a diverse mix of designations, with the largest group being field employees (43.3%), followed by machine operators (36.4%). Administrative staff and employers constituted smaller proportions of the respondents. This diversity reflects the range of roles within the industry.

The results show that a significant portion of the workforce, particularly field employees and machine operators, transitioned to remote work during the pandemic. This adaptation signifies the industry's flexibility in response to the changing work environment. While a substantial number of employees received the necessary resources for remote work, there was room for improvement, particularly among machine operators and employers. This highlights the need for better support in certain areas. The data underscores the widespread impact of the pandemic on the physical and mental well-being of employees. This emphasizes the importance of support and initiatives to address these concerns within the industry. Respondents generally perceived the effective implementation of health and safety measures in their workplaces during the pandemic. This suggests a positive approach to employee well-being and safety. The findings emphasize that disruptions in the supply chain were common during the pandemic. These disruptions likely had implications for the operational aspects of the industry, highlighting the need for supply chain resilience.

The data underscores the influence of the pandemic on employees' perceptions of job security, particularly among field employees. This emphasizes the need for strategies to address job security concerns. The data highlights a proactive approach to training and development related to pandemic preparedness within the industry, reflecting a commitment to employee preparedness. Despite the challenges posed by the pandemic, a significant portion of employees perceived a positive sense of camaraderie and teamwork within their organizations. This is a positive indicator of organizational culture and resilience.

The statistical analysis revealed a significant association between respondents' designations and their satisfaction levels with communication and updates provided during the pandemic. This indicates that satisfaction varies significantly based on job roles within the industry, necessitating further exploration of the specific nature of this relationship.

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