



## Analysis Effects of COVID-19 Pandemic on Productivity: A Survey in PETRONAS Pengerang, Johor

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### KEYWORDS

Productivity  
Online survey  
COVID-19  
Google Forms

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### ABSTRACT

The oil and gas industry is currently experiencing a third episode of declining prices within a span of 12 years. Despite demonstrating resilience and the ability to recover from previous shocks, the present circumstances are markedly different due to the global humanitarian crisis triggered by the COVID-19 pandemic. This crisis has led to disruptions in the supply chain and significant and unexpected drops in demand for goods. Furthermore, the financial performance and structure of the sector are considerably worse compared to previous crises. Various factors contribute to the low returns, including shale fuel production, supply surplus, and unfavorable economic market conditions that surpass the limits of capital discipline. To gain a deeper understanding of the situation, a productivity survey was conducted at PETRONAS Pengerang, Johor, involving 71 respondents who participated via Google Forms. The survey responses were analyzed using the SPSS application, and additional support for the findings was obtained from relevant journals and reference materials cited by PETRONAS employees. In conclusion, despite experiencing multiple downturns, the oil and gas industry has a history of rebounding due to its indispensable role in daily life worldwide.

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### 1.0 INTRODUCTION

Coronavirus disease (COVID-19) is an infectious disease that is brought on by the SARS-CoV-2 virus. The majority of those who contract the virus will suffer from mild to moderate respiratory diseases and recover without the need for special care. However, some people will get serious illnesses and need to see a doctor. Serious illnesses are more likely to strike older people and those with underlying medical disorders, including cancer, diabetes, cardiovascular disease, or chronic respiratory diseases, World Health Organisation (WHO).

As the COVID-19 pandemic sweeps across the globe, the oil and gas industries face significant operational challenges. Some companies have temporarily shuttered factories in response to government restrictions or falling demand, but others are facing significant demand increases. Frontline manufacturing staff cannot take their work to the relative safety of their homes. Plant leaders are therefore looking for ways to operate through the immediate crisis, all while preparing for a potentially much longer period of heightened uncertainty regarding demand and supply, and a lasting need to maintain enhanced hygiene and physical distancing.

The COVID-19 pandemic has affected virtually every aspect of life, extending beyond public health concerns. Although previous pandemics like the SARS outbreak in 2003 and the Ebola outbreak in 2014 have been studied, there has been a lack of research examining the direct impact of pandemics on companies, particularly in relation to productivity within the oil and gas sector. In order to gain insights into this matter, we conducted a survey of PETRONAS Pengerang in Johor to determine how their productivity was affected during the challenging period of the COVID-19 pandemic.

The previous research results do not provide any specific information about the analysis conducted to examine the effects of the COVID-19 pandemic on productivity within PETRONAS Pengerang, Johor. However, the results do provide some information about PETRONAS' performance during the pandemic. PETRONAS faced challenges due to the pandemic, including a decline in demand and prices [1] [5]. Despite these challenges, PETRONAS remained optimistic and took deliberate steps to strengthen its resilience [2]. PETRONAS enforced preventive health and safety measures to keep employees, customers, and stakeholders safe [3]. PETRONAS also focused on operational efficiency and capitalizing on its strong market presence in the region to mitigate the impact of the pandemic. Overall, the search results suggest that the pandemic had a significant impact on the oil and gas industry, including PETRONAS, but it is unclear how it specifically affected productivity within PETRONAS Pengerang, Johor.

The investigation was carried out to find out if the COVID-19 epidemic had an impact on PETRONAS Pengerang's productivity. It was essential to comprehend how the epidemic affected production in order to spot any potential issues or disruptions the business might experience. Organisations can use this information to establish plans and put policies in place to lessen the effects of upcoming crises. PETRONAS Pengerang can learn more about its resilience and flexibility in times of crisis by looking at its productivity levels throughout the epidemic.

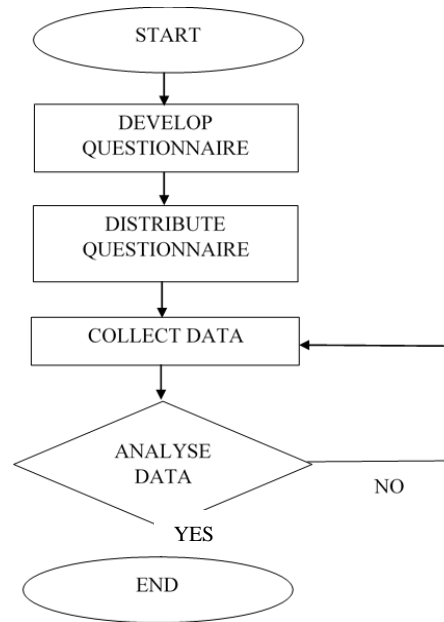
By specifically focusing on PETRONAS Pengerang and conducting a survey within the organization, the analysis aimed to provide a detailed understanding of the local effects of the pandemic on productivity. This localized perspective allows for a more comprehensive assessment of the situation, considering the unique circumstances and factors specific to PETRONAS Pengerang. Ultimately, the survey aimed to ensure a comprehensive evaluation of productivity, confirming whether the COVID-19 pandemic had a significant impact on PETRONAS Pengerang's productivity levels or not.

## **2.0 METHODOLOGY**

This study is aimed at analyzing the productivity of PETRONAS Pengerang, Johor, during COVID-19. An online survey has been handed out to the employees of the oil and gas company to avoid harmful contact and the spreading of the virus. The results and research obtained determined how severely the pandemic is affecting the company. The results have been analyzed using SPSS software.

## 2.1 Process Flowchart

The purpose of the flow process is to make sure that all of the steps for this project are done on time. This flow chart consists of the steps of the project from the beginning to the end in order by connecting the topics via arrows, as shown in Figure 2.1 below:



**Figure 2.1:** Process Flowchart

## 2.2 Online Survey Responses (Google Forms)

During the COVID-19 pandemic, the oil and gas sector faced numerous challenges and disruptions, impacting productivity levels within the industry. To gain a better understanding of these effects, a survey was conducted to investigate productivity and the challenges faced by employees in the oil and gas sector. This introduction provides an overview of the survey design, participant selection, distribution process, survey period, data collection and analysis methods, as well as the integration of external sources for validation and interpretation of the findings.

### i. Survey Design:

The survey was carefully designed to gather relevant information and capture the experiences and perceptions of employees working in the oil and gas sector. The survey questions were thoughtfully crafted to address the specific focus on productivity during the COVID-19 pandemic. By utilizing well-designed questions, the survey aimed to provide insights into the impact of the pandemic on productivity levels and identify any challenges faced by the industry.

### ii. Selection of Participants:

The participants for the survey were chosen from employees working in the oil and gas sector at PETRONAS Pengerang, Johor. The selection process ensured the inclusion of individuals directly involved in the industry, allowing for a comprehensive understanding of the sector's productivity

during the pandemic. A diverse range of roles and positions within the sector were represented among the 71 chosen respondents, enabling a holistic view of the productivity landscape.

iii. Distribution of Survey and Survey Period:

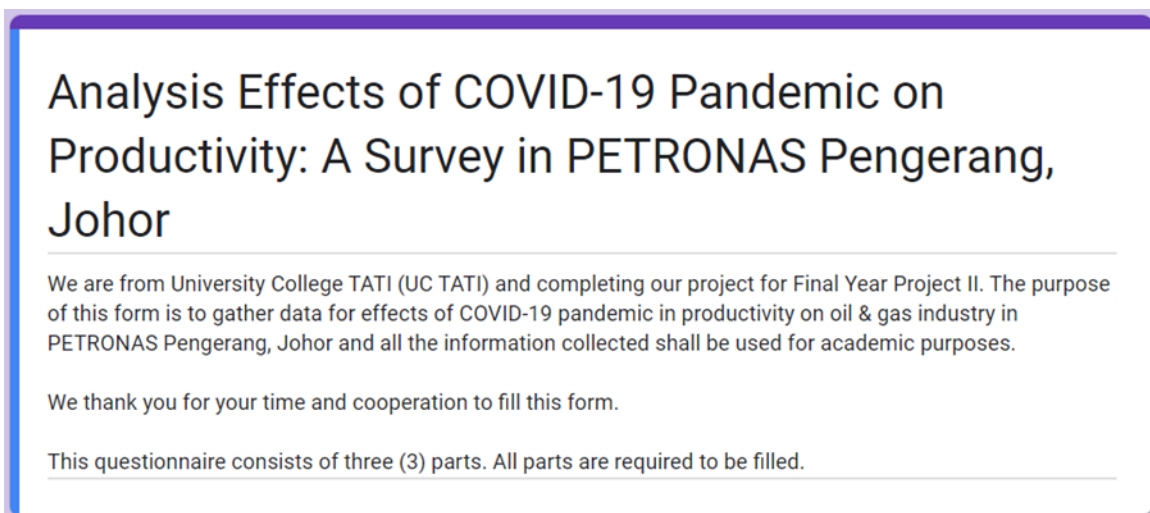
The survey was distributed to the selected participants using Google Forms, an online survey platform. The survey link was shared via email or other appropriate communication channels to ensure ease of access for the participants. Clear instructions and a designated timeframe were provided to guide respondents through the completion of the survey. The survey was conducted between October and December 2021, capturing the experiences and observations of the participants during the ongoing COVID-19 pandemic.

iv. Data Collection and Analysis:

Through the online Google Forms platform, participants were asked to provide their responses to the survey questions. The collected data encompassed both quantitative and qualitative information related to productivity within the oil and gas sector. Once the survey period concluded, the responses were exported from Google Forms and imported into statistical analysis software, such as SPSS. This allowed for a thorough examination of the data, facilitating the identification of patterns, trends, and key insights about productivity during the COVID-19 pandemic.

v. Integration of External Sources and Interpretation:

To enhance the credibility and validity of the survey findings, relevant journals and other reference materials were consulted. These external sources provided additional context and information to support the responses given by PETRONAS employees. The data collected from the survey, along with insights from external sources, were meticulously analyzed and interpreted to draw meaningful conclusions regarding productivity within the oil and gas sector during the surveyed period. The interpretations were based on a comprehensive analysis of the survey responses and the integration of relevant external references, ensuring a robust understanding of the sector's productivity in light of the COVID-19 pandemic.



**Figure 2.2.1:** Online Survey Header

Gender

Male

Female

Age

20 - 30

30 - 40

40 - 55

**Figure 2.2.2:** Gender and Age

**Position**

- General worker
- Engineer
- Quality control (QC)
- Supervisor
- Leader
- Technician
- Others

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**Salary**

- RM 2000 - RM 3500
- RM 3500 - RM 5000
- RM 5000 & above

**Figure 2.2.3:** Position and Salary

Working shift

Day shift

Night shift

Flexitime

Part I: Productivity During COVID-19

Scale 1 = Completely Disagree, 2 = Disagree, 3 = Neutral, 4= Agree, 5 = Completely Agree

The company's performance had decreased since COVID-19.

1      2      3      4      5

Completely Disagree                  Completely Agree

The company had reduced the production quantity of products.

1      2      3      4      5

Completely Disagree                  Completely Agree

**Figure 2.2.4:** Working Shift and Start of Questionnaire Part I

I feel highly connected to my teams as we work remotely.						
	1	2	3	4	5	
Completely Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely Agree
I have everything I need to do my job while working from home.						
	1	2	3	4	5	
Completely Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely Agree
I feel that I am as productive working from home as I am in my normal work environment.						
	1	2	3	4	5	
Completely Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely Agree
I am fine with working online at home for as long as it takes.						
	1	2	3	4	5	
Completely Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely Agree

**Figure 2.2.5:** Continuation of Questionnaire Part I

The COVID-19 has affected the company a lot in their work flow.

1 2 3 4 5

Completely Disagree      Completely Agree

The company has less workers now than before COVID-19.

1 2 3 4 5

Completely Disagree      Completely Agree

I have regular, productive online meeting sessions with my manager.

1 2 3 4 5

Completely Disagree      Completely Agree

Part II: Working Condition  
Scale 1 = Completely Disagree, 2 = Disagree, 3 = Neutral, 4= Agree, 5 = Completely Agree

**Figure 2.2.6:** Start of Questionnaire Part II

I have safe channels to share any concerns regarding COVID-19 or its impact.						
	1	2	3	4	5	
Completely Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely Agree

I don't feel concerned about losing my job.						
	1	2	3	4	5	
Completely Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely Agree

I don't feel anxious about the future of our company.						
	1	2	3	4	5	
Completely Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely Agree

**Figure 2.2.7:** Continuation of Questionnaire Part II and Start of Questionnaire Part III

The company shrunk the workforce by laying off workers.

1 2 3 4 5

Completely Disagree      Completely Agree

Overall, I am satisfied with my organization's response to the Coronavirus/COVID-19 situation.

1 2 3 4 5

Completely Disagree      Completely Agree

Part III: Working From Home  
Scale 1 = Completely Disagree, 2 = Disagree, 3 = Neutral, 4= Agree, 5 = Completely Agree

I have the right amount of virtual contact with my colleagues on a weekly basis.

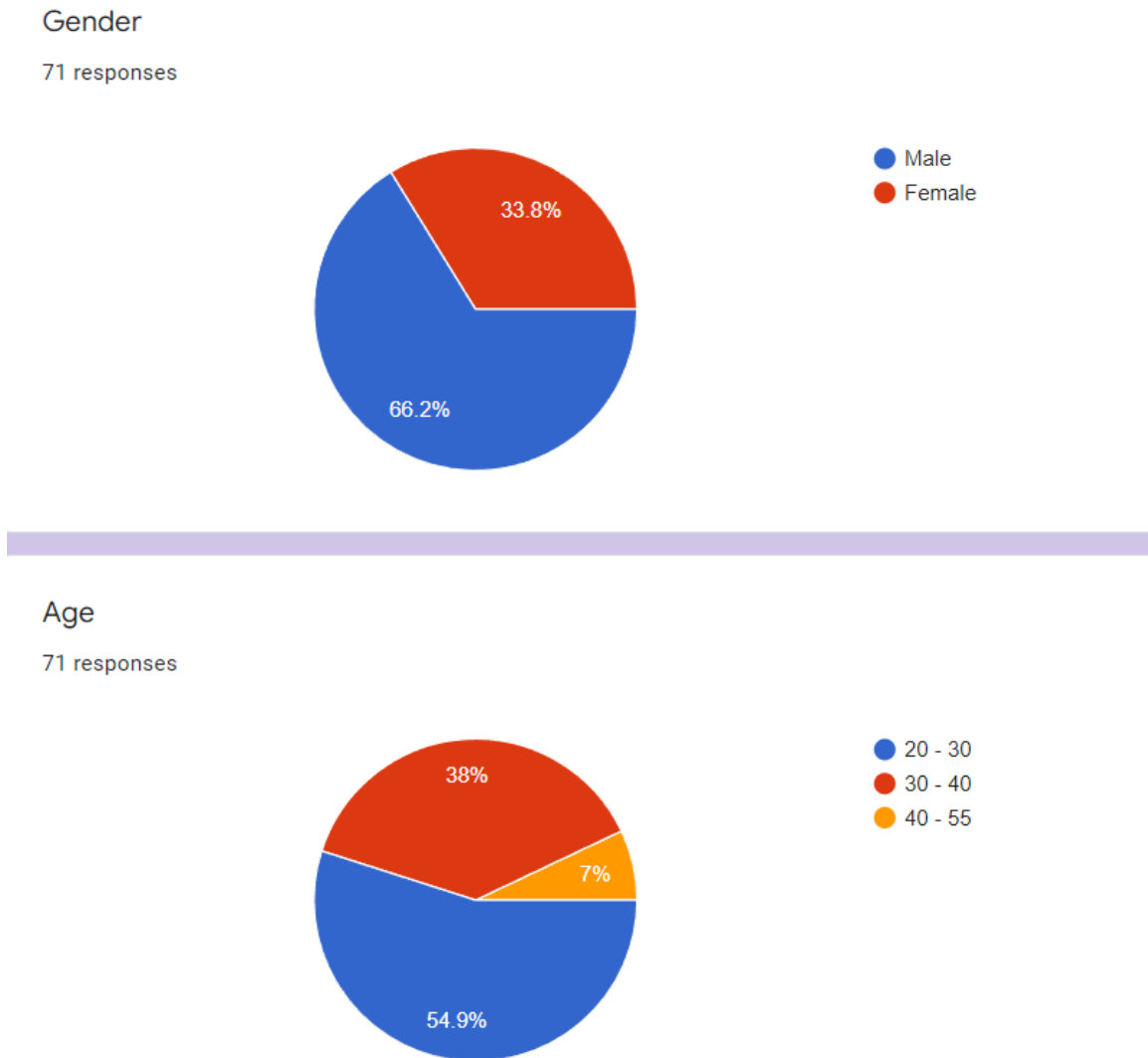
1 2 3 4 5

Completely Disagree      Completely Agree

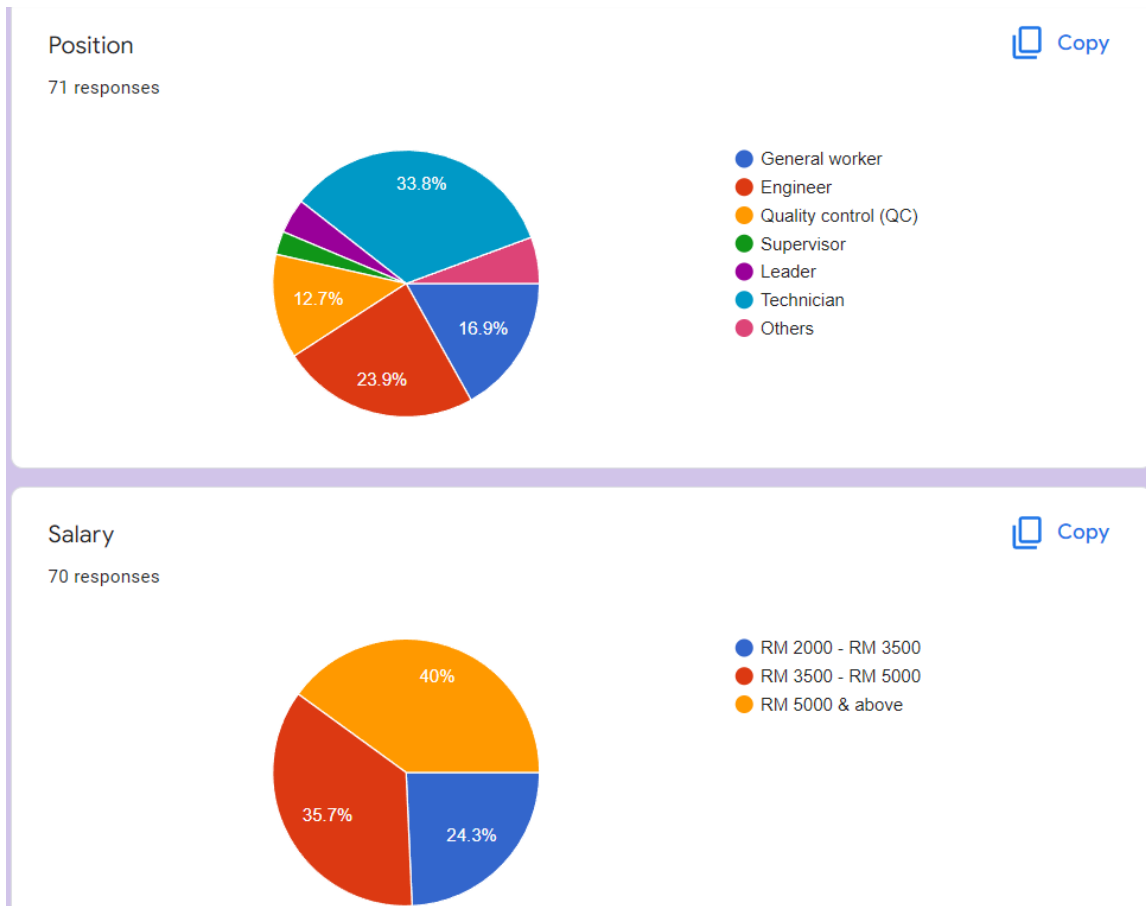
**Figure 2.2.8:** Continuation of Questionnaire Part III

### 3.0 RESULTS AND DISCUSSION

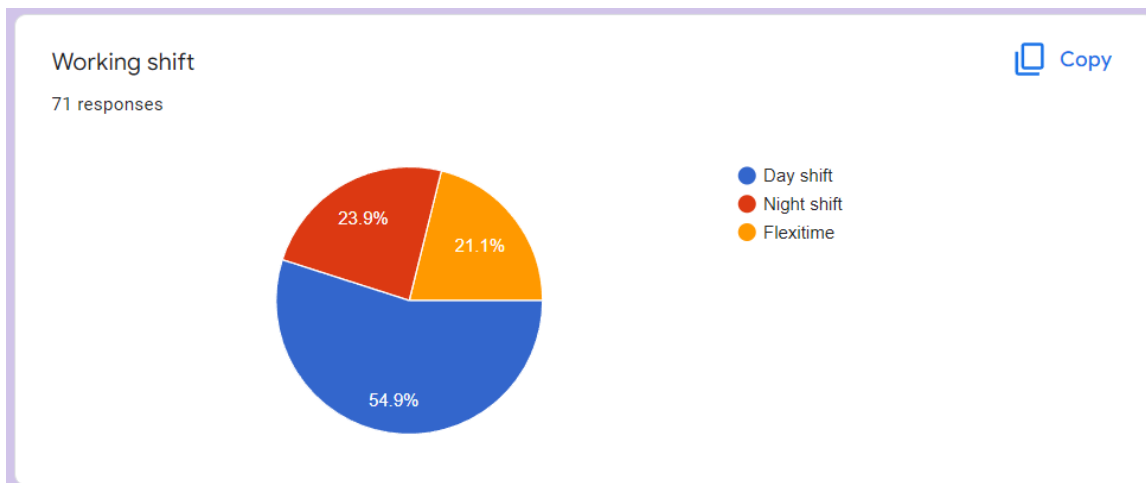
This part shows the results of the online survey, which were analyzed with version 26 of the Statistical Package for Social Science (SPSS) software. After the demographics section, the questionnaire is divided into three parts: Part I is Productivity During COVID-19, Part II is Working Conditions, and Part III is Working from Home.



**Figure 3.1:** Gender and Age Results



**Figure 3.2: Position and Salary Results**



**Figure 3.3: Working Shift Results**

Scale 1 = Completely Disagree, 2 = Disagree, 3 = Neutral, 4= Agree, 5 = Completely Agree

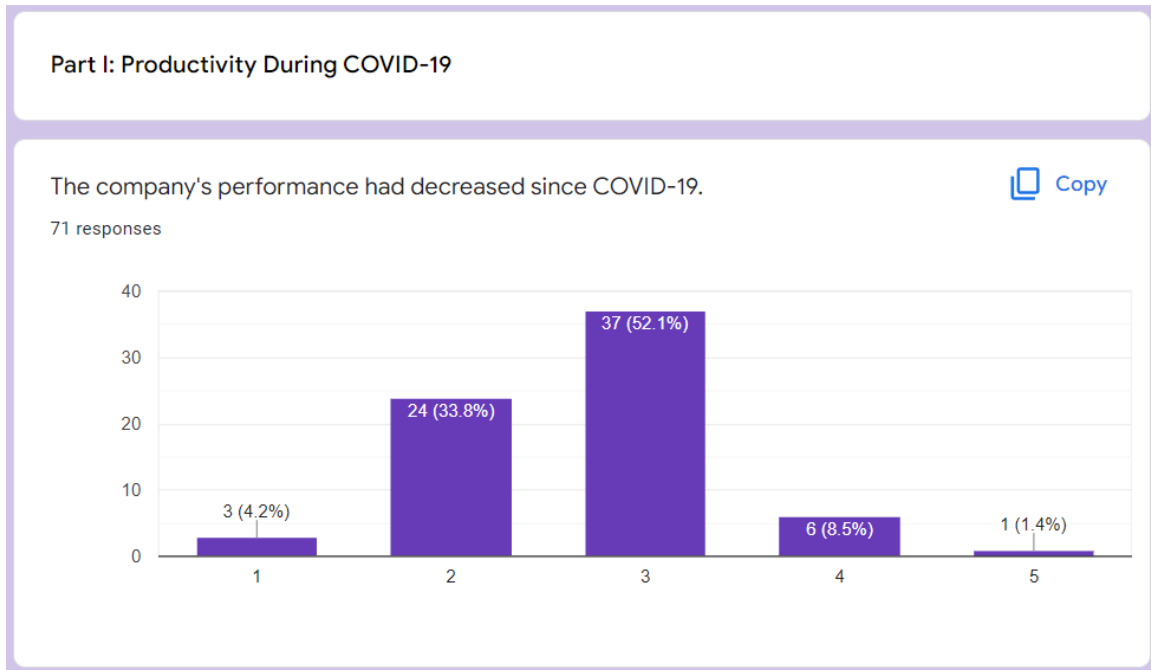


Figure 3.4: 1<sup>st</sup> Question's Result of Questionnaire Part I

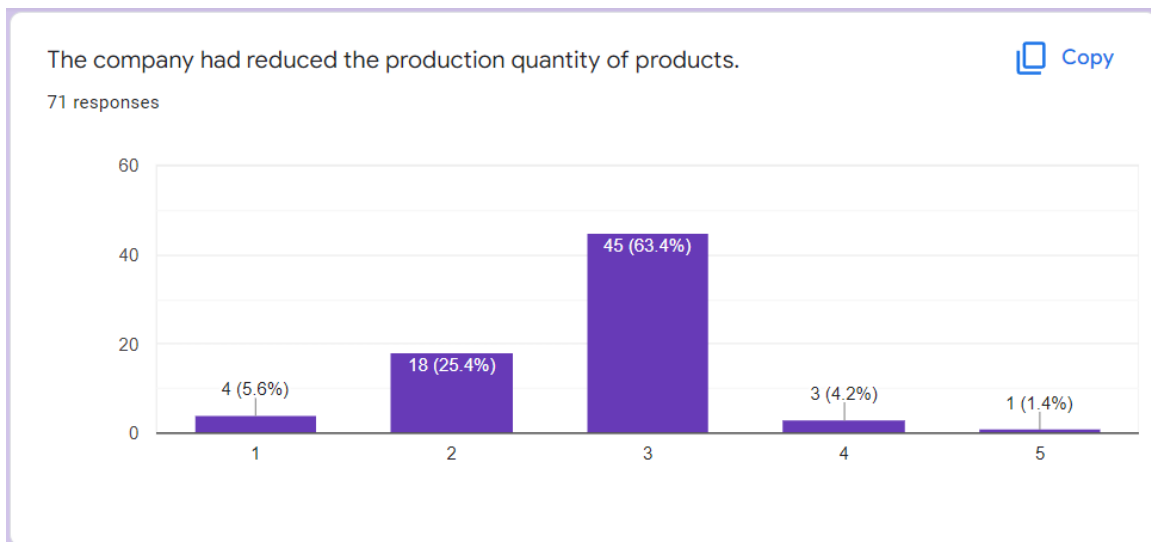
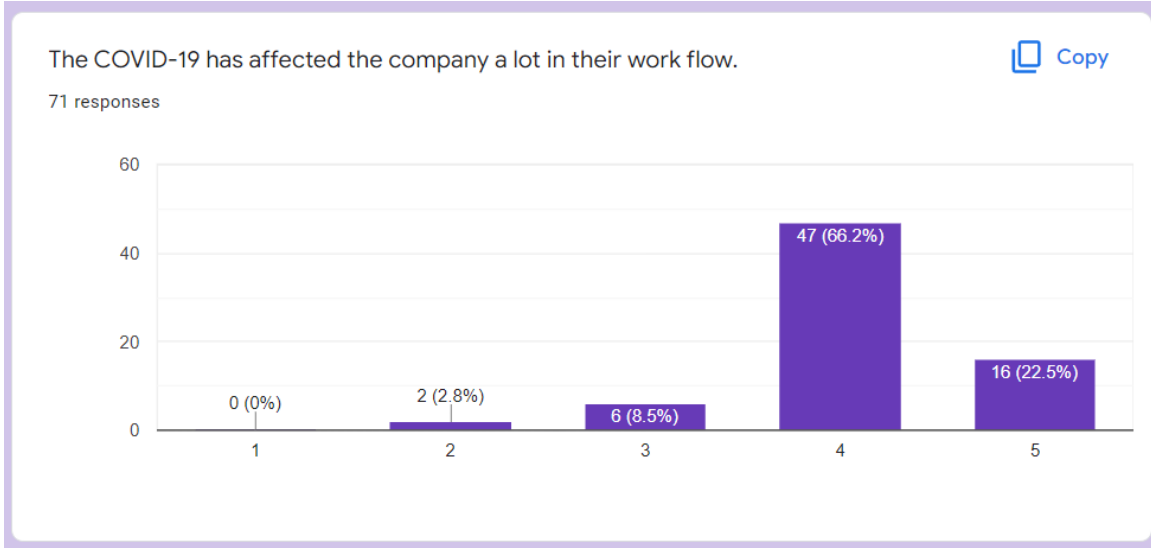
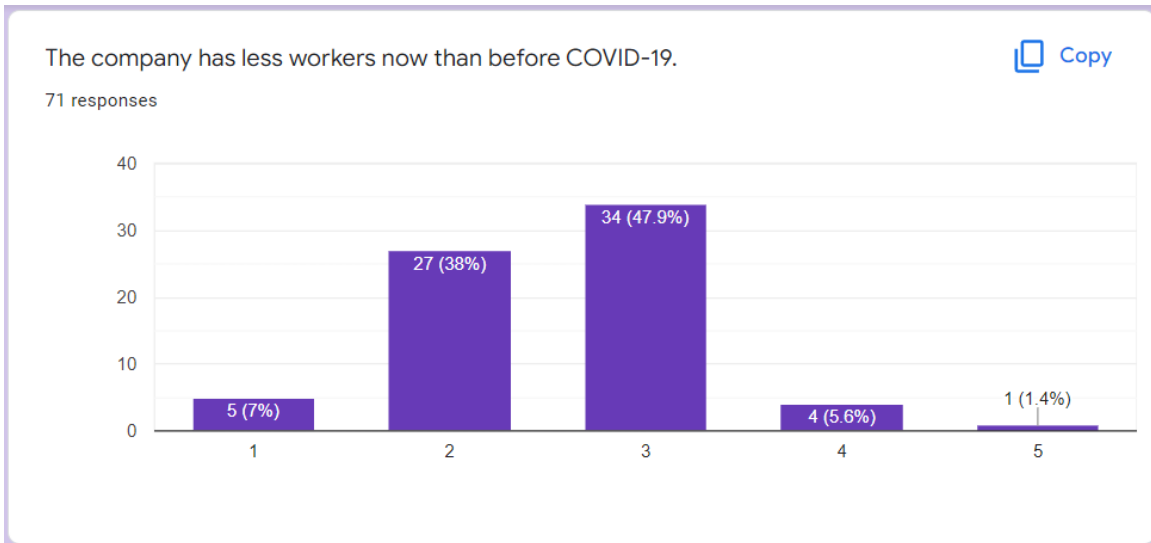


Figure 3.5: 2<sup>nd</sup> Question's Result of Questionnaire Part I



**Figure 3.6:** 3<sup>rd</sup> Question's Result of Questionnaire Part I



**Figure 3.7:** 4<sup>th</sup> Question's Result of Questionnaire Part I

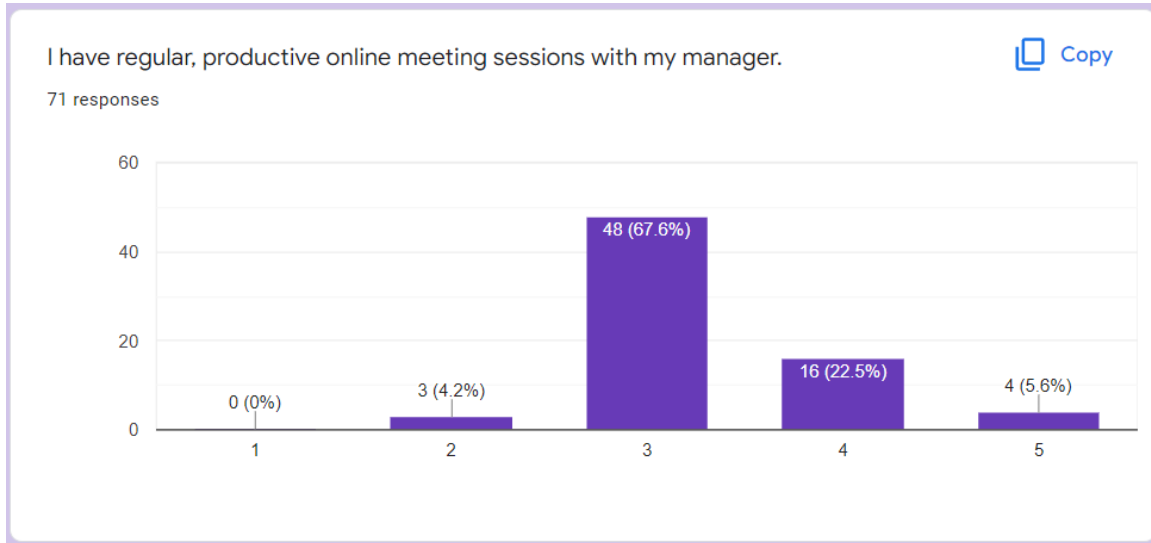


Figure 3.8: 5<sup>th</sup> Question's Result of Questionnaire Part I

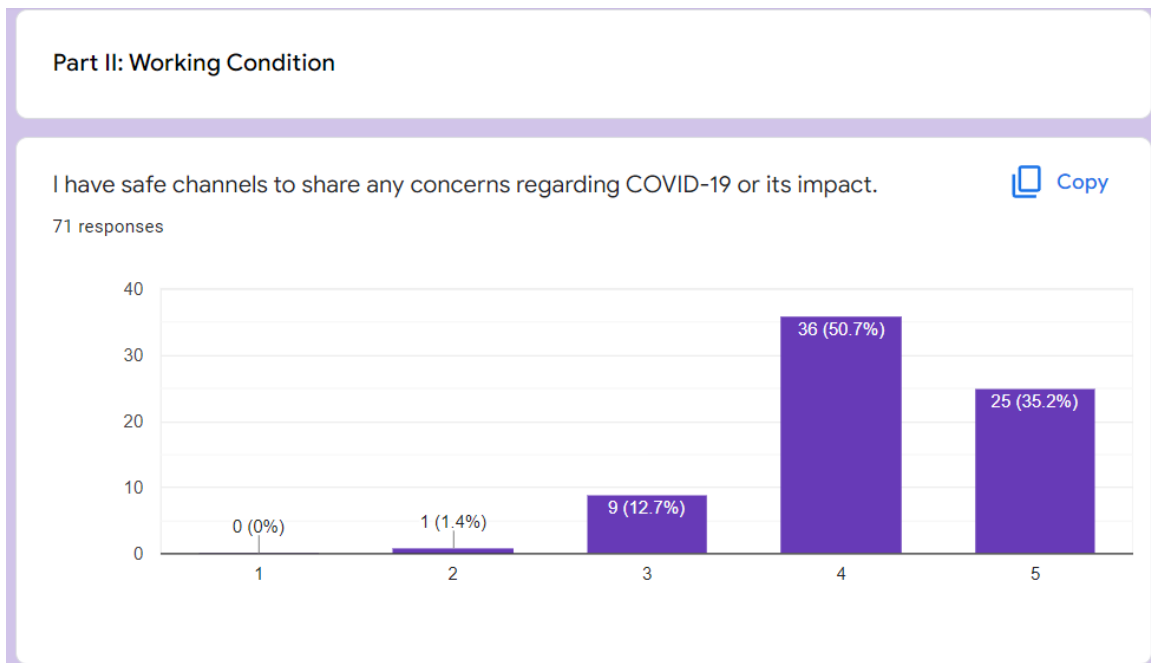
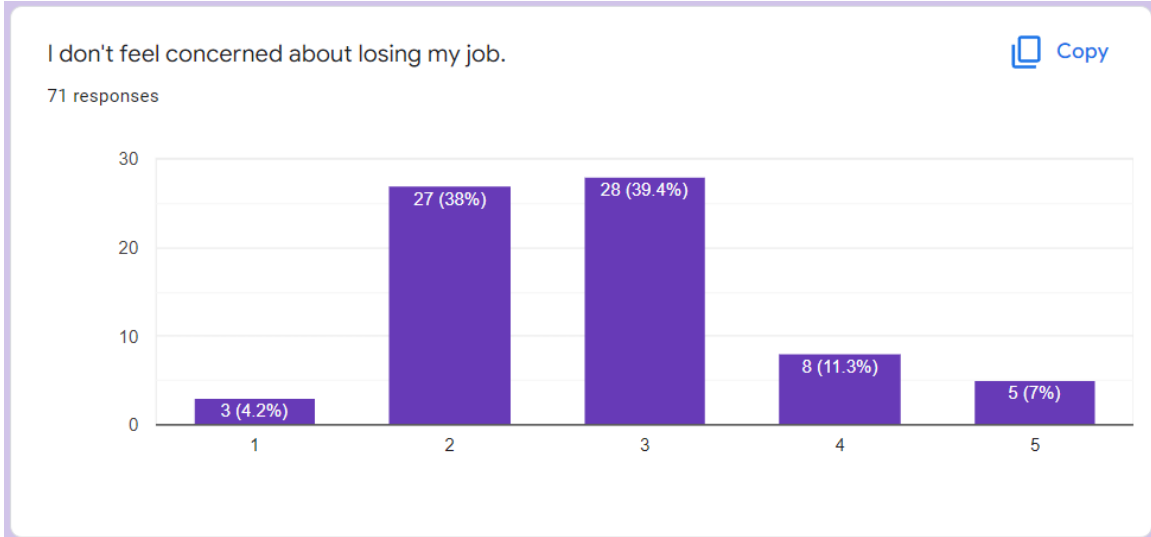
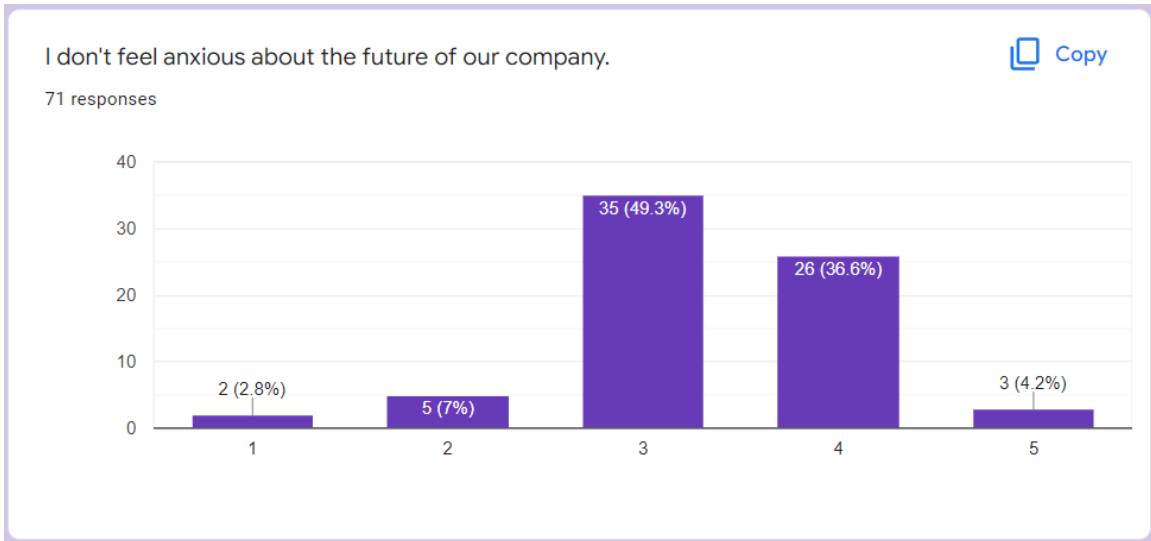


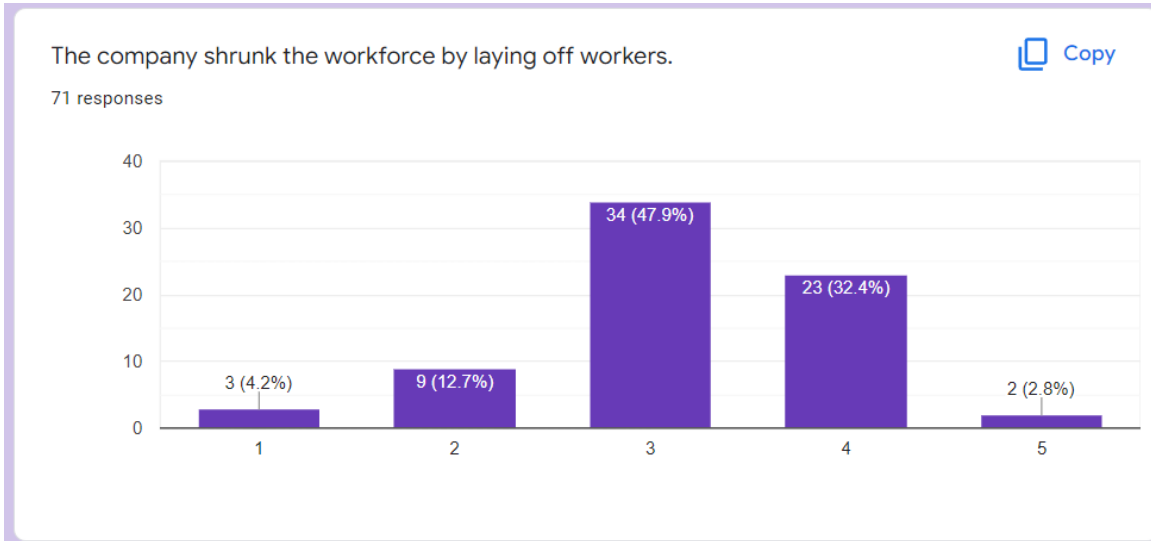
Figure 3.9: 1<sup>st</sup> Question's Result of Questionnaire Part II



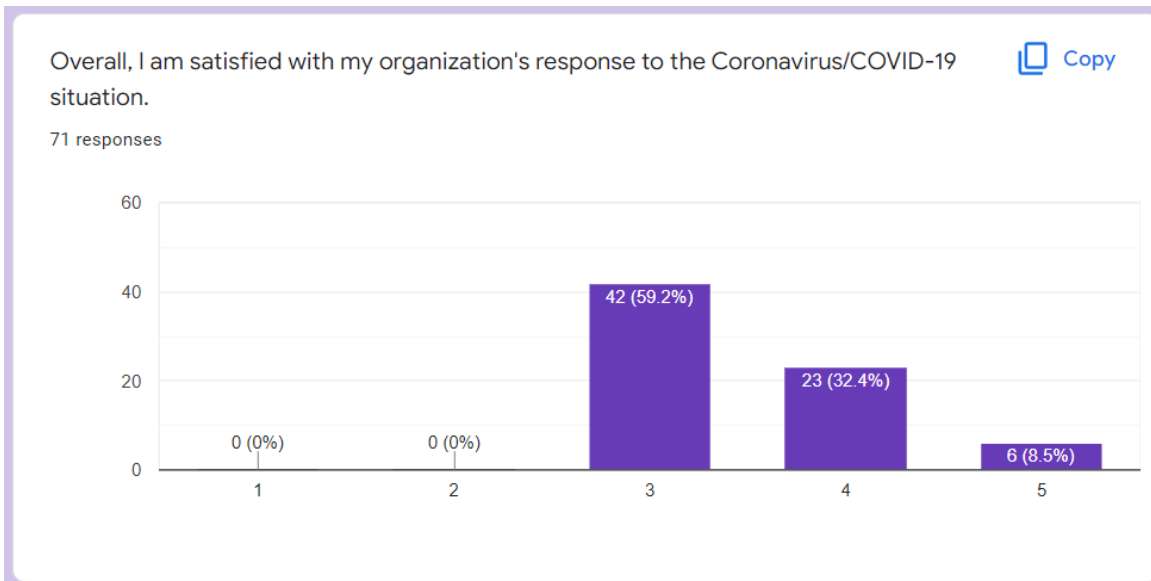
**Figure 3.10:** 2<sup>nd</sup> Question's Result of Questionnaire Part II



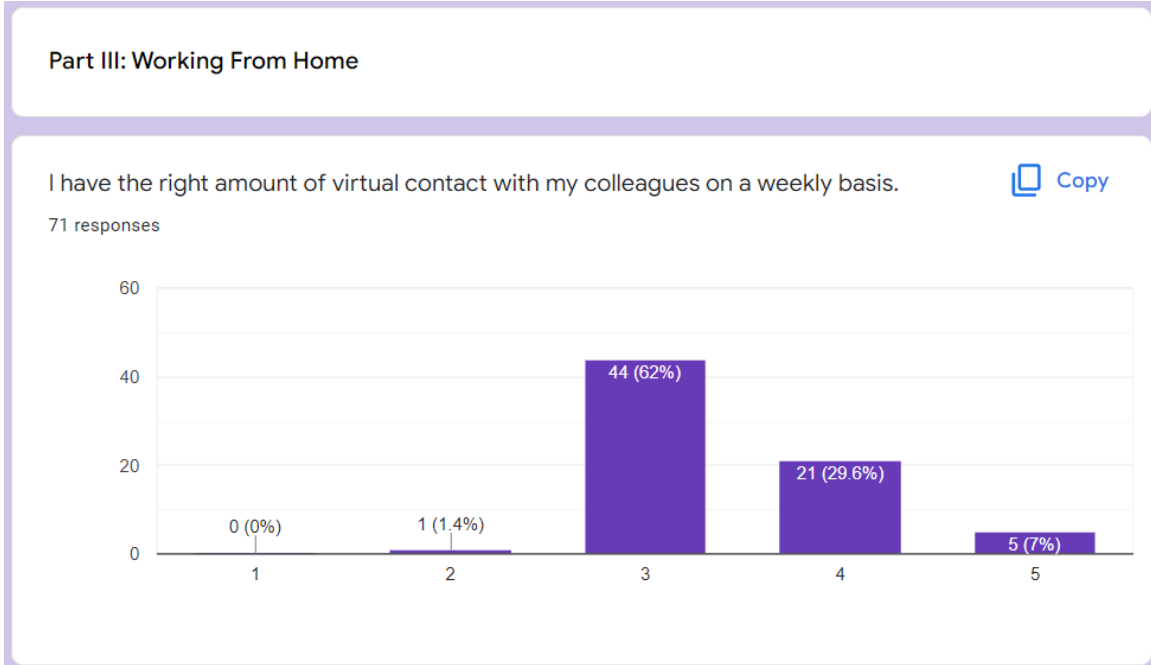
**Figure 3.11:** 3<sup>rd</sup> Question's Result of Questionnaire Part II



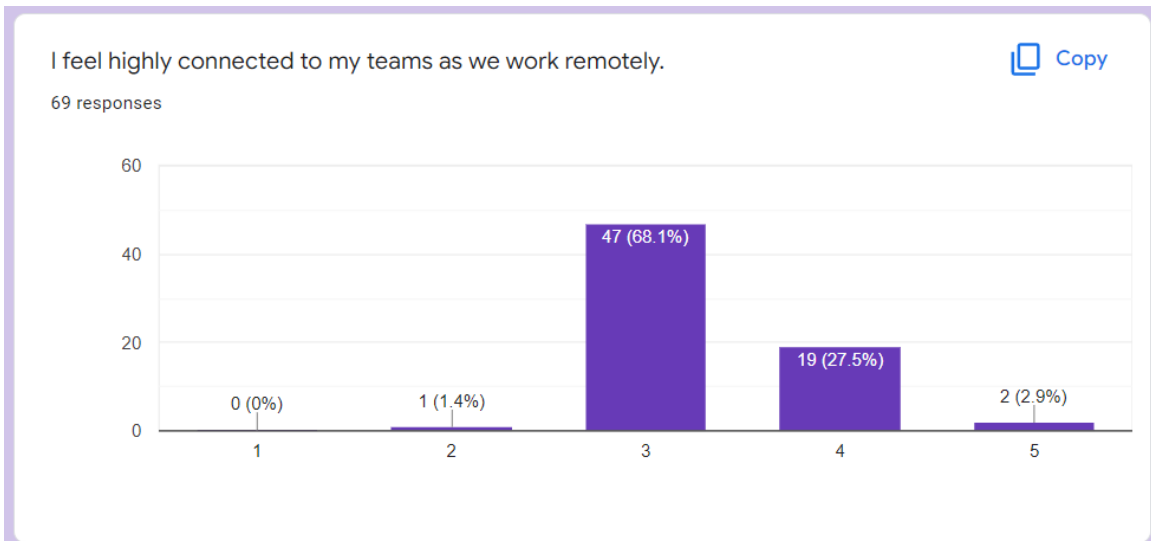
**Figure 3.12:** 4<sup>th</sup> Question's Result of Questionnaire Part II



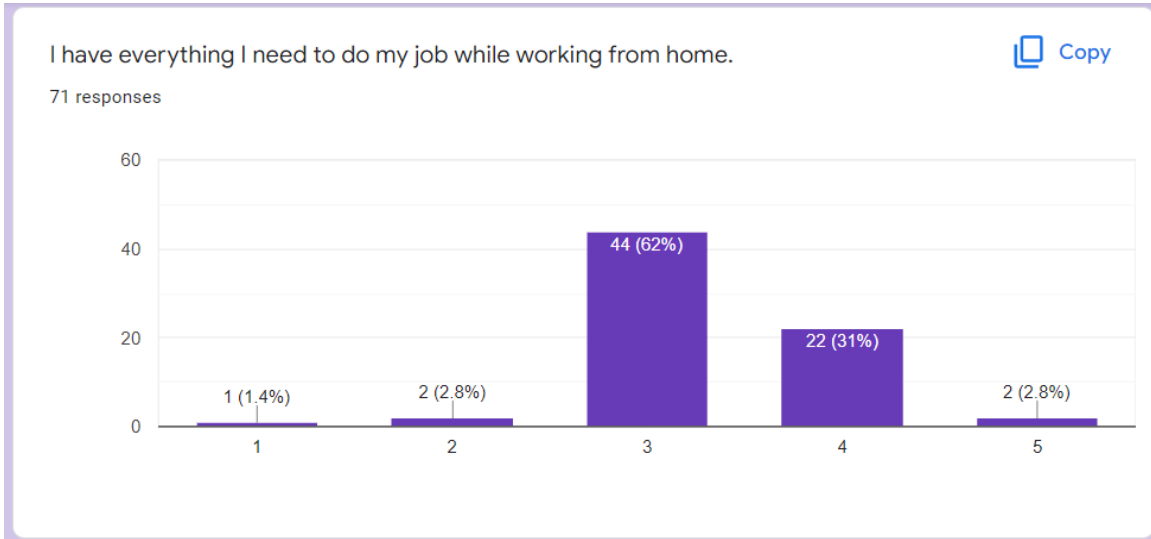
**Figure 3.13:** 5<sup>th</sup> Question's Result of Questionnaire Part II



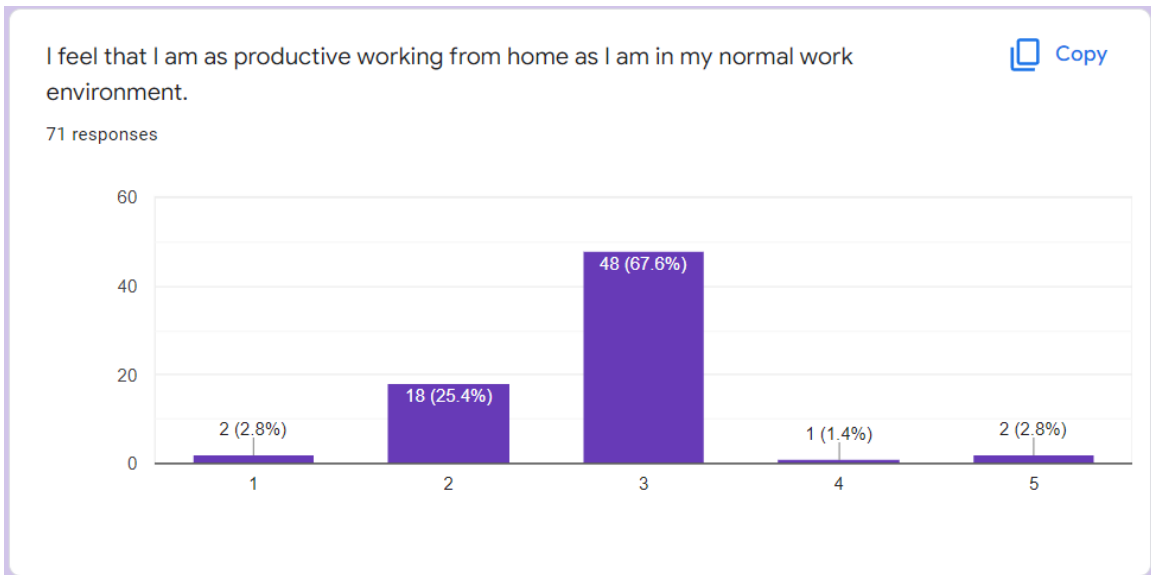
**Figure 3.14:** 1<sup>st</sup> Question's Result of Questionnaire Part III



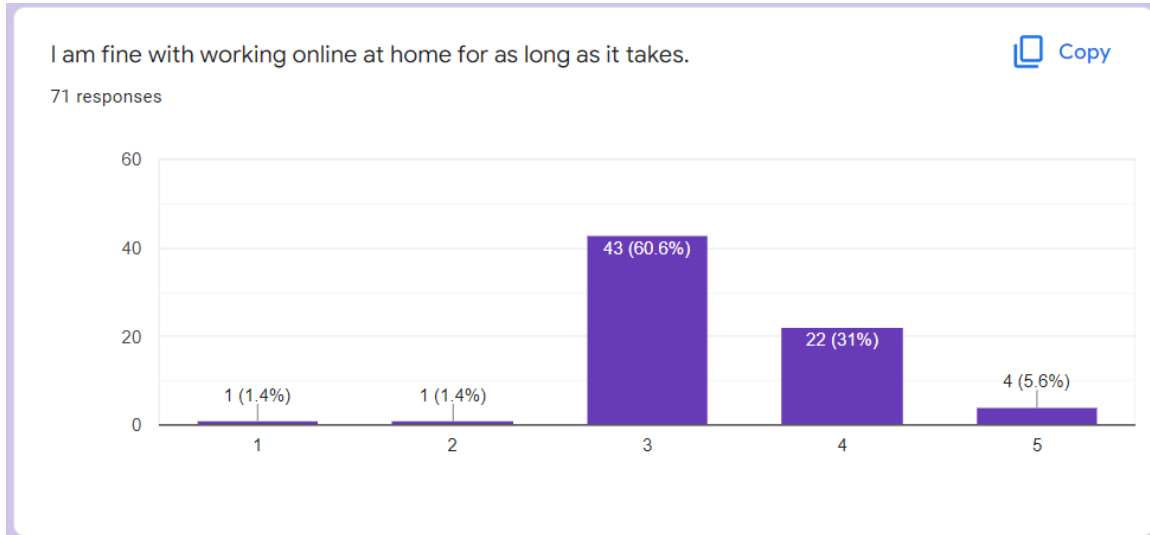
**Figure 3.15:** 2<sup>nd</sup> Question's Result of Questionnaire Part III



**Figure 3.16:** 3<sup>rd</sup> Question's Result of Questionnaire Part III



**Figure 3.17:** 4<sup>th</sup> Question's Result of Questionnaire Part III



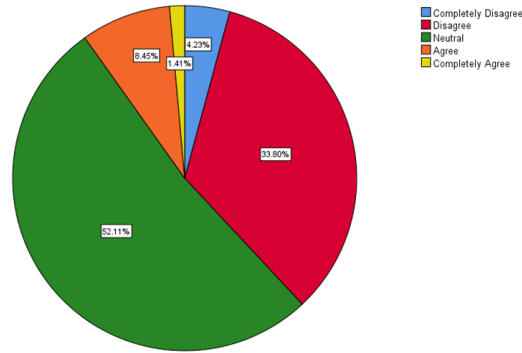
**Figure 3.18:** 5<sup>th</sup> Question's Result of Questionnaire Part III

### 3.1 SPSS ANALYSIS

This section presents the analysis that was conducted using Statistical Package for Social Science (SPSS) version 26. The explanations are discussed based on some chosen results of 20 questions that were distributed to PETRONAS Pengerang, Johor, using Google Forms to 71 respondents.

Figure 3.1.1 presents a pie chart illustrating the perspectives of PETRONAS Pengerang Johor employees regarding the company's performance in light of the COVID-19 pandemic. The chart indicates that 33.80% of respondents disagreed with the notion that the company's performance had decreased, while 52.1% expressed neutrality on the matter. Although the working environment may not suggest a decline in performance, traders believe that the company is indeed facing challenges. PETRONAS is committed to enhancing operational efficiency and achieving commercial success while maintaining financial discipline, despite the direct impact of the COVID-19 pandemic and anticipated difficulties, including the sharp decline in oil prices.

To ensure the company's resilience and sustainability, PETRONAS is actively strengthening strategies to mitigate the short-, medium-, and long-term impacts on its business. The financial statement of PETRONAS in the half-yearly report highlights its performance from 2017 to 2019, demonstrating positive results. However, in 2020, the company experienced a significant decrease in performance attributed to the COVID-19 pandemic. This context underscores the importance of assessing the pandemic's impact on the company's financial standing and reinforces the need for proactive measures to navigate these challenging circumstances.

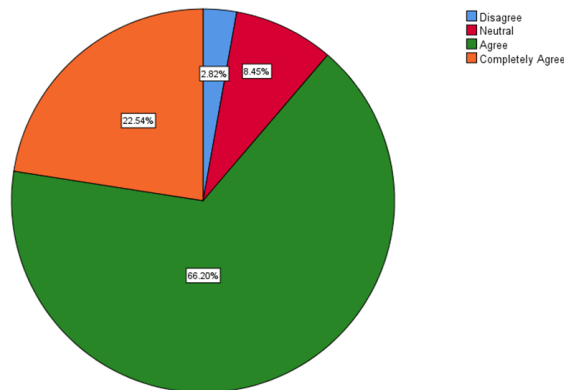


**Figure 3.1.1:** Response on if the company's performance had decreased since COVID-19

In Figure 3.1.2, a pie chart showcases the responses of employees regarding the impact of the COVID-19 pandemic on the company's workflow. The chart reveals that 66.2% of employees strongly agree that the pandemic has had a significant effect, while 22.54% simply agree with this statement. Only a small fraction, 2.82%, disagree with the notion.

During the global COVID-19 pandemic, PETRONAS faced substantial challenges that extended beyond the plummeting oil prices. The company recognized the far-reaching implications on daily life and acknowledged the significant disruptions to its operations. However, despite the collapse in oil prices, PETRONAS remained steadfast in upholding its core principle of "amanah," ensuring the security of the value chain and optimal business operations.

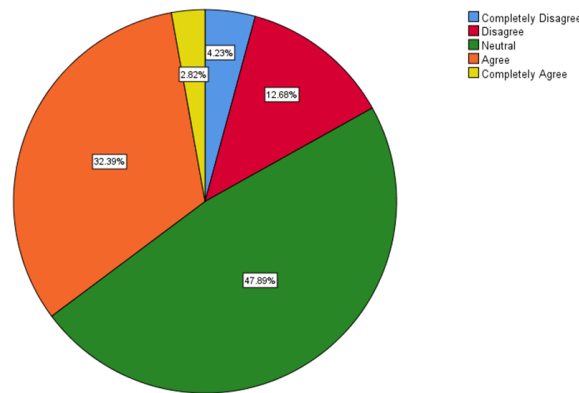
PETRONAS has been vigilant in closely monitoring the situation in Malaysia and the countries where it operates. The company is committed to adhering to the guidelines set by local authorities, prioritizing the safety of its employees, their families, an extensive network of partners, and customers. By placing safety as a paramount concern, PETRONAS aims to navigate through these challenging times while maintaining its commitment to trust and responsibility.



**Figure 3.1.2:** Response on if the COVID-19 pandemic has affected the company a lot in their workflow

Figure 3.1.3 depicts a pie chart illustrating the responses of employees regarding whether the company resorted to layoffs in order to reduce its workforce. The chart reveals that 12.68% of employees disagree with this statement, while 47.89% maintain a neutral stance. Additionally, 32.39% of employees agree with the notion, and 2.82% completely agree. On the contrary, 4.23% of employees completely disagree with the idea of layoffs.

In the oil and gas sector, the challenges extend beyond a mere price decline; there is also a significant contraction in job opportunities. Between March and August 2020, the oil, natural gas, and chemical industries in the United States alone witnessed a staggering loss of 107,000 jobs [4]. This rate of layoffs is unprecedented in the industry's history, even for a sector known for its volatile cycles of rapid growth and severe downturns. The magnitude and pace of these job losses are striking, reflecting the profound impact the industry is facing during these turbulent times.

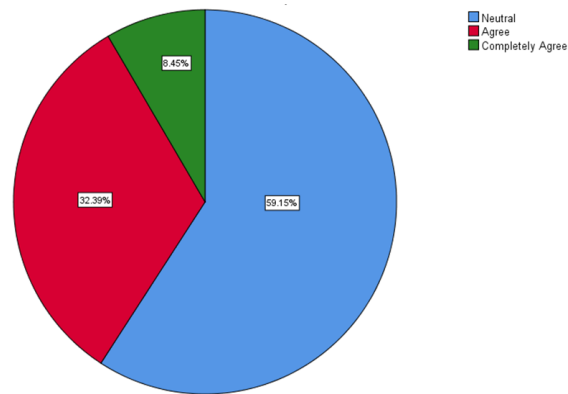


**Figure 3.1.3:** Response of did the company shrink the workforce by laying off workers

Figure 3.1.4 showcases a pie chart representing the level of satisfaction among employees regarding their organization's response to the COVID-19 situation. The chart reveals that 59.15% of employees hold a neutral position, while the remaining 40.85% either agree or completely agree with their organization's response.

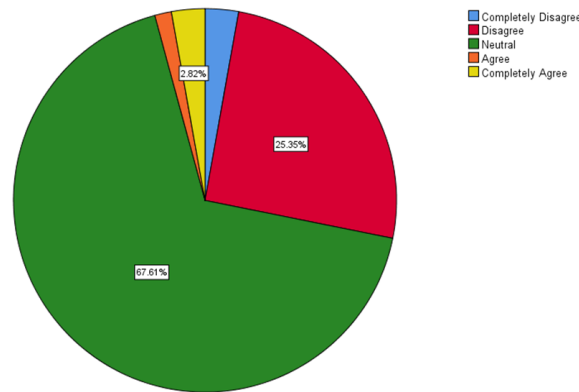
PETRONAS has been actively and resolutely responding to the COVID-19 outbreak since its inception. The company has implemented a series of decisive measures to ensure the safety and well-being of its employees. These proactive steps effectively manage the risk of exposure and reduce the potential transmission of the virus within the organization.

Furthermore, as the impact of COVID-19 continues to affect various segments of society, PETRONAS is actively supporting the Malaysian government's efforts to assist affected communities. The company has made significant contributions, surpassing RM100 million in both monetary and material forms [3]. This support includes medical supplies, protective gear, and other essential resources for front-line workers and community members. PETRONAS is committed to playing a pivotal role in aiding communities not only in Malaysia but also in the countries where it operates, as they navigate through these challenging times caused by the COVID-19 pandemic.



**Figure 3.1.4:** Opinions of if employees are satisfied with their organization's response to the COVID-19 situation

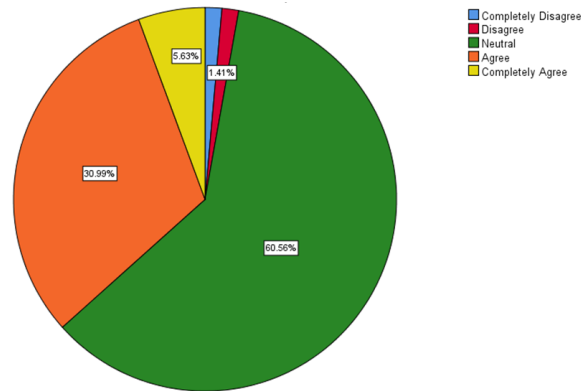
In Figure 3.1.5, there is a pie chart depicting the sentiments of employees regarding the productivity of their online work environment (from home) compared to the usual work environment. Approximately 67.61% of employees express a neutral or uncertain stance on this matter, while 25.35% disagree that working from home is as productive as working in a normal, pre-pandemic work environment. In the case of corporate jobs and sales jobs, the presence of "poor workplace communication" and "poor communication with clients" significantly hampers productivity across various companies [2]. This observation aligns with the notion that these types of jobs require extensive coordination and organization both internally and externally.



**Figure 3.1.5:** Response of employees feeling as productive working from home as they are in the normal work environment

Figure 3.1.6 presents a pie chart illustrating the attitudes of employees towards working remotely from home for an indefinite period. Approximately 60.56% of employees express a neutral stance on this matter, while 30.99% agree and 5.63% completely agree with this arrangement. However, analysts are cautioning that although working from home has become the prevailing norm, if this trend persists beyond the pandemic, it could pose a significant risk for the oil and gas industry. The primary concern lies in the surge of remote working, which has led to a decline in commuting and business air travel, consequently impacting oil demand negatively. As gasoline consumption constitutes a substantial portion of overall oil demand, with roughly 45% of each refined crude barrel

being allocated to gasoline, it is worth noting that approximately 28% of gasoline demand in the U.S. stems from people commuting to and from work [6].



**Figure 3.1.6:** Response of if employees are fine with working online at home for as long as it takes

#### 4.0 CONCLUSION

In conclusion, this research utilized a quantitative approach and substantiated its findings by referencing reputable journals, articles, or research papers. The data collection process involved distributing a questionnaire to respondents through Google Forms.

The project extensively examined the impact of the COVID-19 pandemic on productivity at PETRONAS Pengerang, Johor. The analysis incorporated information from external sources to explain the obtained results. It is evident that the pandemic did have an effect on the productivity of the oil and gas company, but it is noteworthy that the company managed to recover from these effects.

#### ACKNOWLEDGEMENT

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