Analyzing Opportunities for Developing an Information Systems in   the Yemen Petroleum Company (YPC): A Case Study (YPC - Aden Branch)

Amna Fadel Mansoor Mohammed [1,*]
Nabil Mohammed Ali Munassar [2]

[1] University of Science and Technology (U.S.T), Staff at Yemen Petroleum Company (YPCA).
[2] University of Science and Technology (U.S.T) Aden Yemen.
* Corresponding Author Designation, Email: amnafadel44@gmail.com

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Amna Fadel Mansoor Mohammed
University of Science and Technology (U.S.T)
Staff at Yemen Petroleum Company (YPCA)
Aden, Yemen
amnafadel44@gmail.com

Nabil Mohammed Ali Munassar
University of Science and Technology (U.S.T)
Aden, Yemen

Abstract— **The integration of information systems (IS) into industrial operations is essential for enhancing efficiency, accuracy, and decision-making within organizations. This case study explores the opportunities for developing an information system in the Yemen Petroleum Company (YPC), particularly its Aden branch. Emphasizing the importance of information technology in economic and social development, this study investigates the potential long-term benefits of IS, aligned with financial support phases in a firm.**

Drawing from a detailed literature review, the study delves into the YPC's origin, establishment, and strategic goals, while underscoring the pivotal role of IS in contemporary organizational environments. Key IS functions, such as data collection, analysis, storage, and transfer, are analyzed, referencing theoretical frameworks from established researchers like Langefors [18] and Symons [19]. The study also examines the application of Six Sigma methodologies—particularly the DMAIC (Define, Measure, Analyze, Improve, Control) process—to enhance IS quality and performance within YPC.

Data were collected through a questionnaire designed based on Six Sigma standards, targeting YPC's IT department staff. The results reveal insights into the demographics, educational backgrounds, job positions, and experience levels of the participants. Additionally, the study identifies prevalent IS challenges within YPC, such as security weaknesses, integration issues, and difficulties in adapting to external changes.

Performance measurements of current IS systems were also assessed, with varied responses ranging from system stability and data security to technical support quality. The findings indicate a need for significant improvements in these areas. The study concludes with recommendations for enhancing IS performance, proposing mechanisms for continuous monitoring and improvement, ensuring long-term stability and efficiency of IS in the YPC.

Overall, this research highlights the critical need for developing robust IS frameworks in YPC, demonstrating the profound impact of strategic IS implementation on organizational success and resilience in a rapidly evolving technological landscape.

Keyword___ information system, Petroleum Company, Six Sigma, DMAIC.

I. INTRODUCTION

The speedy developments in information and communication technologies (ICTs) in recent years have resulted in significant changes in the way the world operates and communicates [1].

As time progresses, information systems increasingly play a vital role in the social and economic advancement of nations. This necessitates enhancing the standards of various industries, including trade, finance, science, and industry, through the application of information systems and technology.

In light of these circumstances, information technology, manufacturing technology, and related concepts are evolving rapidly. Thus, it is crucial to consider the long-term development potential of information systems, directly correlating with the financial support provided during specific phases within a firm. [7].

The core function of an information system (IS) revolves around the process of gathering, analyzing, storing, and transferring relevant data to support management operations within any company [10].

This research focuses on analyzing opportunities for developing an information system in the Yemen Petroleum Company (YPC), and the questionnaire has been prepared based on Six Sigma standards.

II. LITERATURE REVIEW

A. Overview About YPCA

YEMEN PETROLEUM COMPANY ADEN BRANCH

Vision

Attaining a leading position in the marketing of petroleum products within the local market, utilizing advanced technology and maintaining exceptional standards.

Strategy

Ensuring the consistent supply of petroleum derivatives to the local market.

Origin and Establishment

The initial phase began with the founding of the Yemen National Oil Company, as per Legal Declaration No. (33) of 1970 and Economic Corporation Resolution No. (38) of 1970, issued on March 1, 1970. This was grounded in Article (5) of the Economic Corporation Law for the Public Sector and National Planning No. (37), dated November 27, 1969. Article (1) mandated the creation of a company under the Oil Authority, named the "Yemeni National Oil Company." Article (2) specified the company's nominal capital at two hundred and fifty thousand Yemeni dinars, with a paid-up capital of fifty thousand Yemeni dinars, subject to review upon finalizing the net assets. Article (3) established the company's main office in Aden.

The second phase saw the formation of a branch under the General Administration of the Yemeni Oil Company in Sana'a, known as the "Petroleum Products Distribution Company," following the establishment of the Republic of Yemen on May 22, 1990. This alignment with the government's policy at the time aimed to consolidate companies and institutions with similar economic activities, supported by Cabinet Resolution No. (191) of 1990, issued on December 5, 1990.

B.   Information Systems

[3]As discussed previous, "Information Systems (IS) are systems that provide information service" [18]. Langefors [18] highlights both the "systems aspect and the information aspect (or infological aspect)." The information aspect indicates that the primary purpose of the stored data is to convey information to people (and processes). In contrast, the systems aspect emphasizes "the importance of the integration achieved through the relationships between the parts, the data, the processes, the users" [18].

Considering the systems aspect, it is evident *f*that the term integration is integral to this approach, with significant implications, as data, people, processes, and environment are all entities within the system [19]. Individuals may access certain data from any part of the system, regardless of who entered the data, and similarly, data and programs can be utilized from any part of the system under the same conceptual framework. However, the term IS system embodies the concept of a "whole", characterized by internal coherence and the understanding that "the whole is greater than the sum of its parts" [19].

[9] Information systems (IS) have become ubiquitous in contemporary society, driving the rapid digitalization of various sectors. A notable application of IS is in emergency response systems (ERSs), which are tasked with providing crucial services to save lives and mitigate environmental damage during both minor, frequent, and major emergencies. Specific IS applications within ERSs facilitate decision-making, communication, information sharing, and resource dispatching. However, the effectiveness of emergency response has been compromised due to public sector budget cuts and a shortage of professional resources, coinciding with an increase in natural and man-made disasters, such as forest fires, storms, and terrorist attacks, in recent decades. No institution exists today that can function effectively without utilizing the most up-to-date technologies available to them [2].

Six Sigma

Six Sigma is a methodical, data-centric approach designed to eliminate defects, minimize process variations, and enhance overall organizational performance. By providing a structured framework for problem-solving and ongoing improvement, Six Sigma plays a crucial role in process enhancement and quality management. Grasping its principles is key to understanding its core objectives and methodology.

Six Sigma Processes

The DMAIC process is a widely used problem-solving methodology within Six Sigma projects. It offers a systematic method for process improvement, allowing organizations to identify and resolve issues, reduce variation, and boost overall performance. Let's delve into the specifics of the DMAIC process:

1.   *Define*

In the Define phase, the project's scope, objectives, and deliverables are explicitly outlined. The main focus is on comprehending the problem or opportunity and aligning the project's goals with the organization's broader objectives.

2.   *Measure*

This phase involves collecting relevant data and establishing baseline performance metrics. It is crucial for understanding the current state of the process and provides a foundation for subsequent analysis and improvement.

3.   *Analyze*

During the Analyze phase, the collected data is scrutinized to identify the root causes of process issues or variations. The objective is to gain a deeper understanding of the factors contributing to the problem and pinpoint the most significant causes.

4.   *Improve*

The Improve phase is dedicated to implementing solutions and making process enhancements based on the analysis conducted in the previous phases. The aim is to optimize the process and achieve the desired outcomes.

5. Control

The Control phase focuses on sustaining the improvements made and ensuring the long-term stability of the process. This involves establishing control mechanisms to monitor and maintain the enhanced process performance.
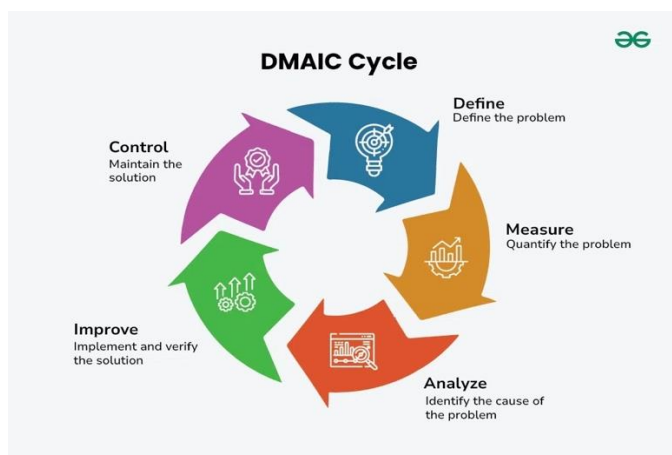

Figure1

III. METHODOLOGY

Research methodology is a systematic approach to addressing a specific issue, involving the study of the best ways to conduct research. This aims to provide an overview and justification of data collection and analysis techniques, focusing on research methodology concepts. The chapter seeks to offer a comprehensive overview of research design strategies, data collection techniques, data analysis, as well as validity, reliability, and all ethical considerations that were taken into account. Additionally, the questionnaire was prepared based on Six Sigma standards.

IV. THE RESULTS

All the respondents gave back the questionnaire. The questionnaire consists of two sections. First section was personal questions about the participations. Second section was about six sigma standers for Analyzing Opportunities for Developing an Information Systems in   the Yemen Petroleum Company. All the information is analyzed and put into tables and figures as following:

Section One: Participant Demographics

1- Personnel questions

Gender Distribution:

Table 1: Gender Distribution

Gender Distribution	Frequency	Percent	Mean
Female	17	54.8	
Male	14	45.2	
Total	31	100.0	1.45

According to Table , 45.2% of the participants were men, and 54.8% of the others were female, as shown in Figure 4.3.
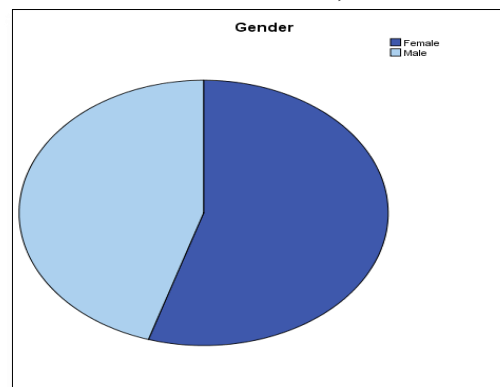

Figure 2 : Gender

Age Distribution:

Table 2: Age Distribution

Age Distribution	Frequency	Percent	Mean
21-25	2	6.5	
26-30	8	25.8	
31-35	10	32.3	
36-40	5	16.1	
41-45	2	6.5	
More than 45	4	12.9	
Total	31	100.0	3.29

The age distribution of the IT department employees is broken down into six groups as shown in Table . the first group (aged 21 to 25), 2people overall and represents 6.5%. There are the second group (26–30 years old) 8 people, or 25.8%. 10 people make up the third group (ages 31 to 35), which accounts for 32.3% of the total. 5 people make up the fourth-third group (aged 36 to 40), which accounts for 16.1% of the total. The final group (more than 45 years) for a total of 4 participants, or 12.9 %, as illustrated in Figure 4.4
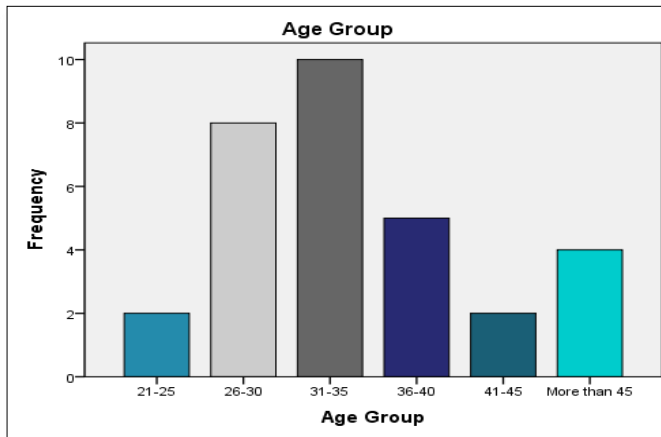
Figure 3: Age Distribution

Education Level:

Table 3: Education level

Education level	Frequency	Percent	Mean
Diploma	2	6.5	
Bachelor's degree	27	87.1	
Master's degree	2	6.5	
Total	31	100.0	3.0

The staff members of the IT department are categorized into three groups based on their educational backgrounds in Table 4.6. which accounts for 15% of all certificates. There are 2 people with a diploma, or 6.5% of the total, The majority of the participants have bachelor's degrees, 27 people, which represents 87.1%. A master's degree held by 2 of the participants represents 6.5 percent.
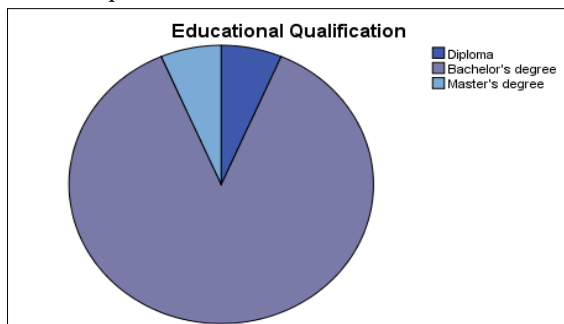

Figure 4: Education level

Current Job Position:

Table 4: Current Job Position

Current Job Position	Frequency	Percent	Mean
Management director	5	16.1	
Department head	4	12.9	
Employee	22	71.0	
Total	31	100.0	2.54838

Table shows that Current Job Position in IT department are categorized into three Position the first Management director and there are 5 mangers, the second Position have 5 Department head and the third Position are 22 Employees.
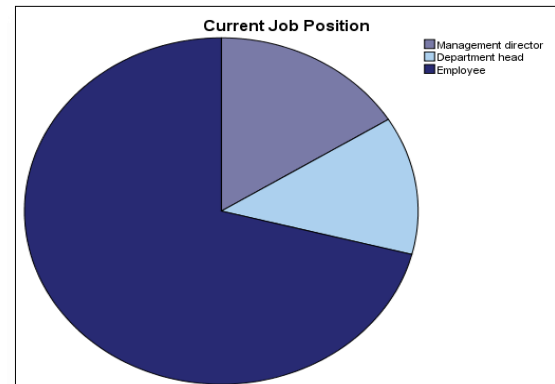
Figure 5: Current Job Position

Experience Range:

Table 5: Experience Range

Experience Range	Frequency	Percent	Mean
Less than a year	1	3.2	
1-2 years	15	48.4	
3-5 years	6	19.4	
6-10 years	4	12.9	
More than ten years	5	16.1	
Total	31	100.0	2.903226

The staff members of the IT department are categorized into five groups based on their range of experience, as shown in Table 4.5. There are one in the first group (Less than a year), for a total of one people, or 3.2%. There are the second group (1–2 years old), of 15 people, or 48.4%. There are third group (3–5 years old), for 6 people—or 19.4%—in this group. There are 4 people in the fourth group (6–10 years old), or 12.9% of the total. The final group (More than ten years) for a total of 5 people, or 16.1%, according to Figure.
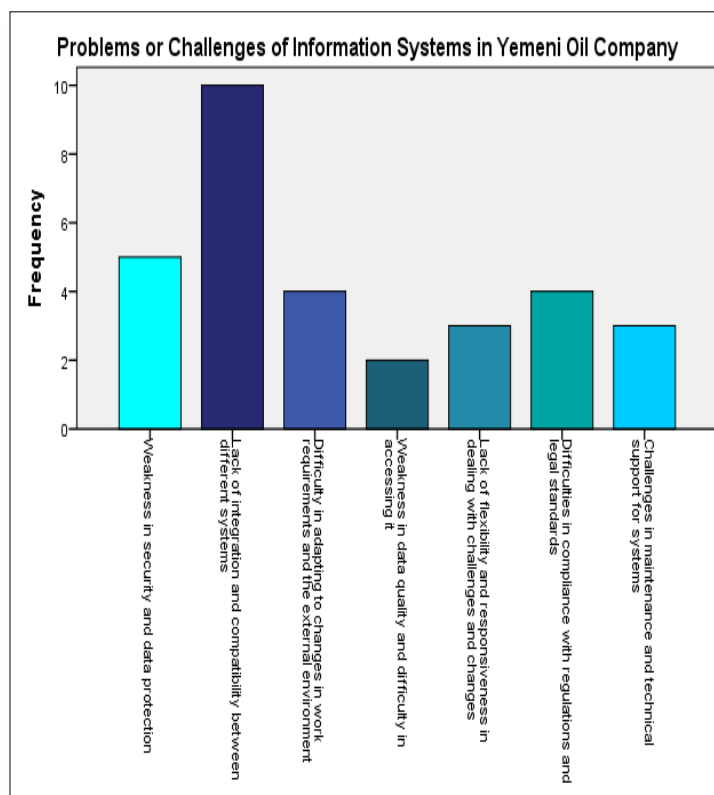
Figure 6: Experience Range

Section Two:

1. Problems or Challenges of Information Systems in Yemeni Oil Company

Table 6: Problems or Challenges

Problems or Challenges of Information Systems in Yemeni Oil Company	Frequency	Percent	Mean
Weakness in security and data protection	5	16.1	
Lack of integration and compatibility between different systems	10	32.3	
Difficulty in adapting to changes in work requirements and the external environment	4	12.9	
Weakness in data quality and difficulty in accessing it	2	6.5	
Lack of flexibility and responsiveness in dealing with challenges and changes	3	9.7	
Difficulties in compliance with regulations and legal standards	4	12.9	1-
Challenges in maintenance and technical support for systems	3	9.7	
Total	31	100.0	3.387097

Table shows that Problems or Challenges of Information Systems in Yemeni Oil Company so the first problem is Weakness in security and data protection and the people choose it 5 or 16.1 Percent, the second Problem is Lack of integration and compatibility between different systems and the people choose it 10 or 32.3 Percent, the third problem is Difficulty in adapting to changes in work requirements and the external environment and the people choose it 4 or 12.9 Percent, the forth problem is Weakness in data quality and difficulty in accessing it and the people choose it 2 or 6.5 Percent, Lack of flexibility and responsiveness in dealing with challenges and changes and the people choose it 3 or 9.7 Percent, Difficulties in compliance with regulations and legal standards and the people choose it 4 or 12.9 Percent, Challenges in maintenance and technical support for systems and the people choose it 3 or 9.7 Percent.

Figure 7: Problems or Challenges of Information Systems in Yemeni Oil Company

2. Performance Measurement

Table 7: Performance Measurement

Q		Strong Disagree	Disagree	Somewhat agree	Agree	Strong Agree	Mean
Overall system performance							
System stability and absence of failures	T	0	4	10	14	3	2.48
	%	0	12.9%	32.3%	45.2%	9.7%	
Speed and responsiveness	T	1	0	8	18	4	2.23
	%	3.2%	0	25.8%	58.1%	12.9%	
Do you believe that the current information systems meet users' needs and facilitate their tasks?	T	0	1	9	18	3	2.26
	%	0	3.2%	29.0%	58.1%	9.7%	
Do you believe that the current information systems are capable of adapting to changes in work requirements and the external environment?	T	0	4	17	8	2	2.74
	%	0	12.9%	54.8%	25.8%	6.5%	
Do you believe that the current information systems provide a high level of data security and protection?	T	1	5	10	10	5	2.58
	%	3.2%	16.1%	32.3%	32.3%	16.1%	
Do you believe that the current information systems are capable of facing future challenges?	T	0	5	12	11	3	2.61
	%	0	16.1%	38.7%	35.5%	9.7%	
Data Quality							
Do you agree on the accuracy and consistency of the data?	T	0	0	9	13	9	2.00
	%	0	0	29.0%	41.9%	29.0%	
Do you agree on the availability of data and ease of access to it?	T	1	1	9	14	5	2.30
	%	3.2%	3.2%	29.0%	45.2%	16.1 %	
System Security							
Do you agree on the level of data protection and security	T	0	5	11	9	6	2.48
	%	0	16.1%	35.5%	29.0%	19.4%	
Ease of implementation and management of security measures:	T	2	4	12	9	4	2.71
	%	6.5%	12.9%	38.7%	29.0	12.9%	
System Integration							
System's ability to integrate with external systems	T	2	4	11	10	4	2.68
	%	6.5%	12.9%	35.5%	32.3%	12.9%	
Availability and use of integrated programming interfaces and technologies	T	1	3	8	16	3	2.45
	%	3.2%	9.7%	25.8%	51.6%	9.7%	
System Support and Maintenance							
Quality of technical support and continuous maintenance:	T	0	2	13	12	4	2.42
	%	0	6.5%	41.9%	38.7%	12.9%	
Ease of applying updates and fixes:	T	0	3	13	12	3	2.52
	%	0	9.7%	41.9%	38.7%	9.7%	

Performance Measurement in the company so the first category was Strongly Agree, and Q1 was System stability and absence of failures 3 persons chose or 5.2 percent, Q2 was Speed and responsiveness 4 persons chose or 6.9 percent, Q3 was Do you believe that the current information systems meet users' needs and facilitate their tasks 3 persons chose or 5.2 percent, Q4 was Do you believe that the current information systems are capable of adapting to changes in work requirements and the external environment 2 persons chose or 3.4 percent, Q5 was Do you believe that the current information systems provide a high level of data security and protection 5 persons chose or 8.6 percent, Q6 was Do you believe that the current information systems are capable of facing future challenges 3 persons chose or 5.2 percent,Q7 was Do you agree on the accuracy and consistency of the data 9 persons chose or 15.5 percent, Q8 was Do you agree on the availability of data and ease of access to it 3 persons chose or 5.2 percent, Q9 was Do you agree on the level of data protection and security 6 persons chose or 10.3 percent, Q10 was 10Ease of implementation and management of security measures 4 persons chose or 6.9 percent, Q11 was System's ability to integrate with external systems 4 persons chose or 6.9 percent,Q12 was Availability and use of integrated programming interfaces and technologies 3 persons chose or 5.2 percent,Q13 was Quality of technical support and continuous maintenance 4 persons chose or 6.9 percent and Q14 was Ease of applying updates and fixes 3 persons chose or 5.2 percent.

 so the second category was Agree, and Q1 was System stability and absence of failures 14 persons chose or 8.0 percent, Q2 was Speed and responsiveness 18 persons chose or 10.3 percent, Q3 was Do you believe that the current information systems meet users' needs and facilitate their tasks 18 persons chose or 10.3 percent, Q4 was Do you believe that the current information systems are capable of adapting to changes in work requirements and the external environment 8 persons chose or 4.6 percent, Q5 was Do you believe that the current information systems provide a high level of data security and protection 10 persons chose or 5.7 percent, Q6 was Do you believe that the current information systems are capable of facing future challenges 11 persons chose or 6.3 percent,Q7 was Do you agree on the accuracy and consistency of the data 13 persons chose or 7.5 percent, Q8 was Do you agree on the availability of data and ease of access to it 14 persons chose or 8.0 percent, Q9 was Do you agree on the level of data protection and security 9 persons chose or 5.2 percent, Q10 was Ease of implementation and management of security measures 9 persons chose or 5.2 percent, Q11 was System's ability to integrate with external systems 10 persons chose or 5.7 percent,Q12 was Availability and use of integrated programming interfaces and technologies 16 persons chose or

9.2 percent,Q13 was Quality of technical support and continuous maintenance 12persons chose or 6.9 percent and Q14 was Ease of applying updates and fixes 12 persons chose or 6.9 percent. the third category was Somewhat Agree, and Q1 was System stability and absence of failures 10 persons chose or 6.6 percent, Q2 was Speed and responsiveness 8 persons chose or 5.3 percent, Q3 was Do you believe that the current information systems meet users' needs and facilitate their tasks 9 persons chose or 5.9 percent, Q4 was Do you believe that the current information systems are capable of adapting to changes in work requirements and the external environment 17 persons chose or 11.2 percent, Q5 was Do you believe that the current information systems provide a high level of data security and protection 10 persons chose or 6.6 percent, Q6 was Do you believe that the current information systems are capable of facing future challenges 12 persons chose or 7.9 percent,Q7 was Do you agree on the accuracy and consistency of the data 9 persons chose or 5.9 percent, Q8 was Do you agree on the availability of data and ease of access to it 9 persons chose or 5.9 percent, Q9 was Do you agree on the level of data protection and security 11 persons chose or 7.2 percent, Q10 was Ease of implementation and management of security measures 12 persons chose or 7.9 percent, Q11 was System's ability to integrate with external systems 11 persons chose or 7.2 percent,Q12 was Availability and use of integrated programming interfaces and technologies 8 persons chose or 5.3 percent,Q13 was Quality of technical support and continuous maintenance 13 persons chose or 8.6 percent and Q14 was Ease of applying updates and fixes 13 persons chose or 8.6 percent. the forth category was Disagree, and Q1 was System stability and absence of failures 4 persons chose or 9.8 percent, Q3 was Do you believe that the current information systems meet users' needs and facilitate their tasks 1 persons chose or 2.4 percent, Q4 was Do you believe that the current information systems are capable of adapting to changes in work requirements and the external environment 4 persons chose or 9.8 percent, Q5 was Do you believe that the current information systems provide a high level of data security and protection 5 persons chose or 12.2 percent, Q6 was Do you believe that the current information systems are capable of facing future challenges 5 persons chose or 12.2 percent,Q8 was Do you agree on the availability of data and ease of access to it 1 persons chose or 2.4 percent, Q9 was Do you agree on the level of data protection and security 5 persons chose or 12.2 percent, Q10 was Ease of implementation and management of security measures 4 persons chose or 9.8 percent, Q11 was System's ability to integrate with external systems 4 persons chose or 9.8 percent,Q12 was Availability and use of integrated programming interfaces and technologies 3 persons chose or 7.3 percent,Q13 was Quality of technical support and

continuous maintenance 2 persons chose or 4.9 percent and Q14 was Ease of applying updates and fixes 3 persons chose or 7.3 percent. The fifth category was Strongly Disagree, and Q2 was Speed and responsiveness 1 persons chose or 12.5 percent, Q5 was Do you believe that the current information systems provide a high level of data security and protection 1 persons chose or 12.5 percent, Q8 was Do you agree on the availability of data and ease of access to it 1 persons chose or

12.5 percent, Q10 was Ease of implementation and management of security measures 2 persons chose or 25.0 percent, Q11 was System's ability to integrate with external systems 2 persons chose or 25.0 percent, Q12 was Availability and use of integrated programming interfaces and technologies 2 persons chose or 25.0 percent, and Q14 was Ease of applying updates and fixes 1 persons chose or 12.5 percent.
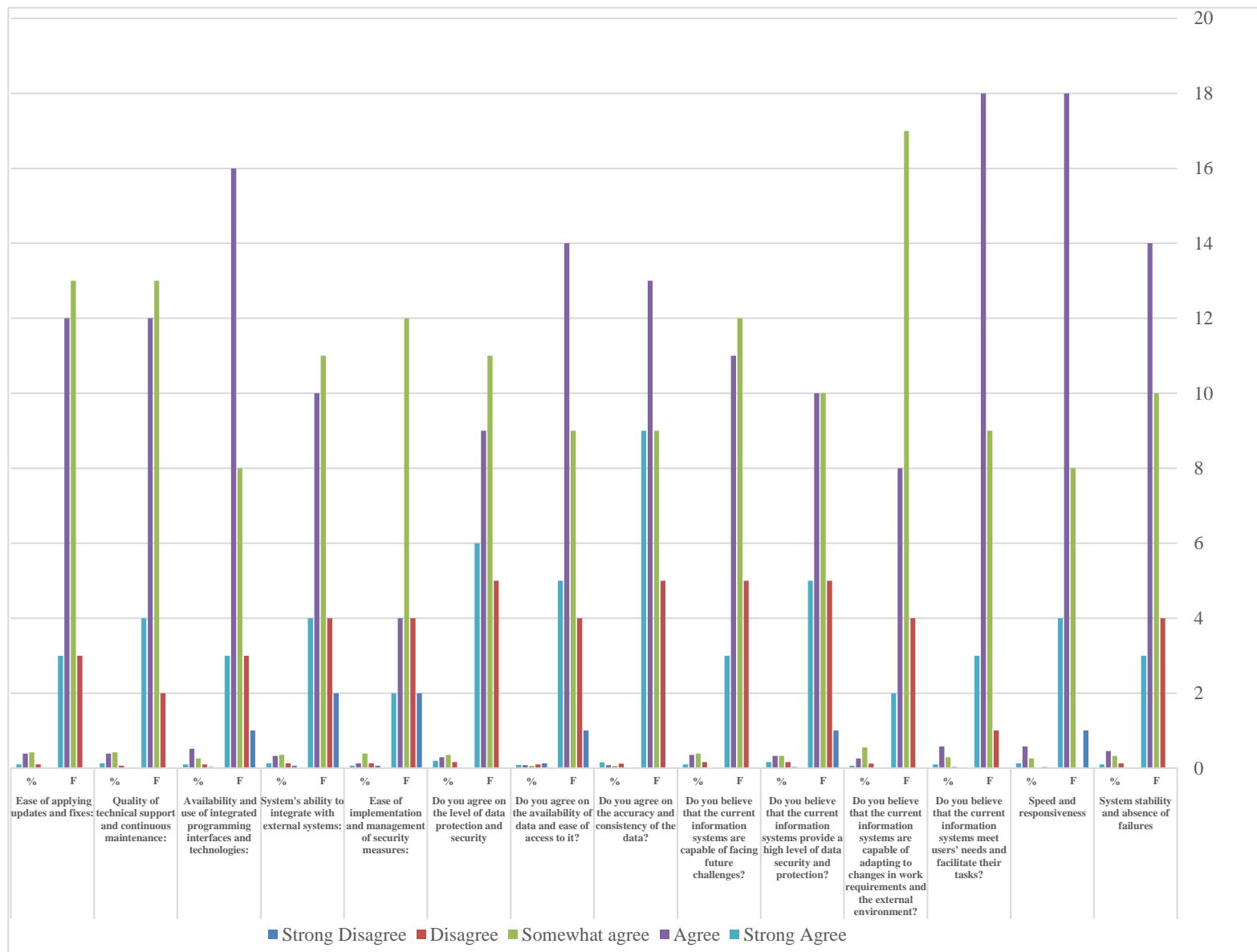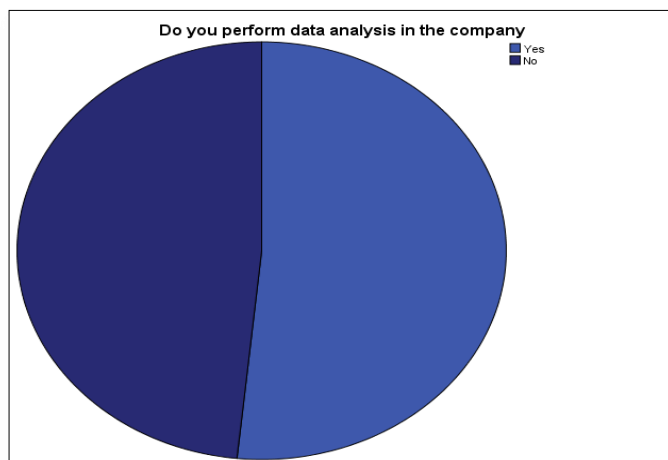

Figure 8: Performance Measurement

1. Data Analysis

Table 8: Analysis of
(do you perform data analysis in the company)

Do you perform data analysis in the company	Frequency	Percent	Mean
Yes	16	51.6	
No	15	48.4	1.483871
Total	31	100.0	

This table show answered the question do you perform data analysis in the company So the people answered **yes** was 16 persons or 51.6 percent and people answered **no** was 15 persons or 48.4 percent.
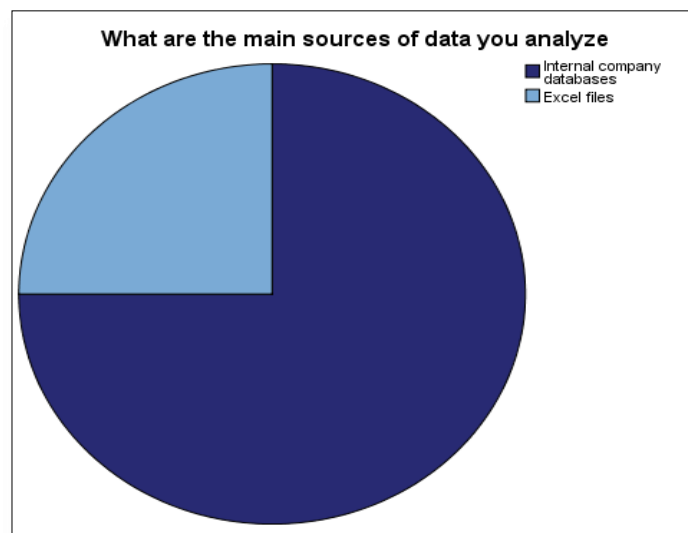

Figure 9 : Analysis of
(do you perform data analysis in the company)

Table 9: Tools or software use for data analysis

Tools or software use for data analysis	Frequency	Percent	Mean
sql+	11	35.5	
Microsoft Excel	4	12.9	2.266667
Total	15	48.4	
Missing	16	51.6	

This table show answered the question tools or software use for data analysis in the company to analysis data the first sql+ the employees were used 11 or 35.5 percent and the second was Microsoft Excel the employees were used 4 or 12.9 percent.

And the manager of IT said was used Microsoft accesses and SQl server in the past.
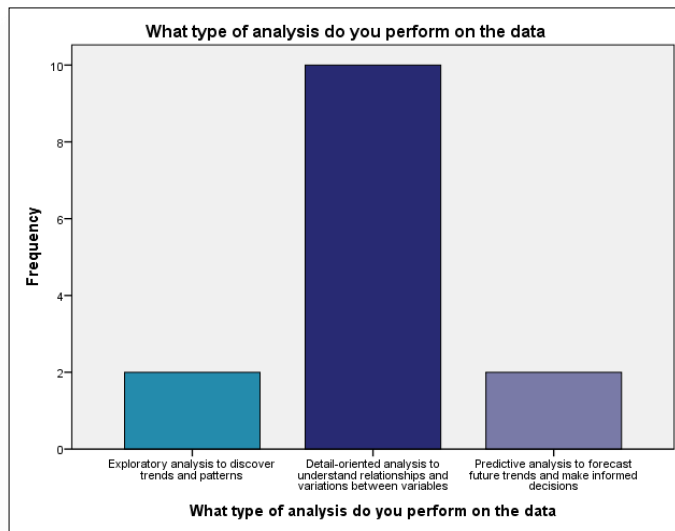

Figure 10 : tools or software use for data analysis

Table 10: Type of analysis do you perform on the data in the company

Type of analysis do you perform on the data in the company	Frequency	Percent	Mean
Exploratory analysis to discover trends and patterns	2	6.5	
Detail-oriented analysis to understand relationships and variations between variables	10	32.3	
Predictive analysis to forecast future trends and make informed decisions	2	6.5	
Total	14	45.2	
Missing	17	54.8	
Total	31	100	2.0

This table show answered the question was type of analysis do you perform on the data in the company so the first one

Exploratory analysis to discover trends and patterns 2 persons chose or 6.5 percent, the second was Detail-oriented analysis to understand relationships and variations between variables 10 persons chose or 32.3 percent, the third Predictive analysis to forecast future trends and make informed decisions 2 persons chose or 6.5 percent.

Figure 11: Type of analysis do you perform on the data in the company
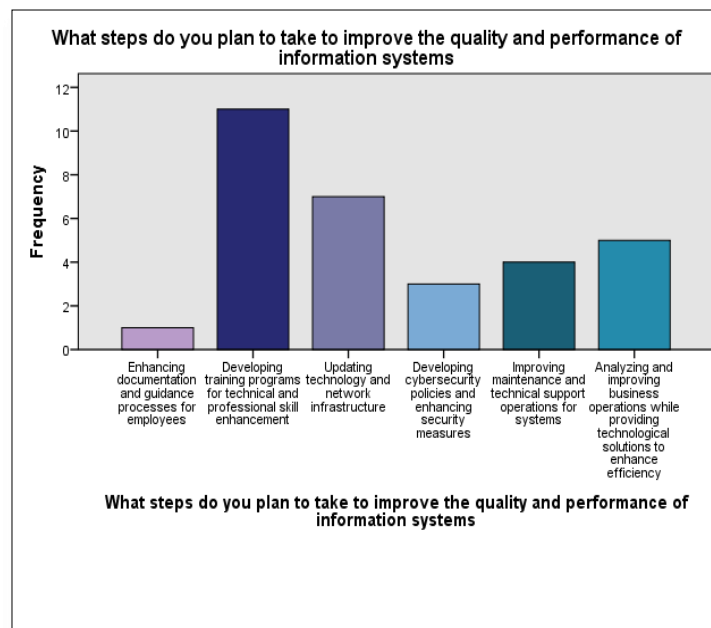
2. Improve

Table 11: steps do you plan to take to improve the quality and performance of information systems

steps do you plan to take to improve the quality and performance of information systems	Frequency	Percent	Mean
Enhancing documentation and guidance processes for employees	1	3.2	
Developing training programs for technical and professional skill enhancement	11	35.5	
Updating technology and network infrastructure	7	22.6	3.419355
Developing cybersecurity policies and enhancing security measures	3	9.7	
Improving maintenance and technical	4	12.9	
support operations for systems			
Analyzing and improving business operations while providing technological solutions to enhance efficiency	5	16.1	
Total	31	100.0	

This table shows what steps do you plan to take to improve the quality and performance of information systems the first step Enhancing documentation and guidance processes for employees 1 persons chose or 3.2 percent, the second step Developing training programs for technical and professional skill enhancement 11 persons chose or 35.5 percent, the third step Updating technology and network infrastructure 7 persons chose or 22.6 percent, the forth Developing cybersecurity policies and enhancing security measures 3 persons chose or 9.7 percent, the fifth step Improving maintenance and technical support operations for systems 4 persons chose or 12.9 percent, the sixth step Analyzing and improving business operations while providing technological solutions to enhance efficiency 5 persons chose or 16.1 percent.
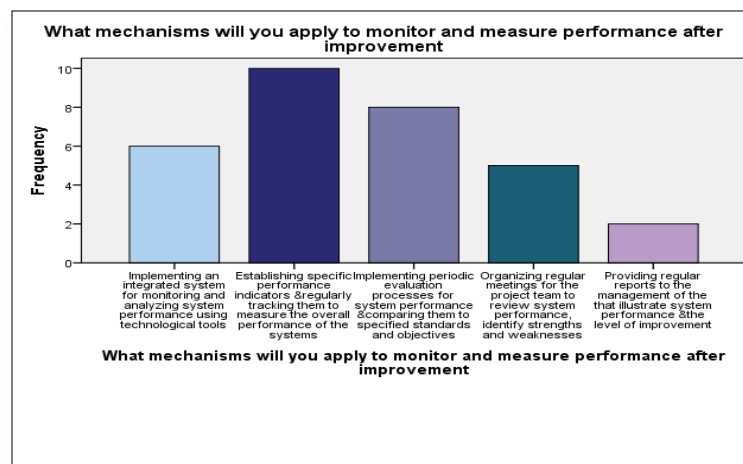

Figure 12: steps do you plan to take to improve the quality and performance of information systems

3. Control

Table 12: What mechanisms will you apply to monitor and measure performance after improvement

What mechanisms will you apply to monitor and measure performance after improvement	Frequency	Percent	Mean
Implementing an integrated system for monitoring and analyzing system performance using technological tools	6	19.4	
Establishing specific performance indicators &regularly tracking them to measure the overall performance of the systems	10	32.3	
Implementing periodic evaluation processes for system performance and comparing them to specified standards and objectives	8	25.8	
Organizing regular meetings for the project team to review system performance, identify strengths and weaknesses	5	16.1	
Providing regular reports to the management of the that illustrate system performance and the level of improvement	2	6.5	
Total	31	100.0	2.580645

This table shows What mechanisms will you apply to monitor and measure performance after improvement the first step Implementing an integrated system for monitoring and analyzing system performance using technological tools 6 persons chose or 19.4 percent, the second step Establishing specific performance indicators and regularly tracking them to measure the overall performance of the systems 10 persons chose or 32.3 percent, the third step Implementing periodic evaluation processes for system performance and comparing them to specified standards and objectives 8 persons chose or 25.8 percent, the Organizing regular meetings for the project team to review system performance, identify strengths and weaknesses 5 persons chose or 16.1 percent, the fifth step Providing regular reports to the management of the that illustrate system performance &the level of improvement for systems 2 persons chose or 6.5 percent.

Figure 13: What mechanisms will you apply to monitor and measure performance after improvement

V. CONCLUSION

The integration of information systems (IS) in industrial operations is crucial for enhancing efficiency, accuracy, and decision-making within organizations. This case study focused on the opportunities for developing an information system in the Yemen Petroleum Company's (YPC) Aden branch. Emphasizing the importance of information technology in economic and social development, this study investigated the potential long-term benefits of IS in alignment with financial support phases within the firm.

The study began with a detailed literature review, exploring the YPC's origin, establishment, and strategic goals while underscoring the pivotal role of IS in contemporary organizational environments. It highlighted key IS functions, such as data collection, analysis, storage, and transfer, referencing theoretical frameworks from established researchers like Langefors [18] and Symons [19]. Furthermore, the study examined the application of Six Sigma methodologies, particularly the DMAIC (Define, Measure, Analyze, Improve, Control) process, to enhance IS quality and performance within YPC.

Data were collected through a questionnaire designed based on Six Sigma standards, targeting YPC's IT department staff. The results provided insights into the demographics, educational backgrounds, job positions, and experience levels of the participants. Additionally, the study identified prevalent IS challenges within YPC, such as security weaknesses, integration issues, and difficulties in adapting to external changes.

VI. KEY FINDINGS

Demographics and Experience:
The IT department staff comprises 54.8% females and 45.2% males.
The age distribution showed a majority in the 31-35 age group .(%32.3)
Most participants hold a bachelor's degree.(%87.1)
The majority have 1-2 years of experience.(%48.4)

IS Challenges:
The most significant issues include lack of integration and compatibility between different systems (32.3%), security weaknesses (16.1%), and difficulty adapting to changes .(%12.9)

Performance Measurements:
Performance measurements indicated mixed responses regarding system stability, speed, and responsiveness.
The highest agreement was on the accuracy and consistency of data (15.5%) and speed and responsiveness.(%10.3)

Data Analysis Practices:
About half of the participants perform data analysis (51.6%), primarily using SQL+ (35.5%) and Microsoft Excel.(%12.9)
The predominant type of analysis is detail-oriented to understand relationships and variations between variables .(%32.3)

Improvement Steps:
Key steps planned for improving IS quality and performance include developing training programs for technical and professional skills (35.5%) and updating technology and network infrastructure.(%22.6)

Monitoring Mechanisms:
Mechanisms for monitoring and measuring performance post-improvement include implementing an integrated system for monitoring and analyzing system performance (19.4%) and establishing specific performance indicators with regular tracking.(%32.3)

VII. REFERENCES

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