International Journal of Studies in Business Management, Economics and Strategies
Volume 3, Issue 8, August - 2024
ISSN (E): 2949-883X
Scholarsdigest.org

THE IMPACT OF MANAGEMENT INFORMATION SYSTEMS ON TOTAL QUALITY MANAGEMENT: AN ANALYTICAL STUDY OF THE VIEWS OF A SAMPLE OF EMPLOYEES AT SAMARRA PHARMACEUTICAL FACTORY

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Abstract
The primary objective of this study is to explore the relationship between Management Information Systems (MIS) and Total Quality Management (TQM) by examining their respective dimensions: administrative requirements, physical requirements, software requirements, and human requirements for MIS, and top management support and commitment, continuous improvement, and training and development for TQM. The researcher employed a descriptive-analytical methodology, reviewing previous studies and scientific references, and used a specially designed questionnaire for data collection. The study covered all individuals in the Quality Management Department, section heads, and administrative units at Samarra Pharmaceutical Factory, using a comprehensive sampling method. Out of 110 distributed questionnaires, 105 were returned, with 100 deemed valid. Statistical analysis revealed a statistically significant impact of MIS dimensions on TQM dimensions. The study recommended developing and improving the hardware, equipment, and infrastructure of the management information systems to ensure their efficient and accurate operation, and to guarantee the security of important information and data. Additionally, it also recommended implementing a continuous and effective system for measuring customer satisfaction, utilizing customer feedback to enhance the quality of products and services, thereby increasing the organization's competitive advantage in the market.

Keywords: Management Information Systems, Total Quality Management, Samarra Pharmaceutical Factory.

Introduction

Although humans have been using information for a long time, the current advancement in information technology and its impact on management information systems has created a significant opportunity to collect a larger volume of information and utilize it excellently due to its accuracy and timeliness. This technology allows for processing and storing data to be retrieved and used at any time. This advancement is attributed to the development of information systems and their devices, which positively affect organizational systems and their operations. It is worth mentioning that Total Quality Management (TQM) is a modern

trend in the field of management, adopted by organizations to achieve their objectives. Japanese organizations were pioneers in implementing the TQM system, which aims to enhance performance, address production problems, improve quality, reduce costs, and satisfy customers by meeting their needs. In this context, and after reviewing previous studies and research, the researcher aims to demonstrate the impact of management information systems on Total Quality Management in Samarra Pharmaceutical Laboratory and to propose appropriate solutions and recommendations based on the results of this study.

The Research Problem:

Business organizations face intense competition in the market, necessitating the development of products to cope with customer's desires and needs, especially with the significant opening of Iraqi markets and their heavy reliance on imports, including pharmaceuticals. Therefore, these organizations adopt the philosophy of Total Quality Management (TQM) to keep up with market competition. Management information systems are crucial for providing timely and quality data to assist management in decision-making and problem-solving. As a result, this research focuses on management information systems and their impact on total quality management in Samarra Pharmaceutical Factory. The research problem is clarified through the following main question:

– What is the correlation between management information systems and TQM in Samarra Pharmaceutical Laboratory?

– From this main question arise the following sub-questions:

– What is the correlation between management information systems and the support and commitment of senior management?

– What is the correlation between management information systems and continuous improvement?

– What is the correlation between management information systems and employee training and development?

The Research Importance

The importance of this study is evident through:

- The scarcity of previous studies on the impact of management information systems on TQM in the Pharmaceutical Laboratory of Samarra.
- Focusing on the national pharmaceutical sector in Iraq (Samarra Pharmaceutical Laboratory).
- The significance of the targeted sector for the Iraqi community.

The Research Objectives:

This study aims to:

- Demonstrate the impact of management information systems on TQM.
- Assess the current use of management information systems in the Pharmaceutical Laboratory of Samarra.
- Show the reality of implementing TQM in Samarra Pharmaceutical Laboratory.

The Research Model

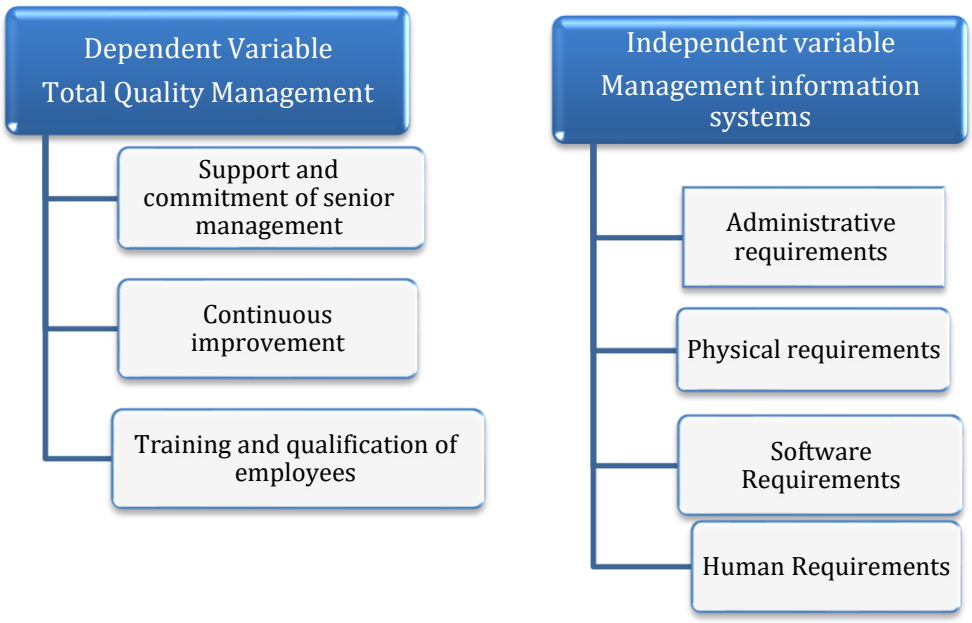

Figure (1): The Model of Research Variables

Source: The figure was prepared by the researcher based on studies by (Mohamed et al., 2022), (Al-Taha, 2017), (Al-Ani, 2021), (Hassan et al., 2022)

The Research Hypotheses:

Main Hypothesis:

- There is a statistically significant effect of management information systems on Total Quality Management (TQM).

Sub-Hypotheses:

- There is a statistically significant effect of management information systems on the support and commitment of senior management.
- There is a statistically significant effect of management information systems on continuous improvement.
- There is a statistically significant effect of management information systems on employee training and development.

The Research Methodology and Data Collection Tool:

Methodology: The researcher used a descriptive-analytical method to prepare this study, aiming to clarify the aspects of the relationship and the extent of the correlation between its variables and dimensions.

Spatial and Temporal Limits: The study is conducted at Samarra Pharmaceutical Laboratory for the year 2024.

Data Collection Tool: The researcher employed a questionnaire to collect data for this study, which consists of three sections:

1. Personal and Professional Information:
2. Independent Variable Questionnaire (Management Information Systems) and its dimensions (administrative requirements, physical requirements, software requirements, human requirements) (Mohamed et al., 2022; Al-Taha, 2017).
3. Dependent Variable Questionnaire (Total Quality Management) and its dimensions (senior management support and commitment, continuous improvement, employee training and development) (Al-Ani, 2021; Hassan et al., 2022).

The Research Community and Sample:

The study community includes all members of the TQM department, department heads, administrative and production staff at Samarra Pharmaceutical Laboratory, totaling 110 individuals. The study sample is comprehensive.

Theoretical Framework

Section One: Management Information Systems

The Concept of MIS:

Management Information Systems (MIS) is a network of various elements that have evolved progressively to provide necessary information for decision-makers. According to Huwaida (2012), MIS consists of individuals, equipment, databases, procedures, communications, and applications that can operate manually, automatically, or mechanically to collect, process, store, and then deliver data to the intended recipients. Additionally, MIS involves using technology to assist management in achieving its goals through specialized devices and applications, enabling administrative processes to be conducted more easily and efficiently compared to traditional methods, thus reducing costs and enhancing results (Iman, 2021). The American Information Systems Association defines an information system as an automated system designed to collect, organize, analyze, deliver, and present information for use by individuals across various organizational activities (Al-Bayati & Hassan, 1992). Based on the aforementioned, MIS can be described as a system comprising elements that work together to provide the necessary information to aid decision-makers in making informed choices.

Types of Management Information Systems:

Following advancements in information technology, including devices and applications, and the changing information needs of organizations, management information systems have rapidly evolved and diversified. Several types have emerged, including those mentioned by Al-Rahman et al. (2018).

1. **Executive Support Systems (ESS**): These systems operate at the strategic level within an organization and are designed to assist in decision-making.
2. **Expert Systems**: These are computer-based guidance systems that perform strategic thinking and analysis similar to human experts, aimed at solving complex problems. They are widely used in the field of artificial intelligence.

3. **Management Reporting Systems**: These systems provide information to management to assist in decision-making, utilizing management reports and leveraging stored data and information from databases.
4. **Decision Support Systems (DSS)**: These systems assist management in making unstructured decisions.

Characteristics of Management Information Systems:

MIS has several distinct characteristics, including (Al-Taha, 2017):

1. These systems support decision-making for structured and semi-structured managerial and operational control.
2. They provide performance reports for monitoring.
3. They rely on available data and information from various management levels and departments.
4. They play a basic role in decision-making based on past and present data.
5. These systems are inflexible and focused on the internal environment.

Objectives of Management Information Systems:

MIS aims to achieve the following (Al-Neel, 2019):

Certainly, every system aims to achieve specific objectives, and management information systems aim to:

1. Provide necessary information by ensuring that information is available in the right format and timing.
2. Supply precise information to various management levels within the organization.
3. Support management in planning, organizing, controlling, directing, and decision-making.
4. Provide data relevant to the internal environment.
5. Offer data about the external environment needed by the organization.

Dimensions of Management Information Systems:

Researchers have identified various dimensions of MIS, including (Mohamed et al., 2022; Al-Taha, 2017):

1. Administrative Requirements: These requirements are decisions made by management to facilitate and benefit from MIS.
2. Physical Requirements: They stand for all physical elements used in operating the systems, such as devices, printers, paper, disks, and central processing units.
3. Software Requirements: These are the non-physical elements used in system operation, including operating systems, applications, and software.
4. Human requirements: These refer to individuals possessing expertise and knowledge in technology, computer science, and information systems who are employed within an organization. These individuals are carefully selected to operate and maintain the system. They play a crucial role in ensuring the smooth functioning of the organization's information systems." (Hamoudah, 2012; Al-Sayefi, 2004).

Section Two: Total Quality Management

The Concept of TQM

Quality initially refers to a set of predefined specifications that measure the accuracy and readiness of a product to meet customer needs and desires (Hussein, 2022). According to the Federal Quality Institute, Total Quality Management (TQM) is executing work correctly the first time, with an emphasis on customer feedback to assess performance improvement (Abdul Mohsen, 2005). It also refers to the systematic approach to ensuring that planned activities proceed as intended, representing the ideal method to prevent issues by promoting and encouraging optimal administrative and organizational performance, and effectively and efficiently using the organization's physical and human resources (Al-Sakranah, 2009). Deming defined TQM as a management philosophy focused on meeting and exceeding customer expectations and needs both now and in the future (Ali, 2011). Tonks described it as the involvement and commitment of management and employees to enhance work processes by meeting or surpassing customer expectations (Radwan, 2012). Therefore, TQM can be seen as a comprehensive management philosophy focused on achieving correct work execution with no errors to ensure customer satisfaction and continuous improvement.

Importance of Total Quality Management:

The importance of TQM is highlighted by Dudin (2014) through several points:

1. TQM reduces customer complaints by meeting their needs and desires.
2. Enhances organizational efficiency in achieving customer satisfaction.
3. Fosters team spirit and collective work to improve employee satisfaction.
4. Improves work processes.
5. Reduces costs.
6. Increases profits and competitiveness through continuous improvement.
7. Contributes to gaining a larger market share.

Functions of Total Quality Management:

TQM aims to fulfill various functions, including (Al-Tamimi & Al-Khatib, 2008):

1. TQM serves as a key strategy to face international competition in the current globalization era.
2. TQM contributes to improving living standards, developing investment fields, and enhancing production and trade.
3. Developing human resource capabilities to improve performance and optimize their use.
4. TQM serves as a key approach to enhancing organizations' competitive abilities.

Challenges of Total Quality Management:

Despite its numerous advantages for organizations, its implementation faces several obstacles. One such challenge is the misalignment with the organization's culture, as its application requires decisions that bypass the complexities of administrative routines. It needs a decentralized system within the organization to facilitate its operations and achieve its goals. The persistence of some organizations in maintaining centralization is a significant obstacle to total quality management. Additionally, inadequate financial and physiacl

resources can impede its effectiveness and goal achievement. The limited capabilities of personnel working in quality management can also be a barrier. Resistance to change, whether from management or staff, further hinders the implementation of total quality management and obstructs its objectives (Abd, Khudair, 2012; Sharqi, 2016).

Dimensions of Total Quality Management:

Based on previous studies, the key dimensions of TQM identified by researchers include:

1- The Support and Commitment of Senior Management: This involves the ability of senior management to shift organizational culture to support TQM principles, as effective leadership is crucial for influencing employee values, behavior, and culture (Thawabti, 2016).

2- Continuous Improvement: It is a fundamental step in TQM, continuous improvement integrates ongoing development and refinement within the organization to keep up with advancements (Al-Haddad, 2009).

3- Training and Development: This process aims to improve and enhance the efficiency of employees to achieve organizational goals (Ali, 2008). Training and development are crucial factors for satisfying employee needs and retaining them (Hussein & Kammoun, 2024).

Conclusion:

Management Information Systems are crucial for organizations, providing accurate and timely information essential for problem-solving and decision-making, ultimately helping achieve organizational goals. On the other hand, TQM creates an environment and administrative philosophy that minimizes errors, avoids problems, reduces costs, and fosters continuous improvement to enhance customer satisfaction, gain a larger market share, and remain competitive. The correlation between TQM and MIS is evident, as TQM relies on MIS for necessary internal and external data to solve problems, correct errors, and make informed decisions, thereby supporting the achievement of organizational objectives.

Application

Introduction:

This section presents the data and its analysis, collected by the researcher through a questionnaire distributed to the research community, consisting of 110 employees at Samarra Pharmaceutical Factory, including the entire Total Quality Management department, department heads, divisions, and administrative and production units. Of the 105 responses received, 100 were valid. The researcher used a comprehensive sample for this study, categorizing and analyzing the responses to the questionnaire to assess the impact of management information systems on total quality management at the factory.

Statistical Analysis Results:

First: Results of Validity and Reliability Testing for Study Variables:

The statistical analysis showed the results of reliability testing using Cronbach's Alpha Coefficient, and validity testing through the square root method, as detailed in the following table:

Table (1): Results of Validity and Reliability Testing for Study Variables.

Variables (Dimensions)	Stability coefficient (α)	Validity coefficient
Administrative Requirements	(0,936)	0,967
Physical Requirements	(0,817)	0,904
Software Requirements	(0,970)	0,985
Human Requirements	(0,949)	0,974
Management Information Systems	(0,947)	0,973
Top Management Support and Commitment	(0,897)	0,947
Continuous Improvement	(0,795)	0,892
Employee Training and Development	(0,785)	0,886
Total Quality Management	(0,942)	0,971

Source: Based on the Statistical Analysis Results of Cronbach's Alpha Test.

The previous Table No (1) shows that the Cronbach's Alpha values ranged from 0.785 to 0.970. Since it is statistically recognized that the test statistic should be at least 0.7, these values are considered acceptable, reflecting reliability and confidence in the research variables and confirming their suitability for the subsequent stages of analysis.

Second: Descriptive Analysis of the Demographic (Personal) Data of the Research Sample:

The analysis presented in Table (2) reveals the following key results:

- Gender: It was found that 66% of the total sample were male, whereas 34% were female.
- Age: The analysis shows that 56% of the sample were aged between 35 and 45 years. Additionally, 24% were aged between 45 and 55 years, 11% were under 25 years, and 9% were aged between 25 and less than 35 years.
- Educational Qualification: It was observed that 65% of the sample held a bachelor's degree, 24% had postgraduate degrees, 9% had diplomas, and 2% had high school diplomas.
- Job Specialization: It was found that 66% of the sample were technicians, 31% were administrative staff, and 3% had medical specializations.
- Work Experience: The data indicates that 33% of the sample had work experience ranging from 10 to less than 15 years, followed by 30% with more than 15 years of experience, 25% with 5 to less than 10 years of experience, and 12% with less than 5 years of experience.

This diversity in the professional backgrounds of the sample members may enhance the accuracy and objectivity of the research results. It also reflects that the study sample includes scientifically qualified individuals capable of providing objective responses to the survey items, as well as practical experience that contributes to accurate and objective responses.

Table (2) Results of Frequency Distributions and Percentages of Demographic Variables for the Sample.

Variables	Categories	Frequencies	Percentages
Gender	Male	66	%66
	Female	34	%34
Age	Less than 25	11	%11
	From 25 to less than 35	9	%9
	From 35 to less than 45	56	%56
	From 45 to less than 55	24	%24
	From 55 years and above	-	-
Educational qualification	Secondary school and below	2	%2
	Diploma	9	%9
	Bachelor's	65	%65
	Postgraduate studies	24	%24
Specialization	Administrative	31	%31
	Technical	66	%66
	Medical	3	%3
Years of experience	Less than 5 years	12	%12
	From 5 to less than 10 years	25	%25
	From 10 to less than 15 years	33	%33
	From 15 years and above	30	%30

Source: The table was prepared by the researcher based on SPSS analysis results.

Third: Results of Hypothesis Testing:

Before testing the study hypotheses, it is essential to examine the nature, strength, and direction of the relationships between the dimensions of the study variables, as this is a prerequisite for regression analysis. The details are shown in the following table:

Table (3): Correlation Matrix Between Dimensions of Study Variables.

Dimensions	Administrative Requirements	Physical Requirements	Software Requirements	Human Requirements	Top Management Support and Commitment	Continuous Improvement	Training and Developing employees
Administrative Requirements	**1**						
Physical Requirements	****0,509**	**1**					
Software Requirements	****0,371**	****0,695**	**1**				
Human Requirements	****0,614**	****0,541**	****0,469**	**1**			
Top Management Support and Commitment	****0,680**	****0,827**	****0,747**	****0,704**	**1**		
Continuous Improvement	****0,648**	****0,775**	****0,675**	****0,676**	****0,912**	**1**	
Training and Developing employees	****0,593**	****0,721**	****0,726**	****0,642**	****0,869**	****0,922**	**1**

** stands for ‘significant at 0,01’

Source: The table was prepared by the researcher based on SPSS analysis results.

Table 3 demonstrates a statistically significant correlation between the dimensions of management information systems and total quality management. The correlation coefficients ranged from 0.593, the lowest value found between administrative requirements (a dimension of management information systems) and employee training and development (a dimension of total quality management), to 0.827, the highest value observed between physical requirements (a dimension of management information systems) and top management support and commitment (a dimension of total quality management).

Main Hypothesis: There is a statistically significant effect of management information systems on Total Quality Management. This hypothesis was tested through the following sub-hypotheses:

Sub-Hypothesis 1: There is a statistically significant effect of management information systems on top management support in TQM. The regression analysis results for this hypothesis are shown in the following table:

Table (4) Results of Regression Analysis on the Impact of Management Information Systems on Top Management Support in TQM.

Independent Variable Dimensions	**Dependent variable**	**(ß) Beta**	**(T)**	**(Sig)**
Administrative Requirements	Support and commitment of senior management	**0,248	4,753	(0,000)
Physical Requirements		**0,388	6,416	(0,000)
Software Requirements		**0,288	5,149	(0,000)
Human Requirements		**0,206	3,814	(0,000)
R^2= (0,850)	Adj. R^2 = (0,844)	F (Sig.) = 134,830 (0,000)		

** Significant at the 0.01 level * Significant at the 0.05 level

Source: The table was prepared by the researcher based on SPSS analysis results.

Table (4) shows the following:

1. Significance of the Regression Model: The F-value is 134.830, which is significant at the 0.01 level.

2- The significance of the impact of all dimensions of management information systems is highlighted by the following values: Physical requirements have *T* value of 6.416, software requirements have *T* value of 5.149, administrative requirements have *T* value of 4.753, and human requirements have *T* value of 3.814. Entirely, these are significant at the 0.01 level. This indicates a positive and significant impact of each dimension of management information systems on top management support and commitment, a dimension of total quality management. In terms of impact strength, the dimensions are ranked as follows: Physical requirements with a β value of 0.388, followed by software requirements with β =0.288, then administrative requirements with β =0.248, and finally human requirements with a β value of 0.206.

3. Adjusted R^2: The adjusted R^2 value is 0.844, indicating that the dimensions of management information systems explain 84.4% of the variance in top management support, whereas the

remaining percentage is due to other variables not included in the model. Thus, the hypothesis is supported as there is a statistically significant effect of management information systems on top management support in TQM at a significance level of less than 0.01.

Sub-Hypothesis 2: There is a statistically significant effect of management information systems on continuous improvement in TQM. The regression analysis results for this hypothesis are shown in the following table:

Table (5): Results of Regression Analysis on the Impact of Management Information Systems on Continuous Improvement in TQM.

Independent Variable Dimensions	**Dependent variable**	**Beta (ß)**	**(T)**	**(Sig)**
Administrative Requirements	Continuous improvement	**0,234	4,449	(0,001)
Physical Requirements		**0,386	4,910	(0,000)
Software Requirements		**0,215	2,961	(0,004)
Human Requirements		**0,222	3,154	(0,002)
R^2= (0,747) **Adj. R^2** = (0,736) **F (Sig.) =** 70,026 **(0,000)**				

** Significant at the 0.01 level * Significant at the 0.05 level

Source: The table was prepared by the researcher based on SPSS analysis results.

Table (5) shows the following:

1. The Regression Model is significant: The F-value is 70.026, which is significant at the 0.01 level.
2. The significance of the impact of all dimensions of management information systems is shown by the following values: Physical requirements have *T* value of 4.910, administrative requirements have *T* value of 4.449, human requirements have *T* value of 3.154, and software requirements have *T* value of 2.961, where all significant at the 0.01 level. This indicates a positive and significant impact of each dimension of management information systems on continuous improvement, a dimension of total quality management. In terms of impact strength, the dimensions are ranked as follows: Physical requirements with a β value of 0.386, followed by administrative requirements have β= 0.234, then human requirements with β = 0.222, and finally software requirements with a β value of 0.215.
3. Adjusted R^2: The adjusted R^2 value is 0.736, indicating that the dimensions of management information systems explain 73.6% of the variance in continuous improvement, while the remaining percentage is due to other variables not included in the model. Thus, the hypothesis is supported as there is a statistically significant effect of management information systems on continuous improvement in TQM at a significance level of less than 0.01.

Sub-Hypothesis 3: There is a statistically significant effect of management information systems on employee training and development in TQM. The regression analysis results for this hypothesis are shown in the following table:

Table (6): Results of Regression Analysis on the Impact of Management Information Systems on Employee Training and Development in TQM.

Independent Variable Dimensions	Dependent variable	(ß) Beta	(T)	(Sig)
Administrative Requirements	Training and developing the employees	**0,200	2,729	(0,008)
Physical Requirements		**0,235	2,774	(0,007)
Software Requirements		**0,390	4,970	(0,000)
Human Requirements		**0,209	2,754	(0,007)
R^2= (0,705) **Adj. R^2** = (0,693) **F (Sig.) =** 56,882 **(0,000)**				

Significant at the 0.01 level * Significant at the 0.05 level

Source: The table was prepared by the researcher based on SPSS analysis results.

It is evident from Table (6) that:

1) The regression model is significant, and the F-value is 56.882, which is significant at the 0.01 level.

The significance of the effect of all dimensions of management information systems is demonstrated by the following values: Software requirements have *T* value of 4.970, physical requirements have *T* value of 2.774, human requirements have *T* value of 2.754, and administrative requirements have *T* value of 2.729, all significant at the 0.01 level. This indicates a positive and significant impact of each dimension of management information systems on training and development of employees, a dimension of total quality management. In terms of impact strength, the dimensions are ranked as follows: Software requirements with a β value of 0.390, followed by physical requirements with β=0.235, then human requirements with β=0.209, and finally administrative requirements with a β value of 0.200.

3) The adjusted R^2 value is (0.693), which means that the dimensions of management information systems explain 69.3% of the variance in the level of employee training and development, with the remaining percentage attributable to other variables not included in the model. Thus, the hypothesis is supported, showing a statistically significant effect of management information systems on employee training and development, one of the dimensions of Total Quality Management, at a significance level less than 0.01.

Conclusions:

1. Management Information Systems contribute significantly to achieving Total Quality Management with increased effectiveness and efficiency.
2. Management Information Systems provide the necessary, accurate, and timely information and data, analyze and classify them to support high-level management decisions, assess performance, detect problems and obstacles early, and address them promptly.
3. Management Information Systems enhance the role of control by tracking inventory, raw materials, and production processes, and offer insights derived from available data and

information, which contributes to raising the level of development and continuous improvement.

4. Management Information Systems provide necessary data about employee performance, helping to identify training and development needs, which positively impacts total quality.

Recommendations:

1. It is recommended that the hardware, equipment, and infrastructure of Management Information Systems (MIS) should be developed and improved to ensure their efficient and accurate operation, and to ensure the security of important information and data.
2. It is also recommended to provide training and development programs for employees to increase and enhance their skills, which will contribute to using Management Information Systems effectively and efficiently.
3. Activate the role of Management Information Systems in real-time monitoring of production quality, detecting issues, and addressing them, and use the available information and data to support continuous development and improvement.
4. Strengthen the application of Total Quality Management in the laboratory and promote a culture of quality among all employees.
5. Establish a continuous and effective system for measuring customer satisfaction, and use their feedback to improve the quality of products and services, thereby increasing competitiveness in the market.

References

1. Abdel-Razek, M. H., El-Sayed, I., & Ayad, A. (2022). A proposed model for implementing Total Quality Management in the tourism sector. Journal of Association of Arab Universities for Tourism and Hospitality, 23(2), 33-45.
2. Abdul-Mohsen, T. M. (2005). Total Quality Management and Six Sigma. Dar Al-Fikr Al-Arabi, Cairo.
3. Al-Ani, M. G. I. (2021). The impact of Total Quality Management on administrative development. International Academic Journal of Economics and Administrative Sciences, 3(1), 37-53.
4. Al-Bayati, H. A., & Abdel-Razek, M. H. (1992). Introduction to Management Information Systems. Mosul: Dar Al-Kutub for Printing and Publishing, University of Mosul, Iraq, p. 49.
5. Al-Haddad, A. I. (2009). Total Quality Management (1st ed.). Dar Al-Fikr Publishers and Distributors, Amman, Jordan.
6. Al-Neel, H, A. M. (2019). Management Information Systems. Shendi University, Faculty of Economics, Commerce, and Business Administration, 1st ed.
7. Al-Oly, A. (2008). Applications in Total Quality Management (1st ed.). Dar Al-Maysara for Printing and Publishing, Amman, Jordan.
8. Al-Sakarneh, B. K. (2009). Organizational and managerial development (1st ed.). Dar Al-Maseerah for Publishing and Distribution, Amman, Jordan.
9. Al-Sayarfi, M. (2004). Management Information Systems. Dar Al-Thaqafa for Publishing and Distribution.

10. Al-Taha, A. H. M. (2017). The impact of information systems on enhancing lean production in industrial companies (Master's thesis, College of Business, University of Amman).
11. Al-Tamimi, F., & Al-Khatib, A. (2008). Total Quality Management. Modern World Publishing, Amman, Jordan, pp. 31-32.
12. Boukhemis, L. (2011). Total Quality Management: ISO 9000. Dar Al-Raya for Publishing and Distribution, Algeria.
13. Dudin, A. Y. (2014). Total Quality Management. Academicians Publishing and Distribution, Amman, 1st ed.
14. Hamouda, & Al-Mokhtar, A. (2021). The role of Management Information Systems in strategic decision-making (Doctoral dissertation, University of Al-Zawiya).
15. Howida, A, A. (2012). Management Information Systems: Theory and application (1st ed.). Khartoum: Dar Al-Janane Publishing and Distribution.
16. Hussein, Y. A. (2022). The role of job satisfaction in enhancing the quality of job performance: An applied study in Iraqi universities. Journal of World Economics and Finance, 9, 138-146.
17. Hussein, Y. A., & Kamoun, R. (2024). Talent management and job engagement: The mediating effect of transformational leadership: An analysis of the perspectives of faculty members at Tikrit University. International Journal of E-Business and E-Government Studies, 16(1), 1-25.
18. Idris, A., Masoud, M. S., & Al-Hamali, S. (2022). The role of Management Information Systems in the quality of administrative decisions.
19. Iman, B. (2021). Management Information Systems and their impact on strategic decision-making (Doctoral dissertation, University of M'sila).
20. Radwan, M. A. (2012). Total Quality Management. Arab Group for Training, Cairo, 1st ed.
21. Rahman, W., & Afaf. (2018). The contribution of Management Information Systems to decision-making among employees (Unpublished master's thesis). University of 8 May.
22. Sharqi, K. (2016). Total Quality Management in improving the performance of higher education institutions (Doctoral dissertation, Mohamed Khider University of Biskra, Department of Economic Sciences).
23. Sulaiman, F. A., & Khdeir, H. J. (2012). Challenges in implementing Total Quality Management: A field study at the University of Babylon. Journal of Human Sciences, 1(12).
24. Thawabthah, M. M. H. (2016). The impact of implementing Total Quality Management strategy on Human Resource Management practices: A study of commercial banks in the West Bank (Master's thesis, Middle East University, Amman, Jordan).