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Evaluating of Improvement Level in Some of Diyala Governorate Departments according to the Eighth Requirement of Standard (ISO10006:2017)

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Abstract :

The research seeks to evaluate the reality of the level of improvement in a number of the Diyala governorate departments and to identify the gap between the actual reality of these departments and one of the requirements of the standard (ISO10006: 2017) through a case study of these departments, which are two departments (Engineering Construction and Buildings) which use tight checklists that are prepared according to the eighth requirement in the specification for improvement. The data are analyzed based on the seven-point Likert scale and statistical equations. The main result of this research at the engineering construction department is that the project management adopted documenting and analyzing the deviations depending on the importance of these deviations, where some minor deviations are dealt with simultaneously without documenting them. The main results at the department of buildings is the lack of a sufficient and integrated system for documentation that can be used by the project management, where the department did not specify the system that can be followed in projects and what are the procedures for storage, preservation and distribution, and the department did not develop a mechanism for improvement that can be followed to identify problems and treat them in order not to occur in the future.

Paper type : Research paper

Keywords: ISO 10006:2017 , Quality Management, Improvement

1.Introduction:

Conducting improvement in organizations of all kinds is vital to ensuring the quality of services and products that organizations provide to customers and beneficiaries, which leads to competitive advantages and increased beneficiary satisfaction. The standard (ISO10006: 2017) is an important tool for measuring the availability of improvement in organizations, as it helps to identify areas that need improvement and development and defines the standards necessary to achieve this, and it also includes a requirement for improvement. Therefore, this standard (ISO10006: 2017) helps measure the availability of these processes in organizations and indicates their efficiency by identifying the gaps in effective practices and processes necessary to achieve improvement. In project management in Diyala Governorate, the Department of Engineering Construction and the Department of Buildings to identify its strengths and weaknesses and to know the problems that hinder the possibility of applying the standard (ISO 10006: 2017), as well as urging top management to research and develop permanently, and attention to quality as a major success factor for projects that It implements and disseminates theoretical concepts and foundations of knowledge in the field of project quality management by highlighting the intellectual efforts of researchers and authors in this field. The importance of the research is evident in the selection of a sample that was not researched using the standard specification (ISO 10006: 2017) it is the first study dealing with this standard in Diyala Governorate, as far as the researcher knows.

There are previous studies within the field of study relied on by the researcher, as follows:

Piqueras and Armiñana (2014) focused on how standard (10006) can be applied through project management, what are the advantages and requirements of this standard and what are the roles of officials in it, this study provided a critical analysis of the use of standard (10006) in construction projects, where the study discussed a series of special circumstances: temporary and mobile work centres, heterogeneous final product, factors of physical adaptation of the production process, little manufacturing. The study found that under these conditions, the application of standards (ISO10006 and up to the 9000 family) will create greater complexity than the traditional industrial process, which is more adaptable to the process of change. Hasan (2015) diagnosed the gap between the standard requirements of the international standard (ISO10006: 2003) and the reality of the project quality management system in Al-Mansour General Contracting Company / university buildings project using a checklist prepared by the researcher based on the paragraphs of the international standard. The results of the checklist analysis confirmed that there is a gap of 37% in achieving the standard requirements for project quality. Molina-azorín et al. (2015) analysed the relationship between quality, environmental management and competitive advantage and analysed the data using partial least squares path modelling. The results of the study were that quality management and environmental management allow to improve the competitive advantage in terms of costs and differentiation. Al-Turfi (2017) examined organizational structures and processes and analysed of the main issues and causal relationships in the management of regional development projects in the holy province of Karbala. The study used questionnaires and personal interviews to reach its goals and concluded that political changes, unqualified project managers, organizational changes, inappropriate organizational structures, lack of government legislation, poor motivation and encouragement, and slow decision-making, all factors that negatively affect projects. Qutb et al. (2018) dealt with the impact of the application of quality management systems on improvement through the use of questionnaires and interviews to reach the actual reality of the sample surveyed the study found that there is a weakness in the concepts of quality for projects in the arab region and there is a need for support to reach a high level of quality. Jumaa and Khaleel (2022) diagnosed the level of application of the quality management system in projects using guidelines (ISO 10006:2017), by determining the gap between the actual reality and the project processes using the seventh requirement of this standard based on the case study method for the

research sample, which is the Sumo residential complex project. Data and information were collected through a checklist that included seven axes, as well as the research relied on a set of statistical methods. Through the results of the research, it was found that the level of application of the seventh requirement of the standard (ISO 10006:2017) in the research sample amounted to 94%, and the size of the gap of 6% was distributed on procurement operations and operations related to risks and time. Al aziza (2022) pointed to measure the level of availability of project quality management items the international standard 2017: 10006 through the use of a standard measurement tool (checklist) and this study concluded that there is a weakness in the availability of the standard items and the need for training courses to raise the level and efficiency of workers. Potkany et al. (2022) clarified the interrelation between the practical use of quality management systems to performance. The method of stratified sample selection was applied to the industrial structure where the sample representation was evaluated by chi-square good-of-fit test. Pearson's chi-square test, interval estimates of ratios, and contingency analysis were implemented to test the mentioned research hypotheses. The study found the existence of important relationships between the capital structure, the volume of use of QMPs and the performance measured by the return on sales. Al-Obaidi et al. (2022) identified the role of technological capabilities (technical, administrative and organizational skills) in the possibility of applying the international standard ISO 10006 in an Iraqi service company to create an advanced service environment leading to the production of services that meet the customer's needs in terms of quality and cost on the one hand and achieving a competitive advantage on the one hand. On the other hand, the study adopted the descriptive analytical approach, and used the questionnaire form as a main tool in collecting data and information. The study found that there is a correlation between the technological capabilities and the requirements of Standard 10006.

The research problem is evident in the departments' need to apply the principle of improvement. The departments that specialize in project management, including the research sample in particular, need to apply modern specifications whose contents contain procedures that enable the departments to analyze problems, treat them and prevent their recurrence by drawing lessons to benefit from them in future projects. Therefore, the departments concerned with implementing or supervising projects must know the standard specifications, including (ISO 10006) to apply them ensure quality in their projects and reduce waste of time, effort, and cost through analyzing problems, addressing them, and using the results in continuous improvement. The research problem is summarized through the following questions:
It is the knowledge of the actual reality of the processes related to improvement in those departments.

The extent of the gaps that exist between the actual reality in these sections and the requirements of the processes related to improvement in the standard (ISO 10006:2017).

How can these sections address problems and improve the reality of providing specification requirement?

The research objectives are to diagnose the gaps between the actual reality of these departments and one of the requirements of the standard (ISO 10006: 2017) and identify the problems that hinder the application of one of the requirements of the standard (ISO 10006: 2017) and come up with conclusions according to what has been researched and studied in the actual reality of those sections.

2. Material and Methods:

2.1 The research method:

The research was based on the case study approach of relying on checklists, personal interviews and actual living for recording observations, in addition to the information available to the researcher about the research sample (Department of engineering construction and the Department of buildings).

2.1.1 The search tools :

In the theoretical aspect, the researcher relied on the sources and contributions represented by references and literature (books, scientific treatises, periodicals) that are interested in the field of research . In the practical aspect, this research was based on the case study method to identify the actual reality in the departments under consideration to know aspects of their activities and how to carry out their duties, relying on :

- 1) Interviews: The researcher conducted interviews with managers and officials in those departments to find out the actual reality of them
- 2) Field presence in the researched departments
- 3) Access to documents and records
- 4) Checklists prepared by the researcher under the standard (10006) after reviewing previous sources such as. (Al aziza, 2022) and (Hasan, 2015) and the study used after field review of the research sample and based on the source (al-Najjar and Jawad, 2017) a scale for the study as shown in Table (1), where the study believes that it is appropriate to the reality of the sample and reflects the results of the data of the field researched better.

Table 1: Research Scale

| No. | Scale paragraph | Scale paragraph weight (degree) |
|-----|----------------------------------------------|---------------------------------|
| 1 | Fully available and fully documented | 6 |
| 2 | Fully available and partially documented | 5 |
| 3 | Fully available and undocumented | 4 |
| 4 | Partially available and fully documented | 3 |
| 5 | Partially available and partially documented | 2 |
| 6 | Partially available and undocumented | 1 |
| 7 | Unavailable and undocumented | 0 |

Source: Prepared by the researcher

The researcher has relied on the following tools to calculate the data, calculate the gaps and the level of availability of the requirements of the standard: (al-Najjar and Jawad, 2017)

- The equation below was used to determine the approximate extent of availability of the requirements of the specification and document them.

$$\text{Weighted arithmetic mean} = \frac{\sum(\text{repetitions} \times \text{weight})}{\sum(\text{repetitions})} \quad (1)$$

- The percentage of conformity between the actual reality and the full availability of the requirements of the specification was calculated according to the following equation
congruence percentage= (weighted mean ÷ highest score on the scale) x 100% (2)

- The size of the gap between the full availability of the requirements of the specification and the actual reality was calculated by the following equation:

$$\text{Gap size} = 1 - \text{congruence percentage} \quad (3)$$

2.2 Quality Management:

Organizations recognize the importance of quality management and have entire departments dedicated to it. They have detailed processes in place to ensure that their products and services comply with different quality requirements. They also know that they must offer those products and services at competitive prices. To succeed in today's competitive business environment, good companies develop their own best practices and evaluate the best practices of other organizations in order to continuously improve the way they conduct their business (Schwalbe, 2019). Quality management practices refer to activities that are critical to the company and that are expected to lead, directly or indirectly, to quality improvement, competitive performance, productivity and profitability as 'a systematic way to ensure that regulated activities occur in the manner planned'. It is a holistic management philosophy that focuses on the continuous improvement of each individual process of the company, through organizational change (Kafetzopoulos et al., 2015). It is a management system that entails the development of a number of practices for managing organizations such as leadership, people management, planning, information and Analysis, Design, Operations Management, Supplier Management, and customer / stakeholder focus. Quality management may not always succeed in achieving its goals, as there are several reasons for the failure of quality management to improve performance, such as : (lack of motivation to apply a real quality culture, or because the company implemented it inefficiently, or due to lack of administrative support). (Molina-azorín et al., 2015). As for quality management in the construction sector, the British Research Institute has developed since 1978 a definition, which is "the total specifications of the building that conform to the requirements, including the way in which these specifications are interrelated so that they are balanced and integrated with all the formal, functional and aesthetic styles of the building and the surrounding environment." The Texas Institute for Construction Industries defined it as Sequential, quality in a simplified form is "conforming to requirements", and requirements are the contracted characteristics of a product, process, or service, and properties are chemical and physical properties such as size, temperature, pressure, dimensions, and any specifications used to determine the nature of the product, process, or service. Despite attempts at theoretical definition For quality in the construction industry to make it an objective (quantitative) issue, quality in practice bears a special aspect because the factors necessary to diagnose it are not bound by a certain way of measurement, including the functional performance factors (Qutb et al., 2018).

2.3 Quality Management System:

The process of quality improvement needs to form an integrated system that ensures the continuity of the organization in its work and integrates the efforts of individuals, machines, as well as information, thus forming a quality management system that aims to increase the effectiveness and efficiency of products so that they are convenient to use and meet the customer's wishes, as well as this system gives that quality is the result of the joint work of the team (Al-Tai et al., 2008). It was mentioned in the standard (ISO 9000: 2005) that the quality management system is an administrative system that allows guidance and control of the organization in the areas of quality (Malouk, 2010). The quality management system is a corporate culture that consists of awareness of quality concepts, and their application by senior management, through actual practices that emphasize the participation of employees in the strategic planning process and focus on internal and external customers and the process of continuous improvement of the performance of the organization and the services it provides, setting appropriate standards for measurement and analysis of, And finding what is required of organized and specialized training according to appropriate standards (Al-Saidiya, 2017). As for the benefits and importance of quality systems, quality management leads to tangible benefits such as reducing non-quality-related costs, value-added activities and operations, in addition to intangible benefits such as increasing customer satisfaction, maximizing workforce motivation and improving environmental impact. (Bounabri et al., 2018) . Quality management processes

and practices help to produce outputs and results that meet the objectives of the project and comply with the expectations, uses and acceptance criteria expressed by the organization and relevant stakeholders. Close attention to quality in project processes and deliveries leads to positive results (Pmbok® Guide, 2021).

2.4 Standard (ISO 10006):

Just as every country has a constitution and laws that one must abide by, each organization needs its own rules of conduct. These rules are best determined by the criteria of ISO, and currently almost all companies offer a quality management system according to these criteria. Modern business is based on project-based business processes, and in order for a project to be successful, it must be achieved by certain rules. In 1997 the International Organization for Standardization published the ISO standard 1997 : ISO10006 entitled 'quality management-guidelines for quality in project management'(Piqueras and Armiñana, 2014), then issued (ISO10006: 2003), and then in November 2017 issued the third version of this series of specifications. The instructions in ISO 10006 are addressed to many users. They are applied in the case of various projects - large or small, simple or complex, individual or being part of a program or group of enterprises. The standard includes two practical aspects of program management: organization operations and organization products. In the introduction, it is stated that the main general management group bears the responsibility of achieving the objectives associated with quality, however, the quality of all processes and products is the responsibility of all individuals according to their position in the organization; generating and maintaining the quality of the process and products requires a systematic approach; the requirements and expectations of the customer and any other parties interested in a particular task must be understood and met; some managed stages in the life cycle of the organization can be distinguished, such as the preparation of assumptions, the enterprise project, and the completion and termination (Macek, 2011).

2.5 Eighth Requirement of(ISO10006:2017) Measurement, analysis and improvement in projects:

The eighth requirement in the ISO 10006: 2017 standard includes several sub-requirements that the researcher will clarify using the literature within this field, which are as follows:

2.5.1 Measurement and Analysis:

Measuring and analyzing and comparing an organization's achievement with what is planned is the basis for evaluating the organization's performance, efficiency and effectiveness (fayyadh, 2018), whose importance is evident by enabling the organization to make the right decisions through the following :(Mahdi and Hassan, 2020)

- 1) Providing accurate and important information to all levels of the Administrative Organization on a regular basis, this information is relied on in the planning, organizational, guidance and control management processes
- 2) Enabling the organization to provide services at high levels of high quality to the beneficiaries by maintaining the practice of its activities efficiently and effectively.
- 3) It helps in the adoption of units of measurement that can be implemented.
- 4) Helps top management adopt realistic and achievable goals that can be easily disseminated among all working individuals.
- 5) It helps to correct, motivate and prevent by making appropriate and timely decisions.
- 6) Contributes to motivating employees to participate in the right team work
- 7) Identify the required training programs for the purpose of achieving efficiency, effectiveness, development and promotion process.

2.5.2 Improvement:

Organizations focus on the wishes and needs of the customer in order to continuously improve and build a relationship with the beneficiaries (Al-Adhami and Alrawi, 2022), where improvement is one of the important pillars that aims to fully master the business in the productive processes of the organization and senior management should understand that improvement is a process that should not stop and opportunities for improvement always exist It should be invested (AbdulRazzaq, 2016).

1) Improvement by the originating organization: Continuous improvement of the overall performance of the organization should be a permanent goal of the organization. The original project organization is responsible for continuous research to improve the effectiveness and efficiency of the processes under its supervision. The continuous improvement course is based on the concept of 'Plan-Do-Check-Act' (PDCA) (Bassi, 2017). Continuous improvement as mentioned (Rose, 2014) includes at least three specific actions, namely:

- Communication is essential: the project team must have effective communication within itself and with customers, suppliers and stakeholders. Communication is a way of identifying problems and opportunities, solving problems and exploiting opportunities.
- Corrective actions are also necessary: fixing problems is necessary, but not enough. Project managers and team members should also identify the causes of any problems and eliminate or minimize them as much as possible. It's good to fix the problem; it's better to prevent it from happening again.
- Identify opportunities and work on them: The planning, testing and verification cycle provides a disciplined approach to continuous improvement based on identified problems or opportunities. The results of continuous improvement may be small gradual steps or big leaps forward.

The improvement has benefits for the organization (as shown in Figure 1) that enable it: (Rose, 2014)

1. Meet dynamic needs and requirements: customer needs are always changing.
2. Maintain competitiveness: competitors are always improving. The world market is not in a stable state ; it is a race, and the race cannot be won by staying still.
3. Reduce costs and increase profits: the global market includes competitors with very low costs, especially in labor. Reducing costs can increase competitiveness, which leads to increased sales and overall profits.
4. Development of new technologies, processes and products : technology is always changing. Optimizing processes to take advantage of new technology or simply to employ a better method can reduce costs, provide a better product, or both.

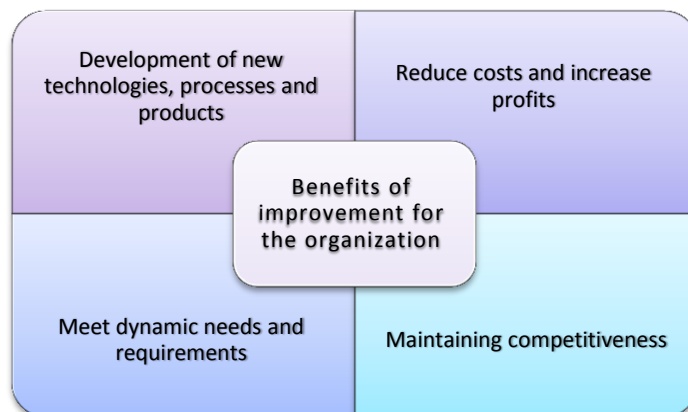


Figure 1: Benefits of improvement for the organization

Source: prepared by the researcher based on (Rose, 2014) project quality management: why, what and how second edition, J. Ross publishing, USA, P28.

Improvement by the project organization: The research and development process that aims to improve the efficiency and effectiveness of operations in the project is the responsibility of the project management, and it must bear in mind that project management is an integrated process and not an isolated task and this is achieved through documentation and analysis of information during the course of the project, improvement means motivating employees and increasing their ability to always strive to make organizational performance better than before, as gradual and innovative improvements in operations, services, goods, low cost, higher quality and increase in market share all come from During improvement, improvement is one of the forms of employee creativity and it includes a recognition of making quality better and working to participate in those tasks that lead to it (Al-Obaidi et al., 2022: 375).

3. Discussion of Results :

Checklists were used, which included questions representing the eighth requirement (measurement, analysis and improvement in projects) of the requirements of the standard (ISO 10006:2017) and the results of the data and their analysis for each department as in the tables below:

3.1 Department of Engineering Construction:

1) Examination of the measurement and analysis requirement (8-2) for the Department of Engineering Construction, and the results were as follows in Table (2):

Table 2: Checklist (Results of respondents' answers about the requirement)

| Main Item (8) Measurement, Analysis and Improvement | | Level of availability and documentation of the items of the standard (ISO10006:2017) for item (8) measurement, analysis and improvement in the project | | | | | | |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------|---------------------|----------------------|--------------|------------------------------|
| NO. | Sub-item 8-2 Measurement and analysis | Fully available | | | Partially available | | | Unavailable and undocumented |
| | | Fully documented | partially documented | undocumented | fully documented | partially documented | undocumented | |
| 1 | The department has the ability to ensure efficient and effective measurement of data in order to improve performance and enhance customer and beneficiary satisfaction | | | • | | | | |
| 2 | The department can apply several methods to measure performance, such as evaluating individual activities and auditing, evaluating the resources used with cost and time compared to the original estimates, evaluating the performance of the external supplier, achieving the project goals, and evaluating the satisfaction of the concerned parties. | | • | | | | | |
| 3 | Documented information on cases of non-conformity can be analyzed, addressed, and learned from for the purpose of continuous improvement by project management | | • | | | | | |
| 4 | The project management can participate with the beneficiary in documenting cases of non-conformity in addition to corrective actions | • | | | | | | |
| | Weights | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | The number of repetitions | 1 | 2 | 1 | 0 | 0 | 0 | 0 |
| | Results | 6 | 10 | 4 | 0 | 0 | 0 | 0 |
| | Weighted arithmetic mean | 5 | | | | | | |
| | congruence percentage | 83.33% | | | | | | |
| | Gap degree | 16.67% | | | | | | |

Source: Prepared by the researcher

Analysis: Table (2) shows the results of item (8.2 measurement and analysis), where the level of availability and documentation of this item according to the weighted arithmetic mean is (5) and a percentage of the extent of congruence of (83.33), which means the quality of a gap by a percentage (16.67) and can be inferred through these results on the strengths and weaknesses, which are as follows:

- strengths: the Department continuously, through committee reports, field visits and meetings, confirms the accuracy of the data and determines it correctly using comparisons with the work progress tables and the required specifications to ensure the development of appropriate treatments and increase the quality of performance and satisfaction of the beneficiary parties and provide the beneficiaries with copies of reports that determine the reality of work in the project Continuously identify and analyze existing deviations and address them to ensure that they do not recur
- Weaknesses: the need for data accuracy is guided orally through meetings and visits to the project site. the department also adopts some metrics to measure performance by calculating completion rates through the work progress table and financial ratios. The documentation process for analysing deviations by the project management committee and taking continuous improvement measures depends on the importance of these deviations. some deviations may not It requires documentation and is processed in any way

2) Examination of the requirement (8.3.1 continuous improvement by the original organization) for the Department of Engineering Construction and the results were as follows in Table No. (3):

Table 3: Checklist (Results of respondents' on the requirement)

| Main Item (8) Measurement, Analysis and Improvement | | Level of availability and documentation of the items of the standard (ISO10006:2017) for item (8) measurement, analysis and improvement in the project | | | | | | |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------|---------------------|----------------------|--------------|------------------------------|
| NO. | Sub-item 8.3.1 Continuous improvement by the original organization | Fully available | | | Partially available | | | Unavailable and undocumented |
| | | fully documented | partially documented | undocumented | fully documented | partially documented | undocumented | |
| 5 | The department can define the information it needs to learn from the project as well as create a system to locate, collect, store, update, and retrieve project information. | • | | | | | | |
| 6 | The department can keep all the risk information for the projects it is completing | • | | | | | | |
| 7 | All relevant information needed to learn from the project, including feedback from the beneficiary parties, can also be obtained. Results of audits, records, reports, and procedures for learning in the project can also be obtained after validation. | • | | | | | | |
| 8 | The department has the ability to participate with the beneficiary in reviewing the performance of the project immediately before its closure, with documenting the results of the review based on the project plan to clarify the experience gained from it. | • | | | | | | |

| | | | | | | | | |
|--|---------------------------|------|---|---|---|---|---|---|
| | Weights | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | The number of repetitions | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Results | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Weighted arithmetic mean | 6 | | | | | | |
| | congruence percentage | 100% | | | | | | |
| | Gap degree | 0% | | | | | | |

Source: Prepared by the researcher

Analysis: Table No. (3) shows the results of item (8.3.1 continuous improvement by the originating organization), showing the level of availability and documentation of this item according to the weighted arithmetic mean is (6) and by a percentage of the extent of conformity, which is (100), which means the quality of a gap by a percentage (0) and through these results can be inferred points Strengths and weaknesses are as follows:

- Strengths: The department archives and saves all information and data related to the project in special files for the purpose of reference when needed, including reports, administrative correspondence, advances and laboratory tests.

- Weaknesses: None

3) Examination of the requirement for (8.3.2 continuous improvement by project management) for the Department of Engineering Construction and the results were as follows in Table No. (4):

Table 4: Checklist (results of the respondents ' duties on the requirement)

| Main Item (8) Measurement, Analysis and Improvement | | Level of availability and documentation of the items of the standard (ISO10006:2017) for item (8) measurement, analysis and improvement in the project | | | | | | |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------|---------------------|----------------------|--------------|------------------------------|
| NO. | Sub-item 8.3.2 Continuous improvement by project management | Fully available | | | Partially available | | | Unavailable and undocumented |
| | | fully documented | partially documented | undocumented | fully documented | partially documented | undocumented | |
| 9 | The project management has the ability to establish an information management system that meets the requirements for learning from the project specified by the department | • | | | | | | |
| 10 | The project management can ensure that the information provided to the department is accurate and complete | • | | | | | | |
| 11 | The project management can make improvements by using the project information by taking advantage of the project information management system that has been established in the department | • | | | | | | |
| | Weights | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | The number of repetitions | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Results | 18 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Weighted arithmetic mean | 6 | | | | | | |
| | congruence percentage | 100% | | | | | | |
| | Gap degree | 0% | | | | | | |

Source: Prepared by the researcher

Analysis: Table (4) shows the results of item (8.3.2 continuous improvement by the project organization), where the level of availability and documentation of this item according to the weighted arithmetic mean is (6) and a percentage of the extent of congruence of (100), which means and the quality of a gap by a percentage (0) and can be inferred through these results on the strengths and weaknesses, which are as follows:

- strengths : the project management committee creates an information management system that enables it to use information easily and conveniently when it is needed, the information is classified and collected according to a system almost similar to the department, and the project management committee authenticates all the information that it sends to the Department
- weaknesses : None

3.2 Buildings Department:

1) Checking the requirement(measurement and analysis (2.8)) for the Department of buildings and the results were as follows in Table (5).

Table 5: Checklist (Results of respondents' answers about the requirement)

| Main Item (8) Measurement, Analysis and Improvement | | Level of availability and documentation of the items of the standard (ISO10006:2017) for item (8) measurement, analysis and improvement in the project | | | | | | |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------|---------------------|----------------------|--------------|------------------------------|
| NO. | Sub-item 8-2 Measurement and analysis | Fully available | | | Partially available | | | Unavailable and undocumented |
| | | fully documented | partially documented | undocumented | fully documented | partially documented | undocumented | |
| 1 | The department has the ability to ensure efficient and effective measurement of data in order to improve performance and enhance customer and beneficiary satisfaction | | | | | | • | |
| 2 | The department can apply several methods to measure performance, such as evaluating individual activities and auditing, evaluating the resources used with cost and time compared to the original estimates, evaluating the performance of the external supplier, achieving the project goals, and evaluating the satisfaction of the concerned parties. | | | | | | • | |
| 3 | Documented information on cases of non-conformity can be analyzed, addressed, and learned from for the purpose of continuous improvement by project management | | | | | | • | |
| 4 | The project management can participate with the beneficiary in documenting cases of non-conformity in addition to corrective actions | | | • | | | | |
| | Weights | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | The number of repetitions | 0 | 0 | 1 | 0 | 0 | 3 | 0 |
| | Results | 0 | 0 | 4 | 0 | 0 | 3 | 0 |
| | Weighted arithmetic mean | 1.75 | | | | | | |
| | congruence percentage | 29.17% | | | | | | |
| | Gap degree | 70.83% | | | | | | |

Source: Prepared by the researcher

Table (5) shows the results of item (8.2 measurement and analysis), which shows the level of availability and documentation of this item according to the weighted arithmetic mean is (1.75) and by a percentage of the extent of conformity is (29.17), which means the quality of a gap by a percentage (70.83) and through these results can be inferred the strengths and weaknesses, which are as follows:

- strengths: the department can provide the beneficiaries with copies of reports that determine the reality of work in the project, and the project management committee can continuously identify and analyze existing deviations and address them to ensure that they do not recur
- weaknesses: the department needs to increase the number of employees and provide all the required technical specialties and mechanisms for measuring data for all project activities through the formation of evaluation committees, which in turn prepare reports and submit proposals for corrective actions

2) Examination of the requirement (8.3.1 Continuous improvement by the establishment organization) for the Buildings Department and the results were as follows in Table (6) :

Table 6: Checklist (Results of respondents' duties on the requirement)

| Main Item (8) Measurement, Analysis and Improvement | | Level of availability and documentation of the items of the standard (ISO10006:2017) for item (8) measurement, analysis and improvement in the project | | | | | | |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------|---------------------|----------------------|--------------|------------------------------|
| NO. | Sub-item 8.3.1 Continuous improvement by the original organization | Fully available | | | Partially available | | | Unavailable and undocumented |
| | | fully documented | partially documented | undocumented | fully documented | partially documented | undocumented | |
| 5 | The department can define the information it needs to learn from the project as well as create a system to locate, collect, store, update, and retrieve project information. | | | | | | • | |
| 6 | The department can keep all the risk information for the projects it is completing | | | • | | | | |
| 7 | All relevant information needed to learn from the project, including feedback from the beneficiary parties, can also be obtained. Results of audits, records, reports, and procedures for learning in the project can also be obtained after validation. | | | | | | • | |
| 8 | The department has the ability to participate with the beneficiary in reviewing the performance of the project immediately before its closure, with documenting the results of the review based on the project plan to clarify the experience gained from it. | | | • | | | | |
| | Weights | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | The number of repetitions | 0 | 0 | 2 | 0 | 0 | 2 | 0 |
| | Results | 0 | 0 | 8 | 0 | 0 | 2 | 0 |
| | Weighted arithmetic mean | 2.5 | | | | | | |
| | congruence percentage | 41.67% | | | | | | |
| | Gap degree | 59.33% | | | | | | |

Source: Prepared by the researcher

Table (6) shows the results of item (8.3.1 continuous improvement by the originating organization), showing the level of availability and documentation of this item according to the weighted arithmetic mean is (2.5) and by a percentage of the extent of conformity, which is (41.67), which means the quality of the gap by a percentage (59.33), and through these results can be inferred the strengths and weaknesses They are as follows:

- strengths: the department can archive and save all information and data related to the project in special measures for reference when needed, including reports, administrative communications, advances and laboratory tests, all project activities are reviewed with the participation of the concerned authorities before closing and fixing the notes in the initial receipt reports
- weaknesses: the department needs to emphasize the learning culture by identifying weaknesses in the work and addressing them through procedures and developing the employees ' self-and technical capabilities for the purpose of benefiting from them later

3) Checking the requirement (8.3.2 continuous improvement by the project management) for the Department of buildings and the results were as follows in Table (7) :

Table 7: Checklist (Results of Respondents' Duties on the Requirement)

| Main Item (8) Measurement, Analysis and Improvement | | Level of availability and documentation of the items of the standard (ISO10006:2017) for item (8) measurement, analysis and improvement in the project | | | | | | |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------|---------------------|----------------------|--------------|------------------------------|
| NO. | Sub-item 8.3.2 Continuous improvement by project management | Fully available | | | Partially available | | | Unavailable and undocumented |
| | | fully documented | partially documented | undocumented | fully documented | partially documented | undocumented | |
| 9 | The project management has the ability to establish an information management system that meets the requirements for learning from the project specified by the department | | | | | • | | |
| 10 | The project management can ensure that the information provided to the department is accurate and complete | | | | | | | • |
| 11 | The project management can make improvements by using the project information by taking advantage of the project information management system that has been established in the department | | | | | | | • |
| | Weights | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | The number of repetitions | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| | Results | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| | Weighted arithmetic mean | 0.76 | | | | | | |
| | congruence percentage | 11.11% | | | | | | |
| | Gap degree | 88.89% | | | | | | |

Source: Prepared by the researcher

Table (7) of the results of item (8.3.1 continuous improvement by the originating organization) shows the level of availability and documentation of this item according to the weighted arithmetic mean is (0.76) and by a percentage of the extent of conformity is (11.11), which means there is a gap by a percentage (88.89) and through these results can be inferred the strengths and weaknesses They are as follows:

- strengths : there are no
- weaknesses: the department does not have an adequate and integrated documentation system that can be used by the project management .the department has not specified the system that can be followed in projects and what are the storage, preservation and distribution procedures. the department has not developed a mechanism for improvement in order to use it in the project.

From the above results , the current study is consistent with previous studies (Hassan, 2015; Al aziz, 2022; Jumaa and Khaleel, 2022) in the existence of gaps in the application of Standard 10006 for governmental organizations, and these results support the results of the study (Qutb et al., 2018) that the concepts of quality in the Arab region need support to reach high levels.

4. Conclusion:

The research found, through the data that appeared in the checklists, in addition to the information that was available through field coexistence, the need for the departments to create a system for evaluating and motivating employees and determining the extent of their need for development courses to address weaknesses and enhance their strengths within their specializations and familiarize them with modern means of work to choose the best And the most appropriate of them to work in projects and use the results of this assessment in the process of continuous improvement. The results also showed that the commitment of the Engineering Construction Department to improvement according to the eighth requirement of the standard (ISO 10006:2017) is high-level, except in the case of documenting deviations and analyzing them according to the continuous improvement procedures by the Project Management Committee, as it depends on the importance of these deviations, as some minor deviations are dealt with immediately without being documented. As for the Buildings Department, the results showed its need to increase the number of workers in all required technical disciplines who have experience and knowledge of modern work methods and data measurement mechanisms for all project activities to form evaluation committees that prepare reports and submit proposals for corrective measures. The results showed Also, the Department of Buildings does not have an adequate and integrated system for documentation that explains the procedures followed in the storage, preservation and distribution operations, and it can be used by the project management. The department did not develop a mechanism for improvement that can be followed to identify problems and treat them in order not to occur in the future.

Authors Declaration:

Conflicts of Interest: None

-We Hereby Confirm That All The Figures and Tables In The Manuscript Are Mine and Ours. Besides, The Figures and Images, Which are Not Mine, Have Been Permitted Republication and Attached to The Manuscript.

- Ethical Clearance: The Research Was Approved By The Local Ethical Committee in The University.

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تقييم مستوى التحسين لبعض دوائر محافظة ديالى وفقا للمتطلب الثامن في المواصفة
(ISO10006:2017)

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هذا العمل مرخص تحت اتفاقية المشاع الابداعي نُسب المُصنّف - غير تجاري - الترخيص العمومي الدولي 4.0
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مستخلص البحث:

يسعى البحث الى تقييم واقع مستوى التحسين في عينة من دوائر محافظة ديالى وتحديد الفجوة بين الواقع الفعلي لهذه الدوائر واحد متطلبات المواصفة (ISO10006:2017) من خلال دراسة حالة لهذه الدوائر وهما دائرتي (الاعمار الهندسي , المباني) باستخدام قوائم الفحص المحكمة التي جرى اعدادها وفقا للمتطلب الثامن في المواصفة والخاص بالتحسين. تم تحليل البيانات بالاعتماد على مقياس ليكرت السباعي والمعادلات الاحصائية. توصلت الدراسة الى نتائج اهمها كانت بالنسبة لدائرة الاعمار الهندسي ان ادارة المشروع تعتمد في توثيق الانحرافات وتحليلها على اهمية هذه الانحرافات فبعض الانحرافات البسيطة يتم معالجتها انيا دون توثيقها. اما بالنسبة لدائرة المباني فهو عدم امتلاكها نظاما كافيا ومتكاملا للتوثيق يمكن ان يستخدم من قبل ادارة المشروع حيث لم تحدد الدائرة النظام الذي يمكن اتباعه في المشاريع وما هي اجراءات الخزن والحفظ والتوزيع ولم تضع الدائرة الية للتحسين يمكن اتباعها لتحديد المشاكل ومعالجتها من اجل عدم حدوثها مستقبلا.

نوع البحث: ورقة بحثية

المصطلحات الرئيسية للبحث : المواصفة (ISO10006:2017), ادارة المشاريع , التحسين.

*البحث مستل من رسالة ماجستير