JPB REVIEW
INTERNATIONAL JOURNAL OF PROFESSIONAL BUSINESS REVIEW
ISSN: 2525-3654
OPEN ACCESS

CRITICAL SUCCESS FACTORS FOR QUALITY IMPROVEMENT PROJECTS IN PASURUAN, EAST JAVA, INDONESIA

Wiwik Sulistiyowati[A], Mokh. Suef[B], Moses Laksono Singgih[C]

ARTICLE INFO

Article history:

Received 18 August 2023

Accepted 22 November 2023

Keywords:

Critical Success Factors;
Importance-performance Analysis;
Quality;
Quality Improvement Project.

ABSTRACT

Purpose: This study aims to determine the factors influencing the successful implementation of quality improvement projects.

Theoretical framework: This research will focus on finding critical success factors for quality improvement projects and prioritizing improvements to improve the performance and success of quality improvement project implementation.

Design, Methodology and Approach: The research used Smart PLS-SEM and Importance Performance Analysis (IPA). Smart PLS-SEM was first used to determine critical success factors for Quality Improvement Projects (QIPs). Furthermore, IPA was used to determine the position of each factor based on its importance and achievements**.**

Findings: The result showed all dimensions and indicators significantly affect the success of quality improvement projects. The dimension with the highest outer loading value is the quality performance measurement dimension. The next step is measured using the IPA method to determine the critical factors for project success. The results of the IPA analysis show that quality control and leadership are crucial factors in the success of quality improvement projects in the second quadrant. At the same time, the factor that prioritizes improvement is quality assurance (first quadrant).

Research, Practical & Social implications: Research, Practical, and Social Implications: The research implies that quality control and leadership are critical success factors for quality improvement projects. Leadership plays an essential role in implementing quality improvement projects, and leadership commitment is an important key to the success of these projects. In addition, there is a requirement for support from leadership regarding resource allocation. This resource allocation includes labor, costs, information systems, machines, and tools. Another factor that is critical to the success of these projects is quality control. Implementation of quality control has a vital role during the quality improvement project process and after the project. With quality control, the product suits the specifications and standards and meets the targets and standards set. Products that track the results of the implementation of quality control can ensure that the product's quality is guaranteed and follows the target set.

Originality/Value: This research combines two methods to determine the critical success factors in implementing quality improvement projects. Previous research, using SEM-PLS and IPA method measurements, was carried out separately, measuring the importance and performance levels. In this study, the outer loading

[A] *Master of Engineering in Industrial Engineering from Institut Teknologi Sepuluh Nopember, Department of Industrial and Systems Engineering, Institut Teknologi Sepuluh Nopember, Surabaya, East Java, Indonesia. E-mail:* wiwik@umsida.ac.id *Orcid:* https://orcid.org/0000-0001-7325-2215
[B] *Professor of Industrial Engineering in Quality Engineering and Management, Department of Industrial and Systems Engineering, Institut Teknologi Sepuluh Nopember, Surabaya, East Java, Indonesia. E-mail:* m_suef@ie.its.ac.id *Orcid:*https://orcid.org/0000-0002-5165-2194
[C]*Professor of Productivity and Quality in Smart Manufacturing Systems, Department of Industrial and Systems Engineering, Institut Teknologi Sepuluh Nopember, Surabaya, East Java, Indonesia. E-mail:* moseslsinggih@ie.its.ac.id *Orcid:* https://orcid.org/0000-0002-6200-6411

results in the original sample measurement with SEM-PLS for importance value in the IPA method.

Doi: https://doi.org/10.26668/businessreview/2023.v8i12.3993

FATORES CRÍTICOS DE SUCESSO PARA PROJETOS DE MELHORIA DA QUALIDADE EM PASURUAN, JAVA ORIENTAL, INDONÉSIA

RESUMO

Objetivo: Este estudo visa determinar os fatores que influenciam o sucesso da implementação de projetos de melhoria da qualidade.
Enquadramento teórico: Esta investigação centrar-se-á na descoberta de factores críticos de sucesso para projectos de melhoria da qualidade e na priorização de melhorias para melhorar o desempenho e o sucesso da implementação de projectos de melhoria da qualidade.
Design, metodologia e abordagem: A pesquisa utilizou Smart PLS-SEM e Importance Performance Analysis (IPA). O Smart PLS-SEM foi usado pela primeira vez para determinar fatores críticos de sucesso para Projetos de Melhoria da Qualidade (QIPs). Além disso, o IPA foi utilizado para determinar a posição de cada fator com base na sua importância e realizações.
Resultados: O resultado mostrou que todas as dimensões e indicadores afetam significativamente o sucesso dos projetos de melhoria da qualidade. A dimensão com o maior valor de carga externa é a dimensão de medição de desempenho de qualidade. A próxima etapa é medida usando o método IPA para determinar os fatores críticos para o sucesso do projeto. Os resultados da análise do IPA mostram que o controlo de qualidade e a liderança são factores cruciais para o sucesso dos projectos de melhoria da qualidade no segundo quadrante. Ao mesmo tempo, o fator que prioriza a melhoria é a garantia de qualidade (primeiro quadrante).
Implicações de pesquisa, práticas e sociais: Implicações de pesquisa, práticas e sociais: A pesquisa implica que o controle de qualidade e a liderança são fatores críticos de sucesso para projetos de melhoria de qualidade. A liderança desempenha um papel essencial na implementação de projetos de melhoria da qualidade e o compromisso da liderança é uma chave importante para o sucesso desses projetos. Além disso, existe a necessidade de apoio da liderança no que diz respeito à alocação de recursos. Esta alocação de recursos inclui mão de obra, custos, sistemas de informação, máquinas e ferramentas. Outro fator crítico para o sucesso desses projetos é o controle de qualidade. A implementação do controle de qualidade tem um papel vital durante o processo do projeto de melhoria da qualidade e após o projeto. Com controle de qualidade, o produto atende às especificações e padrões e atende às metas e padrões estabelecidos. Produtos que acompanham os resultados da implementação do controle de qualidade podem garantir que a qualidade do produto seja garantida e siga a meta estabelecida.
Originalidade/valor: Esta pesquisa combina dois métodos para determinar os fatores críticos de sucesso na implementação de projetos de melhoria da qualidade. Pesquisas anteriores, utilizando medições dos métodos SEM-PLS e IPA, foram realizadas separadamente, medindo a importância e os níveis de desempenho. Neste estudo, a carga externa resulta na medição da amostra original com SEM-PLS para valor de importância no método IPA.

Palavras-chave: Fatores Críticos de Sucesso, Análise Importância-Desempenho, Qualidade, Projeto de Melhoria da Qualidade.

FACTORES CRÍTICOS DE ÉXITO PARA PROYECTOS DE MEJORA DE LA CALIDAD EN PASURUAN, JAVA ORIENTAL, INDONESIA

RESUMEN

Propósito: Este estudio tiene como objetivo determinar los factores que influyen en la implementación exitosa de proyectos de mejora de la calidad.
Marco teórico: Esta investigación se centrará en encontrar factores críticos de éxito para proyectos de mejora de la calidad y priorizar mejoras para mejorar el rendimiento y el éxito de la implementación de proyectos de mejora de la calidad.
Diseño, metodología y enfoque: La investigación utilizó Smart PLS-SEM y Análisis de Rendimiento de Importancia (IPA). Smart PLS-SEM se utilizó por primera vez para determinar factores críticos de éxito para proyectos de mejora de la calidad (QIP). Además, se utilizó IPA para determinar la posición de cada factor en función de su importancia y logros.
Hallazgos: El resultado mostró que todas las dimensiones e indicadores afectan significativamente el éxito de los proyectos de mejora de la calidad. La dimensión con el valor de carga exterior más alto es la dimensión de medición del desempeño de calidad. El siguiente paso se mide utilizando el método IPA para determinar los factores críticos para el éxito del proyecto. Los resultados del análisis IPA muestran que el control de calidad y el liderazgo son

factores cruciales en el éxito de los proyectos de mejora de la calidad en el segundo cuadrante. Al mismo tiempo, el factor que prioriza la mejora es el aseguramiento de la calidad (primer cuadrante).
Implicaciones prácticas, sociales y de investigación: Implicaciones sociales, prácticas y de investigación: La investigación implica que el control de calidad y el liderazgo son factores críticos de éxito para los proyectos de mejora de la calidad. El liderazgo juega un papel esencial en la implementación de proyectos de mejora de la calidad, y el compromiso del liderazgo es una clave importante para el éxito de estos proyectos. Además, existe un requisito de apoyo del liderazgo en cuanto a la asignación de recursos. Esta asignación de recursos incluye mano de obra, costos, sistemas de información, máquinas y herramientas. Otro factor que es crítico para el éxito de estos proyectos es el control de calidad. La implementación del control de calidad tiene un papel vital durante el proceso del proyecto de mejora de la calidad y después del proyecto. Con el control de calidad, el producto se ajusta a las especificaciones y estándares y cumple con los objetivos y estándares establecidos. Los productos que rastrean los resultados de la implementación del control de calidad pueden garantizar que la calidad del producto esté garantizada y siga el objetivo establecido.
Originalidad/valor: Esta investigación combina dos métodos para determinar los factores críticos de éxito en la implementación de proyectos de mejora de la calidad. La investigación anterior, utilizando mediciones del método SEM-PLS e IPA, se llevó a cabo por separado, midiendo la importancia y los niveles de desempeño. En este estudio, la carga externa da como resultado la medición de la muestra original con SEM-PLS para el valor de importancia en el método IPA.

Palabras clave: Factores Críticos de Éxito, Análisis de Importancia-Desempeño, Calidad, Proyecto de Mejora de la Calidad.

INTRODUCTION

Companies in the industrial and service industries face a variety of challenges as a result of global competitiveness. These challenges include cost-effectiveness, sustainability, and manufacturing flexibility (Rodriguez et al., 2022). Companies should improve the quality of both products and services to survive in this increasingly competitive environment. Any manufacturing industry's processes and products must have quality as a foundational element (Tambare et al., 2022). Quality improvement is a continuous process found in all stages of the production process of a product. Therefore, in process improvement, the most important thing is to comprehensively find problems in each step of the process (Florent et al., 2009). Quality requirements can be presumptions, restrictions, or organizational objectives (Kaur et al., 2013). Quality improvement projects greatly benefit if the efforts reach the target and increase customer satisfaction. Customer satisfaction has an impact on the company's image. Customer satisfaction is an essential part of an organization that aims to retain customers (Zailani et al., 2023). The main objectives of quality improvement are to identify the underlying causes of variability, take the necessary actions to make work processes predictable, and then constantly enhance process performance (Weiner et al., 2006). Quality improvement elements include setting goals, studying the system, designing the improvement effort, and measuring the impact or return on investment (Mortimer et al., 2018). The main goal of improvement is to enhance local procedures and results, not to add new, generally applicable information. There are still successes and failures in the implementation of quality improvement projects. The failure of a quality improvement project is very detrimental to the company.

On the other hand, the goal of quality improvement still needs to be achieved. Failure prevention measures in quality improvement projects are crucial to completing these objectives correctly. The research's specific objectives are to: 1) Develop a conceptual model based on a quality improvement project and the constructs of project success, leadership, quality planning, quality assurance, quality control, and quality performance measurement; 2) Validate the model using appropriate validity checks of partial least squares (PLS) modeling; 3) The measurement of the factors that are the priority for improvement with the IPA Method. Smart PLS-SEM (Partial et al. Equation Modeling) is a common data analysis technique because it accepts small sample sizes (Barclay et al., 2015). In addition, PLS-SEM uses the boot-strapping technique to obtain the significant value of the route coefficient from a distribution derived from the data (Hussain et al., 2018; Zaman, 2020). The results of measuring the implementation of quality improvement projects will be analyzed further using the importance-performance analysis (IPA) method. They are using the follow-up analysis to determine the prioritized factors for improvement. Practitioners use IPA to examine two aspects of service characteristics: performance level (customer satisfaction) and importance (Deng, 2008). Analysis of the significance and effectiveness of the various project management stages enables management to pinpoint areas that can be improved immediately and those that can wait till later (Haverila et al., 2020). Project success is the goal of IPA construction. The conventional IPA model uses a two-dimensional graph that divides the matrix into four quadrants to indicate the states of the quality characteristics. First, clients value product or service quality characteristics, but organizational performance is poor. Second, keep up the excellent work. According to customers, organizational performance and the importance of a product or service's quality characteristics are very high. Third, poor priority: the organizational performance on the consumers' cognitive importance and the product or service quality characteristic needs to be higher. Fourth, possible overkill: Organizational performance on the characteristic of product or service quality is strong, but the cognitive importance of the customers could be higher (Ho et al., 2016; Martilla et al., 1977). This research aims to determine the factors that influence the successful implementation of quality improvement projects.

THEORETICAL REFERENCE

Quality Improvement Projects

Quality improvement projects are a systemic approach to planning and implementing continuous performance improvements (Weiner et al., 2006). Quality improvement (QI) is a constant process that involves evaluating quality, attempting to raise its value, and, as necessary, re-evaluating quality and making more efforts to enhance it. The work team must establish and achieve quality improvement project goals and correctly determine the activities to execute. Stakeholder impact is one of many factors to consider when creating an improvement team. These teams should include (1) team leaders, (2) technical experts, (3) system leaders, (4) improvement advisors, and (5) executive sponsors (Silver et al., 2016). The main goal of improvement practices is to enhance local procedures and results, not to add new, generally applicable information (Ogrinc et al., 2016).

Smart PLS-SEM

Structural equation modeling (SEM) is an essential analytical tool in social sciences research, including information systems research (Hair, Joe et al., 2018) The advantage of PLS-SEM is its ability to estimate complex models with many constructs, indicator variables, and structural paths without imposing distributional assumptions on the data (Hair, Joe et al., 2018). The application of PLS-SEM emphasizes the predictive nature of its analyses (Hair, 2021). Using the PLS-SEM when other methods fail due to a small sample size, however, consumer behavior researchers have yet to pay much attention to how well they could predict the results of theoretical models in the past. Researchers can use the PLS-SEM approach to analyze correlations between latent and observable variables (Hair, 2021). PLS-SEM can used when other methods fail due to a small sample size; however, consumer behavior researchers have yet to pay much attention to how well they could predict the results of theoretical models in the past. Researchers can use the PLS-SEM approach to analyze correlations between latent and observable variables (Hair, 2021). A PLS path model consists of two elements. First, a structural model (the inner model in the PLS-SEM context) represents the constructs (circles or ovals). The structural model also displays the relationships (paths) between the constructs. Second, the measurement models (also referred to as the outer models in PLS-SEM) of the constructs display the relationships between the constructs and the indicator factors (rectangles) (Hair et al., 2017). Model construction and estimation used to be primarily concerned with the specification, validation, and interpretation of factor loadings and underlying factors (latent variables). However, in the 1970s, the relationships between factors became a central research focus (Charles et al., 2022).

When constructing path models, it is crucial to comprehend four fundamental aspects: constructs, measured variables, linkages, and error terms. Constructs, also known as unseen factors or latent variables, are factors that cannot be directly quantified. See path models as circles or ovals. Rectangles are used in path models to represent measured variables, i.e., observed observations (raw data), indicators, or manifest variables. In path models, hypotheses define relationships and are characterized by single-headed arrows that signify a causal or predictive relationship. When route models are estimated, the error terms for reflectively measured indicators and endogenous components represent the unexplained variance. Formative indicators and exogenous constructs do not have error terms.

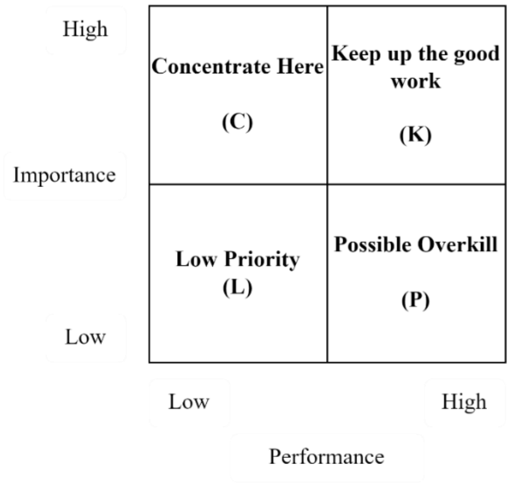
Additionally, path models differentiate between structural (inner) and measurement (outer) models. Model of latent unobservable factors (constructs) according to measurement theory. Reflective and formative models can describe them—demonstrating the relationships between latent, unobservable variables via a structural approach. The two types of latent factors are endogenous and exogenous (Hair et al., 2017).

Importance Performance Analysis (IPA)

IPA creates a two-dimensional matrix by compiling two responses: importance and performance. It separates quality attributes into four quadrants based on the central tendency of importance and performance using the median as the matrix split value (Ho et al., 2016). This method aids in comprehending client satisfaction and identifying and prioritizing those services or products that require improvement (Ormanovic & Ciric, 2017). A study conducted by Ormanovic et al. (2017) showed that the diagonal model (DM) and the data-centered quadrant model (DCQM) in the IPA chart should give a preference over the quadrant model (QM) and the scale-centered quadrant model (SCQM). Coordinate axis transformation, which uses fixed values for coordinate intersection, is another excellent solution. Since participants' conscious preferences can directly affect customer satisfaction data gathered, indirect estimating approaches for the performance and importance dimensions are advised (Ormanovic & Ciric, 2017). The conventional IPA model uses a two-dimensional graph that divides the matrix into four quadrants to indicate the states of the quality characteristics. Figure 1 shows a traditional IPA matrix (Cheng et al., 2008; Ho et al., 2016; Martilla et al., 2010). A set of selected attributes measures the importance and performance of products and services. Assessment of the performance is a comparison of assessment after and before the consumption experience. The importance and performance scores are then directly compared in a two-dimensional IPA grid, which consists of vertical and horizontal axes scaling the importance and performance ratings. A two-dimensional IPA grid constructed using the mean or median values of aggregate attribute importance and performance scores yields four quadrants (Kim & Oh, 2002). IPA is used to extend PLS-SEM as the results or factors to determine latent factors (Hair, et al., 2014). The two-dimensional IPA map is obtained based on the customer satisfaction survey results by describing performance on the X-axis and importance on the Y-axis. Performance refers to how well the product or service functions from the people's perspective that stand to gain (Arslan, Mueyyed et al., 2023). By identifying the relationship between stakeholder expectations and program performance, the IPA business model can provide valuable insights into the aspects of the program that may require additional attention or resources, ultimately leading to a more effective and relevant educational offering (Angelito, Grace & Binasoy, Joel, 2023).

However, the outer loadings are primarily related to the results of the relationships in the reflective measurement model. In contrast, external weights relate to the effects of the relationships in the formative measurement model (Hair et al., 2017). The significance testing of the indicator weights relies on the bootstrapping procedure, which facilitates the derivation of standard errors from the data without relying on distributional assumptions (Hair, et al., 2022). In addition, Hock et al. (2022) reported that IPA (the importance and performance analysis) can extend the PLS-SEM processing results for additional studies at the manifest variable level. An analysis of a particular endogenous latent variable may focus on the indicators of the exogenous latent variable with the highest relevance. Figure 1 shows Importance-Performance Analysis matrix.

Figure 1. Importance-Performance Analysis matrix



Source: (Ho et al., 2016)

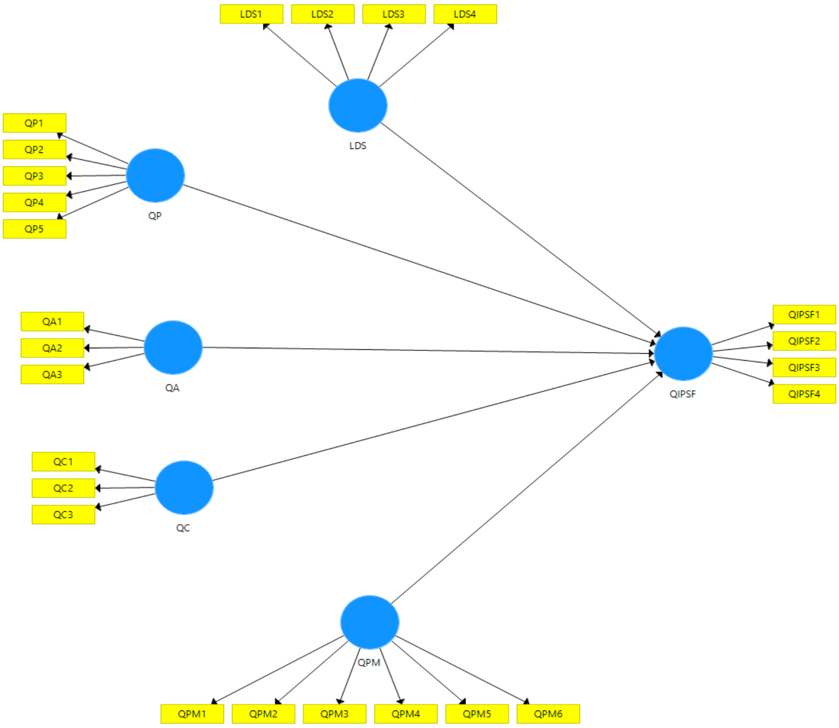
Conceptual Model

The conceptual model explains the relationships between the latent factors and their manifest variables. Thirty-two observed factors were obtained from the literature and divided into seven groups. Figure 2 shows the relationship between the exogenous and endogenous latent constructs as represented in a conceptual model. Several studies have discussed behavioral factors influencing the success and failure of quality improvement projects in manufacturing industries and found that various factors influence success and failure. Implement the multiple elements affect how well quality improvement programs, including (1) management commitment; (2) focus on consumers; (3) employee engagement and empowerment (Dückers et al., 2008); (4) supplier relations (suppliers); (5) the training and education of employees (Brennan et al., 2013; Mills & Weeks, 2004; Schouten et al., 2010; Xiong, 2016); (6) quality culture; (7) teamwork; (8) communication; (9) vision and strategy; (10) measurement, equipment, and rewards (Bullington et al., 2002); (11) key performance indicators; (12) adaptation to environmental changes; (13) the results of implementation and achievements; (14) socialization of the project; (15) the selection of appropriate areas for quality improvement projects (Jaca et al., 2011); (16) cost (A. Kassem et al., 2019; Chandra, 2015); and quality, time, customer satisfaction, and profit (Chandra, 2015). Associate several factors with the failed implementation of quality improvement projects, namely: (1) a lack of commitment and support from top management; (2) poor communication practices; (3) incompetent teams; (4) inadequate training and learning; (5) the incorrect selection of strategies, process improvement methods, and related tools/techniques; (6) the system and culture of rewards and recognition for team achievements; (7) the scope and responsibility of each team's duties; (8) sub-optimal team size and composition; (9) inconsistent monitoring and control systems; (10) resistance to change (Antony et al., 2019; Antony & Gupta, 2019; Richard, 2014). With the possibility of success or failure in implementing quality improvement projects, it is necessary to research what critical factors cause success and failure in Indonesian companies. The failure of a quality improvement project is very detrimental to a company because it has wasted resources and does not achieve the goal of quality improvement. Failure prevention measures in quality improvement projects are crucial to achieving these objectives correctly. We included 15 factors for the success of quality improvement projects and 10 factors for failure. The explanation is in line with the purpose of this study to determine the critical factors of QIP both from the measurement results of dimensions and indicators using factor analysis. Figure 1 shows the relationship between the exogenous and endogenous latent constructs as represented in a conceptual model. As a result, seven major structures impact quality improvement project success. The following hypothesis is the study:

The first hypothesis (H1) shows that leadership significantly affects quality improvement project success. Transformational project leaders can effectively demonstrate their focus on hard and soft criteria for project success, including cost, time, quality, performance, economic success, and stakeholder engagement and satisfaction (Zaman et al., 2019). Discuss the combined effects of transformational leadership and risk-mitigating techniques, such as project flexibility and visibility, on multidimensional project success in this work. They can be used for individual projects and task programs (Zaman et al., 2019). **The second hypothesis (H2) is that quality planning significantly affects quality improvement project success. A crucial first step in the life cycle of a project is determining the needs and requirements of owner organizations at the early stages of a capital facility project** (Peña & Parshall, 2001). **The third hypothesis (H3) is that quality assurance significantly affects quality improvement project success.** The critical components of a quality management system are quality planning, quality control, and quality assurance. It is crucial to pay attention to each of these components for the success of a building project (Prathapchandran & Palson, 2019). **The fourth hypothesis (H4) is that quality control substantially affects the success of quality improvement projects.** Depend on one quality control method for inspecting or verifying final items. Before the products reach the customer, the goal is to filter them such that products that refuse to follow the rules are either repaired or tossed (Prathapchandran & Palson, 2019). **The fifth hypothesis (H5) shows that quality performance measurement significantly affects the success of quality improvement**

projects. The CI program must be successful if the improvement is to be maintained by the achieved results (Jaca et al., 2012). Figure 2 shows Conceptual model based on hypothesis.

Figure 2 Conceptual model based on hypothesis



Source: Prepared by the authors (2023)

METHODOLOGY

In this study, we used Smart PLS-SEM to design models that explained and identified critical factors and constructs in quality improvement projects. Furthermore, importance-performance analysis (IPA) was used to determine each factor's position (quadrant) and find the most critical factors in the successful implementation of QIPs for the Indonesian Pharmaceutical factory. The research method had six stages. The first stage included identifying factors and indicators. The second stage involved the questionnaire preparation, and the third stage included the distribution of questionnaires, which was previously carried out in the discussion process to synchronize theories and conditions in the company. The fourth stage included data processing using PLS-SEM to conduct validation and reliability tests based on the values of the loading factors and Cronbach's alpha. The fifth stage involved data processing using Smart PLS-SEM, with the aim of testing models and hypotheses. Finally, the sixth stage comprised identifying the relationship between performance and level of importance to determine the most significant factors to consider.

Instrument Design

The instrument's (questionnaire) design used five variables: factor X with 21 indicators and one variable Y with four indicators. The questionnaire used a Likert scale, ranging from 1 to 5 points. A value of 1 indicated not very influential; 2 indicated no significance; 3 denoted effective; 4 indicated substantial; and 5 indicated powerful influence. Table 1 shows the variables and factors affecting the success of QIPs

Table 1 Variables and Factors affecting the success of QIPs.

Variable	Indicators		Reference
LDS (Leadership)	LDS1	Support from company leadership	(Dückers et al., 2008)(Chandra, 2015; Dückers et al., 2008; Kassem et al., 2020)
	LDS2	Support for resource allocation	
	LDS3	Leadership participation	
	LDS4	Commitment from the leadership	
QA (Quality Assurance)	QA1	Analysis of project results	(Gibson & Gebken, 2003; Prathapchandran & Palson, 2019; Salvi, 2020)
	QA2	Identification of causes of stakeholder dissatisfaction	
	QA3	Evaluation of the effects of the fulfillment of quality standards	
QC (Quality Control)	QC1	Monitoring (inspection) before work implementation	(Gibson & Gebken, 2003; Prathapchandran & Palson, 2019; Salvi, 2020)
	QC2	Monitoring (assessment) during work implementation	
	QC3	Monitoring (review) after the work completed	
QP (Quality Planning)	QP1	The existence of improvement targets	(Gibson & Gebken, 2003; Peña & Parshall, 2001)
	QP2	Existence of quality standards	
	QP3	Criteria for the scope of improvement	
	QP4	Existence of quality management methods	
	QP5	The socialization of metric process criteria to stakeholders	
QPM (Quality Performance Measurement)	QPM1	Cost calculation of scrap/failed products	(Jaca et al., 2012)
	QPM2	Calculation of the percentage of rework units	
	QPM3	Estimate of the percentage of defective units	
	QPM4	Quality cost measurement,	
	QPM5	Quality training for employees	
	QPM6	Improvement of employee skills and knowledge	
QIPSF (Quality Improvement Project Success Factor)	QIPSF1	Cost	(Chandra, 2015)
	QIPSF2	Quality	
	QIPSF3	Scope of Quality Improvement	
	QIPSF4	Training and Education	

Source: Prepared by the authors (2023)

Questionnaire Design

Distribute the questionnaires to 60 respondents who understood quality improvement projects well—the questionnaire aimed to identify the factors affecting quality improvement project outcomes. The questionnaire results were evaluated for validity and reliability using Cronbach's alpha value. Validity and reliability tests determine whether the methods and tools selected and used for research are consistent and reliable. The instrument was valid from the results of PLS-SEM processing on loading factors, which are ideal if the value is ≥0.7. Meanwhile, determine the reliability consistency from the composite reliability value (>0,6) and Cronbach's alpha; the limit for acceptance as a reliable instrument is ≥0.7 (Haryono, 2016). Validity is the accuracy of a tool in determining whether an item is suitable for use. At the same time, repeating the reliability test assesses the measuring device's consistency, i.e., whether the tool used is reliable and remains consistent with the measurement. The questionnaires were to the employees who understood quality improvement projects well. This questionnaire aims to determine the factors influencing the success of quality improvement projects. The distribution questionnaires give employees who have a good understanding of quality improvement projects. The purpose of distributing this questionnaire is to determine the effect of exogenous and endogenous latent construct variables. The questionnaire contains endogenous variables, namely the Quality Improvement Project Success Factor (QIPSF), which has time, cost, quality, and teamwork indicators. Meanwhile, the exogenous variable has five variables: leadership, quality planning, quality assurance, quality control, and quality performance measurement of the results of the implementation of quality improvement projects—the data analysis using PLS-SEM by conducting hypothesis testing.

Respondent Demography Data

This study's target population (respondents) was personnel who performed a quality improvement in the pharmaceutical company object in this study—surveying by distributing questionnaires to the respondents. Obtain the data from the questionnaires after collection, validation, and reliability tests using PLS-SEM and taking the Data while implementing the 2021 quality improvement project.

The demographics analyzed the data from the distribution of questionnaires to the respondents. Respondents are experts on quality improvement projects consisting of the Improvement and Innovation team, leaders, supervisors, and directors. Respondents taken comprise the population of the object drug company's Quality Improvement and Innovation

Division consisting of 60 people. The results of filling out the questionnaire from the entire population (60 respondents) were collected. Sixty respondents indicated that all data were valid and reliable. The data is declared valid if the value is more than 0.3 and reliable if Cronbach's alpha value is more significant than 0.6. After testing the validation and reliability of each indicator, the next step is to process the data using SEM-PLS. Based on demography analysis, 39 respondents (65%) were men, and 21 (35%) were men. There are 30 respondents (50%) aged 31-40, 18 respondents (30%) aged 20-30, as many as 11 respondents (18, 30%) aged (41-50) and one respondent (1.70%) aged > 50. Table 2 shows demographic data regarding respondents.

Table 2. The Demographic Respondent

Respondent Profile		Frequency	Percentage
Gender	Men	39	65 %
	Woman	21	35 %
Age	20-30	18	30%
	31-40	30	50%
	41-50	11	18,30%
	> 50	1	1,70%
Positions	Director	1	1,67%
	Manager	2	3,33%
	Supervisor	4	6,67%
	Leader	5	8,33%
	Improvement and Innovation team	48	80%

Source: Prepared by the authors (2023)

Data Analysis

They are conducting the Data analysis using PLS-SEM (partial least squares structural equation modeling). PLS-SEM is a multivariate statistical technique in which the calculation compares the values of all multiple dependent variables and multiple independent variables. For analysis techniques using PLS, this is to design an SEM statistical method based on variance values to execute or solve multiple regressions when there are problems in the specification and distribution of data, such as sample measurements in research, missing data, and multicollinearity, to determine the estimated results or model predictions. It uses a set of components with weight estimates to obtain scores for the latent variables based on the inner model (the structural model that links latent variables) and the outer model (the measurement model that connects indicators with their constructs) specified. Furthermore, it uses the IPA method to determine the critical success factors in quality improvement projects that should be a priority for improvement.

RESULT AND DISCUSSION

RESULT

It uses the information that meets the requirements to build a structural model and calculate each latent variable. Structural equation modeling (SEM)—accessed using the Smart PLS software—was used to create the model.

This research examined the structural model of project success concerning several latent factors. Structural models show how latent factors are related, each measured by various indicators. The modeling output, which underwent multiple evaluation stages, was used as the final model to facilitate discussion. Judge the model according to the validity and dependability of the formulation of the latent variable. Table 3 demonstrates that the reliability and validity of all constructs were confirmed based on the composite reliability value.

Table 3. The Reliability and Validity Value

Indicators	Mean	Standard Deviation	Outer Loading	Cronbach's Alpha	rho_ A	Composite Reliability	AVE
QIPSF1	3,800	0,945	0,892	0,896	0,902	0,929	0,765
QIPSF2	4,183	0,922	0,919				
QIPSF3	4,200	0,909	0,902				
QIPSF4	3,967	0,966	0,780				
LDS1	4,300	0,843	0,901	0,937	0,938	0,955	0,841
LDS2	4,317	0,885	0,910				
LDS3	3,933	0,998	0,935				
LDS4	3,950	1,007	0,922				
QA1	3,967	0,966	0,946	0,911	0,919	0,944	0,849
QA2	3,950	1,007	0,937				
QA3	4,167	0,934	0,880				
QC1	4,117	0,915	0,903	0,925	0,927	0,952	0,870
QC2	4,150	0,980	0,951				
QC3	4,150	0,963	0,943				
QP1	3,800	0,945	0,874	0,920	0,924	0,940	0,758
QP2	4,183	0,922	0,903				
QP3	4,200	0,909	0,887				
QP4	4,167	0,986	0,887				
QP5	3,933	0,964	0,798				
QPM1	4,317	0,846	0,904	0,936	0,943	0,950	0,759
QPM2	4,150	0,891	0,797				
QPM3	4,183	0,922	0,873				
QPM4	4,200	0,909	0,889				
QPM5	4,117	0,915	0,899				
QPM6	4,233	0,824	0,859				

Source: Prepared by the authors (2023)

Each latent variable's Cronbach's alpha value exceeded the 0.70 threshold, falling between a minimum of 0.896 and a maximum of 0.937. Rho A, a different indication, had a good value of more than 0.90 and composite dependability. The value of the average variance extracted (AVE) demonstrated the existence of convergent validity (Yanginlar et al., 2023) .

The AVE value of all factors was adequate or proper, with a maximum value of 0.870 and a minimum value of 0.758. Considering the scale of these standards, all latent factors were deemed suitable or acceptable. Table 3 shows construct reliability and validity.

Final Model

It uses the path coefficient analysis results to explain the measurement of a project's success. It uses 5 Variables and 21 indicators, including leadership, quality assurance, quality planning, quality control, and quality performance measurement. Based on Table 3, the leadership outer loading value of -0.041 was insignificant, with t-statistic = 0.901 and p-value = 0.371. Quality Assurance outer loading value 0.064 was un-significant, with t-statistic = 1.906 and p-value = 0.061. Quality Control outer loading value of -0.289 was significant, with t-statistic = 7.969 and p-value = 0.00. Quality Planning outer loading value of 1.086 was significant, with t-statistic = 22,085 and p-value = 0.000. Quality Performance Measurement outer loading value of 0.154 was significant, with t-statistic = 3,032 and p-value = 0.000. Furthermore, quality planning had an extreme outer value of 1.086 and was significant with a t-statistic value of 22.085 and p-value = 0.000. Figure 3 shows how the structural model—which comprised the suggested latent factors for evaluation—and the measurement model—which included appropriate indicators for each variable—was developed. Revise the measurement and structural models in this figure. The measurement model outside the image represents the latent variable building, which consisted of the relevant items and had a minimum loading value of 0.50 and a t-statistic value of more than 2.00—in Figure 3, connecting a yellow box with a loading value larger than 0.50 by an arrow to the blue circle representing the latent variable measurement (Figure 4 and a t-statistic greater than 2.00) (Hair, Joseph et al., 2014, 2022; Haryono, 2016).

Based on focus group discussions with the manager, leader, supervisor, Improvement and Innovation Team, and the person conducting quality improvement projects, we used five variables and 21 indicators in this study. From these five variables and 21 indicators, our research team developed a hypothesis for implementing this work, as discussed earlier. The hypotheses were accepted if the p-value was smaller than 0.05 (Table 3). There were five hypotheses in this study:

a) H1: Leadership factors un-significantly and favorably influence a project's success. Reject the hypothesis if the p-value was 0.371 (> 0.05).

b) H2: Quality assurance un-significantly and favorably influences a project's success. Reject the hypothesis if the p-value was 0.000 (> 0.05).

c) H3: Quality control factors significantly and favorably influence the success of a project. The p-value was 0.000 (< 0.05), and the hypothesis was accepted.

d) H4: Quality Planning factors significantly and favorably influence the success of a project. The p-value was 0.000 (< 0.05), and the hypothesis was accepted.

e) H5: Quality performance measurement factors significantly and favorably influence a project's success. The p-value was 0.000 (< 0.05), and the hypothesis was accepted.

Table 4 shows Statistic indicators of path relationship between variables.

Table 4 Statistic indicators of path relationship between variables

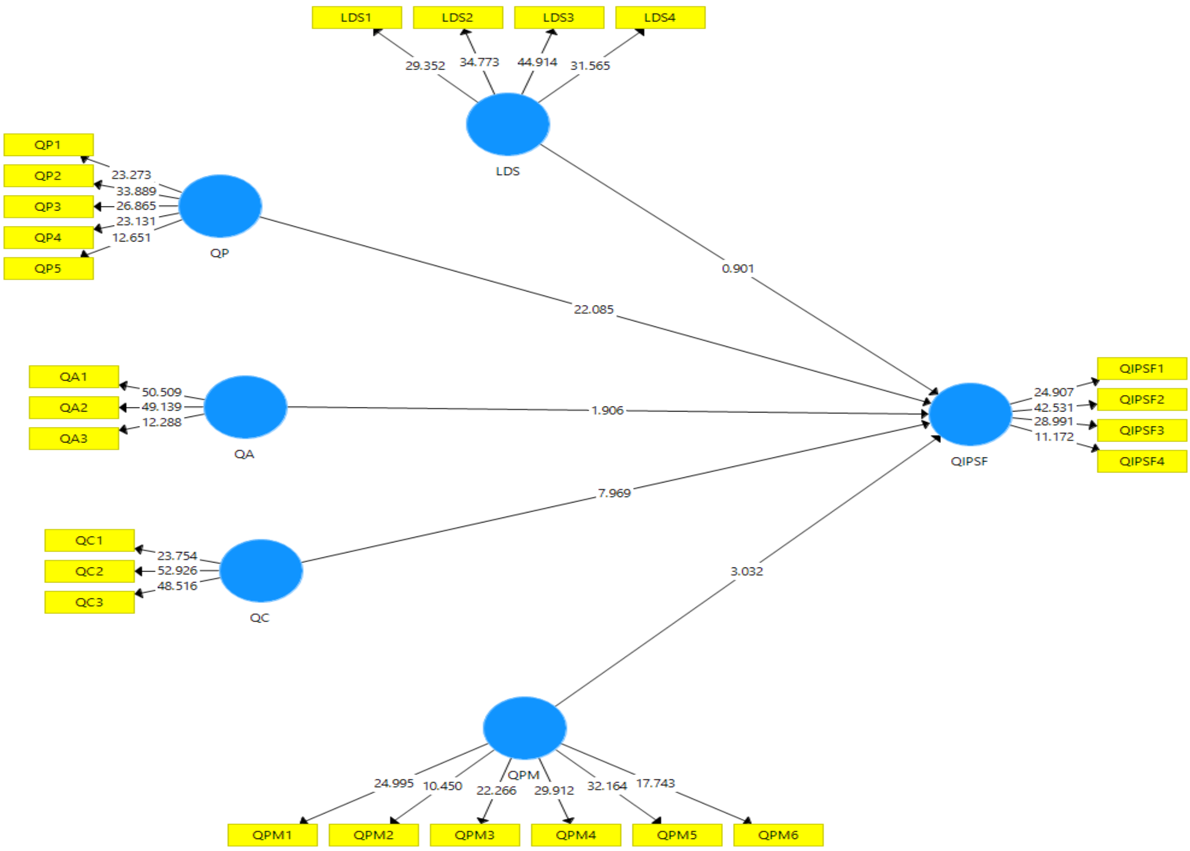
	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values	Decision
LDS -> QIPSF	-0,041	-0,047	0,046	0,901	0,371	**Rejected**
QA -> QIPSF	0,064	0,065	0,033	1,906	0,061	**Rejected**
QC -> QIPSF	-0,289	-0,286	0,036	7,969	0,000	Accepted
QP -> QIPSF	1,086	1,078	0,049	22,085	0,000	Accepted
QPM -> QIPSF	0,154	0,163	0,051	3,032	0,004	Accepted

Source: Prepared by the authors (2023)

Based on the results of hypothesis testing, the critical factor that affects quality improvement projects in pharmaceutical factories in Indonesia is quality planning (QP). This factor had the highest t-statistic of 22.085 with a p-value smaller than 0.05 and a positive original sample value (coefficient or direction of relationship) of 1.086. Thus, acceptance of the hypothesis of quality planning significantly influences the success of quality improvement projects.

After testing the hypothesis for each of these factors, the next step was to carry out the importance and performance analysis (IPA) to obtain elements that affect project success. The IPA measurement results highlight the critical factors and indicators that affect quality improvement projects. In this study, the IPA measurement for the importance level, which functions as a weight using the results of data processing in bootstrapping contained in the outer loading of the original sample data, was used to determine the direction of hypothesis testing. Calculate the external loadings or extreme weights for all measurement model constructs in the PLS path model. However, outer loadings are primarily related to the results of relationships in the reflective measurement model. The external weights are related to the results of relationships in the formative measurement model (Hair et al., 2017). Table 4 represents the outer loading data. Obtain the performance value via direct measurement through surveys and questionnaires. The difference between the IPA method used in this study and the traditional IPA method developed by Martilla and James (1977) is that the conventional IPA is measured using two-dimensional importance and performance values in four quadrants. Figure 3 shows Final structural equation model of critical factors in the success of quality improvement projects.

Figure 3. Final structural equation model of critical factors in the success of quality improvement projects.



Source: Prepared by the authors (2023)

Importance-Performance Analysis

After assessing the model, the following step revealed that three variables were significant. Project success was the goal of IPA construction. Table 4 shows the mean performance and mean importance ratings. Based on the mean values of importance and performance for the constructs and indicators in this research, the importance-performance map for the constructs contained four parts: "concentrate here," "keep up the good work," "low priority," and "possible overkill (Martilla et al., 1977). The mean values represent the boundaries between the four quadrants. The "keep up the good work" advice calls for maintaining the items in this quadrant at high levels because of their significance. Table 5 shows Mean Importance and Performance Value for IPA Measurement and **Figure 4** shows Importance Performance Map.

Table 5. Mean Importance and Performance Value for IPA Measurement

Variable	Indicators		Mean Importance	Mean Performance
LDS	LDS1	Support from company leadership	0,901	3,800
	LDS2	Support for resource allocation	0,910	4,183
	LDS3	Leadership participation	0,935	4,200
	LDS4	Commitment from the leadership	0,922	4,167
QA	QA1	Analysis of project results	0,946	3,933
	QA2	Identification of causes of stakeholder dissatisfaction	0,937	3,967
	QA3	Evaluation of the effects of the fulfilment of quality standards	0,880	3,950
QC	QC1	Monitoring (inspection) before work implementation	0,903	4,167
	QC2	Monitoring (assessment) during work implementation	0,951	4,117
	QC3	Monitoring (review) after the work completed	0,943	4,150
QP	QP1	The existence of improvement targets	0,874	4,150
	QP2	Existence of quality standards	0,903	4,317
	QP3	Criteria for the scope of improvement	0,887	4,150
	QP4	Existence of quality management methods	0,887	4,183
	QP5	The socialization of metric process criteria to stakeholders	0,798	4,200
QPM	QPM1	Cost calculation of scrap/failed products	0,904	4,117
	QPM2	Calculation of the percentage of rework units	0,797	4,233
	QPM3	Estimate of the percentage of defective units	0,873	3,800
	QPM4	Quality cost measurement,	0,889	4,183
	QPM5	Quality training for employees	0,899	4,200
	QPM6	Improvement of employee skills and knowledge	0,859	3,967

Source: Prepared by the authors (2023)

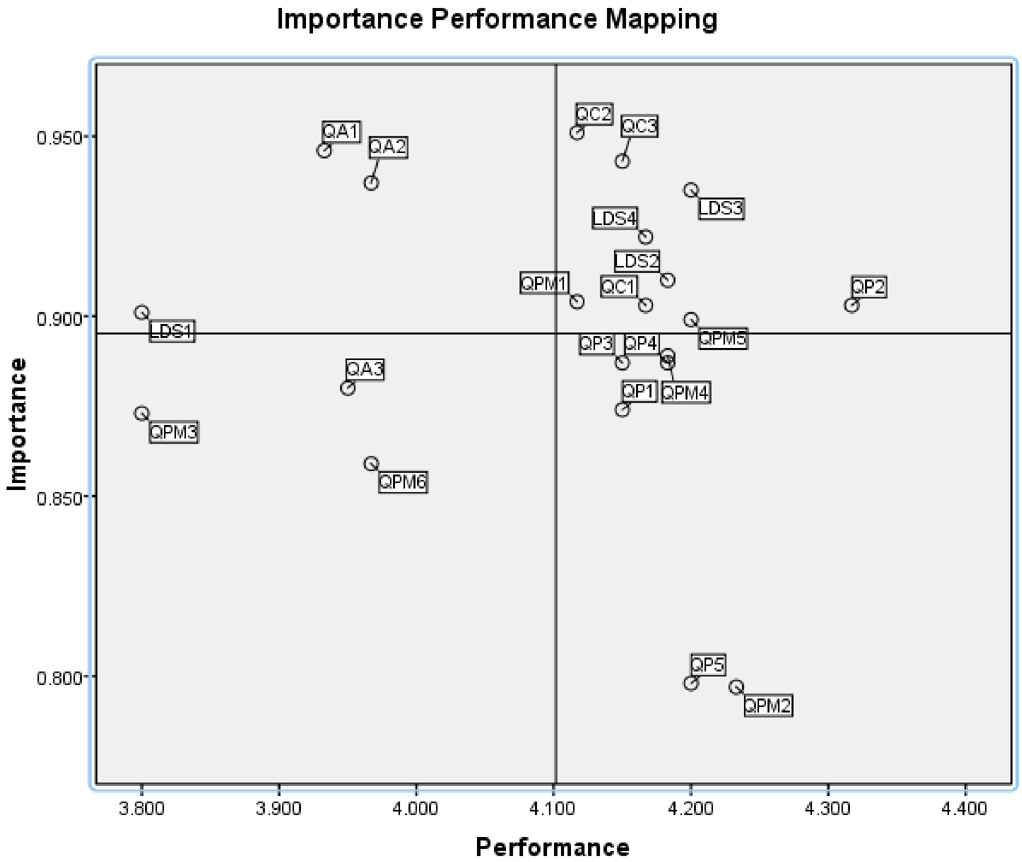
The importance-performance mapping also showed seven indicators in quadrant two. Based on Figure 4, the second quadrant is a quadrant that has a high importance value and high performance. The quadrant shows these factors are critical for successfully implementing quality improvement projects. There are the following:

a. Quality control variables and monitoring and evaluation before work implementation indicators with a mean importance rating of 0.903 and a mean performance rating of 4.167.

b. Quality control variable and monitoring and evaluation during the work implementation indicator with a mean importance rating of 0.951and a mean performance rating of 4.117

c. Leadership variables and leadership participation indicators with a mean importance rating of 0,935 and a mean performance rating of 4.200

Figure 4. Importance Performance Map



Source: Prepared by the authors (2023)

Quadrant one is a quadrant with a high importance value but low performance. The quadrant shows that the factors are priorities for improvement for the success of quality improvement projects. There are the following:

a. Quality assurance variable and analysis of project result indicators with a value mean importance rating of 0.945 and a mean performance rating of 3.933.

b. Quality assurance variable and identification of causes of stakeholder dissatisfaction indicator with a value mean importance rating of 0.937 and a mean performance rating of 3.950.

DISCUSSION

The study results show that the outer loading value of the data from the original sample size influences critical factors in the success of quality improvement projects. The IPA measurement results and the external loading results for the factors were different. We found that quality control and leadership were crucial factors in the success of quality improvement projects. Research conducted by Salvi, (2020) said that the quality control process comprises good planning, training, giving clear decisions and directions, regular supervision, reviewing finished operations right away for accuracy and completeness, and recording all assumptions, recommendations, and judgments (Salvi, 2020). A study conducted by (Zaman et al., 2019) provided clarity for concentrating on many project success criteria and boosts the project leader's confidence in adding value to crucial tasks for project success. Managers can evaluate projects side by side using a multidimensional perspective. It is based on several success metrics and utilizes transformational leadership as the cornerstone for project management advancements across numerous application sectors. The study's findings give project managers clear instructions on improving their projects' chances to satisfy design objectives, influence customers, and benefit their businesses. Understanding how transformational leadership affects the success of multidimensional projects gives organizations additional project options. This study showcases project managers' willingness to develop their skills and continuously enhance organizational performance. Increasing their appetite for successful projects is another managerial perspective on the study (Zaman, 2019). Some studies have reported different results on the critical success factors in quality improvement projects, suggesting that cost, quality, time, customer satisfaction, and profit could be general indicators of project success (Chandra, 2015). According to research by Kumar et al. (2014) the project manager plays a key regulating factor for resource assessment and wise resource allocation in effectively developing projects (Kumar et al., 2014). Consider cost, duration, the number of developers, and defects when determining if a project will be successful. Understanding how changes in these resources affect projects helps the organization plan, manage, and develop initiatives that ultimately create high-quality software, ensuring good products (Kumar et al., 2014). In addition, research conducted by Bullington et al. (2022) found that training and education are required as organizations re-evaluate potential new prospects in an ever-changing environment. New skills and methods will be necessary when changes occur to improve and successfully provide high-quality goods and services (Bullington et al., 2002).

CONCLUSION

Based on the results of hypothesis testing, the most critical factor that affects quality improvement projects in pharmaceutical factories in Indonesia is quality planning (QP). This factor had the highest t-statistic of 22.085, with a p-value smaller than 0.05 and a positive original sample value (coefficient or direction of relationship) of 0.319. The hypothesis was accepted, and we concluded that QP significantly influences the success of quality improvement projects. Modify the IPA measurement method by using the importance value obtained from the outer loading value and performance from the results of the distributed questionnaires. This study's critical success factors for quality improvement (quality control and leadership) were in quadrant two, showing the highest significance and performance values. Thus, these two factors need to be maintained. Meanwhile, factors with high importance but a low performance value should be a priority to improve. From the results of the IPA, prioritize the factors for improvement contained in quadrant one, namely quality assurance.

Limitation: This study focuses exclusively on pharmaceutical companies that engage in the manufacturing of products, specifically those involved in the production process to create tangible goods.

The implication: The research implies that quality control and leadership are critical success factors for quality improvement projects. Leadership plays an essential role in implementing quality improvement projects, and leadership commitment is an essential key to the success of these projects. In addition, it requires support from leadership regarding resource allocation. This resource allocation includes labor, costs, information systems, machines, and tools. Another factor that is critical to the success of these projects is quality control. Quality control has a vital role because it can be implemented during the quality improvement project process and after the project. With quality control, the product suits the specifications and standards and meets the targets and standards set. Products that track the results of the implementation of quality control can ensure that the product's quality is guaranteed and follows the target set.

Research contribution: this research contributes to variables that affect quality improvement projects and is helpful for leaders and teams who carry out quality improvement projects in the company. The results obtained in this study can improve the quality and quantity of products and work more productively.

REFERENCES

A. Kassem, M., Khoiry, M. A., & Hamzah, N. (2019). Using probability impact matrix (PIM) in analyzing risk factors affecting the success of oil and gas construction projects in Yemen. *International Journal of Energy Sector Management*, *14*(3), 527–546. https://doi.org/10.1108/IJESM-03-2019-0011

Angelito, Grace, A., & Binasoy, Joel, P. (2023). Evaluating The Bachelor Of Public Administration Program Objectives Through Importance-Performance Analysis : A Business Model Approach Article history : Keywords : Importance-Performance Analysis ; Public Administration Program ; Evaluating the Bachelor. *International Journal of Professional Business Review*, 1–13.

Antony, J., & Gupta, S. (2019). *Top ten reasons for process improvement project failures*. *10*(1), 367–374. https://doi.org/10.1108/IJLSS-11-2017-0130

Antony, J., Lizarelli, F. L., Fernandes, M. M., Dempsey, M., Brennan, A., & McFarlane, J. (2019). A study into the reasons for process improvement project failures: results from a pilot survey. *International Journal of Quality & Reliability Management*, *ahead-of-p*(ahead-of-print), 1699–1720. https://doi.org/10.1108/ijqrm-03-2019-0093

Arslan, Mueyyed, A. ., Thiruchelvam, S., & Hayder, G. (2023). Assessing The Prefabricated Building Factory's Quality By Pointing Out its Strengths And Weaknesses in Terms of Vision, Plan, And Evaluation., *International Journal of Professional Business Review*, 1–18.

Barclay, D., Higgins, C., & Thompson, R. (2015). A Partial Least Square Structural Equation Modeling (PLS SEM) Preliminary Analysis on Organizational Internal and External Factors Influencing Effective Construction Risk Management among Nigerian Construction Industries. *Rev. Téc. Ing. Univ. Zulia*, *38*(3), 143–155. https://www.academia.edu/download/41322873/14A_Partial_Least_Square_Structural_Equation_Modeling_PLS_SEM.pdf

Brennan, S. E., Bosch, M., Buchan, H., & Green, S. E. (2013). Measuring team factors thought to influence the success of quality improvement in primary care: a systematic review of instruments. *Implementation Science : IS*, *8*, 20. https://doi.org/10.1186/1748-5908-8-20

Bullington, S. F., Easley, J. Y., Greenwood, A. G., & Bullington, K. E. (2002). Success factors in initiating versus maintaining a quality improvement process. *EMJ - Engineering Management Journal*, *14*(3), 8–14. https://doi.org/10.1080/10429247.2002.11415168

Chandra, H. P. (2015). Structural equation model for investigating risk factors affecting project success in Surabaya. *Procedia Engineering*, *125*, 53–59. https://doi.org/10.1016/j.proeng.2015.11.009

Charles, S. H., Chang-Richards, A., & Yiu, T. W. (2022). What do post-disaster reconstruction project success indicators look like? End-user's perspectives. *International Journal of Disaster Resilience in the Built Environment*, *13*(1), 31–50. https://doi.org/10.1108/IJDRBE-11-2020-

0112

Cheng, Y., Yen, T.-M., & Tsai, C.-H. (2008). Modify IPA for quality improvement: Taguchi's signal-to-noise ratio approach. *The TQM Journal*, *20*(5), 488–501. https://doi.org/http://dx.doi.org/10.1108/17542730810898458

Deng, W. J. (2008). Fuzzy importance-performance analysis for determining critical service attributes. *International Journal of Service Industry Management*, *19*(2), 252–270. https://doi.org/10.1108/09564230810869766

Dückers, M. L. A., Wagner, C., & Groenewegen, P. P. (2008). Developing and testing an instrument to measure the presence of conditions for successful implementation of quality improvement collaboratives. *BMC Health Services Research*, *8*, 1–9. https://doi.org/10.1186/1472-6963-8-172

Florent, T. M., Zhen, H., & Romaric, A. A. (2009). The continuous improvement model of lean production based on multi-type and small-batch production. *2009 International Conference on Information Management, Innovation Management and Industrial Engineering, ICIII 2009*, *1*(1), 469–472. https://doi.org/10.1109/ICIII.2009.119

Gibson, G. E., & Gebken, R. J. (2003). Design quality in pre-project planning: Applications of the project definition rating index. *Building Research and Information*, *5*, 346–356. https://doi.org/10.1080/0961321032000087990

Hair, Joe, F. (2021). Next-generation prediction metrics for composite-based PLS-SEM. *Industrial Management and Data Systems*, *121*(1), 5–11. https://doi.org/10.1108/IMDS-08-2020-0505

Hair, Joe, F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2018). When to use and how to report the results of PLS-SEM", European Business Review. *European Business Review*, *31*(1), 2–24. https://doi.org/https://doi.org/10.1108/EBR-11-2018-0203

Hair, Joseph, F., Hult, G, T, M., Ringle, Cristian, M., & Sarstedt, M. (2014). A Primer on Partial Least Squares Structural Equation Modeling. In *SAGE Publications India Pvt. Ltd*. https://doi.org/10.1016/j.lrp.2013.01.002

Hair, Joseph, F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. ., & Ray, S. (2022). Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook. In *Springer*. https://doi.org/10.1080/10705511.2022.2108813

Hair, J. F., Hult, G. T., Ringle, C., & Sarstedt, M. (2017). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) - Joseph F. Hair, Jr., G. Tomas M. Hult, Christian Ringle, Marko Sarstedt. In *Sage*.

Haryono, S. (2016). Metode SEM untuk Penelitian Manajemen dengan AMOS, LISREL, PLS. *Badan Penerbit PT. Intermedia Personalia Utama*, 450.

Haverila, M., Haverila, K. C., & Twyford, J. C. (2020). Critical variables and constructs in the context of project management: importance-performance analysis. *International Journal of Managing Projects in Business*. https://doi.org/10.1108/IJMPB-02-2020-0071

Ho, L. H., Chang, P. Y., & Yen, T. M. (2016). Using modified IPA to define quality improvement strategies: A study of air-conditioning industry in Taiwan. *TQM Journal*, *28*(2), 180–194. https://doi.org/10.1108/TQM-04-2014-0039

Hussain, S., Fangwei, Z., Siddiqi, A. F., Ali, Z., & Shabbir, M. S. (2018). Structural Equation Model for evaluating factors affecting quality of social infrastructure projects. *Sustainability (Switzerland)*, *10*(5), 1–25. https://doi.org/10.3390/su10051415

Jaca, C., Viles, E., Mateo, R., & Santos, J. (2011). *Components of sustainable improvement systems : theory and practice*. https://doi.org/10.1108/17542731211215080

Jaca, C., Viles, E., Mateo, R., & Santos, J. (2012). Components of sustainable improvement systems: Theory and practice. *TQM Journal*, *24*(2), 142–154. https://doi.org/10.1108/17542731211215080

Kassem, M. A., Khoiry, M. A., & Hamzah, N. (2020). Structural modelling of internal risk factors for oil and gas construction projects. *International Journal of Energy Sector Management*, *14*(5), 975–1000. https://doi.org/10.1108/IJESM-11-2019-0022

Kaur, H., Ahamad, S., & Verma, G. N. (2013). Identification & Analysis of Parameters for Program Quality Improvement : A Reengineering Perspective. *Computer Engineering and Intelligent Systems*, *4*(5), 23–31.

Kim, B., & Oh, H. (2002). An Extended Application of Analysis. *Journal of Hospitality & Leisure Marketing*, *9*(3/4), 107–125. https://doi.org/10.1300/J150v09n03

Kumar, N. R. S., Nair, T. R. G., & Suma, V. (2014). Impact of Resources on Success of Software Project. *Advances in Intelligent Systems and Computing*, *248 VOLUME*(July), 687–693. https://doi.org/10.1007/978-3-319-03107-1_75

Martilla, J. A., And, & James, J. C. (1977). Importance-Per Analysis. *The Journal of Marketing*, *41*(1), 77–79. http://www.jstor.org/stable/1250495 .

Martilla, J. A., And, & James, J. C. (2010). Importance-Per Analysis. *The Journal of Marketing*, *41*(1), 77–79.

Mills, P. D., & Weeks, W. B. (2004). Characteristics of successful quality improvement teams: lessons from five collaborative projects in the VHA. *The Joint Commission Journal on Quality and Safety*. https://www.sciencedirect.com/science/article/pii/S1549374104300171

Mortimer, F., Isherwood, J., Wilkinson, A., & Vaux, E. (2018). Sustainability in quality improvement: redefining value. *Future Healthcare Journal*, *5*(2), 88–93. https://doi.org/10.7861/futurehosp.5-2-88

Ogrinc, G., Davies, L., Goodman, D., Batalden, P., Davidoff, F., & Stevens, D. (2016). SQUIRE 2.0 (Standards for QUality Improvement Reporting Excellence): Revised publication guidelines from a detailed consensus process. *BMJ Quality and Safety*, *25*(12), 986–992. https://doi.org/10.1136/bmjqs-2015-004411

Ormanovic, S., & Ciric, A. (2017). IMPORTANCE-PERFORMANCE ANALYSIS : DIFFERENT APPROACHES. *Acta Kinesiologica*, *11*(2r), 58–66.

Peña, W. M., & Parshall, S. a. (2001). *Problem Seeking* (Sofia Fonseca de Nino (ed.); Fourth Edi). John Wiley & Sons, Inc.

Prathapchandran, U., & Palson, P. (2019). *Study on Quality Control of Project Management System*. 5304–5308.

Richard, M. (2014). Why continuous improvement initiatives fail in manufacturing environments? A systematic review of the evidence. *International Journal of Productivity and Performance Management*, *63*(3), 370–376. https://doi.org/10.1108/IJPPM-07-2013-0124

Rodriguez, R. D., Medini, K., & Wuest, T. (2022). A DMAIC Framework to Improve Quality and Sustainability in Additive Manufacturing—A Case Study. *Sustainability (Switzerland)*, *14*(1), 1–18. https://doi.org/10.3390/su14010581

Salvi, S. (2020). Quality Assurance and Quality Control for Project Effectiveness in Construction and Management. *International Journal of Engineering Research And*, *V9*(02). https://doi.org/10.17577/ijertv9is020028

Schouten, L. M. T., Grol, R. P. T. M., & Hulscher, M. E. J. L. (2010). Factors influencing success in quality-improvement collaboratives: Development and psychometric testing of an instrument. *Implementation Science*, *5*(1), 1–9. https://doi.org/10.1186/1748-5908-5-84

Silver, S. A., Harel, Z., McQuillan, R., Weizman, A. V., Thomas, A., Chertow, G. M., Nesrallah, G., Bell, C. M., & Chan, C. T. (2016). How to begin a quality improvement project. *Clinical Journal of the American Society of Nephrology*, *11*(5), 893–900. https://doi.org/10.2215/CJN.11491015

Tambare, P., Meshram, C., Lee, C.-C., Ramteke, R. J., & Imoize, A. L. (2022). Performance measurement system and quality management in data-driven industry 4.0: A review. *Sensors*, *22*(1). https://doi.org/10.3390/s22010224

Weiner, B. J., Alexander, J. A., Shortell, S. M., Baker, L. C., Becker, M., & Geppert, J. J. (2006). Quality improvement implementation and hospital performance on quality indicators. *Health Services Research*, *41*(2), 307–334. https://doi.org/10.1111/j.1475-6773.2005.00483.x

Xiong, G. (2016). Change Management on Improvement Project for Success. *2016 IEEE International Conference on Service Operations and Logistics, and Informatics (SOLI)*, 53–59. https://doi.org/10.1109/SOLI.2016.7551661

Yanginlar, G., Civelek, Mustafa, E., & Gulcur, E. (2023). THE EFFECT OF SUPPLY CHAIN RISK MANAGEMENT ON LOGISTICS PERFORMANCE AND INNOVATION PERFORMANCE Gözde Yanginlar A , Mustafa Emre Civelek B , Emre Gülçür C Article history : Keywords : Supply Chain Risk Management ; Innovation Performance ; The Effect of Su. *International Journal of Professional Business Review*, 1–22.

Zailani, Q. N. N., Sundram, V. P. K., Ibrahim, I., & Senathirajah, A. R. S. (2023). Plan-Do-Check-Act Cycle: a Method To Improve Customer Satisfaction At a Municipal Council in Malaysia. *International Journal of Professional Business Review*, *8*(4), 1–16. https://doi.org/10.26668/businessreview/2023.v8i4.931

Zaman, U. (2020). Examining the effect of xenophobia on “transnational” mega construction project (MCP) success: Moderating role of transformational leadership and high-performance work (HPW) practices. *Engineering, Construction and Architectural Management*, *27*(5), 1119–1143. https://doi.org/10.1108/ECAM-05-2019-0227

Zaman, U., Nawaz, S., Tariq, S., & Humayoun, A. A. (2019). Linking transformational leadership and "multi-dimensions" of project success: Moderating effects of project flexibility and project visibility using PLS-SEM. *International Journal of Managing Projects in Business*, *13*(1), 103–127. https://doi.org/10.1108/IJMPB-10-2018-0210