

# Risk Identification in Management System Process Integration Which Have Impact on the Goal of Management System Components

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**Keywords:** Risk Identification, Process Integration, Integrated Management System.

**Abstract:** Integrated Management System is a combination of two or more management system that facilitate a company to achieve its goals. In this case, the integrated systems are Quality Management System (QMS), Environmental Management System, and Safety Management System. In integrating one management system with another, the approach used is process integration. In the process integration, there are several risks that have impact on component goals in the management system process integration. The purpose of this study is to identify risks that have an impact on the goals of the component and make the dominant risks management strategy in the process integration. This study uses respondents' survey strategy to identify risks in the management system process integration and case study strategy to find out the dominant risks management strategies. The result of this study are risks in the process integration of management system and dominant risk management strategies.

## 1 INTRODUCTION

Implementation of Integrated Management System for better quality management is a preference for many organizations (Muzaimi et al., 2017). Previously, organizations in the world were not exempt from construction companies too focused on individual management systems (Mourougan, 2015).

The American Society of Quality (2015) divides the integration of management systems in three approaches which are process integration, risk integration, and audit integration (Paraschivescu, 2016). Process integration is a simulated device that aims to achieve optimization, feasibility, and integral solutions in a sustainable design (Klemes et al., 2013)

Process integration is a method of combining part or all of the process to reduce resource consumption (Bugdol and Jedynek, 2015). This research uses a process integration approach that consists of 8 components, namely the scope (1), leadership (2), integration of management policy (3), planning (4), support (5), operational (6), performance evaluation (7), and improvement (8) (Masuin et al., 2018).

The integration of system management has advantages for the organization. On the other hand, there are factors that inhibit and cause the purpose of the management system components to be not achieved. In the research of Rajkovic, Aleksic,

Milicevic, and Cudic (2008), the risk comes from internal and external.

Process integration has a fairly high risk and can have an impact on objectives. Therefore, it is necessary to mature planning and identify the risks that may occur either during management system process integration. Once the risk is identified, the risk should be assessed based on possible occurrence and impact it may cause. This is done to prevent any accidents that occur and can have an impact on project work in particular and on the safety of the surrounding environment in general.

From the explanation above, the study was conducted with the aim of identifying the risks that can occur in the integration process. When the risk is identified, the appropriate strategy can be applied to manage risk (in this research is the dominant risk) and the purpose of the component on process management system integration can be achieved.

## 2 LITERATURE REVIEW

Integrated Management System (IMS) is a management system that combines all components into a comprehensive system to facilitate the achievement of objectives and goals (Muzaimi, Chew, & Hamid, 2017). An IMS occurs when two or more

systems unite by eliminating the independence of one or both, but without losing their identities (Poltronieri et al., 2017). The integration consists of three main management systems: Quality Management System (QMS), Environmental Management System (EMS), and Safety Management System (SMS). The goal of implementing a management system by integrating several standards and documents is to achieve synergistic action in the organization (Zgodavova and Bober, 2012).

IMS can be done by using 3 approaches, namely process integration, risk integration, and audit integration (Paraschivescu, 2016). Process integration is a method of combining part or all of the process to reduce resource consumption and harmful emissions to the environment (Klemes, Varbanov, & Kravanja, 2013). Bugdol et al (2015) explained that only 0-70% of all processes are integrated with the integration matrix (Bugdol & Jedynek, 2015). Bugdol (2015) said that not all processes need to be integrated.

This research uses a process integration approach that consists of 8 components, namely the scope (1), leadership (2), integration of management policy (3), planning (4), support (5), operational (6), performance evaluation (7), and improvement (8) (Rofi'udin, Masuin, & Latief, 2018).

The three standards of QMS, EMS, and SMS are generally based on the principle of continuous improvement by the Deming cycle (Plan-Do-Check-ACT) (Zeng et al., 2010). The PDCA cycle is a concept of sustainable business enhancement and additional troubleshooting (Singh, 2013). The process integration of the third process management system is also based on the PDCA approach described in Figure 1.

Blue lines demonstrate leadership, integration of management policy, scope, planning, supporter, operational, performance evaluation, and improvisation supporting the system to perform process integration.

The red lines demonstrate PDCA cycle in process integration and its correlation with management system components. PDCA is an ongoing approach of management system in the flow of planning, implementation, checking and corrective action (Ribeiro et al., 2017). The planning stages consist of scope, leadership, and integration of management policies. Leadership is needed to create the unity of goals and direction and involvement of people activating an organization to align strategies, policies, processes and resources to achieve its objectives. The Input of planning in the integration process management system is the needs and expectations of stakeholders as well as internal and external issues of

the organization that are reflected in the scope of the system regarding organizational objectives and goals (Mourougan, 2015).

The implementation stage requires operational and supporting components. The operation of the system must be done in accordance with the planned. In operation, it takes resources that build, implement, and maintain an integrated management system. The required resources are on supporting components.

Performance evaluation should be done to the results and services produced in the operational phase. The result of performance evaluation was made the foundation for a system improvement. Organizations must find and filter opportunities for improvement and take important actions to respond to system sustainability objectives.

### 3 RESEARCH METHOD

This study uses two methods, respondents survey and case studies. Respondents survey is suitable to answer what and how large the correlation of each survey variable. Analysis of surveys is useful for identifying a thing (Yin, 2013). Therefore, this strategy is used to identify risks in the integration of process management systems that impact the objectives of IMS components on construction company organizations. The samples taken in this research survey strategy are purposive samples. In accordance with the research restrictions that have been included in the research constraints in the first chapter, selected respondents are the stakeholders of the construction management (government or private owned) implementing QMS, EMS, and SMS.

Case studies are used to investigate a small number of cases in depth, such as the study of why a project failed (Tan, 2011). The case study strategy is suitable for answering the question "How and why" (Yin, 2013). Yin (2013) argues that this strategy is conducted without controlling the characteristic errors of the events studied and the research focuses on contemporary events. The case studies research strategy is due to questions relating to operational relationships that need to be tracked over time, rather than sheer frequency or incidence. This strategy is suitable for use in this research as it can answer strategies for managing the dominant risk, so that the objectives of the integrated management system components can be achieved.

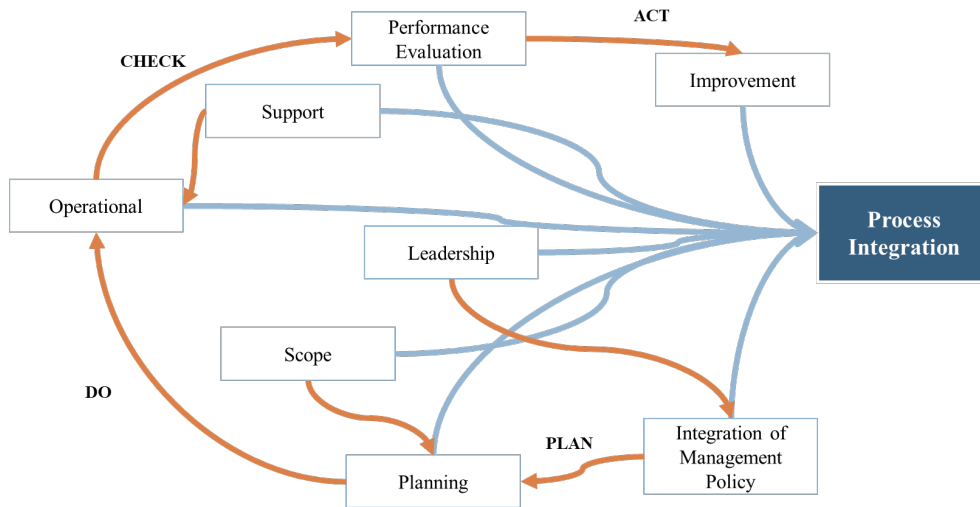


Figure 1: Process integration model. Source: (Rofi'udin, Masuin, & Latief, 2018)

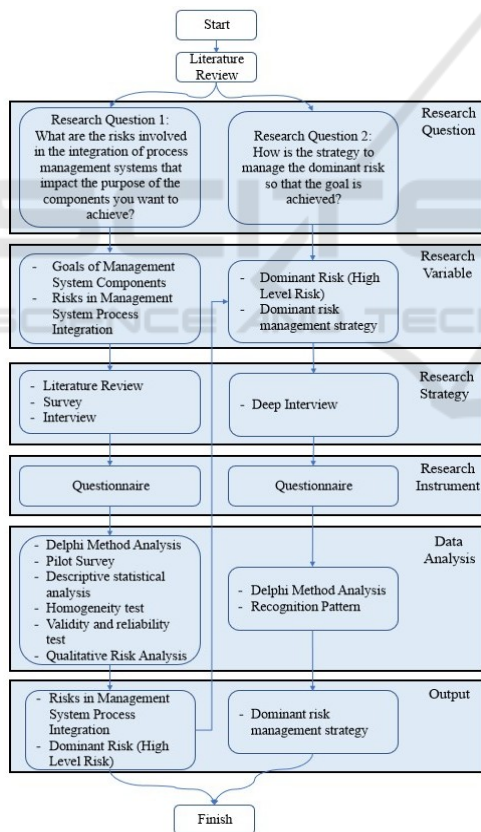


Figure 2: Research Operational Model

### 3.1 The Goals of Management System Components

This study defines the purpose of the clauses or components of the integration process management

system. The purpose of clauses is obtained by literary studies and validated by experienced experts in the Integrated Management System.

#### 3.1.1 Scope

Scope assignment is required:

- to identify external and internal issues of the organization
- to know the organization and its context and identify the needs and expectations of the company

#### 3.1.2 Leadership

Good leadership is one aspect that guarantees the continuity of the system achieved (Gianni and Gotzamani, 2014). The goals of this component or clause are:

- to determine who is responsible for the QMS EMS, and SMS;
- to create a unity of purpose and direction of organizational policy;
- to establish norms or standards that become a reference to integrating management systems.

#### 3.1.3 Integration of Management Policy

Integration of management policies integrates several elements, which are values, regulations, objectives, objectives, vision, and organizational mission (Rofi'udin et al., 2018). The integration of management policies is a process by which an

institution performs a change from a irregularity and multi-dimensional institution to a new governance system (Candel and Biesbroek, 2016). The goals of this component are:

- to provide instructions regarding the outcome of an organization
- to define the most important and common terminology in the design process approach, implementation, operation of integrated management systems

### 3.1.4 Planning

Planning aims to set project scope, correct the objectives, and determine the required actions for the project's purpose to be achieved. In planning, the inputs needed in the management integration process are the needs and expectations of stakeholders as well as internal and external issues of the Organization in relation to the objectives and objectives of an organization (Mourougan, Auditing Integrated Management System for Continuing Suitability, Sustainability, and Improvement, 2015).

### 3.1.5 Support

The goals of this component or clause are:

- to determine and provide the resources required for the establishment, implementation, maintenance and continuous improvement
- to determine competence. Competence criteria need to be set for each function and role relevant to the management system
- to raise the awareness of the people involved in the management system of policies, significant aspects, and the impact of relevance on their activities.
- to ensure that the mechanisms that facilitate the communication in the management system run effectively

### 3.1.6 Operational

The goals of operational are:

- to ensure that processes are ready to meet the requirements of the management system and to implement the actions identified in the planning;
- to establish, implement and maintain the necessary processes to address potential emergency situations identified.

### 3.1.7 Performance Evaluation

Therefore, evaluation is an important part of the integration of process management systems. Performance evaluation includes inspection, measurement, analysis, assessment, internal audit, and management review. The goals of this component are:

- to determine the range of monitoring and measurement necessary to assess the fulfilment of obligations on the management system.
- to ensure that all processes are audited at the required frequency and ensure that internal audits are consistent and thorough, clear objectives and scope must be set for each audit
- to ensure the continued suitability, adequacy and effectiveness of quality management system.

### 3.1.8 Improvement

This component has several purposes as follows:

- to determine the opportunity for improvement and apply the necessary actions to achieve the desired results.
- to eliminate the cause of the actual problem so as to avoid recurrence of the problem.
- to continuously improve the suitability, adequacy and effectiveness of management systems (quality, environment, safety) to improve performance.

## 3.2 Risks in Management System Process Integration

After defining the purpose in the clause in the integration process, the findings gained are the identification of risks that occur in the integration process that may affect the purpose of the clause or component. These risks are obtained by conducting related literary studies and conducting 2-round expert validation. The identified risks that are validated by experts are as many as 95 risk factors.

### 3.2.1 Risk Assessment

Risk quality analysis is performed to determine the level of risk, whether low, moderate, or high. The Level of risk can be obtained by multiplying the average probability value and the average impact value. The average probability value is obtained by summing the risk frequency and then divided by the total data obtained, which is 30 respondents. The

average impact value is obtained by summing the impact value then divided by the amount of data, which is 30 data. The following are indicators of the scale:

Table 1: Scale Assessment of Risk Frequency.

Scale	Category	Indicator
0,1	Very Low	Very small possibilities
0,3	Low	Less likely to occur
0,5	Moderate	Quite possibly happening
0,7	High	It may happen
0,9	Very High	Very likely to happen

Table 2: Risk Impact Assessment Scale.

Scale	Category	Indicator
0,05	Very Low	No impact on the purpose of components/clauses
0,1	Low	Slight impact on the purpose of components/clauses
0,2	Moderate	Insufficient impact on the purpose of components/clauses
0,4	High	Impact on the purpose of components/clauses
0,8	Very High	Greatly affects the purpose of the component/clause

After obtaining the average probability value and the average impact value, the multiplication is done between the two values to get the risk value. From the risk value, it is rated from 1 to 95 from the highest risk rating to the lowest risk rating. Then, determined the level of risk by looking to match the table below.

Table 3: Risk Category.

Risk Score	Risk Category
0,01-0,05	Low Risk
0,06-0,17	Moderate Risk
0,17-0,72	High Risk

After the calculation is done, 10 of the highest risks are obtained as follows in Table 4.

### 3.3 Strategies for Managing the Dominant Risks

At the previous stage, the dominant risk has been identified through a qualitative assessment of risk. Dominant risk is interpreted as a high level of risk. This stage aims to collect data in the form of strategy proposals by outlining causes, preventive measures, impacts and corrective actions.

#### 3.3.1 Causes and Impact of Risk

Causes that have been identified and validated as much as 9 causes. One cause could be the cause for some risk. The most common cause of risk is P2, which is lack of human resources competence.

Table 5 are compiled causes previously validated by experts.

Table 5: Causes of Risk in Process Integration Management System.

Code	Cause
P1	Lack of awareness to consider inflation in the identification of issues
P2	Lack of human resource competence
P3	Limited partner availability
P4	Understanding the different scopes
P5	Lack of socialization on the importance of unity
P6	Preparation of an immature program
P7	Management system problems are rarely used as a subject in the company's activities
P8	Lack of training and certification obtained by human resources
P9	Analysis of the root cost is not specific or not on target

The impact has been identified and validated by experts as much as 35 impact. Any impact can occur due to more than one risk factor. The most impact occurs because the risk occurs is D2 and D6. D2 is an implementation of an integrated management system that is not optimal. D6 is an organizational performance goal not achieved. Table 6 are compiled impacts previously validated by experts.

Table 6: Impacts of Risk in Process Integration Management System.

Code	Impact
D1	Identify external and internal organization issues inaccurate
D2	Implementation of integrated management system not optimal
D3	Organizational risk does not comply with the third process of management systems
D4	Company identification need and expectation inaccurate
D5	Workers' views are not equal or unequal
D6	Organizational performance goals not achieved
D7	The audit process is not running properly
D8	Ineffective management system

#### 3.3.2 Risk Response

After identification of the cause of the risk, a preventative action can be sought to prevent the cause from occurring. The proposed preventive action is 9 actions and has received approval from the expert. Preventive measures may be enforced to prevent more than one cause. The most proposed preventive action to prevent the cause is TP5, which is conducting related socialization activities. Table 7 are compiled preventive actions previously validated by experts.



Table 4: Highest Risks that Have Impact on the Goal of Management System Components

Risk	Ranking	Risk Score	Goal of the Component
Component/Clause Scope			
X1. Lack of inflation considerations	2	0.307	To identify external and internal issues of the organization
X2. The organization in the construction company does not set the Job Description & Standard/Requirements integrated to the 3 systems	3	0.291	
X3. Weak partner selection	1	0.481	
X4. The organization in the construction company has not been able to identify and analyse important issues related to Risk and Opportunity in relation to quality, safety, and environment	9	0.218	
X5. Inaccurate Corporate priority orientation	8	0.231	To know the organization and its context and identify the needs and expectations of the company
Component/Clause Leadership			
X6. Lack of unity of view of all employees who are already working under the previous standard	6	0.24	To create a unity of purpose and direction of organizational policy.
Component/Clause Support			
X7. Lack of financial resources	7	0.235	To determine and provide the resources required for the establishment, implementation, maintenance and continuous improvement
X8. Lack of employee motivation	4	0.264	To raise the awareness of the people involved in the management system of policies, significant aspects, and the impact of relevance on their activities
Component/Clause Performance Evaluation			
X9. Lack of competence auditors	10	0.215	To ensure that all processes are audited at the required frequency and ensure that internal audits are consistent and thorough, clear objectives and scope must be set for each audit
X10. Evaluation of follow-up results of audit results still less precise	5	0.258	To ensure the continued suitability, adequacy and effectiveness of quality management system.

Table 7: Preventive Actions of Risk in Process Integration Management System.

Code	Preventive Action
TP1	Consider economic factors
TP2	Using competent human resources to set JOB Description & Standard/requirements integrated to all three management systems,
TP3	Conduct a partner prequalification
TP4	Improving socialization and related training
TP5	Conducting socialization regarding
TP6	Prepare programs for financial resource needs in detail
TP7	Integrate management systems with business processes
TP8	Increase training and certification programs related to
TP9	Ensuring evaluation of follow-up results of audit results researched

The risks that occur will cause impact. Therefore, it is necessary to identify the impact that will occur, so that it can be determined the corrective action. From table 8, it is possible to know that a proposed corrective action was proposed to take as many as 8 actions. The corrective action can be proposed for more than one variable. The most corrective action to be proposed for risk factors is TK1, which is to perform the related review.

Table 8: Corrective Actions of Risk in Process Integration Management System.

Code	Corrective Action
TK1	Perform related rereviews
TK2	Set Job Description According to scope management system used
TK3	Choose a new partner that's considered stronger
TK4	Re-identify
TK5	Re-socialize
TK6	To make planning the financial resources
TK7	Monitor motivation by integrating motivation towards understanding the management system in the company
TK8	Audit by combining senior auditors and junior auditors

Lack of HR competence is the cause of the many risks that occur. There are 5 risk factors that can occur due to lack of HR competence. It is in the background of lack of perfect knowledge of human resources in the field of integrated management system considering the integration of management system has not been implemented in many companies, especially construction companies(Asif et al., 2008).

Lack of HR competence can be prevented by preventive measures such as conducting socialization, training, and certification related to integrated management system. It is considered relevant because the most corrective action proposed in the study is to socialize the details of the integrated management system. From the findings, it can be seen that the organizational performance is not achieved is the most widely encountered impact when a risk occurs. As for the most proposed corrective action is to do a re-review of issues or problems that occur in the integration of process management systems.

**3.3.3 Pattern Recognition**

After defining the cause and impact of the risks that occur, as well as propose preventive actions and corrective actions, can be made recognition pattern as in Figure 3. The recognition pattern is a flow from left to right, starting from preventive action, cause, risk, impact, corrective action. From the recognition pattern, it can be clearly seen the pattern of interrelated strategies between one's risk and the other risk. For example, TP5 can be done to prevent the causes of P5 and P6.

**4 CONCLUSIONS**

Process integration has a fairly high risk and can have an impact on objectives. Therefore, it is necessary to mature planning and identify the risks that may occur either during management system process

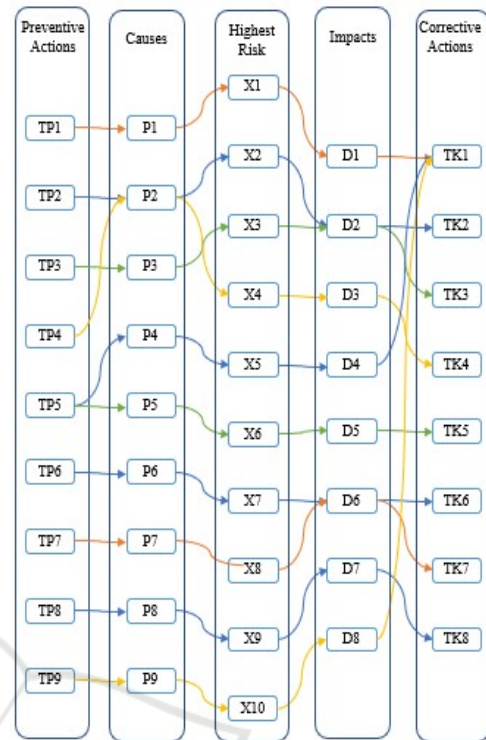


Figure 3: Recognition Pattern for Top 10 Risks

integration. The identified risks must be managed by defining their causes and impacts. Once known cause and impact, it can be proposed preventive measures to prevent occurrence and corrective action in response if the impact occurs.

Based on this study, there are 10 highest risks in management system process integration and 5 risks occurring in scope component/clause.

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