



Design of Risk Management System on Material Handling Services to Fulfill ISO 9001:2015 Requirements Clause 6.1 Based on ISO 31000:2018

HasyaQinthara Putri^a, WiyonoSutari^b, Sheila Amalia Salma^c

^{a,b,c} Department of Industrial Engineering, Telkom University, Indonesia

Corresponding Autor: hasyaqinthara@student.telkomuniversity.ac.id

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A B S T R A C T

The main task in the IHKP division is to deliver goods in the form of materials, semi-finished products, finished products, or even waste, from plant A to plant B in the consumer factory area, namely the PT XYZ factory. Based on the Traffic Accident Data from the IHKP Division, there were 18 major accidents that occurred in 2016-2020. In solving the above problems, the IHKP division carries out risk management only after the risk occurs. The IHKP Division does not yet have an effective risk prevention plan. In other words, the aim of this study was to design the system of risk management for the company's material handling services to meet the requirements of ISO 9001:2015 based on ISO 31000:2018. In the first stage of the study, researchers conducted a gap analysis of the actual condition of the company and its requirements. In the second stage, the researcher makes a proposed business process design according to the gaps obtained. In the third stage, a business process improvement method was applied by the researchers to the proposed business. As a result, the proposed business process and the draft SOP are then verified to the company to ensure whether the proposal is in accordance with the company or not.



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1. Introduction

It is important for logistics service companies to maintain and improve their services and efficiency in order to maintain the fulfilment of consumer needs. Various companies continue to innovate in order to remain the number one company and still get the attention of their customers. Especially with the COVID-19 pandemic, there are many changes in habits and new regulations that must be adjusted in order to work optimally even though they have to coexist with the pandemic. So, to maintain customer confidence, every logistics service company must take precautions that are applied in the quality management system.

The company engaged in logistics, especially supply chain logistics. There are seven divisions at this company, one of which is the Internal Handling KP (IHKP) division. The main task in the IHKP division is to deliver goods in the form of materials, semi-finished products, finished products, or even waste, from plant A to plant B in the consumer factory area, namely the PT XYZ factory. The process of delivering goods is carried out with several units of vehicles owned by the company, such

as excavators, payloaders, bulldozers, load luggers, trailers, flat trucks, dump trucks, cargo trucks, and pickups. There are several ways to maintain service quality, one of which is risk handling by the company. A company will not be free from risks. Therefore, the company must be aware of risks that can occur and may hinder the process or purpose of their work.

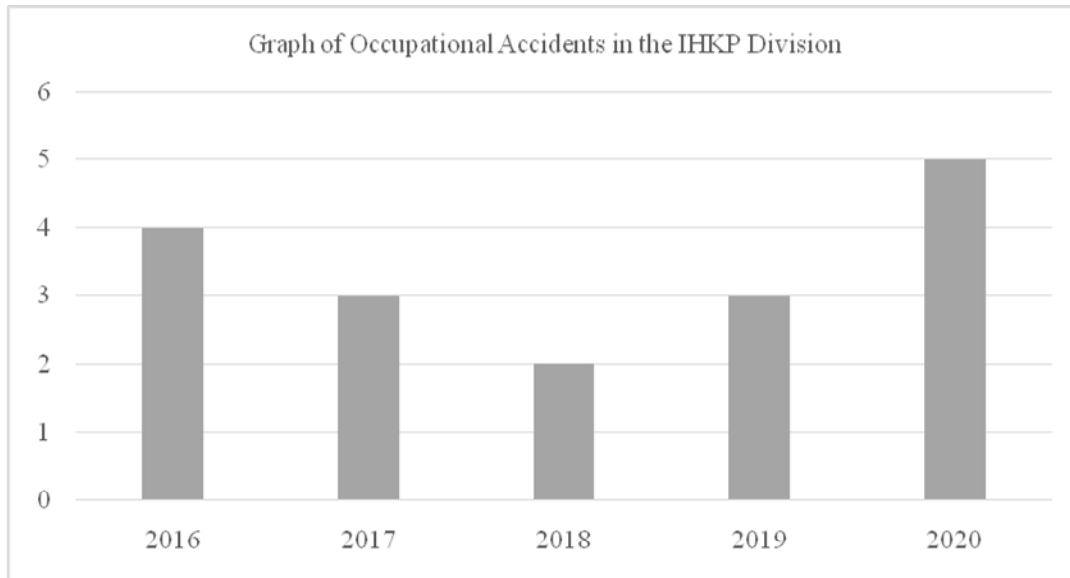


Figure 1. Graph of Occupational Accidents in the IHKP Division

In solving the problems stated above, the IHKP division carries out risk management only after the risk occurs. The IHKP Division does not yet have an effective risk prevention plan. To prevent the risks from occurring, the IHKP division can refer to the requirements of ISO 9001: 2015 clause 6.1 and carry out a risk assessment that has been set in ISO 31000:2018. Risk management can prevent companies based on failure and it can provide guidance for a company in monitoring all effects that may occur both in the short and long term (Darmawi, 2008; Fahmi, 2010).

ISO 9001:2015 clause 6.1 contains plans for actions in dealing with risks and opportunities by applying risk-based thinking. Risk based thinking is a concept of thinking that is carried out automatically without realizing it and has the aim of achieving an effective quality management system. The planning in clause 6.1 can be described through who, what, when, where, and how these risks must be controlled. When planning a quality management system, the organization must take into account the issues based on (4.1) and the requirements based on (4.2). In addition, the achievement of the desired results can be done by determining the necessary risks and opportunities with the goal which provide assurance in the quality management system, increasing the impact desired, prevent or reduce unwanted impacts, and achieve improvement (Sukamta, 2016).

Based on the mentioned background, this research focuses on the Design of a Risk Management System on Material Handling Services to Fulfil the Requirements of ISO 9001:2015 Clause 6.1 Based on ISO 31000:2018.

2. Literature Review

a) Quality

Ishikawa defines quality into two parts. First, quality and customer satisfaction are the same, and second, quality could be a broad term that goes on the far side product quality and includes human quality, processes, and different physical aspects. Quality is the power of a product or service to do what it is supposed to do to satisfy the expectations of customer (Robbins & Coulter, 2012). According to Montgomery, quality is the suitability of a product or service for

use (Douglas C. Montgomery, 2013). Quality is that the dynamic state related to products, services, people, processes, and environments that surpass needs and facilitate turn out superior worth (Goetsch & Stanley, 2014).

b) Risk

Risk is the possibility of loss or unintended effect associated with an activity. Meanwhile, uncertainty is the position of having no clue about what will happen next. The bigger the uncertainty, the bigger the risk. For individual farm managers, risk management contains optimizing the expected come backs consistent with the risks concerned and risk tolerance that's what makes it attainable to come up with profits. If no risk detected, it'll be no come back within the capability to control it with success (Crane et al., 2013). Risk may be described as an aggregate of the possibility of prevalence of a dangerous occasion or case inside a positive time frame and circumstances, which has a severity of damage or harm to human health, property, the environment, or any aggregate due to the case itself (Department of Occupational Safety and Health, 2008)

c) Risk Management

Risk management is a process when a risk is managed in accordance with other business aspects. In fact, risk cannot be completely eliminated nor should the organization seek to do that way, but it can be controlled or reduced by concerning to a certain extent. The organizations, that take the risks, may be the most successful organization. As the process of identifying risks and classifying them in such a way, risk management can be actually assessed and prioritized. The organization then takes part to control and coordinate selected responses. Therefore, as a control mechanism, risk management aims to ensure that the overall risk level remains to the acceptable limits (Alexander Roberts William Wallace Neil McClure, 2012). Risk management includes several activities such as planning, organizing, compiling, coordinating, and supervising including evaluating risk management programs (Djojosoedarso, 1999).

d) Risk Management Process

The risk management process has a series of stages which, when carried out in sequence, can allow for continuous improvement in decision making (Kululanga & Kuotcha, 2010). There are eight points that are highlighted in risk management process. There are the systematic communication application, policies, procedures and practices for consulting activities, setting contexts and assessing, managing, monitoring, reviewing, and recording and reporting risks (ISO 31000, 2018). Furthermore, as the part of management and decision-maker, it should be integrated into the organization's structure, operations, and processes. The following are the stages of the process of the risk management:

1. Communication and Consultation

2. Scope, Context, Criteria

3. Risk Assessment which divided into three parts as follows.

- Risk Identification;
- Risk Analysis; and
- Risk Evaluation

4. Risk Treatment

5. Monitoring and Review

6. Recording and Reporting

e) ISO 9001:2015

ISO 9001 is known as a standard for establishing the requirements of the quality management system. It is true that businesses and organizations become more efficient & increases customer satisfaction through ISO 9001 (Abu Al-Rub & Shibhab, 2020). To emphasize this point, it is an important element of today's reality, because mass production with an essentially driven strategy

has turned into an increasingly attractive strategy with increased customer engagement and market orientation from strategy and the perspective of industry. In order to meet the quality needs, the cost & time field of quality management viewpoint is consistently expanded from “what” is done to “how” it is done (ISO 9001, 2015).

f) Standard Operating Procedure

Every company has rules, but the rules in the company are made more formal called Standard Operating Procedures or commonly called SOP. The company uses SOP to meet the company's goals so that all members can move towards the same point, which are the vision and mission of the company itself. SOP acts as rules, procedures, and systems that are clearly, completely and neatly arranged. It can be concluded Standard Operating Procedure is a guideline for how members of the company should carry out their work. Therefore, each position in the company has its own SOP (Fatimah, 2016). The objectives of the preparation of SOP are as follows:

1. Maintain work consistency of every officers, employees, teams and all work units,
2. Clarify the flow of duties, authorities, and responsibilities of each work units,
3. Facilitate the process of assigning tasks and responsibilities to employees who run them,
4. Facilitate the process of monitoring and control functions of each work processes,
5. Avoiding work process errors,
6. Provide information about documents needed in a work process.

g) Business Process Improvement

A business process, a process consisting of some action that have a logical goal using the resources to process predetermined future (Fauzi&Mas'ud, 2019). BPI is a framework that is carried out systematically, created by organizations that aims to improve business processes. According to Susan, business process improvement has 3 objectives, including the following (Susan Page, 2015):

1. Effectiveness

Focusing on the customer and whether the process produces the desired results and meets the customer's needs.

2. Efficiency

Focuses on the employees who are responsible for the entire process, the workers in one department or another, and how easily the company can use the business processes.

3. Adaptability

Adaptability focuses on how to evaluate the company that modifies business processes based on changing business requirements easily. In short, are the business processes flexible in the face of changing needs?

Process improvement techniques have been written on the improvement technique wheels. The following is a process improvement technique (Hanik & Mas'ud, 2019).

1. Bureaucracy
2. Value Added
3. Duplication
4. Simplification
5. Cycle Time
6. Automation

3. Methodology

In this study, ISO 9001:2015 clause 6.1 used as a requirement to find gaps from the company's actual conditions. The form in this research is based on ISO 31000:2018, which contains six points.

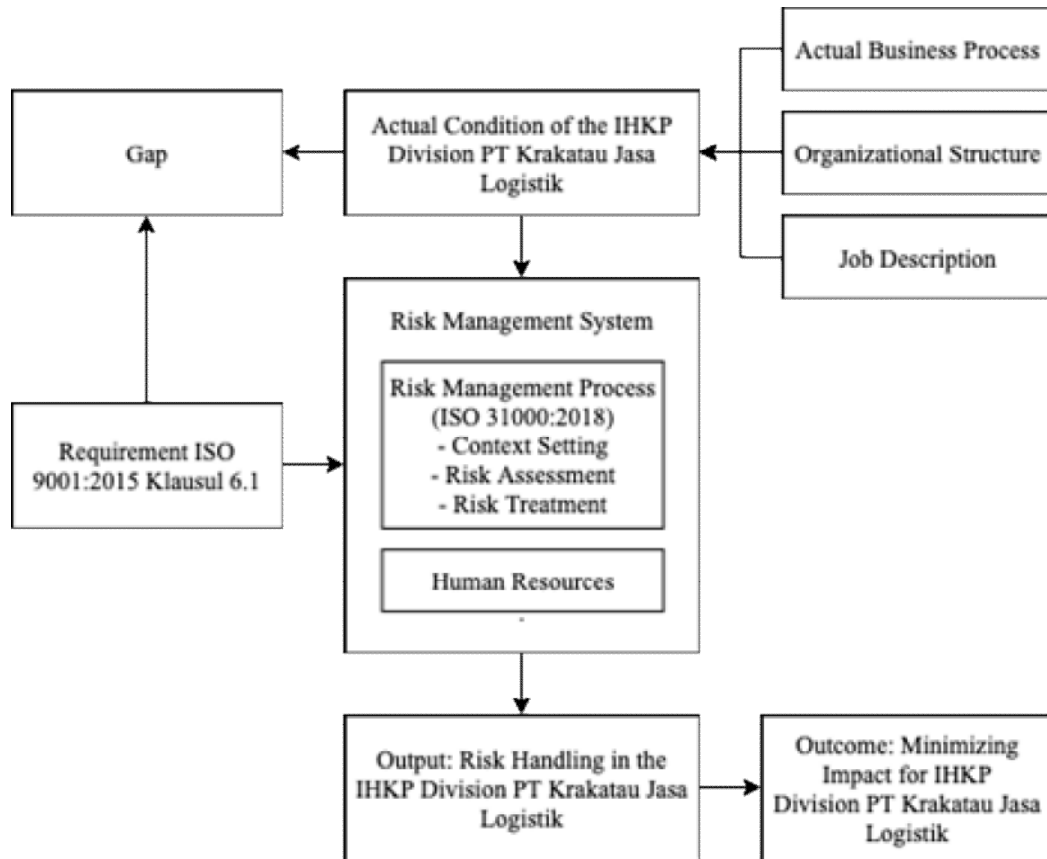


Figure 2. Conceptual Model

The study begins with a comparison between the actual conditions of the IHKP Division with the requirements of ISO 9001: 2015 clause 6.1, which will result in a gap. The aspects of the gap obtained from the comparison are the availability and ability of human resources to carry out risk management system and the availability of equipment that supports the company's risk management system process. The results of the gap will be analysed to be used as a direction for the creation of a risk management system for risk management in the company. These two aspects of the gap will be used to determine what the company should do when moving from the existing process to the proposed process.

After the risk management system is designed, a system that aims to control risk so that it remains within the limits that can be accepted by the company and minimize the impact caused by the risk. The risk management system in this research has two components, which are the risk management process and the human resources who will undergo the risk. By referring to ISO 31000:2018 theory, the author designs the risk management process. To support the process, the company needs equipment that helps the company in documenting the process. The support equipment proposed by the author is in the form of SOPs and forms.

The output of this research is a Risk Management Procedure for IHKP Division. The SOP designed by the author contains several things, which are rules, steps, person in charge, documents, tools needed, as well as other related matters over the risk management system process. In this research, the result will be beneficial for IHKP Division. The benefit that will be obtained by the company is effective risk control so that it can reduce or even eliminate the impact or loss caused by the risk.

4. Results and Discussion

a) Risk Management Objectives Identification

Table 1. Identification of Risk Management Objectives

Reference	Process Objective
Company aspirations	By implementing a risk management system in the IHKP division, risks that could potentially occur in material handling services can be handled properly and can operate according to the targets required by customer companies.
ISO 9001:2015	Having a focus on increasing customer satisfaction and the suitability of products and services that have been planned, using the principle of risk based thinking.
ISO 31000:2018	Improving performance, encouraging innovation, and supporting goals achievement can be realized into the risk management objectives.

Based on the three references above, the author integrates the objectives of the risk management system. Based on ISO 9001:2015 and ISO 31000:2018, it can be concluded that the aim is for companies to have optimal processes. Therefore, the company aims to make the company aware of the risks to minimize the impact of risk and achieve company goals.

b) Gap Identification

At this stage, the author identifies the gap between the actual conditions of the company and the requirements of ISO 9001:2015 clause 6.1. A more detailed gap analysis table has been attached to the appendix of the research.

The following is a comparison of the requirements of ISO 9001:2015 with the actual conditions of IHKP division. The conclusions from the results obtained after identifying the gap are as follows:

1. IHKP division has not determined external and internal issues, and has not documented the issues that have been identified.
2. IHKP division has not determined the person that applicable for the quality management system so that periodic monitoring can be carried out.
3. IHKP division has not considered the risks in all vehicle operation activities so that the company's quality management system can guarantee the desired results.
4. IHKP division has not carried out risk management in all vehicle operating activities in order to increase the desired preventive effect, reduce unwanted impacts, and achieve improvements.
5. IHKP division has not planned any actions to address risks and opportunities in vehicle operation activities. Planning is done to control the risks that will occur and reduce the impact on the company.
6. IHKP division has not made a procedure as documentation of risk and opportunity control. This is done so that risk control planning can be stored as company records and data.
7. IHKP division has not evaluated the effectiveness of the handling or actions taken on a regular basis as the part of reducing the impact of the risks occurred.

c) Process Sequence Design and Responsibilities

After determining the inputs and outputs in the process, the author makes a design of the proposed process sequence and the person in charge using the gap results obtained as a

reference. By using the gap results as design reference, the proposed business process design will comply with the requirements of ISO 9001:2015 clause 6.1. The process sequence is the result based on the gap results obtained from the gap analysis (see Figure 2).

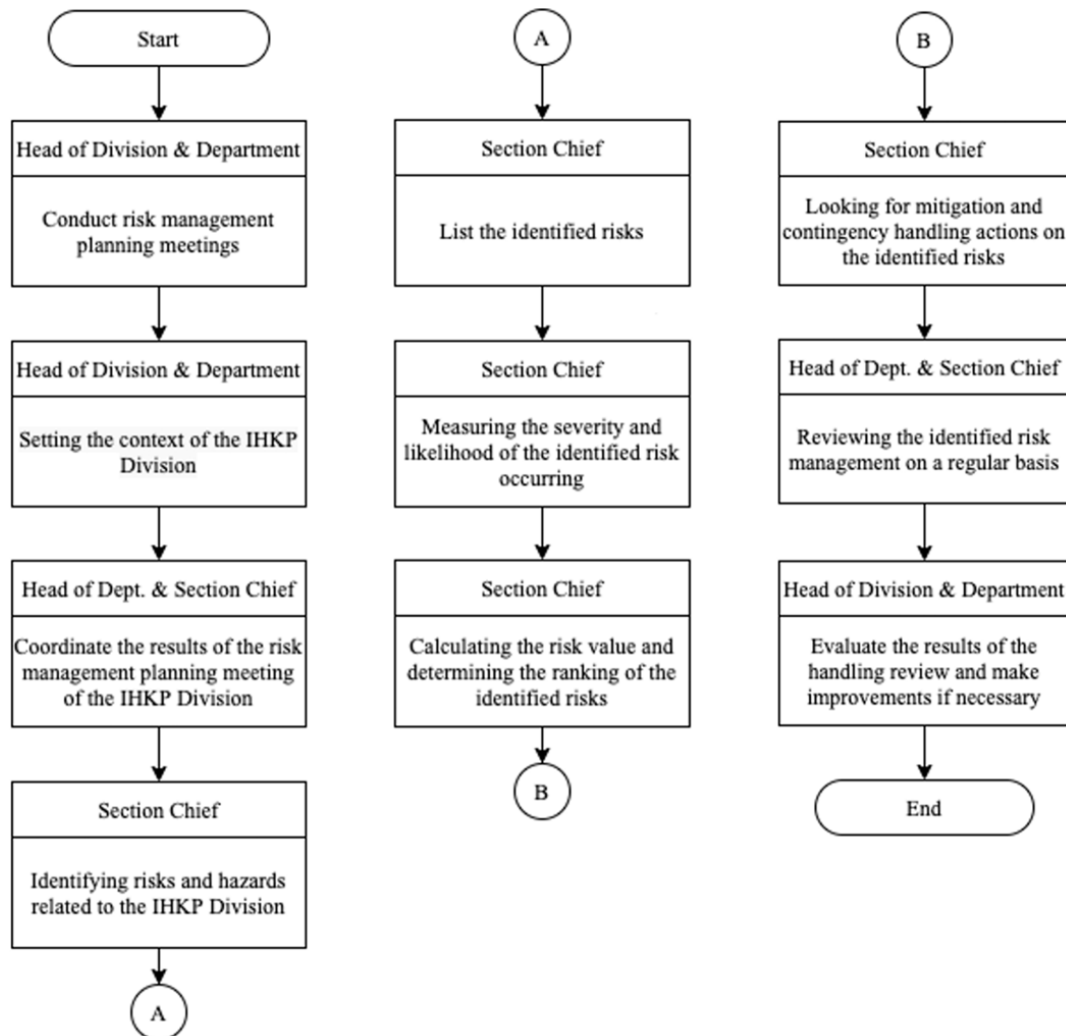


Figure 2. Proposed Business Process Design

d) Process Improvement Using the BPI Method

Process improvement in the risk management process by using the business process is carried out at the stage of applying improvement techniques. At this stage, it is used to improve and improve the previous business processes. Each process will be identified based on their value added, which is divided into three categories, namely RVA (Real Value Added), BVA (Business Value Added), and NVA (Non-Value Added). RVA are activities that directly can noticed by consumer and the output is produce to fulfil consumer needed. BVA are activities that indirectly noticed by consumer and these activities needed as a support. NVA are activities issued as a support too, but the activities are non-value-added to consumer or business process (Arumbasari & Rhamadani, n.d.). Furthermore, each process will be carried out with an improvement technique using one of the six tools on the improvement technique wheel, which are bureaucracy, value added, duplication, simplification, cycle time, and automation. The summary of the process improvement using the BPI method carried out in the business process design can be seen in Table 2. The complete process improvement has been attached to the Final Project.

Table 2. Process Improvement with BPI Method

Process	Value Added Assessment	Apply Improvement Technique	Improvement
Conduct risk management planning meetings	BVA	Simplifying	In this activity, simplification is carried out by combining risk management planning meetings by setting the context of the IHKP division. Activities can be merged because they have the same process actor.
Setting the context of the IHKP Division	BVA		
Identifying risks and hazards related to the IHKP Division	RVA	Simplifying, Automation tools	Simplification is carried out in this activity by combining risk identification activities and making a list of identified risks, so that the relevant forms are not used. In this activity, automation tools are also carried out by creating risk forms using a website-based application, Google Spreadsheet. Activities will be more effective and efficient with automatic data storage, easy data access, and support for work collaboration.
List the identified risks	BVA		

e) Determination of Key Performance Indicators

In measuring a performance or performance during the process, companies need to determine a measuring tool, namely KPI (Key Performance Indicator). KPIs are used in the process of handling risks and opportunities as indicators or performance measurement tools, to find out whether a process is running well or not.

In making KPIs, it begins with setting goals. If the goals have been formulated, then the aspects obtained from these goals need to be measured. The following are the proposed KPIs from the risk management process in the IHKP division.

Table 3. Key Performance Indicators

Objective	Performance Indicator	Formula	Measurement frequency
Checking the success percentage of the risk management system output	Percentage of successful handling of risk cases in the IHKP Division	$\frac{\text{Number of cases successfully handled}}{\text{Total number of cases handled}} \times 100\%$	once every semester
	Percentage of work accident rates in the IHKP Division	$\frac{\text{Number of work accidents}}{\text{Number of working vehicles}} \times 100\%$	once every semester

f) Risk Management System SOPs Design

The proposed process design results in established procedures as documentation in the form of Standard Operational Procedure (SOP). SOPs are made as the company procedures in handling risks and opportunities. The following is a description of the process of the risk management system that has been proposed by the author.

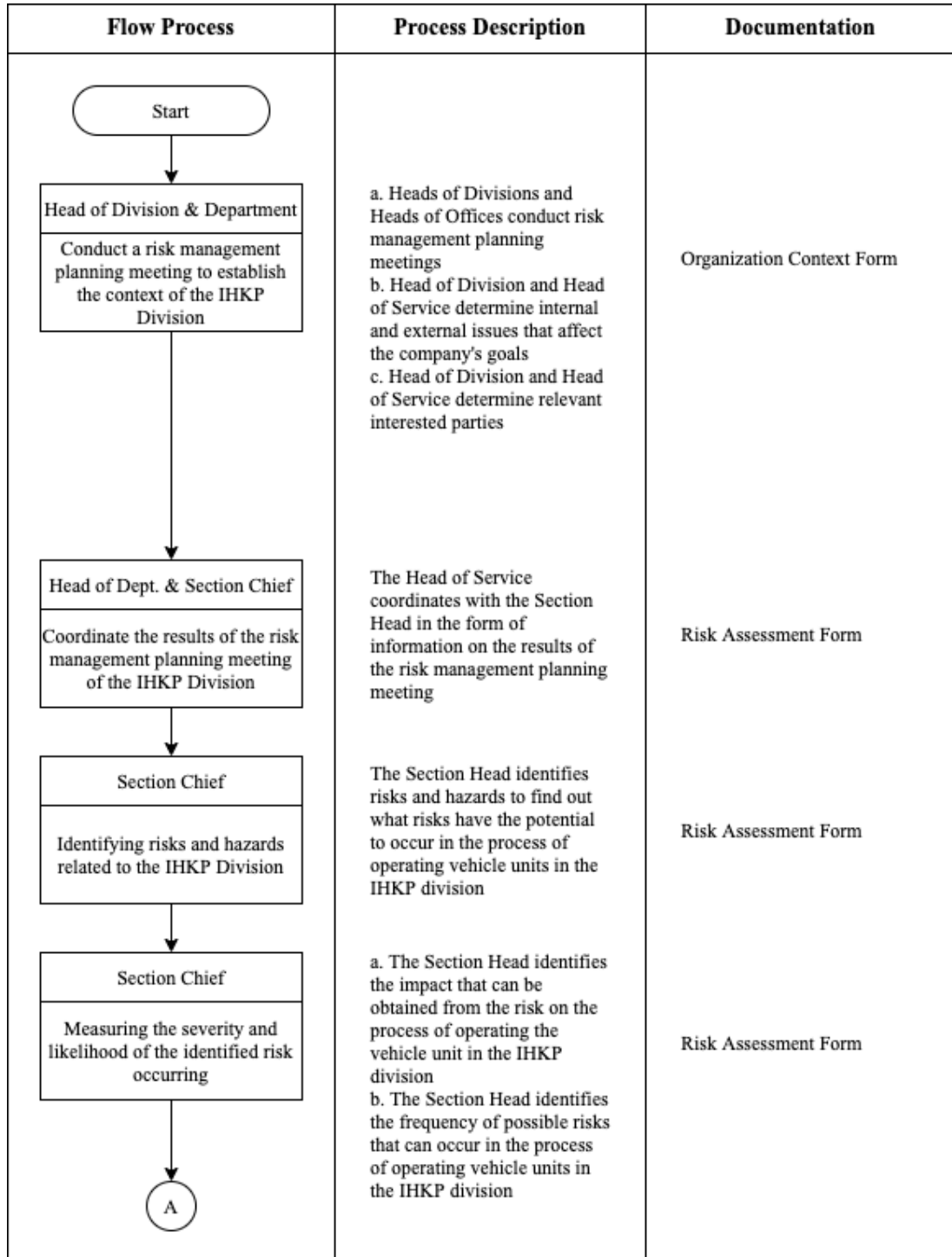


Figure 3. Design Description of Risk Management System Process

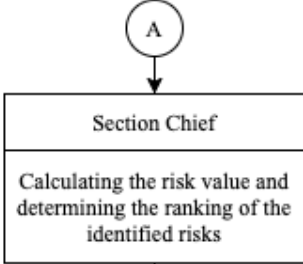
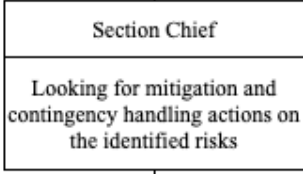
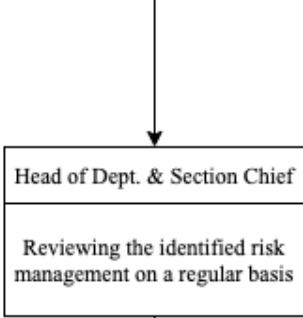
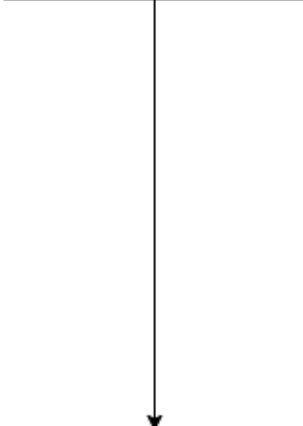
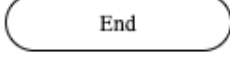
Flow Process	Process Description	Documentation
	<p>a. The Section Head conducts an assessment of the identified risks based on the impact and frequency of possible risks occurring</p> <p>b. The Section Head assigns a ranking to the risk according to the risk value that has been obtained</p>	<p>Risk Assessment Form</p>
	<p>a. The Section Head determines which risks need to be taken and which ones are accepted based on the risk ranking</p> <p>b. Section Head identifies the root causes of selected risks to seek mitigation and contingency risk management actions</p>	<p>Risk Treatment Form</p>
	<p>a. The Head of Service and Section Head together review risk management periodically every six months</p> <p>b. If there is still a risk that has a high risk value, a new treatment will be carried out because it cannot be accepted by the company</p> <p>c. If there is no risk that has a high risk value, then the treatment is considered appropriate because the risk has been accepted by the company</p> <p>d. If there are new potential risks other than the identified risks, an update of the risk register is carried out</p> <p>e. If there are no new potential risks, such as identified risks, no need to update the risk register</p>	<p>Monitoring Form</p>
	<p>a. Head of Division and Head of Service receive the results of the risk register which has been reviewed every six months</p> <p>b. Head of Division and Head of Service evaluate the results of the risk register which has been reviewed every six months</p> <p>c. Head of Division and Head of Service provide feedback on the implementation of risk management</p> <p>d. Head of Service and Head of Service make improvements based on feedback if needed</p>	<p>Monitoring Form</p>
		

Figure 3. Design Description of the Risk Management System Process (Continued)

5. Conclusion

The results of the proposed risk management system design are in the form of a risk management system SOP that is useful to assist companies in carrying out risk management processes. In accordance with the implementation analysis that the author has done, the results of the design have three advantages that can benefit the company and two drawbacks that are still being addressed.

In verifying the design results, the researcher sends a verification checklist sheet to the company to ensure whether the SOP draft is clear enough and in accordance with the company. Based on the verification carried out by the company, the results of the SOP design were found to be the objectives of the risk management system and those requirement rules. So, it can be concluded that the results of the process improvement design in the risk management system of the IHKP division are acceptable and feasible to be implemented.

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References

- Abu Al-Rub, F., &Shibhab, P. (2020). Quality Management Systems (ISO 9001:2015) Green nanoparticles for wastewater treatment View project Fostering Academia Industry Collaboration in Food Safety and Quality-FOODQA: 574010-EPP-1-2016-1-JO-EPPKA2-CBHE-JP View project. <https://doi.org/10.29011/978-1-951814-01-4-002>
- Alexander Roberts William Wallace Neil McClure, P. (2012). Strategic Risk Management. www.ebsglobal.net,
- Arumbasari, A., &Rhamadani, P. (n.d.). Developing Standard Operating Procedure for Production in North Sumatra Construction Companies. 2021. <https://doi.org/10.35891/jkie.v8i2.2524>
- Crane, L., Gantz, G., Isaacs, S., Jose, D., & Sharp, R. (2013). Introduction to Risk Management Understanding Agricultural Risks: Second Edition.
- Darmawi, H. (2008). Manajemen Risiko. Bumi Aksara.
- Department of Occupational Safety and Health. (2008). Guidelines for Hazard Identification, Risk Assessment and Risk Control (HIRARC). Jabatan Keselamatan dan Kesihatan Pekerjaan.
- Djojosoedarso, S. (1999). Prinsip-prinsip Manajemen Risiko dan Asuransi. Salemba.
- Douglas C. Montgomery. (2013). Statistical Quality Control.
- Fahmi, I. (2010). Manajemen Risiko. Alfabeta.
- Fatimah, F. (2016). Pedoman Praktis Menyusun Standard Operating Procedure.
- Fauzi, A., Mas'ud, M. I. (2019). Proses Manufaktur pada Mesin Primer dan Sekunder CV. Karunia Menggunakan Metode Linier Programming. Journal Knowledge Industrial Engineering(JKIE), 6(2), 59–65.<https://doi.org/10.35891/jkie.v6i2.2055>
- Goetsch, D., & Stanley, D. (2014). Quality Management for Organizational Excellence: Introduction to Total Quality. Pearson Education Limited.
- Hanik, U., & Mas'ud, M. I. (2019). Perencanaan Inovasi Pengembangan Agrowisata Bukit Flora Dengan Pendekatan Metode Bisnis Model Kanvas. JKIE (Journal Knowledge Industrial Engineering), 6(3), 81–90.

- Harsoyo STAI Miftahul Ula Nglawak Kertosono Nganjuk, R. (n.d.). Model Pengembangan Mutu Pendidikan (Tinjauan Konsep Mutu Kaoru Ishikawa). <https://doi.org/10.21154/sajiem.v2i1.44>
- ISO 9001. (2015). Implementasi Sistem Manajemen Mutu. www.facebook.com/msukamta
- ISO 31000. (2018). BSI Standards Publication Risk Management - Guidelines (British Standards Institution, Ed.).
- Junaedi, D., Mas'ud, M. I. (2018). Penerapan Metode Forecasting dalam Perencanaan Produksi Bakpia dengan Menggunakan Software POM Guna Memenuhi Permintaan Konsumen. *Journal Knowledge Industrial Engineering (JKIE)*, 5(3), 121–128. <https://doi.org/10.35891/jkie.v5i3.2042>
- Kululanga, G., & Kuotcha, W. (2010). Measuring project risk management process for construction contractors with statement indicators linked to numerical scores. *Engineering, Construction and Architectural Management*, 17(4), 336–351. <https://doi.org/10.1108/09699981011056556>
- Robbins, Stephen., & Coulter, Mary. (2012). *Management*.
- Sukamta. (2016). *Awareness ISO 9001:2015*. TUV Rheinl and Indonesia.
- Susan Page. (2015). *The Power of Business Process Improvement 10 Simple Steps to Increase Effectiveness, Efficiency, and Adaptability*.