Influential factors in development of integrated management system (quality, occupational safety and health and environment management system) in monitoring and evaluation system for performance improvement in Indonesia construction company.

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Abstract. Implementing an integrated monitoring and evaluation system in an Integrated Management System (IMS) is an effective way to monitor performance and evaluate in corporate management. The purpose of this research is to identify the factors that influence the integrated monitoring and evaluation system in the Integrated Management System such as Quality, Occupational Safety and Health, and Environment) and how to develop IMS in monitoring and evaluation system to improve the performance of construction company. The investigation has been conducted via company case studies and surveys to project management experts from construction companies in Indonesia. From the analysis of resulted data, the influential factor has been addressed and integrated to the existing integrated management system to develop monitoring and evaluation system for improvement of company performance.

1. Introduction

According to Indonesia Construction Services Act No. 2 year 2017, construction service is a community activities to realize the building that serves as a supporter or infrastructure of social activities, social economy in order to support the realization of national development goals. To achieve these objectives, construction service providers or companies must implement all those aspect in their works. Therefore, companies need to assess what factors affect their performance. The company is said to have a good performance if it excels on indicators of profitability, growth, sustainability, and competitiveness [1].

Organizational performance has been defined as an organizational ability to fulfill its mission through sound management, strong governance, and a determination to achieve results. It involves repetitive activities to set organizational goals, monitoring progress, and making adjustments to achieve those goals more effectively and efficiently. It can be measured by competitive advantage and differentiation from hard work that focuses on development to provide high-quality services to improve efficiency through change management techniques, which include application of quality management system and environmental standards to reduce product cost and improve product quality [2].

Although the construction industry is project-based, there is a clear relationship between companies and projects that makes performance measurement more complicated. Project-level measures multiple indicators that do not reflect the performance of the entire company. In contrast, company-level policies affect project-level performance measures [3]. Therefore, El Masalah [4] emphasizes the need for enterprise-level performance measurement schemes. In addition, the perception of project and executive managers on the performance are varies due to their different focus [3]. It is uncommon to see cases where the relationship between firms and projects is weak, and project participants ignore a number of important steps for the company. Therefore, it is very important to be considered that the results of the project performance measurement should be applied both on the project and company level [5]. Measurements can be performed by monitoring or supervision. It is crucial to obtain facts, data and
information about the implementation of the program, whether the process activities is carried out to implement the planning. Furthermore, the findings of the monitoring can be used as the information for the evaluation process so that the results of whether the program established and implemented to obtain a matching result [6]. From previous research, IMS show good improvement in healthy industry [7], steel construction industry [8] and also manufacture [9]. The culture and track record of IMS prove that organizational commitment to improve performance can result in cost effectiveness, increased employee and customer satisfaction, and sustained progress [10]. IMS becomes a new strategy for some organizations based on transparency, efficiency, and integrity [11]. System Integration ensures that the company can manage industrial activities and processes as it reduces duplication of activities and costs [12].

Regarding system integration, Karapetrovik reports that there are three types of organizations: organizations that have only integrated documentation, which has integrated processes, objectives and capabilities, and those who have all parts of an integrated management system in a single management system [13]. Leaders describe the following perceived benefits: system understanding, fewer audits, integrated procedures, focus on activities, ease in understanding integrated policy, overview of the whole system, document control, organizational training and auditing, centralized information; better disciplinary management, integrated standards; integrated policy; single audit; The integrated form [13].

Based on the case study at a state-owned construction company in Indonesia in 2018, the Quality and Work Safety and Environment Management System has been implemented through the implementation of ISO 9001, ISO 14001 and OHSAS 18001 by applying the ISO 9001, ISO 14001 and OHSAS 18001 matrix and regulations legislation governing the implementation of work and safety and health and environmental standards. In integrated monitoring and evaluation systems in construction companies, there are problems found both before and after integration, including inaccurate timing, inaccurate data, unclear monitoring mechanisms, poor quality of data and information and unclearness of stakeholders for monitoring and evaluation responsibilities. Based on the 11 companies that has been surveyed, the resulted data can deliver the information about benefits and problems after company implemented the IMS. It has been found that eight companies perceives an effectiveness in internal and external auditing firms, six companies perceives more time-saving and better external company images, five companies have ease in managing business risk, reduce individual system conflicts, cost-effective and reduce internal management complexity. In addition, three companies have increase in business focus and employee motivation. Two companies have an increase in cultural compatibility, and one company felt that this IMS has provided continuous improvement.

Although companies have benefited from the implementation of IMS, there are still shortcomings in existing systems such as inaccurate timing, inaccurate data, lack of clarity of monitoring mechanisms, poor quality of data and information, and unclear responsibilities of monitoring and evaluation stakeholders. This disadvantages or problem can be the factors to improve as the development of integrated management system in integrated monitoring and evaluating.

IMS has an impact on the company's business for both social, environmental and sustainability issues. It also raises management issues for efficient and effective structures and performance management systems [14]. The need for integrated monitoring and evaluation as well as to avoid slow economic growth, high competition, and restructuring of the construction industry have put pressure on construction companies to continue to improve their productivity and performance [15]. From the results of observation, it get the conclusion that the monitoring and evaluation system on the integrated management system in the state-owned construction company in Indonesia is still not optimal and has shortcomings. Therefore, it is necessary to examine what factors are needed integrated monitoring and evaluation system on integrated management system to improve company performance.

2. Research Method
In this study, there are two researches question. The first question (RQ-1) is to find the important factor that influence the integrated monitoring and evaluating system in IMS. The data collection was conducted by study of literature and validate using Delphi method (expert survey) of five experts of
construction management system. Pilot survey has been conducted to find out whether the questionnaires is understandable to respondents. In addition, survey respondent with quality and HSE experience in construction company has been performed. This study used statistical analysis using SPSS version 2.0 to obtain data validation and reliability test.

Research Question 2 (RQ-2) is Identifying influence factor to develop IMS in monitoring and evaluating system to improve performance in construction company. To obtain the input of RQ-2, the researcher conducted case study in Govern Construction company in Indonesia to see the existing of IMS implementation. The study case is done to 11 from 16 Govern construction company in Indonesia which consist of contractor company and Construction management company.

3. Conceptual Model
The conceptual model in this research uses the approach of the synthesis between variables with frame work of the concept (see Figg.1].[16]

4. Literature Review

4.1 Integrated Management System
IMS (Integrated Management System) is a management system that channels modular and mutually supportive business processes through quality, safety and environmental management regulated around the organization's holistic needs. This is a simplification of organizational structure, resources and management that presents opportunities to reduce bureaucracy, duplication of activities, documents and divisions commonly associated with separate management systems [17]. An integrated management system (IMS) can be understood as a series of interconnected processes that share human resources, information, materials, infrastructure, financial resources. IMS is organized to meet the objectives associated with satisfying different stakeholders [13]. Implementation of IMS includes ISO 9001 Quality Management, Environmental Management and Occupational Safety and Health Management ISO 14001 OHSAS 18001 but not limited to this standard. IMS is a management system that combines all business components into a comprehensive system that enables the achievement of its goals and mission [18].

4.2 Monitoring and Evaluating System
Monitoring is an ongoing activity monitoring activity to ensure the conformity of the process and performance as planned. If found irregularities or inaction then immediately fixed so that activities can run according to plan and target. Thus, the results of monitoring into input for the interests of the next process [19]. Evaluation is a step closely related to monitoring activities, because evaluation activities can use data provided through monitoring activities. In planning an activity evaluation should be an integral part, so it can be said as a complete activity. Evaluations are directed at controlling and controlling the achievement of goals [10].

![Figure 1. Conceptual Model](image-url)
5. Discussion and Conclusion

According to Bassioni [21] Company performance consists of profit performance, safety, and productivity. In construction company, the performance has 9 sub-indicators/ factor which can influence by integrated monitoring and evaluation. They are company profit, client satisfaction, partnership development and corporate social responsibility, sustainability, safety culture, effectiveness, efficiency and product conformance. From the research objectives, it is known that there are three factors that influence the development of IMS: monitoring process, integration of technical system, and data process. Based on literature studies, these three factor derive another nine (9). Futhermore, there are additional three indicators of expert validation, so the total is 11 sub-indicators that have influence to improve company performance after validate by expert. From the final survey and expert analysis, the variable and indicators to answer RQ – 1 are listed in the table 1 below:

**Table 1.** Factor that influence development of integrated monitoring and evaluating system in Iims for performance improvement of construction company

| Construction company performance improvement | Rank | Code   | Integrated monitoring and evaluation                      |
|-----------------------------------------------|------|--------|-----------------------------------------------------------|
| **Y.1 Profit**                                | 1    | X1.2   | Monitoring system with actual time                        |
|                                               | 2    | X3.2   | Measurement                                               |
|                                               | 3    | X2.2   | Data exchange procedure and protocol                      |
|                                               | 4    | X1.1   | Monitoring system with actual time                        |
|                                               | 5    | X3.1   | Data identification                                       |
|                                               | 6    | X3.4   | Data structure                                            |
|                                               | 7    | X3.5   | Data Analysis                                             |
|                                               | 8    | X3.3   | Reporting                                                 |
|                                               | 9    | X1.4   | Access Resources                                           |
|                                               | 10   | X2.1   | Communication between system                              |
|                                               | 11   | X1.3   | Work unit                                                 |
| **Y.2 Safety**                                | 1    | X1.2   | Monitoring system with actual time                        |
|                                               | 2    | X2.1   | Communication between system                              |
|                                               | 3    | X3.4   | Data structure                                            |
|                                               | 4    | X3.1   | Data identification                                       |
|                                               | 5    | X3.2   | Measurement                                               |
|                                               | 6    | X1.1   | Monitoring system with actual time                        |
|                                               | 7    | X2.2   | Data exchange procedure and protocol                      |
|                                               | 8    | X1.3   | Work unit                                                 |
|                                               | 9    | X1.4   | Access Resources                                           |
|                                               | 10   | X3.3   | Reporting                                                 |
|                                               | 11   | X3.5   | Data Analysis                                             |
| **Y.3 Productivity**                          | 1    | X2.1   | Communication between system                              |
|                                               | 2    | X2.2   | Data exchange procedure and protocol                      |
|                                               | 3    | X1.2   | Monitoring system with actual time                        |
In eleven existing indicators, from each performance can be seen that all of indicators 100% very influential in integrated management system in integrated monitoring and evaluation.

After found the factor that influence in integrated management system in integrated monitoring and evaluation, the development of integrated management system in integrated monitoring and evaluation can be done by propose influential factors to improve the problem that found previously in existing construction company by case study as follow:

1. **Knowing and determining the monitoring process criteria**

   In the monitoring and evaluation activities in the case study found problems of inaccurate data and low—quality data and information. That's because the planning and data collection is not organized. In the development of integrated management system (QMS and OHSEMS) on this monitoring and evaluation system begins with planning and data collection company. Data include company plans, financial plan project plans, company historical data, employment contracts and other data. This aims to make the monitoring process more focused. In monitoring process required system with actual time is needed. Data obtained as much as possible may soon be stored or distributed in order to avoid problems of timeliness. The data can be stored by including information in the form of data type, received time, processing time and deadline time. It is also necessary to know which work units are responsible for the monitoring process in order to avoid unclearness of stakeholders, and lastly Access Resources. An integrated management system should have access to both human resources and a source of information about the company as a whole. It is necessary to know the capacity of workers as well as the flow of communication and activity on the integrated management system on the monitoring and evaluation system in the company.

2. **Knowing and determining Technical System Integration criteria**

   From survey conducted it is found that communication between management system still done manually, that is using checklist and monitoring list done daily or weekly, but in the implementation of daily monitoring is not implemented properly. One resource person stated that daily monitoring is often duplicated at the end of the week so that the daily data received is not actual and delayed. With the integration of the technical system, communication between systems...
is created so that the work processes and activities of the company can be monitored well and the data received can be centered on an integrated system. With the technical system that facilitates the monitoring system with the actual time, can be seen the performance of the job responsibility stakeholders, for example on daily checklist, in case of delay in charging will affect to the performance of employees on duty and report will be recorded in the company system so it can be evaluated employee performance the. An integrated technical system is also required in monitoring the performance of corporate profits. Companies can monitor corporate finance and also the level of customer satisfaction services by directly involving users of the service in monitoring the progress of work done company. This needs to be facilitated with a technical system in the form of integrated information systems supported procedures and data exchange protocols for data flow data and activities to run effectively and efficiently in order to occur sustainability in the company's business processes and company performance in the future. For improved safety performance, the integration of the technical system plays an important role in the monitoring and evaluation system. In the monitoring of routine programs in the form of meetings, the training includes the fulfillment of on the job training, supervision and rules of government regulations, quality standards, safety and health and the environment and the applicable international standards. In the technical system required experts in the field of data management and technology.

3. Knowing and determining the criteria of data process
After knowing what is needed in the monitoring process and technical system, the next thing to be met is the method of data identification, data measurement, reporting, data analysis and data structure. This is required to manage existing or in-store data. Measurement and data analysis is needed to measure the performance of the company and its employees. In the process of data, a precise measurement standard is needed so that the monitoring process can be monitored and immediately followed up if the measurement standards are not achieved. In detail can be seen in the table below:

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