

# Analysis of the readiness towards the implementation of ISO standard 9001: 2015 in the company of heavy equipment

Suhendris<sup>1</sup>, Dana Santoso<sup>2</sup>

<sup>1</sup>Quality Assurance Manager PT Daya Kobelco Construction Machinery Indonesia

<sup>2</sup>Program Studi Magister Teknik Industri, Universitas Mercu Buana, Jakarta

Email: [suhendris@yahoo.com](mailto:suhendris@yahoo.com), [dana.s@mercubuana.ac.id](mailto:dana.s@mercubuana.ac.id)

**Abstrak.** Market alat berat di Indonesia sangat besar, peluang meningkatkan bisnis alat berat terbuka lebar, semua pesaing memberikan produk dan pelayanan terbaik untuk pelanggannya. Untuk itu perusahaan perlu membangun suatu sistem berstandar Internasional. Sistem tersebut dikenal dengan Quality Management System (QMS) dan dikembangkan dalam sertifikasi standar ISO 9001:2015. ISO 9001 adalah suatu standar yang berisi persyaratan Sistem Manajemen Mutu yang diterbitkan oleh International Organization for Standardization (IOS). Perusahaan yang menjadi objek penelitian adalah Perusahaan Alat Berat yang bergerak dalam bidang penjualan alat berat dan pelayanan purna jual. Permasalahan yang sedang terjadi di perusahaan ini adalah banyak pembayaran uang muka pembelian unit dan suku cadang yang tidak dapat ditagih dikarenakan dokumen yang terkait proses pembelian banyak yang tidak ada dan juga hilang, selain itu juga banyak komplain terkait ketersediaan suku cadang dan jasa servis, hal ini merupakan salah satu dampak tidak langsung belum menerapkan QMS ISO 9001:2015. Tujuan penelitian adalah untuk mengevaluasi kondisi Perusahaan Alat Berat saat ini dan menilai kesiapan Perusahaan dalam pemenuhan standar ISO 9001:2015. Metode yang digunakan adalah gap analysis persyaratan ISO 9001:2015. Perhitungan gap analysis menggunakan checklist yang dibuat berdasarkan persyaratan ISO 9001:2015, dan hasilnya menunjukkan seberapa besar kesiapan Perusahaan Alat Berat memenuhi standar ISO 9001:2015.

Kata kunci: industri, sistem manajemen mutu, gap analysis, ISO 9001:2015.

**Abstract.** Heavy equipment market in Indonesia is very large, the opportunity to increase heavy equipment business is wide open, and all competitors provide the best products and services for their customers. For this reason, companies need to develop an international standard system. The system is known as Quality Management System (QMS) and developed in ISO 9001: 2015 standard certification. ISO 9001 is a standard that contains the requirements of the Quality Management System issued by the International Organization for Standardization (IOS). Companies that become the object of research is heavy equipment company engaged in the sale of heavy equipment and after-sales service. The problem that is going on in this company is that there is a lot of down payment for the purchase of units and spare parts that cannot be billed due to the documents that are related to the purchase process, many of which are non-existent and also missing, besides that there are also many complaints regarding the availability of spare parts and service, this is one of the indirect impacts of not implementing QMS ISO 9001: 2015. The research objective is to evaluate the current condition of the Heavy Equipment Company and assess the readiness of the Company in meeting ISO 9001: 2015 standards. The method used is Gap Analysis requirements of ISO 9001: 2015. Calculation on Gap Analysis uses a checklist made based on the requirements of ISO 9001: 2015, and the results will show how much the readiness of the Heavy Equipment Company meets the ISO 9001: 2015 standard.

Keywords: industry, quality management system, gap analysis, ISO 9001: 2015.

## 1. Introduction

Heavy equipment market in Indonesia is very large, opportunities to increase heavy equipment business are wide open, and all competitors will provide the best products and services for their customers. The development of the system involves groups involved in making decisions in a company. According to Warren Bennis, management is defined as arranging work to be neat or tidying up something messy to be

organized or arranging everything to be smooth. So the management focus is on completing and completing tasks (Tukiran, 2016). In today's business era, many new initiatives such as quality improvement programs are effective as management strategies, as well as the dynamics of change that affect businesses to continue to improve the effectiveness and level of an organization's competition. All types of organizations, both multinational and national scale are constantly confronted with the need to adopt various strategic changes (Haffar *et al.*, 2016). Due to the increasingly tight world economic competition, many organizations have adopted and implemented an effective quality improvement program commonly referred to as Total Quality Management (TQM) as a management strategy. This is because TQM is able to complement other strategies that support an organization to achieve sustainable global marketing competition (Haffar *et al.*, 2016). TQM is an overall managerial approach that aims to integrate all organizational functions to continuously meet customer needs and improve system quality to enhance the profit and productivity of an organization (Mehralian *et al.*, 2016).

ISO 9001 is a standard which is very well known throughout the company engaged in manufacturing in the industrial products and services even how public services (Sumpono & Hasibuan, 2016). ISO 9001 certification provides benefits to the internal company, in the form of product quality and good company performance (Psosmas, 2014). ISO 9001 is a quality management standard (QMS) that helps companies or organizations to be more efficient and increased customer satisfaction (International Organization for Standardization). QMS is established on the international quality standard ISO 9001: 2000, which was later refined to ISO 9001: 2008 (Psosmas, 2010), where corrective and preventive actions at ISO 9001: 2000 are further developed so that corrective and preventive actions must be effectively impacted positive on the processes that occur in the organization (Tukiran, 2016). Jang and Lin on Psosmas (2014) implementing ISO 9001, have a direct positive impact on operational performance. From the customer perspective, implementing ISO 9001 creates positive sentiment from customers towards the manufacturing industry, and encourages customers to provide long-term support, and increases customer satisfaction and loyalty (Psosmas, 2014). In the study conducted by Psosmas (2014) the performance of companies that have implemented ISO 9001, far better than companies that have not implemented ISO 9001, the quality level of products that are produced better also shows that with ISO 9001 standards, companies are more oriented on the process that causes the quality and operational performance of a company to be better. "Kantner (1997) mentions that many companies have increased sales experience after obtaining ISO certification. Calingo (1995) states that with ISO 9000 companies can achieve a better quality system, customer satisfaction, competitive power, and reduction of quality problems.

Every five years, IOS as the parent organization that is responsible for the harmonization of applicable standards in the world, reviews the ISO standards that have been issued. At present, ISO 9001 has entered into the fourth revision until the issuance of the ISO 9001: 2015 international standard, where planning and control from the leadership of the organization becomes an important and main part. When compared with the previous version, the updates contained in the ISO 9001: 2015 standard are explicit requirements regarding risk-based thinking that will be used to support and improve understanding and applications in the process approach that already exists in previous versions. This is manifested in the requirements for the establishment, implementation, maintenance and continuous improvement of the quality management system. By implementing Risk-based thinking the organization will certainly get the expected results and achieve continuous improvement (Tukiran, 2015).

Heavy Equipment Company is a company engaged in the sale of heavy equipment and after-sales service, the company has three divisions, namely marketing division, Product Support division, and Operations division. The company has adopted some of the required standards set out in ISO 9001, but not certification is due to the lack of commitment from the leader and the lack of resources needed to solve them. The purpose of the company to apply several ISO standards is to improve the competitiveness of enterprises, and improve the quality of the resulting product, so that customer satisfaction is maintained. Although some ISO standards have been implemented, many of the problems that occur in this company include many advance payments for unit purchases and spare parts purchases from customers who cannot be billed because documents relating to the purchase process are either missing or missing, as well as many complaints from customers related to the availability of spare parts and services, this is one of the indirect

impacts of the lack of implementation and ISO certification, which with the ISO certificate, indicating QMS of the company has been audited and has been run. This study aims to analyze the readiness of heavy equipment company if it will perform certification of ISO 9001: 2015 standard.

The certification of ISO 9001: 2015 standards needs to be done in order for the company to gain a sustainable competitive advantage (Psosmas, 2010), according to Zaramdi (2007) in Psosmas (2010) the benefits of implementing the ISO 9001: 2015 standard are improving product and service quality assurance, cost efficiency, increased organizational productivity, and enhanced corporate image in the public. Therefore, this study will use the gap analysis method to analyze the current condition of the company and compare it with the ISO 9001: 2015 standard to determine the readiness of the Heavy Equipment Company in conducting ISO 9001: 2015 certification. The results obtained from the gap analysis in the form of the percentage value of the readiness of the company in meeting ISO 9001: 201 standards and also can know the shortcomings of the current system for improvement. In addition, researchers will provide solutions / proposed improvements from the percentage of low readiness values.

Based on the background above, the problems that will be discussed in this study are:

- 1) Is there a gap between the ISO 9001: 2015 standard and the working process already in the Heavy Equipment Company.
- 2) Gap in which clauses need improvement to be able to advance to the ISO 9001: 2015 certification process.

The purpose of this study is to conduct an assessment to see the readiness of the Heavy Equipment Company in meeting the standards of the ISO 9001: 2015 Quality Management System.

## 2 Literature Review

### **ISO 9001: 2015 Quality Management System**

The ISO standard is a standard that contains requirements related to the Quality Management System issued by IOS (International Organization for Standardization). The ISO 9001 standard is a standard of management requirements and is not a product specification standard. As a standard of management requirements, the contents of ISO 9001 are a series of clauses-requirements that guarantee the consistency of the management process related to quality in a system. The clauses in ISO 9001 contain what must be done for organizations that want to implement, and build their own organizational management systems so that a management system is developed which defines how to conduct a series of activities that are specific requirements for their respective organizations.

According to the International Organization for Standardization, the quality management system is a way for a company to control activities that are interconnected (either directly or indirectly) to achieve the desired results.

Hadiwardjo and Wibisono (1996) mentioned, companies that run the quality management system tend to show the following properties:

1. There is a philosophy that prevention is better than detecting, correction, and outcome;
2. Consistent communication in the process and between production, suppliers and buyers;
3. Maintenance of documents that are careful and control them critically efficiently;
4. Quality awareness of all employees, very high management confidence.

ISO 9001: 2015 is the revised result every five years from ISO 9001: 2015. The revision process of ISO 9001: 2008 was started by ISO/Technical Committee (ISO/TC 176) aimed at ensuring the international standard of ISO 9001: 2015 reflects the changing of the increasingly complex and dynamic environment.

Ten Major Changes in Quality Management System ISO 9001: 2015 (ISO consultant, 2015), among others are:

1. The number of clauses increases  
ISO 9001: 2008 has 8 clauses while ISO 9001: 2015 has 10 clauses. When noted, the structure of the ISO 9001: 2015 clause is neater because it has been grouped well.
2. ISO 9001 Principle Reduced  
ISO 9001: 2008 has 8 principles while ISO 9001: 2015 has 7 principles.
3. A new term for the document  
At ISO 9001: 2008, distinguished between quality documents (documents) and quality records (records). At ISO 9001: 2015 both are referred to as documented information. By combining this term, the organization is given the freedom to determine the documented information needed. No longer required to be in the form of procedures (such as 6 compulsory procedures).
4. No Compulsory Procedure  
ISO 9001: 2015 seems to be trying to eliminate the impression that the application of ISO 9001 only relies on the creation of SOPs or procedures. ISO 9001: 2015 is no longer too concerned with documents. ISO 9001: 2015 processes oriented. Although, the existence of a documentation system is still required. It's just simplified into "Documented Information".
5. Manual Quality is Not Compulsory  
Many feel that quality manuals are just a formality document that gives no added benefit. Therefore, the existence of a quality manual in ISO 9001: 2015 is not mandatory. This does not mean a quality manual that has been created should be deleted. We may still use it when needed.
6. Management Representative is not mandatory  
ISO 9001: 2015 does not require the existence of a management representative who must be appointed officially. This could be so that the implementation of ISO 9001 is expected to not only rely on a person in charge only. Each person, especially the person in charge of each department / division / department has the same duties and responsibilities in implementing the ISO 9001: 2015 quality management system.
7. There are no clause exceptions (exclusion)  
ISO 9001: 2008 allows the exclusion of one of the clauses or sub clause 7 if there are irrelevant regulations. None of the ISO 9001: 2015 clauses expressly explain the ability to exclude one of the ISO 9001: 2015 clauses.
8. Replacing the term Preventive Action with Risk Management  
This is one of the most significant elements of change from ISO 9001: 2015. The term preventive action is now replaced with a wider scope, namely risk management.
9. Distinguishing the Terms of Products and Services  
Products according to ISO 9001: 2008 may be goods and services as contained in clause 3 Terms and Definitions: If in the entire International Standard script it is found that the term "product" may also mean "service".  
In the ISO 9001: 2015 version, both are differentiated to provide clear boundaries between goods and services.
10. Replacing several terms  
There are some terms that are replaced in the ISO 9001: 20015 version. Among them:
  - "supplier" is replaced with "external provider"
  - "Purchased Product" replaced with "Externally provided products and services"
  - "Work Environment" is replaced with "Environment for the operation of the process."

### Gap Analysis

Gap analysis is defined by the IT Infrastructure Library (ITIL) as an activity that compares two kinds of data and identifies the differences. Gap analysis is usually used to compare a requirement. Gap analysis is

generally structured in one area, topic or category, thus making the gap analysis efficient to know which sector or field needs to be fixed. Gap analysis becomes effective because the checklist is structured and in accordance with the topic. The checklist will cover all existing requirements and be made hierarchically in its assessment; this will include general questions and provide an overview of the topics or categories to be assessed. Questions on the checklist are made in full, detail and make an assessment of each individual's requirements if needed. Each question relates to another question to ensure its traceability (Picard *et al.*, 2016). Table 1 describes the steps in doing a gap analysis.

Table 1 Score gap analysis

Score	Current Organizational Conditions
1	The organization does not understand the standards requested and does not want to do it
2	The organization understands the importance of standards, but does not do it
3	The organization has documents but not implemented or implemented but no recording
4	Organization is already implemented but not consistent
5	Organization is already implemented and consistent

Respondents will give a values/score for each question in the ISO 9001: 2015 internal audit checklists according to current conditions within the company.

- Assessment of checklist

Values obtained from all respondents who have been included in the internal audit checks ISO 9001: 2015 then calculated the average value, by summing the score then divided by the number of respondents.

Assessment of checklist ISO 9001:2015 by respondent based on current company condition. Respondents selected were respondents who had sufficient competence. Assessments made under the scoring conditions described in table 1 above.

- Assessment of gaps

The gap assessment aims to see how big the gap is in the company. From the results of the checklist, the average score for each question is then divided by the maximum value in the gap analysis score variable. The percentage value obtained for each question is then summed and divided by the number of questions for each sub clause, then to assess the percentage per clause is obtained by summing the percentage value of the sub clause then divided by the number of sub clauses and to know the total percentage of compliance requirements ISO Standard 9001: 2015 can be calculated by summing the percentage value of all clauses then divided by the total number of clauses. In meeting the ISO 9001: 2015 minimum standards, the minimum company gets a percentage value of 61%. The greater the percentage obtained, it indicates that the company is increasingly ready to advance ISO 9001: 2015 certification. The smaller the gap is, the better. To measure readiness the percentage value generated shows the readiness of the company in implementing ISO 9001: 2015. Table 2 shows the proposed range of gap values.

Table 2 Proposed range gap analysis

Percentage	Description
61% ~ 100%	The organization recommended advanced ISO 9001:2015 certification
41% ~ 60%	Organization need small improvements to advance ISO 9001:2015 certification
21% ~ 40%	Organization need major improvements to advance to ISO 9001:2015 certification
1% ~ 20%	The Organization is not yet committed to implementing QMS and ISO 9001:2015 certification

The higher the percentage value obtained shows that the readiness value of the company meets the ISO 9001: 2015 standard and is ready to advance certification. Minimum standard percentage obtained by the company to be able to advance certification is a percentage value of 61%, if below the percentage value; the company is advised to make improvements first before advancing to certification ISO 9001: 2015.

### 3 Method

#### Research methods

Gap analysis method is the method used in this study. Gap analysis is done by comparing the conditions at the time of research with the conditions that should be achieved to meet the ISO 9001: 2015 standard. Assessed are quality system documents that have been created and implemented by the company. The document is known from the results of interviews with several Directors using the ISO 9001: 2015 internal audit checklist and direct observations in the Heavy Equipment Company. The research results obtained will be given an assessment of 1 - 5 for each question and then calculated on average for each question and the percentage is calculated then the percentage is calculated for each sub clause, for each clause and the total requirements of the ISO 9001: 2015 standard and a range of company readiness for implementation. The range is obtained from discussions with experts. The assessment will be used to evaluate the gap against the requirements of ISO 9001: 2015. The gap that arises will determine the priority of improvements that will be made to meet the requirements of ISO 9001: 2015.

#### Stages of Implementation ISO 9001:2015 Certification

In general, before the ISO certification process is carried out, there are stages that must be passed first by the company so that during the certification audit the company can be recommended to get ISO certification. These stages are commonly used by management consultants in helping their clients get ISO certification. The preparation stages for ISO are as shown in Figure 1.



Figure 1 Stages of ISO certification preparation

In this study, the authors limit the scope of the study only to the preparation of documentation in order to meet the minimum standards of ISO 9001: 2015.

#### Research Stages

Research Stages are the stages of the process that are arranged systematically that will be carried out in this study. The research stages can be illustrated in Figure 2.

#### Identify Research Criteria

The research criteria used in this study were taken based on the clauses contained in ISO 9001: 2015; Table 3 shows the research criteria.

Table 3 Research criteria

Clause	Description
4	Organizational Context
5	Leadership
6	Planning
7	Support
8	Operational
9	Performance evaluation
10	Improvements

From the research criteria above, the clauses will be elaborated into sub clauses for each class. Table 4 shows the sub-clauses for each clause.

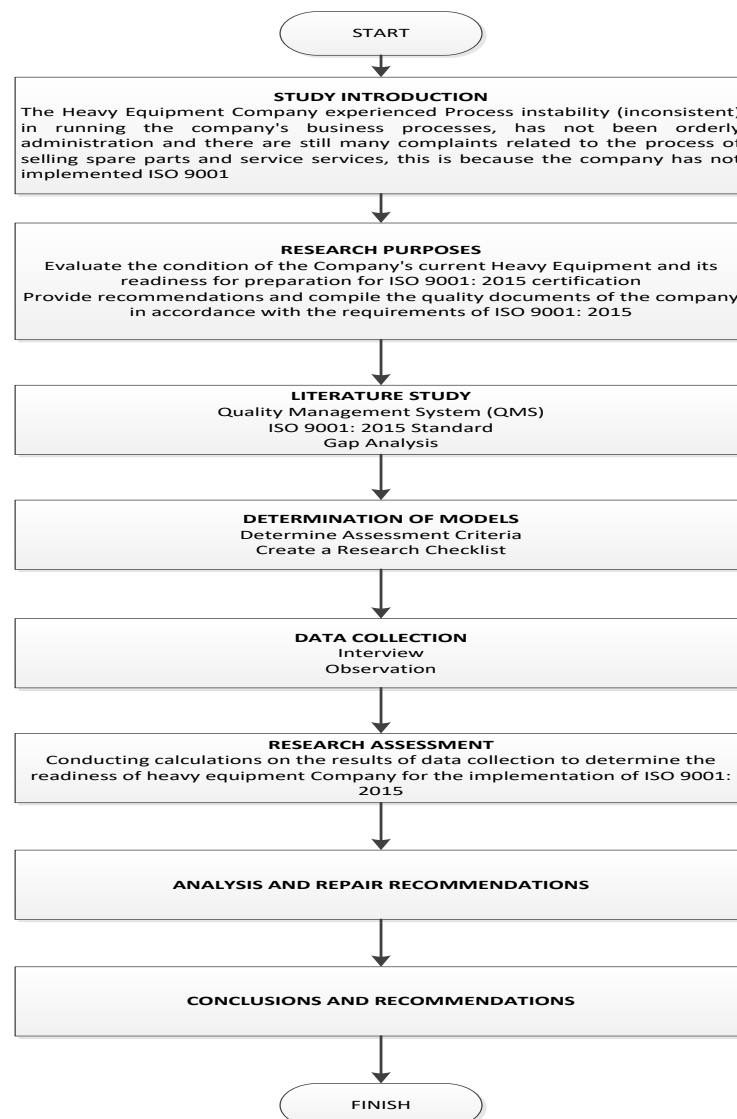


Figure 2 Research stages

**Data collection**

Primary data collection was obtained from field observations and interviews with respondents, and in this study the primary data was also obtained from the system observation process and contained in the ISO 9001: 2015 internal audit checklist with the aim of knowing the company's readiness condition if it wanted to apply for certification. Respondents to fill in the ISO 9001: 2015 internal audit checklists are selected from top management levels, namely the Marketing Director, Support Product Director and Operations Director. Respondents were selected because they have authority in determining the decision for ISO 9001: 2015 certification in Heavy Equipment Company.

**Data processing**

The results of the primary data obtained are then processed by calculating the average value for each question in the checklist shown in the table below. And finally the average percentage will be calculated for all clauses in the ISO 9001: 2015 checklist, like the Table 5.

Table 4 Sub Clauses

Clause 4 Organizational Context
4.1 Understand the organization and its context
4.2 Determine the scope of the quality management system
4.3 Quality management systems and processes
4.4 QMS and Process
Clause 5 Leadership
5.1 Leadership and commitment
5.2 Policy
5.3 Organizational roles, responsibilities and authority
Clause 6 Planning
6.1 Actions to deal with risks and opportunities
6.2 Quality objectives and planning for achieving them
6.3 Planning changes
Clause 7 Support
7.1 Resources
7.2 Competency
7.3 Awareness
7.4 Communication
7.5 Documented information
Clause 8 Operational
8.1 Operational planning and control
8.2 Requirements for products and services
8.3 Control of external products and services provided
8.4 Production and service provision
8.5 Release of products and services
8.6 Control over unsuitable output
Clause 9 Performance Evaluation
9.1 Monitoring, measurement, analysis and evaluation
9.2 Internal audit
9.3 Management Review
Clause 10 Improvement
10.1 General
10.2 Nonconformities and corrective actions
10.3 Continuous Improvement



Table 5 Calculate the Percentage of the Average Value of the Clause

Clause	Description	Value (%)
4	Organizational Context	47%
5	Leadership	44%
6	Planning	57%
7	Support	81%
8	Operational	80%
9	Performance evaluation	40%
10	Improvements	72%
Readiness Value		60%

The calculation results of the percentage obtained for each of the above clauses will show the value of the heavy Equipment Company's readiness to meet the ISO 9001: 2015 standard. Readiness values below 61% still need improvement to meet minimum standard and recommended to advance ISO 9001: 2015 certification.

The percentage value results for each clause can be described using spider charts as shown in Figure 4 below.

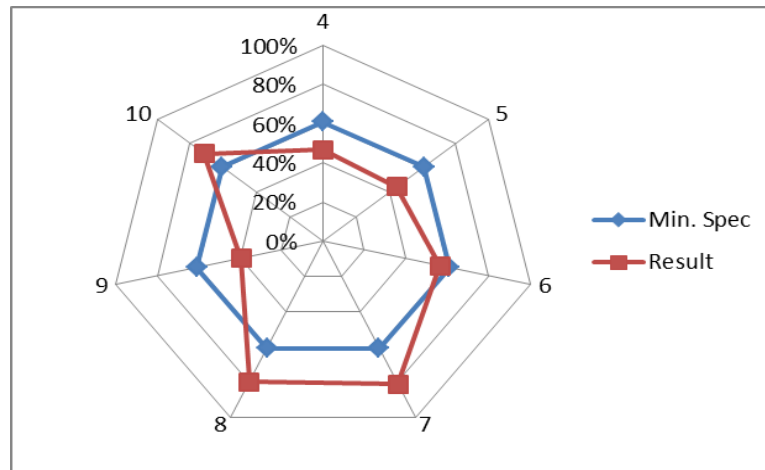


Figure 4 Spider chart value percentage clauses

#### 4 Conclusion

Based on the research that has been done, the researcher has successfully conducted the assessment for each clause of the requirements of SMM ISO 9001: 2018 and the result found gap in some clauses of ISO 9001: 2018 which is still below the minimum value of 61% and if the Heavy Equipment Company plans to certify ISO 9001: 2018 then the gap must be met first.

The researcher also proposes the preparation of the required documents to cover the gap and fulfills the minimum value of each clause that obtains a readiness score below 61%, ie clauses 4, 5, 6 and 9. Once fulfilled, the Heavy Equipment Company can follow ISO 9001: 2018 certification.

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