# Implementation of Quality Management System in compliance CSR (Customer Specific Requirement) using the Barcode System

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**Abstract:** In the era of Industry 4.0 towards the era of society 5.0, it prioritizes the use of technology in carrying out processes and monitoring systems. In the manufacturing industry, especially in the inventory management process, it is very necessary to develop a system for monitoring the quality of its products, both in monitoring processes and in data processing, this functions in determining company policy. The center of Inventory is the process of storing goods, where the entry and exit of goods must be properly monitored so that the FIFO (First In First Out) cycle runs effectively. The implementation of the IATF 16949 Quality Management System in the warehouse department serves as a basis for maintaining the quality of goods in accordance with predetermined clauses. The essence of these standards is the fulfillment of the requirements set by the customer, where these requirements are contained in the CSR (Customer Specific Requirements) clause. Warehouse management in fulfilling these requirements innovates by implementing a barcode system to manage inventory, such as in the process of receiving goods to the process of sending goods, besides that it also acts as a control and filtering medium for CSR fulfillment. The goods to be sent to the customer must comply with the clauses contained in the CSR. With a barcode system, goods cannot be shipped or shipped if the specifications are not in accordance with CSR, because the barcode system implants a filter or provisions that are adjusted to CSR. Therefore the function of implementing the Barcode System is to assist the delivery process so that customer claims do not occur and provide benefits to all processes contained in the warehouse department in optimizing inventory, besides that the system is a way to meet customer satisfaction.
**Keywords**: Inventory, Quality Management System, CSR,  Barcode System

## INTRODUCTION

In the era of digitalization, the use of information technology has been implemented in almost all industrial sectors, including in Indonesia. With the aim of balancing technology-based life besides functioning to increase the quality and quantity of activities in these sectors. The manufacturing industry sector is one that has experienced a fairly rapid increase or technological development, by implementing changes to the 4th industrial revolution, better known as Industry 4.0.

Industry 4.0 is the designation for the current trend of automation in the form of updated and real-time monitoring of data, such as the use of servers, databases, internet networks,

clouds and computer-based applications. Industry 4.0 apart from prioritizing technology, is also supporting in implementing quality management.

The manufacturing industry is the basis of a nation in the economic field which greatly influences people's livelihoods. Emerging technologies can have a major impact on the running of model manufacturing, monitoring, production and even business processes.

In general, the inventory stage is a very important process for every manufacturing company. The stages of the process are the process of receiving goods, storing goods until the process of sending. The application of the IATF16949 Quality Standard is useful as a condition for companies so that goods can be sold to various countries. Basically, large companies engaged in the automotive industry require that they have quality standard certification. This is a guarantee that the goods to be sold are of good quality or quality. The clause on the terms of demand for goods in the IATF 16949 quality standard is on CSR (Customer Specific Requirement) items

However, problems that often arise in the inventory process, especially at the stage of delivery of goods, are incompatibility of goods sent with requests required by customers, such as related to wrong items, number of items, tire age, wrong stickers and others. This causes customer claims which have an impact on decreasing demand for goods, up to the revocation of the certification, then in the long run the company will suffer losses and may even experience bankruptcy.

One form of fulfilling CSR is management optimizing the use of technology to prevent claims from occurring massively, selecting the Barcode System as a tool for fulfilling quality standards in the CSR clause, which focuses on shipping goods, this can be used as a solution to this problem.

In this paper, it will be discussed that the problem of implementing a quality management system in the CSR clause can be overcome by utilizing Barcode System technology. This is a manifestation of the company's commitment to fulfilling customer satisfaction and as a form of implementing Industry 4.0 technology.

## LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

As for research related to "Innovative Quality Management System for Flexible Manufacturing System" (T. Bihi, et al) regarding the use of FMS (Flexible Manufacturing System) in developing and optimizing Quality Systems. The main components of this system are FMS, Quality System, sensoric, and database. In the next study "Reliable and flexible Quality Management Systems in the automotive industry: monitor the context and change effectively" (LM Fonseca, et al), the results of the research are Barcode this research highlights the need for the automotive industry OEMs and Suppliers to properly monitor the organizational (internal and external) context and identify the key issues that affect the ability of their QMS to deliver quality products, and to plan, design, implement and control change in an effective and timely manner, within the whole supply chain.

Based on research by experts, Barcode means a line-shaped code where the thickness of each line is different according to the contents of the code, the code represents certain data or information, usually the price of goods such as food and books [3]. Codes in the form of black and white lines like the example in Figure 2 are useful as storage media for identification data, inventory, shipping data and tracking of goods. The data will be stored in a useful database to facilitate the process of managing inventory in the Warehouse. As for reading the barcode using a scanner, then the data is processed when the scanner fires a laser towards the barcode, from this process information will appear related to the name of the item, type of item, location of placement of the item, and data in and out of the item.

Inventory is a general term that denotes everything or organizational resources stored in anticipation of demand fulfillment. It can also be defined by the management of products or goods stored, identified for use at a certain time and for future purposes. Inventory or stock of goods consists of 3 types, namely raw material inventories, semi-finished products, and finished products. Warehouse as a storage place for finished goods, is tasked with managing the flow of incoming goods, storage, and outgoing goods, in the process there are

several systems that regulate the inventory process, namely by using the FIFO system (First In First Out) or using the FEFO system ( First Expired First Out).

The way the system works is that the barcode scan results will be processed by a server using the internet network and the data will be automatically stored in the Oracle database, by maximizing the Java programming language. Java is an object-oriented programming language also known as Object Oriented Programming (OOP).

The IATF standard 16949 is a global standard that provides Quality Management System (QMS) requirements for application in the automotive industry. This standard was developed by the world automotive organization, namely the International Automotive Task Force or abbreviated as IATF. The core of the IATF standard includes the requirements for fulfilling customer satisfaction contained in the CSR (Customer Specific Requirement). Where the benefits of IATF standards include:

1. Fulfilling customer needs by implementing Customer Specific Requirements
2. Repairing process and system documentation
3. Carrying out continuous improvements or improvements (Continual Improvement)
4. Prioritizing defect prevention measures
5. Implementing an effective system with Core Tools
6. Promote the reduction of process variations and waste in the supply chain.

**METHODS**

To understand the benefits of the barcode system in the inventory process, this paper uses a descriptive research method that describes facts and information in a systematic, factual, and accurate manner. With three stages of research, namely the method of data collection, the method of comparison of measuring instruments, and the implementation of the Barcode System. The data collection method used in this study was a literature study by collecting information based on books, journals and other reading sources related to the research title. The measurement tool comparison method is to compare literature studies with previous studies. Implementation of the Barcode System is to implement the entire inventory process from receiving goods to shipping.

**RESULT AND DISCUSSION**

he purpose of this research is to analyze and identify the application of the Barcode System in optimizing quality standards in the inventory process. As for the implementation of quality standards, there are several clauses that must meet the requirements, see in the following table.

**Table 1. Klausul IATF 16949:2016**

| Klausul  IATF 16949 : 2016 |
| --- |
| 1. Scope / Ruang Lingkup |
| 2. Normative References / Referensi Normatif |
| 3. Terms and Definitions / Istilah dan definisi |
| 4. Context of the organization / Konteks organisasi |
| 5. Leadership / Kepemimpinan |
| 6. Planning for the QMS / Perencanaan |
| 7. Support |
| 8. Operation |
| 9. Performance evaluation / Evaluasi kinerja |
| 10. Improvement / Perbaikan |

Source: Research data, 2022

Based on the explanation above, there are 10 clauses that must be fulfilled by the company. The finished goods warehouse department in implementing quality standards focuses on meeting customer requirements, the product is CSR, where there are items that must be fulfilled by the supply chain before the goods are shipped. In addition to shipping supplies to companies or large distributors, goods are also sent to companies that manufacture car assemblies (OEM).

The implementation of CSR focuses on the delivery process. The following is the flow process for implementing CSR in the warehouse department, which can be seen in Figure 1.
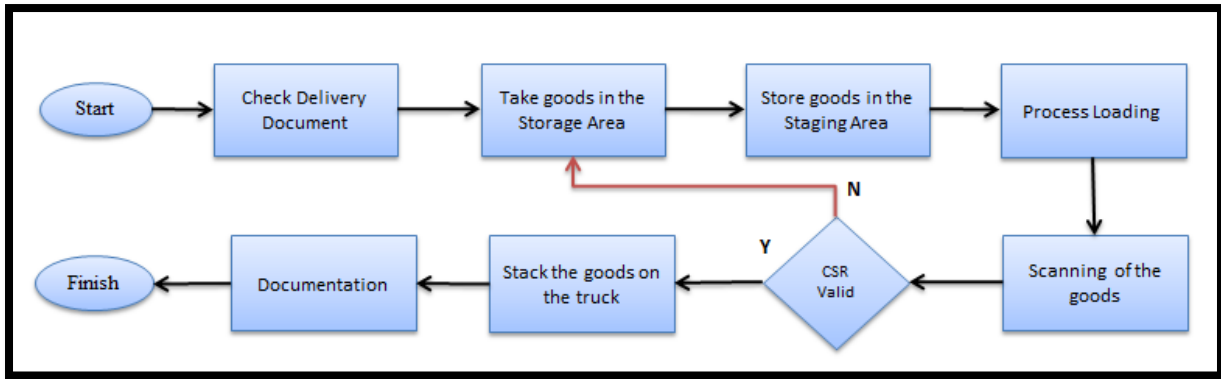
**Figure 1. Flowprocess Delivery**

Based on the picture above, goods cannot be sent if they do not match the shipping documents, where the CSR has been applied to the barcode system. The details of CSR items include:

1. Standards that apply in each country (DOT, SNI, Inmetro)
2. Standards for the age of production of goods
3. Standard types of stickers
4. Standards for FIFO regulations
5. Standards for wrapping or no wrapping

The application of quality standards (CSR) is to use the Barcode System as a filter media and protection. Embedding CSR in the barcode system can minimize errors in the shipping process, so that customer claims can be resolved. The process is carried out by shooting a laser beam at the Barcode section, then the data will be entered and read in the application, if there is a discrepancy, the program will display information.

Following are the results of the implementation of quality standards (CSR) that have collaborated with the barcode system.

1. Related protection results (Standards that apply to each country) Standardization in each country is different, if the delivery of goods is not appropriate, a customer claim will occur.
2. Related protection results (Provisions for the age of production of tires) Each customer determines the provisions for the age of goods that are different.
3. The result of protection on (type of sticker) Each customer determines the type of sticker differently, some use Arabic or Latin.
4. Result of protection on (Standard FIFO setting) Every customer in the tire delivery process must be FIFO, especially goods that will be sent to a vehicle assembly company.
5. Protection results on (Standard Wrapping and No wrapping) There are 2 types of shipping types based on requests from customers.

**CONCLUSIONS**

From this paper it is concluded that the application of a barcode system in inventory management in collaboration with the operation of web-based applications (online) through Scanner media and desktop applications can assist users in supporting work processes and assisting in the process of monitoring goods, both in the process of receiving goods to the delivery process goods. The benefits of using the Barcode System in the implementation of the Quality Management System function as fulfilling the requirements required by the customer, where the agreement is stated in CSR (Customer Specific Requirements). This helps the shipping department increase its productivity, no more finding items that were sent with the wrong item, the wrong sticker or the wrong number of items, so there are no more customer claims. In addition, the system barcode helps maximize the implementation of the Quality Management System, which has been adopted by the company, so that the quality of the goods produced is well maintained according to IATF 16949; 2016 standards.

**REFERENCE**

Shen WM, Norrie DH. Agent-based systems for intelligent manufacturing: A state-of-the-art survey. Knowledge Information System. 1999; 1(2): 129-156. [1]

Zhong RY, Xu X, Klotz E, Newman ST. Intelligent manufacturing in the context of Industry 4.0: A review. Engineering: Elsevier 2017; 3: 616- 630. [2]

Malik, Jaja Jamaludin., dkk. ( 2010). Implementasi Teknologi **Barcode** dalam Dunia Bisnis. Yogyakarta: Penerbit ANDI. [3]

Ristono A., Manajemen Persediaan, Graha Ilmu (D.I Yogyakarta), 2009. [4]

Manual Book IATF 16949, 1st Edition, October 1st 2016, Automotive Quality Management System Standard, Quality management system requirements for automotive production and relevant service part organizations