Optimizing Halal Supply Chains in the Food Industry: Enhancing Sales Management through ERP System Integration

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Halal Supply Chain Management is a comprehensive system grounded in Islamic Sharia principles, encompassing the entire production chain—from procurement and production to storage, sales, shipping, and distribution—ensuring the integrity of halal products from Farm to Plate. The term 'Halal integrity' encompasses material, production process, information, and all aspects associated with product creation through distribution. Achieving this integrity requires seamless integration in each production process, necessitating an integrated information system. Enterprise Resource Planning (ERP) stands out as a solution, serving as an integrated information system capable of harmonizing all company processes, facilitating the monitoring of each operation. This research

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delves into the development of an information system designed to guarantee the halal, cleanliness, safety, and quality of products until they reach consumers. Specifically, the study focuses on the Sales Management module, which oversees the sales and distribution processes. The outcomes of this research showcase the creation of an ERP-based system for sales and distribution, employing the Accelerated SAP (ASAP) research methodology.

1. INTRODUCTION

Based on the 2018/19 Report from State of the Global Islamic Economy published by Thomson Reuters state that the world's Muslim population reaches 1.8 billion people. It is estimated that Muslim spending amounts up to USD 2.1 trillion in 2017 [1]. The Islamic economy has many sectors that show some significant growth, one of them is the halal food industry sector. In 2017 the total consumption of halal food in the Muslim population reached USD 1.303 billion and is expected to continue to increase by 6.1% or around USD 1.9 billion in 2023.

Various countries began working on the halal food industry sector, one of them is Indonesia. Indonesia is one of the halal food consumers with the largest expenditure and is ranked first in the category of Top Muslim Food Expenditure [1]. Indonesia has the largest Muslim population in the world, spending in aggregate USD 218.8 billion across the Islamic economy sectors in 2017. Data from Statistics Indonesia (BPS) stated that in 2018 Indonesia's population reached 265 million with 209.1 million of Muslims or around 87% of Indonesia's population. This amount is 13% of all Muslims in the world.

With the largest Muslim population in the world, Indonesia has a huge market potential for the world's halal industry [1]. Halal is a major requirement for Muslim consumers in consuming food products. The existence of halal assurance becomes an added value in today's food industry competition [2]. The quality of halal products, or commonly known as Halalan Thoyyiban, is the reason for consumers to use halal products because there are guarantees of cleanliness, safety and the product quality for the entire production chain.

Halal Supply Chain in the food industry is an integration of activities that start from the procurement of raw materials, then convert raw materials into goods through the production process and produce finished goods, and end by delivering the finished goods to customers efficiently by following the Islamic Sharia perspective. In Halal food supply chain, the main goal is not only to ensure that satisfaction of the customer is achieved, but also to ensure that the Halal guarantee of the food product remains intact throughout the whole process of the supply chain [2,3].

The concept of halal in the supply chain is the most important thing that must be considered especially by business people who focus on the food industry. The thing that needs to be considered is the importance of controlling, ensuring, and guaranteeing the halal integrity in every supply chain process that must be in accordance with Islamic Sharia [4]. The finished products must be in accordance with Islamic law, which means the product provides good benefits, does not cause harm or endanger consumers in the form of health or morals. The concept of Halal Supply Chain is inseparable from integration in each production process, to integrate and guarantee halal integrity in every process an integrated information system is required. One of the information systems used in this study is an open source ERP system. Open ERP is an open source ERP system that can integrate all processes in the company so that it can help to monitor every process in the company.

This study aims to develop an integrated system that can help companies to monitor the halal integrity in every process in the halal supply chain. The ERP system is adapted to the needs of business processes in food industry companies. This study focuses on the Sales management module that handles the process of selling and distributing halal products in the food industry. The method used in this study is Accelerated SAP (ASAP) method. This study makes a valuable contribution by developing an integrated system designed to monitor halal integrity throughout the complete supply chain within food industry companies. The specific focus on the Sales management module addresses a critical aspect of halal product distribution, ensuring effective management and

monitoring of sales processes. Employing the Accelerated SAP (ASAP) method adds to the contribution, offering a structured approach for the efficient implementation of the ERP system. This research provides a practical and tailored solution to enhance the monitoring of halal integrity, particularly in sales and distribution processes within the food industry. The adoption of the ASAP method ensures a systematic and accelerated implementation, presenting a valuable resource for businesses aiming to uphold and improve halal standards in their operations.

2. MATERIALS AND METHODS

2.1 Understanding the Concept of Halal

Halal is an Arabic word which means lawful, legal, permissible, or permitted by Islamic law. In Quran, Halal is something that is permitted and permissible by the sharia to be done. Allah SWT said in Al-Quran Surah Al-Maidah verse 88:

> *Eat of the good, lawful things provided to you by Allah. And be mindful of Allah in Whom you believe (QS. Al-Maidah, 88).*

The word halal means something good; does not cause harm, provides good benefits, does not endanger one's health or morals. In Islam, Muslim consumers are prohibited from consuming non-halal food in their daily lives. The food must be halal and also good to be consumed by a Muslim.

2.2 Supply Chain Management and Halal Supply Chain

Supply Chain Management is an integration of activities that start from the procurement of raw materials, then convert raw materials into goods through the production process and produce finished goods, and end by delivering the finished goods to customers efficiently and effectively. Whereas, the concept of Halal is applied to the supply chain; it becomes Halal Supply Chain [5]. In every process of Halal supply chain activities starting from the point of origin to the point of consumption must be guaranteed the halal integrity and must follow the Islamic Sharia perspective.

2.3 Enterprise Resource Planning

Enterprise Resource Planning commonly known as ERP systems, are database systems that support the management of medium and large enterprises by collecting and processing data. ERP are also defined as "a collection of integrated functional modules that optimize the business processes both internally and in the company's immediate surroundings" [6]. Thus can be concluded that ERP is an information system used by companies to manage and integrate all data and information in each business area to achieve effectiveness and efficiency in running every business process.

ERP offers several advantages; shortening the time necessary to reach the recipient, better order management, cost reduction, customer service improvement, information integration between the company's departments, improving the efficiency of procurement processes, distribution or production processes improvement, economic and financial situation improvement, automation and unification of data, current access to information [6], and many others. The following are some of the criteria that must be owned by company information systems [7,8]:

1. Has four basic functions, namely:
   a. Financial accounting modules
   b. Procurement modules
   c. Order management modules
   d. Inventory management modules
2. Integrated, not excessive data, uses one main database and provides access to all modules using a single interface.
3. Multiuser platform, can be accessed by more than one user.

2.4 Open ERP

Open ERP is an open core Enterprise Resource Planning (ERP) platform. Its customized applications, support and other services are provided by a global community and official partners all around the world. Open ERP an open source ERP system that consist many application business programm or known as module such as Purchasing, Manufacturing, Inventory, Sales Management, Finance and Accounting and others [9].

2.5 Sales Management

Originally, the term 'Sales Management' referred to the direction of sales force personnel. But, it has gained a significant position in today's world. Sales Management meant management of all marketing activities, including advertising, sales
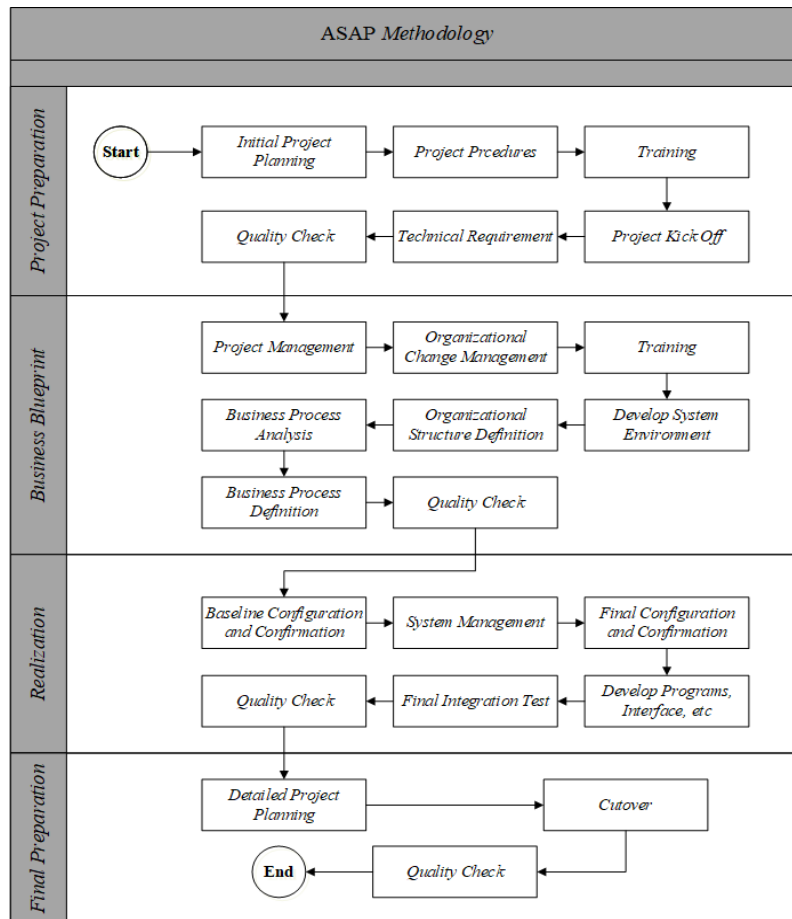
Fig. 1. ASAP methodology roadmap

promotion, marketing research, physical distribution, pricing, and product merchandising [10].

The sales management module allows users to manage and classify sales orders on structural and hierarchical systems. Users can create new orders and review existing orders. Order confirmation can trigger item delivery, invoice and delivery time determined by the order in each order. In this module the seller can get all the information needed in just one screen. Users can control and monitor the ordering and shipping of goods [11].

2.6 Systematics of Research - Accelerated SAP Methodology

The Fig. 1 explains the phases in ASAP Roadmap [12]. In this study, the systematic of the research use ASAP methodology. ASAP stands for Accelerated SAP. ASAP methodology is one of the Software Development Life Cycles (SDLC) that is used for SAP system implementation. The ASAP method provides the right framework for implementing a roadmap. The aim of the ASAP method is to effectively optimize time, human resources, quality, and other resources in the most efficient way. ASAP Roadmap consists these following processes:

1. Project Preparation
2. Business Blueprint
3. Realization
4. Final Preparation

3. RESULTS AND DISCUSSION

Case Study: Sales and Distribution Business Process in Food Industry. Most of Food Industry SMEs currently do not have system that can monitor, automate, and integrate business process in the company.

3.1 Project Preparation

In this phase, the project team underwent the initial planning and preparation for developing the

Halal ERP System project. In this phase, it is important to collect the components needed for the construction of the project.

1) **Project goals:** At this stage, goals are set based on existing problems:

a. To build a system that guarantees halal integrity in the ERP-based sales and distribution process for food industry companies.
b. Integrate supply chain processes involved with the process of selling and distributing goods.
c. To generate a report in the form of documents to ensure halal integrity, especially in the process of selling and distributing finished goods.

2) **Project scope:** The Project Scope discussed in this study are:

a. The design of the open source ERP system at a food industry company in the sales management module.
b. Designing an open source ERP system that is able to manage customer master data.
c. Designing an open source ERP system that can manage the process of selling and shipping finished goods in accordance with applicable halal standards.
d. Designing an open source ERP system that is able to manage sales reporting to ensure halal integrity in the sales and distribution process.

3.2 Business Blueprint

This phase is the stage of identifying the company's business processes, analysing gap, and proposing business processes target in accordance with user requirements. The user requirements obtained from the interview with one of the food industry company [13].

There are following GAP analysis in Sales and Distribution process:

1) Quotation

User Requirement: The process of offering goods to customer is well documented in the systems. The sales reports are well documented.

a. Existing System (As-Is): The process of offering goods to customer is only via messenger application and there is no documentation in this process.
b. Proposed System (To-Be): The Sales Division can now documenting the offering goods process in the system (Quotation document). The document can also be printed and used as a reference for the next process.

2) Sales order

User Requirement: (1) Integration between sales division with inventory and manufacturing division. (2) The sales division can easily check the stock for the ordered goods in the system. (3) The sales division can make and print the sales order document.

a. Existing System (As-Is): (1) The system used by the food industry company for the sales process is currently not integrated with the inventory and manufacturing division. (2) The sales division check the goods stock manually. The data of the stocks are not documented in the system. (3) The document for the order process are made manually by hand. The sales division should input the order to the system.
b. Proposed System (To-Be): (1) The system can integrate the sales process with the inventory and manufacturing process. (2) The sales division can automatically check the goods stock that available for the order in the system. (3) The sales division can input the order process in the system, and can automatically generate the sales order document.

3) Shipping

User Requirement: (1) The process for guaranteeing the Halal Integrity is needed during the picking process. (2) The delivery order documents are automatically generate by system.

a. Existing System (As-Is): (1) During the picking process, the process for guaranteeing the Halal Integrity is done manually and not recorded in the system yet. (2) The delivery order document are

manually made by hand. The sales division should input the delivery order data to the system.

b. Proposed System (To-Be): (1) The process for guaranteeing the Halal Integrity is documented in the system. (2) The sales division can input the delivery order data in the system, and can automatically generate and print the delivery order document.

4) Billing

User Requirement: Integration between sales division with financial division.

a. Existing System (As-Is): The old system not integrate sales and financial division. The sales made the invoice manually by hand, and sent the copy to the financial division for reporting.

b. Proposed System (To-Be): The sales division can make the invoice in the system. Financial division can access the information of the invoice that has been made by sales division.

3.3 Proposed Business Process (To-Be)

3.3.1 Proposed business process of quotation

First, the customer send the order list of finished goods, then the sales division receive the order list and create the Quotation document in the system. After that, the sales division negotiate sales offers with the customers, if the customer does not agree, it will continue until reach an agreement. If the customer agree, the customer will approve the order of finished goods. The process will proceed to the business process of sales order process.
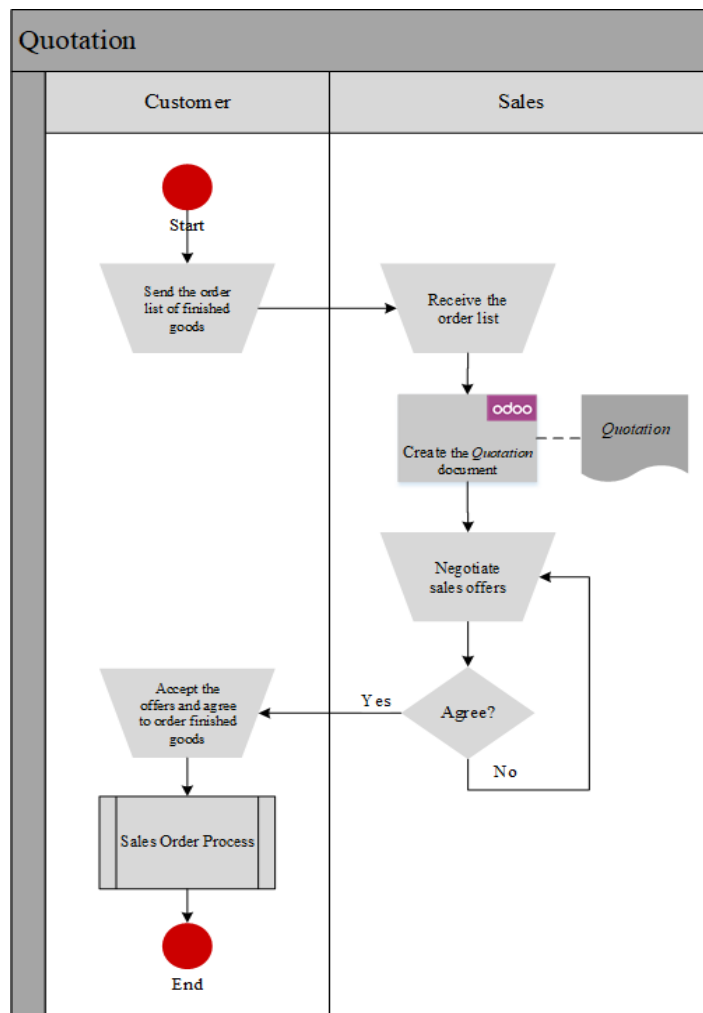

Fig. 2. Proposed business process of quotation

3.3.2 Proposed business process of sales order

After the customer accept and agree to order the finished goods, then the sales division create the sales order document in the system. The other way to create sales order is to "confirm sales" on the quotation document. After that the inventory division checks the availability of goods in the warehouse system, if the goods are available then it will immediately proceed to the next business process, namely the Shipping Process. But, if the goods in the warehouse are not available, the sales division will request a manufacturing order in the system and send it to the manufacturing division. Then the manufacturing division receives the manufacturing order request and continues with carried out the production process of finished goods. After the product is finished, the manufacturing division will send the finished goods to the warehouse. The inventory division will validate the goods that have been produced, followed by updating the stock of finished goods that have entered the warehouse in the system,

and then proceed to the next business process, namely the Shipping Process.

3.3.3 Proposed business process of shipping

After the inventory division update the inventory stock data or after carried out the availability check, then the sales division will print the document data of finished-goods-to-be-sent and validate them. Next, the inventory division will picking up which will be sent, taken and sorted according to the reference from the sales order document. The inventory division will pack the finished goods. Furthermore, the sales division will create delivery order documents through the system or it can be done with click "delivery" in the sales order document. Then, a halal integrity check is carried out on the items to be sent on the system. Then the sales division re-check the finished-goods-to-be-sent. Next, the shipping division will load the finished goods to the container. After that the shipping department will deliver the goods to customers, and the process ends with the outlet receiving the finished goods.
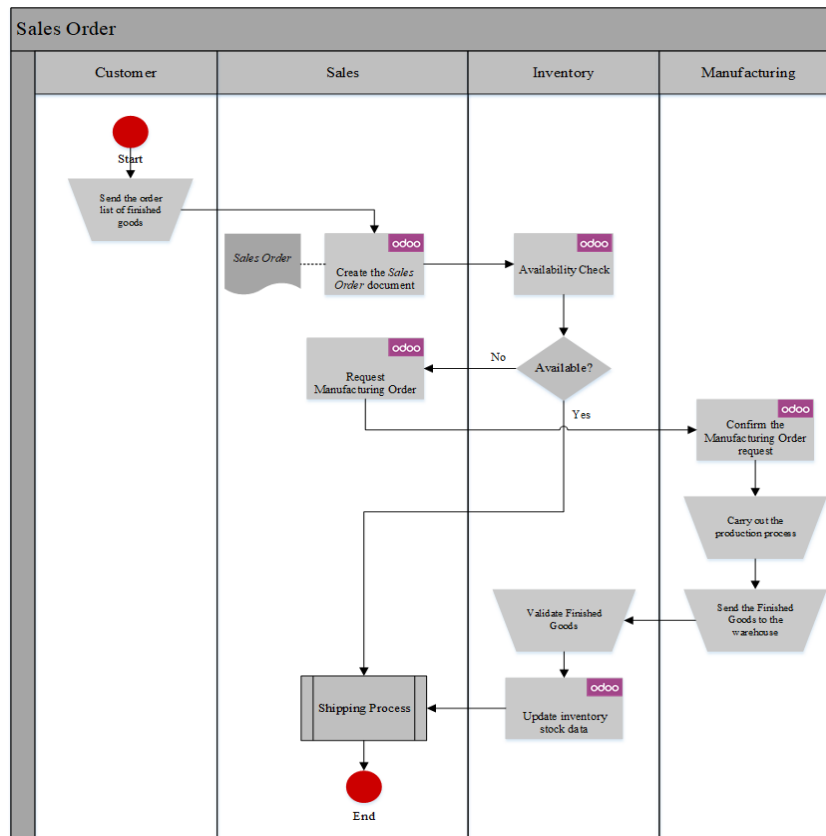

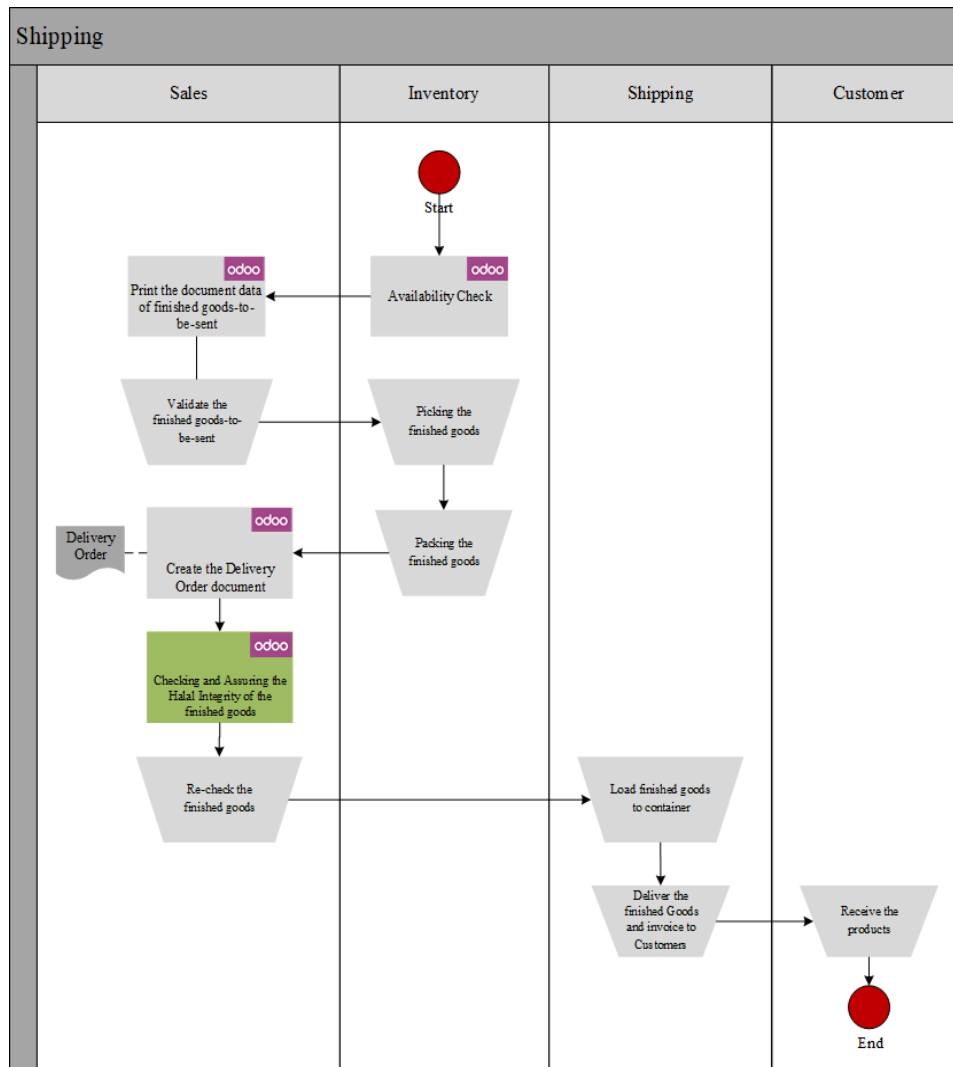**Fig. 3. Proposed business process of sales order**

Fig. 4. Proposed business process of shipping

3.3.4 Proposed business process of billing

The process starts with the sales division create the invoice document. Then, the document will send to the customer. The customer then receives the invoice document and pay the bills. The finance division will receive the payment and update the payment status through the system. The process is end by the finance division create a sales financial report.

Those all processsess can be interpreted as follows:

1) Realization

Realization is the phase of configuration and customization. The system is configured and customized based on the requirement of the company and the system business process. There are several additional fields in each activity carried out in the sales process. The following added field is in Table 1.

2) Final preparation

Final Preparation is the final stage of this research. This stage is the completion of the previous stage, which the company data is added to the system. The result of this stage is the open source ERP system in Sales Management module that can ensure the halal integrity in Sales process, and it can integrate with other module in the company to complete the halal integrity guarantee in every process. Based on the Table 2, the following figures are the results of customization for "Halal indicator" feature in the process of sales order

and picking of goods for checking the halal material before the goods delivered to customers. Fig. 6 shows the Process of Halal Indicator in the Sales Order Form. Besides, the

Fig. 7 shows the results of the Halal Indicator that has been carried out in the Sales Order form and it is adjust to the sales order document to be printed.
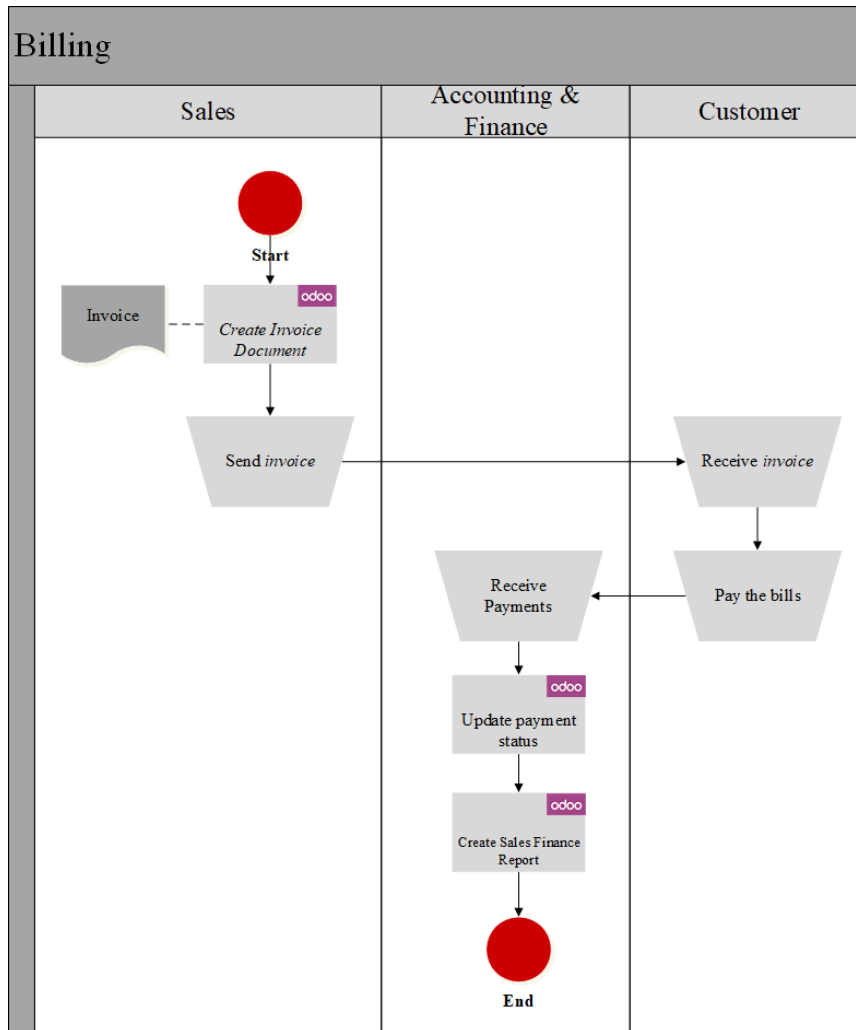

Fig. 5. Proposed business process of billing

Table 1. Configuration and customization field

No.	Field Name	Information
1.	Halal Certificate	Ensuring the Halal Integrity in Sales and distribution process
2.	Distribution Transport Condition	Management control of the distribution transport condition for deliver the finished products
3.	Packaging Condition	Management control of the packaging condition (quality check of the package)
4.	Expired Date	Information about the expired date of the product
5.	Product Contamination	Management control of the contaminated / uncontaminated product
6.	Report monitored by system	Sales Management uses a system to reduce paper usage and to efficient the time management

Table 2. Halal indicator

No.	Field Name	Information
1.	Halal Certificate	The products has been registered in the list of halal products. Halal certificates checked.
2.	Distribution Transport Condition	The distribution transport must be clean and not contaminated with najas.
3.	PackagingCondition	The packaging condition must be neat, clean, not damaged, and not contaminated with najas.
4.	Expired Date	The expired date must be adjusted with the food produced by the company. It is recommended not to sell food product that is close to the expiration date.
5.	Product Contamination	The product must be clean, not damaged and not contaminated with najas.
6.	Report monitoredby system	The halal indicator that has been mentioned above can added to the sales report.

Fig. 6. Halal indicator feature

Fig. 7. Halal integrity check in sales order document

4. CONCLUSION

The development of a Halal Supply Chain Management based on open source ERP system, which has been adjusted with the business process of the food industry company and the company's requirements. With an integrated halal system, the data and the information are relate and integrate with every process at the company, so it can reduce process cost and save produce time. The existence of an integrated system, which can integrate the sales and distribution process with the purchasing and manufacturing process that can provide benefits in providing delivery of data flow and real time information.

5. RECOMMENDATION

The development of a Halal Supply Chain Management based on an open-source ERP system, tailored to the specific needs of the food industry, carries significant research implications. The integration of this system within a company's business processes enhances data coherence and efficiency throughout various operations. The implication lies in the potential cost reduction and time-saving benefits achieved through the seamless integration of data and information across different company processes. By integrating sales and distribution with purchasing and manufacturing processes, the research implies improvements in data flow and real-time information delivery. This can lead to enhanced decision-making capabilities, increased operational efficiency, and a more streamlined halal supply chain management, positively impacting the overall performance and compliance of food industry companies.

The study's limitations include the lack of empirical testing for the Halal Supply Chain Management system in real business environments, relying on theoretical considerations. Challenges like system scalability and adaptability may arise during implementation. It mainly focuses on the Sales management module, neglecting broader implications and challenges within the ERP system. Industry-wide adoption and overcoming resistance to change were not deeply investigated. The study assumes a certain technological proficiency, and applicability to companies with varying capabilities is not thoroughly examined. Further empirical research and practical testing are needed to validate the system's effectiveness and address challenges in diverse business settings. It is suggested in the next study are developing the accounting and financial module is recommended, it can integrate with sales process, and can easily help to make financial reports for every process. Add more fields or halal indicator in the system for further guaranteeing process of the Halal Integrity.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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