# Design of an e-Invoice System Production Information at Haruki Nihongo Gakkou Training Institute Klaten based on Open Source Enterprise Resource Planning Using Odoo Version 16

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**ABSTRACT**
LPK Haruki Nihongo Gakkou, a Japanese-based training institute, faced challenges with inefficient business processes and a cumbersome invoicing system. This paper presents a case study on how they successfully implemented an Odoo-based Enterprise Resource Planning (ERP) system with a Point of Sales (POS) module to address these issues and create a streamlined, integrated E-Invoice system. The paper emphasizes the need for a digital solution to simplify the school's business flow and improve operational efficiency. It details the selection process for the Odoo-based ERP system, highlighting how the system was customized to meet the specific needs of LPK Haruki Nihongo Gakkou identified through interviews and instructions. The implemented system underwent rigorous testing and evaluation by the school, ensuring its effectiveness and user-friendliness. The results showcase the significant improvements achieved through the new system. The paper discusses the positive impact on operational efficiency, streamlined business processes, and simplified invoicing procedures. Additionally, it underlines the enhanced system integration, allowing for seamless data flow across various departments. This case study demonstrates the successful implementation of an Odoo-based ERP system for E-Invoicing in the educational sector. It provides valuable insights for other organizations seeking to improve their business processes and achieve greater operational efficiency through digital integration.

**Keywords: Odoo, ERP, E-Invoice, Point of Sales, Business Process Improvement, Educational Technology, LPK Haruki Nihongo Gakkou**

***Perancangan Sistem Informasi Produksi e-Faktur pada Lembaga Pelatihan Haruki Nihongo Gakkou Klaten Berbasis Open Source Enterprise Resource Planning Menggunakan Odoo Versi 16***

***Abstrak***
*LPK Haruki Nihongo Gakkou, sebuah lembaga pelatihan yang berbasis di Jepang, menghadapi tantangan dengan proses bisnis yang tidak efisien dan sistem penagihan yang rumit. Makalah ini menyajikan studi kasus tentang bagaimana mereka berhasil menerapkan sistem Enterprise Resource Planning (ERP) berbasis Odoo dengan modul Point of Sales (POS) untuk mengatasi masalah ini dan menciptakan sistem E-Faktur yang efisien dan terintegrasi. Makalah ini menekankan perlunya solusi digital untuk menyederhanakan alur bisnis sekolah dan meningkatkan efisiensi operasional. Bagian ini merinci proses seleksi untuk sistem ERP berbasis Odoo, menyoroti bagaimana sistem tersebut disesuaikan untuk memenuhi kebutuhan spesifik LPK Haruki Nihongo Gakkou yang diidentifikasi melalui wawancara dan instruksi. Sistem yang diterapkan menjalani pengujian dan evaluasi yang ketat oleh sekolah, untuk memastikan efektivitas dan kemudahan penggunaan. Hasilnya menunjukkan peningkatan signifikan yang dicapai melalui sistem baru. Makalah ini membahas dampak positif terhadap efisiensi operasional, penyederhanaan proses bisnis, dan penyederhanaan*

*prosedur penagihan. Selain itu, hal ini menggarisbawahi integrasi sistem yang ditingkatkan, memungkinkan aliran data yang lancar di berbagai departemen. Studi kasus ini menunjukkan keberhasilan penerapan sistem ERP berbasis Odoo untuk E-Faktur di sektor pendidikan. Hal ini memberikan wawasan berharga bagi organisasi lain yang ingin meningkatkan proses bisnis mereka dan mencapai efisiensi operasional yang lebih besar melalui integrasi digital.*

**Kata Kunci: Odoo, ERP, E-Faktur, Point of Sales, Peningkatan Proses Bisnis, Teknologi Pendidikan, LPK Haruki Nihongo Gakkou**

## INTRODUCTION

The rapid advancement of information technology in our society has led to significant acceleration in performance and ease of access to necessities and information. This convenience brought about by technological advancements is felt across all sectors, including the business sector. Information technology plays a crucial role in the development and progress of a business by helping to simplify existing business systems. However, several reasons exist why some business actors do not utilize information technology effectively. These factors include a lack of superior resources, unstable company finances, organizational structure education, and a lack of understanding of how to use information technology systems for business development.

Haruki Nihongo Gakkou Training Institute (LPK Haruki Nihongo Gakkou) is a business entity that provides training services for work and Japanese language to the community. This service institution has a main business process, namely training services and Japanese language for people who want to prepare themselves to work in Japan. Based on the results of observations, this business has not yet implemented technology in the business cycle that is carried out, including the invoice system or information system that provides an explanation of transactions involving the use of services and the value that must be paid, which is still made and issued manually. Several drawbacks are found in the manual creation of invoices, namely making it difficult to track invoices from customers and it is not practical for recipients. Considering the problems arising from the manual invoice creation, it is necessary to develop a system using information technology to support the effectiveness of business activities. Several information technology systems can be used, one of which is ERP software, also known as Enterprise Resource Planning. ERP is an integrated application program for planning an managing company resources and is intended to support various business functions and activities. Therefore, it is expected to provide better customer service (Rahayu, 2019). Integrated ERP software can meet various business needs, simplifying daily business operations. The invoice system is one of the output systems that this institution has from its business process. The invoice system will provide various information related to proof of transaction for customers received after they register for training and language courses. However, in the existing invoice system, this service business still uses paper-based invoices given to customers. The use of paper-based invoices is actually very inefficient because it will consume a lot of resources and manpower. Additionally, the long time frame clearly cannot meet the needs of a society that craves something practical, easy, or simple (Xie, Mao, & Shi, 2019). Therefore, with the current paper-based or manual invoice system, an integrated system is needed that can simplify business performance and reduce business economic costs.

### Problem Formulation

The objectives of this research are:

1. To understand the diversity of ERP software types and modules used to

implement the invoicing system at Haruki Nihongo Gakkou Training Academy (LPK Haruki Nihongo Gakkou).
2. To study the level of business efficiency and the impact of ERP implementation at Haruki Nihongo Gakkou Training Academy (LPK Haruki Nihongo Gakkou) on the invoicing system.

**Research Objectives**

1. To understand the business workflow used by LPK Haruki Nihongo Gakkou to support the payment process.
2. To determine the type of ERP program and modules used to implement the electronic payment system.
3. To assess the level of business efficiency and the impact of ERP implementation on the electronic payment system of LPK Haruki Nihongo Gakkou.

**ERP (*Enterprise Resource Planning*)**

Enterprise Resource Planning (ERP) is a company's resource planning system, which is an information system that manages all resources, information, and activities used to carry out business processes. ERP is a software that integrates all departments and systems in a business into a computer system that a business or company needs. ERP is a system that combines various needs into one software in a logical database, making it easier for all business devices to share information and communicate (Hozairi, Buhari, Lumaksono, & Tukan, 2019). The use of this ERP system can make business processes and tasks more efficient and reduce risks and errors.

Currently, there are many ERP software that can be used to develop businesses, both commercial (paid) and open source. Commercial ERP systems include SAP, IFS, Peoplesoft, and JD. Open source ERP systems are free and can be customized according to user needs, making them easier to use.

The reason why a business uses ERP in its business system is that this system has a strong level of modernization and can improve existing systems of a business. In addition, this system can optimize and improve efficiency in business and solve business problems, develop new orders, or update business systems (Gao, Qiu, & Gu, 2020).

In selecting ERP software, in addition to considering the price and type of advantages it has, a business must consider several things from the software used, namely how the ERP module methodology system is selected and several patterns of system usage used (Domagała, Grobler- Dębska, Wąs, & Kucharska, 2021).

Several other factors that are considered in selecting ERP software are:

1. The size of the business being run, because the larger a business, the more complex the business system being run, so the ERP system must be able to meet the needs of the business.
2. The developer's experience in running and modifying ERP systems for their business, because references from developers are important in using an ERP system.
3. Technical support for ERP software, because in developing a system, external factors from the software used must be considered.

**Odoo Application Software**

Odoo is an information system software that was developed in 2005 by Fabien Pinckaers and uses an open-source basis. This application was originally called TinyERP. In 2009, it was renamed OpenERP, and in 2014, it was renamed Odoo. To date, there are 7 million Odoo users. Odoo is an ERP Saas program that uses cloud scope to meet the needs of a business organization. Odoo has several applications, and users have the opportunity to choose and add the necessary programs in their business activities. Therefore, in this program, the system will be more integrated into one integrated system without additional programs that can handle a problem or business system in the organization. The Odoo system is equipped with quality checks where a person can check

the quality of the system. Developers can create a system development plan based on the business process and company needs. The role of ERP in development is to accelerate and simplify the process. Odoo's quality control consists of three functions: control, check, and warning functions (Ahmadiyah, Ratna, Yotifa, & Dinillah, 2021).

This software has several superior capabilities compared to other devices, such as easy-to-modify customization features, relatively fast implementation, and it is license-free. Odoo can be applied to various industries and businesses, ranging from small to large scales. The use of Odoo ERP is expected to improve efficiency, business integration, good decision-making, and enhance the common database across institutions, as well as improve the planning analysis capabilities in utilizing information system technology (Gantira Mira, Lubis, Puspitasari, & Ridho Lubis, 2020).

**Electronic Invoice System**

Electronic invoicing is a system where invoices are created, processed, stored, and delivered in electronic or digital form to customers (Xie et al., 2019). The utilization of electronic invoicing systems can streamline data entry in a business, notably replacing manual invoice systems and reducing paper usage. These electronic invoice documents serve as evidence of sales or purchase transactions in electronic format.

Electronic invoicing systems are designed to track incoming customer records, receipts, deliveries, and other business needs. Each transaction must be stored for a long period, often spanning several years, to assess the consistency of recording and to facilitate efficient retrieval. This avoids placing a heavy burden on the workforce, as it involves examining a vast amount of detailed information such as dates, customer names, product quantities, and more. Therefore, implementing this system is appropriate for businesses (Chang et al., 2020).

## METHODOLOGY

In the design of this e-invoice information system, Rapid Application Development (RAD) is the chosen system development method. RAD is a system that demonstrates that the development cycle is short and tends to save time. The use of this method can provide an explanation for each step of the process, thus saving the design process (Supriatna, 2018).

In the development of systems utilizing this method, several stages are employed.

a. Business Modeling, which involves presenting narrative descriptions and flowchart diagrams to demonstrate business usage.
b. Data Modeling, where Entity-Relationship (ER) models are used

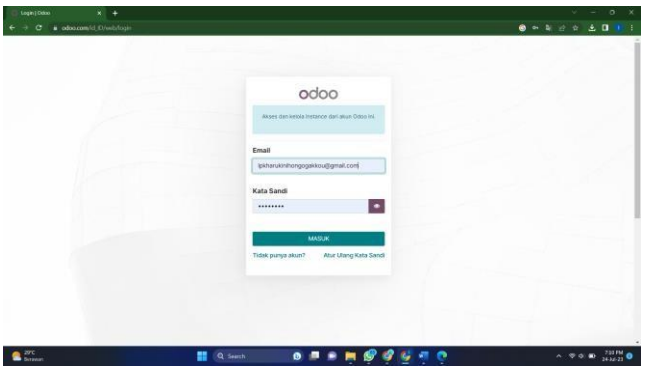
for structuring data relationships.

c. Process Modeling, illustrated using process flowcharts.
d. Application Development, commencing with designing menu models followed by database design and user interface (UI) design (Supriatna, 2018).

## RESULT AND DISCUSSION

In this stage, the results of the design of the Point of Sale information system for the e-invoice system using Odoo-based ERP at LPK Haruki Nihongo Gakkou are described as follows:

1. Login Interface: You can see the login menu through the Odoo ERP website, which is specifically created for a company.




Source: processed primary data, 2023

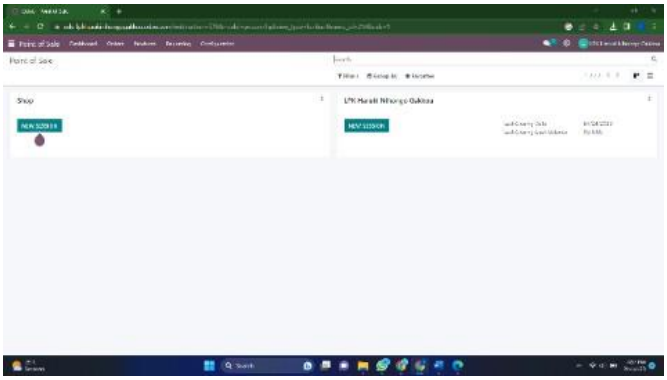
**Picture 1 Login Display**

2. After Login, the Odoo main page will display all the modules that have been installed on the database that has been pre-assembled according to the needs, such as the Point of Sale module.

Source: processed primary data, 2023

**Picture 2 Main Page Display**

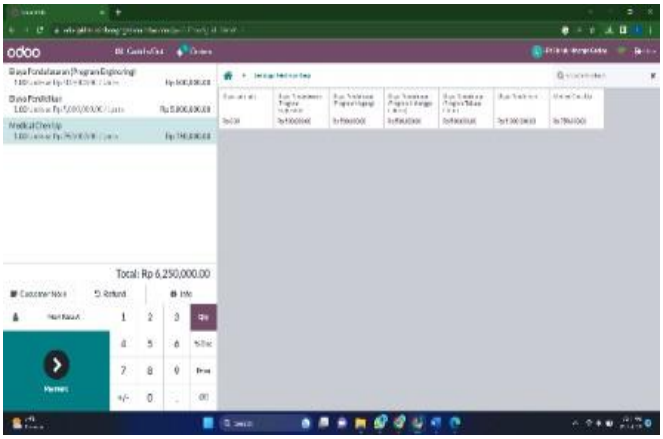
3. Point of Sales module display: This module allows to create a cashier system, which will generate *E-Invoice* and printable receipts, and automatically create sales records.



Source: processed primary data, 2023

**Picture 3. Point Of Sale Dashboard Display**

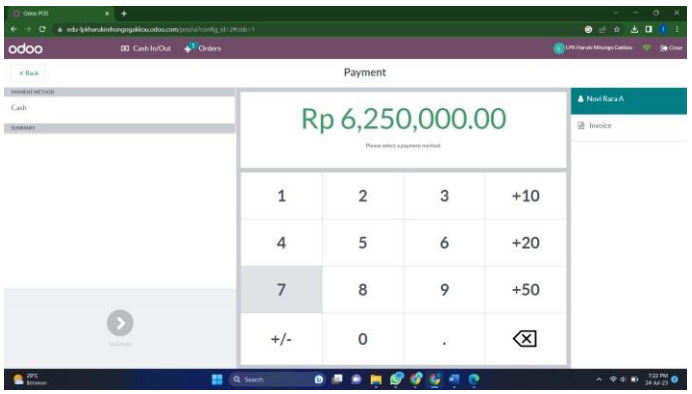
4. Cashier System in the Point of Sales module display: The Point of Sales menu allows you to customize the cashiering system to suit your business needs. Since there is the ability to convert to a touch screen, this feature can be used on tablets and mobile phones in the future. It can also be customized to meet business needs. For example, you can add discounts, customer notifications, and price changes.




Source: processed primary data, 2023

**Picture 4. Cashier System Display**

5. See the transaction feature in cashier system on Point of Sales module: After customer order the goods, next you will be directed to the payment menu. After they do the payment already, the customers are validated and print invoices and receipt.




Source: processed primary data, 2023

**Picture 5 Cashier System Display**

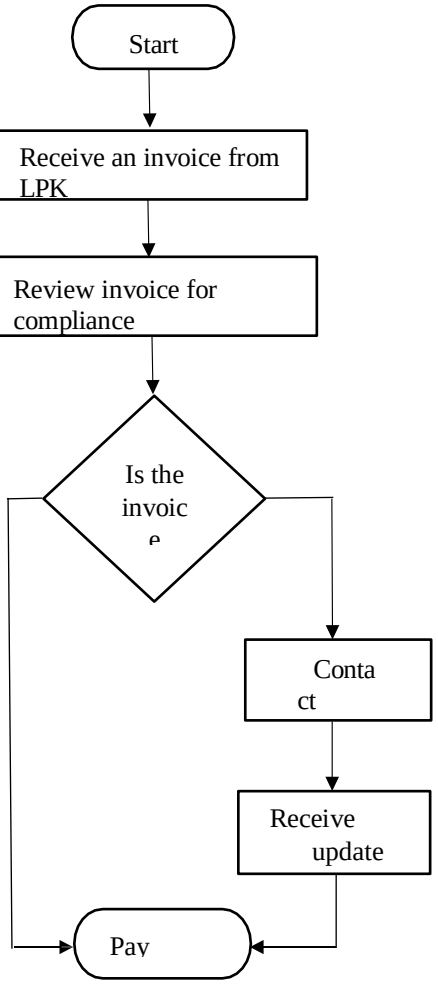

Source: processed primary data, 2023

**Picture 6. Reciept Display**


**Picture 7. Invoice Display**

To change the invoice information that was previously created manually into automated one, use Point of Sale (POS) process on this Odoo menu (Picture 7). This improves the accuracy of quantitative and qualitative data, enabling management into proper and efficient work.

Business Process *Flowchart Analysis*: Based on the ERP implementation result on LPK Haruki Nihongo Gakkou, the research can identify the *flowchart* to adjust the business process. Picture 8 shows the result *flowchart* analysis process.




Source: processed primary data, 2023

**Picture 8 *Flowchart***

**Analysis Gap**

Analysis GAP is a gap analysis method that can be used to evaluate the performance of an organization, this method is used as a tool to measure the service quality provided.

In this study, analysis GAP is done with few adjustment. First, this analyze being used as a method to compare the business implementation that already applied (AS IS) with the developed method that using ERP System in LPK needs. The objective of this analysis is to know how strong ERP system by Odoo can fulfill every needs and implementation process of e-invoice in LPK Haruki Nihongo Gakkou. Analysis GAP using NPF method.

**Table 1. Analysis Gap**

| No | Business Process | Needs | *Fulfilment* | | | Description | |
|---|---|---|---|---|---|---|---|
| | | | N | P | F | AS IS (*Existing Business Process*) | Odoo system ERP (*Business Process E-Invoice*) |
| 1. | Registration System | Applicants can register | | | √ | Conducting direct register does not use the system | Register in the Odoo-based application System |
| 2. | Transaction (Payment) | Applicants can pay the registration fee | | | √ | Conducting transaction directly does not use the system | Conducting online transaction with Odoo and data will enter the database |
| 3. | *Output* Invoice and Bill | Applicants receive the invoice and the proof of registration | | | √ | Receive physical proof of registration | Receive online proof of registration and applicants can print it |
| 4. | Applicants are recorded as a participant | Applicants will get work training | | | √ | Applicant's data is recorded manually does not use the system | Applicant's data will be recorded inside Odoo-based system |

Source: processed primary data, 2023

## CONCLUTIONS

Based on the discussion, it is recognized that ERP (Enterprise Resource Planning) are used on Odoo- based E-Invoice information system on LPK Haruki Nihongo Gakkou, as follows:

1. LPK Haruki Nihongo Gakkou in the process of implementing business flow presents an efficient *E-Invoice* system and simplifies business processes with the application of digital integrated business process.
2. LPK Haruki Nihongo Gakkou uses Odoo-based ERP system with Point of Sales module. The needs of LPK Haruki Nihongo Gakkou were obtained through interviews and instructions given to them.
3. The result of the presentation and testing of the Odoo-based ERP system directly by LPK Haruki Nihongo Gakkou show that the system created has an effect and can improve the efficiency of operations at LPK Haruki Nihongo Gakkou. The entire business system can work well and efficiently with the integrated system.

### Suggestion

ERP system that has been created and presented serves as the basis for the e-invoice information system. Some suggestion can be given, such as:

1. Suggestion to LPK Haruki Nihongo Gakkou
   The result of discussion and summary is, suggestion reviewed for LPK Haruki Nihongo Gakkou are that the current system can be reviewed consistently and also future development and adjustment according to needs.
2. Suggestion for the next researcher
   Researcher are expected to test various types of models or applications to determine the function of Odoo-based ERP and Point of Sales modules for businesses.

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