

Development Of Erp And Dashboard On Module Accounting Using The Economy Circular Concept In The Msme Industry

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Abstract — This research paper aims to develop an ERP system and a customized dashboard with software Odoo as main driver for the accounting module, integrating Circular Economy principles, specifically for the MSME leather tanning industry. The focus is on enhancing operational efficiency, sustainability, and resource optimization within the sector. The study adopts quickstart approach on developing ERP accounting system. Leveraging Circular Economy insights, the ERP system will promote sustainable sourcing, waste reduction, and product lifecycle extension. The customized dashboard will offer real-time financial data for informed decision-making, tracking circularity metrics, and improving strategic choices.

Keywords— ERP system, Odoo, Accounting module, Circular Economy principles, MSME, leather tanning industry.

I. INTRODUCTION

According to Law No. 20 of 2008, which pertains to micro, small, and medium enterprises (SMEs). According to the law, SMEs are defined as self-sustained economic ventures. These enterprises must operate independently and cannot be subsidiaries or branches of other business models. Law No. 20 of 2008 also establishes specific criteria to offer clarity on the classification of business types that fall under its jurisdiction. The majority of Indonesia's leather tanning industry is concentrated in the city of Garut, situated in the province of West Java. This sector primarily deals with the processing of leather, a crucial raw material that frequently serves as the principal component in various industrial applications [8]. Within this context, the Indonesian leather industry stands as an example of a micro, small, and medium enterprise (MSME) that significantly contributes to the country's economy. Statistical data, such as that released by Statistics Indonesia (BPS) in August 2018, reveals that the leather industry consistently supports Indonesia's Gross Domestic Product (GDP), maintaining a relatively steady contribution ranging from 27% to 28% between 2014 and 2017 [1]. According to statistics provided by Statistics Indonesia (BPS) in August 2018, the contribution of the leather industry to Indonesia's overall Gross Domestic

Product (GDP) remained relatively consistent, hovering between 27% and 28% from the years 2014 to 2017 [2].

In accordance with Radman et al. (2003), an elevation in nitrogen levels can lead to the deterioration of water quality and a decline in biodiversity within river ecosystems. The growth of industries contributes to environmental harm through waste production and resource consumption. The escalating environmental concerns prompted governmental action, exemplified by Law No. 3 of 2014, which includes provisions obligating industries to safeguard the environment. Kolomaznik et al. (2008) further emphasize During the tanning process, skin is treated with a chromium sulfate solution, typically containing 60% to 70% chromium sulfate. However, not all of this solution is absorbed by the skin during tanning. Consequently, the excess solution is discharged in a liquid form as waste [10] that waste from the leather tanning sector poses risks to human health due to the presence of certain carcinogenic chemicals, particularly chromium. The chemicals utilized in leather tanning processes can also impair the function and structure of human skin (Febriana et al., 2012). The solved olutions for addressing pollution stemming from the leather tannery industry were explored. One viable approach involves the adoption of a Circular Economy (CE) framework. This concept entails the implementation of a system within the leather industry's small and medium enterprises to mitigate environmental pollution. Brigita Boorova further elucidates that a circular economy is characterized by a business model focused on minimizing waste and optimizing resource utilization. This is achieved by prolonging the active use of materials, thus decreasing the demand for additional resources. [3], therefore the need for an integrated system for companies that can implement circular economic concepts in their business processes.

Based on the case it is necessary to implement an ERP system, ERP stands for Enterprise Resource Planning. ERP is an integrated system used by companies to integrate all company resources and enabling organizations to automate and integrate their key business processes (Albert Verasius Dian, 2021), ERP system implementation using the Odoo application. Odoo is a web-based ERP open source

application used as an Information System application to solve problems in managing business transactions.

II. LITERATURE REVIEW

A. Definition Of MSME

The MSMES are micro, small, and medium enterprises, characterizing a category of small-scale businesses with a combined net value not surpassing IDR 200 million, which encompasses both business property and land. These MSMES can be further categorized into three subgroups: Small Businesses, Medium Businesses, and Micro Businesses. Law No. 20 of 2008 plays a pivotal role in defining these categories by setting explicit criteria, thus enhancing the clarity surrounding the classification of businesses delineated within the legal framework. Regarding the criteria for SME or small and medium enterprises, the Law separates them according to the type of business [1]

B. Definition of ERP

Enterprise Resource Planning (ERP) refers to a comprehensive information system designed to cater to the unique requirements of various departments within a company. The incorporation of ERP within a company's operations needs not encompass the entirety of the system; instead, it can commence with the implementation of a solitary module as a preliminary endeavor. Subsequent modules can be introduced sequentially once the accomplishment of a module is established as successful, thus serving as a reference point for the implementation of further modules. [4].

C. Open source ERP Software

Open-source ERP pertains to an enterprise resource planning (ERP) software system characterized by its publicly accessible source code. This open-source model grants companies the ability to access and modify the code of the ERP system to suit their needs. This approach proves especially appealing to small to mid-sized businesses (SMBs) seeking to enhance or tailor their ERP systems to better align with their requirements. [5]

D. Odoo

Odoo stands as a user-friendly and open-source system management software, capable of seamless integration across diverse platforms. This modern application functions as an Enterprise Resource Planning (ERP) solution, offering an extensive array of distributable modules within an open-source framework. Notably, Odoo encompasses a wide spectrum of application programs or packages, encompassing areas such as Sales, CRM, Project Management, Warehouse Management, Manufacturing, Finance and Accounting, Human Resources, and more. [6]. Odoo has cultivated a suite of 30 core applications that receive regular updates. Additionally, there exists a thriving community comprising over 1500 active members who have collectively contributed more than 4500 applications. These contributions are aimed at addressing a wide spectrum of diverse business requirements [9].

E. Circular Economy

Circular Circular Economy is an environmentally friendly system that maintains material values so that they can be used repeatedly. A circular economy system aims to maximize the circular use of materials to minimize waste production by recovering and reusing products and materials as much as possible, systemically, and repeatedly [3].

The circular economy concept is guided by the main principles of reducing waste and maximizing existing resources. Furthermore, he explained that this approach also promotes resilience by involving various stakeholders and thinking in systems. This circular economy approach is certainly different from the traditional linear economy which uses a take-make-dispose model [3].

F. Sustainability Accounting

Sustainability accounting encompasses the process of quantifying, examining, and disclosing a company's ecological and societal influences. Sustainability accounting serves as a methodical approach for quantifying both the costs and gains associated with environmental conservation endeavors. It aims to create structured reporting systems, facilitate the nurturing of positive connections between corporations and the natural ecosystem, and advance the cause of effective and efficient environmental initiatives, all in pursuit of the overarching goal of attaining sustainable development [11] This practice involves the establishment of frameworks, techniques, and procedures for generating sustainability data with the intention of fostering transparency, upholding accountability, and facilitating informed decision-making. Key components of sustainability accounting encompass recognizing pertinent sustainability concerns within the company, devising indicators and metrics, gathering data, monitoring and gauging overall performance, and effectively communicating this information to both internal and external stakeholders [6].

G. Quickstart Method

According to Wilfa Dwi Rahmi, Avon Budiono The QuickStart method is a method that can be used in implementing Odoo software to ensure that the implementation process runs integrally. The stages in the QuickStart method are :

The first stage is the Kick-off call. The research will be conducted by means of interviews and observations with office holders in the company, The second stage is Analysis. Research at this stage will carry out an analysis related to the company's ongoing business processes and determine the targeting business process. From this stage will get a GAP Analysis. The third stage is Configuration. From the GAP Analysis obtained, it will then prepare system configuration and customization to produce a system that supports the final business process. At this stage, the results of the system configuration will be evaluated using the Blackbox Testing method [7].

III. METHODS

A. Conceptual Method

Conceptual Model is a systematic model developed by designer to design the descriptive regarding the task and how a task can be completed effectively thoroughly according to user's comprehensiveness. This study employs the conceptual model introduced by Hevner, intending to utilize it as a blueprint for creating a structured program, specifically a simulation program. The objective is to establish a tool that facilitates the execution of the simulation study in a systematic manner.

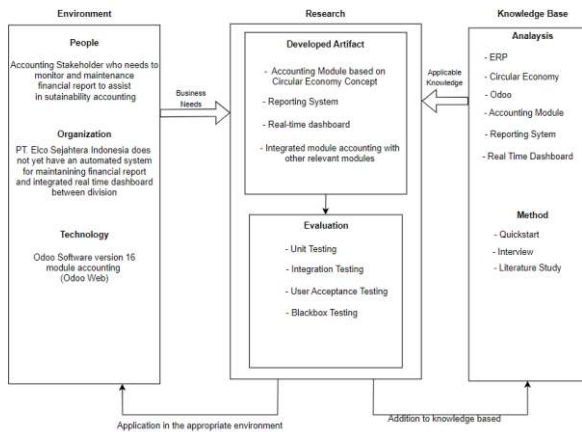


FIGURE III.1
Conceptual Model

According to conceptual model in the Figure III.1 there are three components, namely environment, research, and basic knowledge. The following is an explanation of these three aspect On the environmental aspect, the people section is explained regarding users, namely the Accounting stakeholder that required to maintenance fianancial record at PT. Elco Sejahtera Indonesia. In the research aspect, it is explained about the things that will be examined in this study, namely the development of an ERP accounting module using Odoo software version 16, designing a reporting system, designing a real-time dashboard on the Odoo accounting module. The knowledge based aspects explain the concepts used during research such as ERP, circular economy, odoo, accounting modules, reporting systems, and real-time dashboards

B. Research Systematic

Research Systematic explains regarding solving problems sequentially during the research process. The systematic research method used in this research is the Quickstart method, which is a method which consists of 3 stages, namely the Kick Off Call, Analysis and Configuration stages.

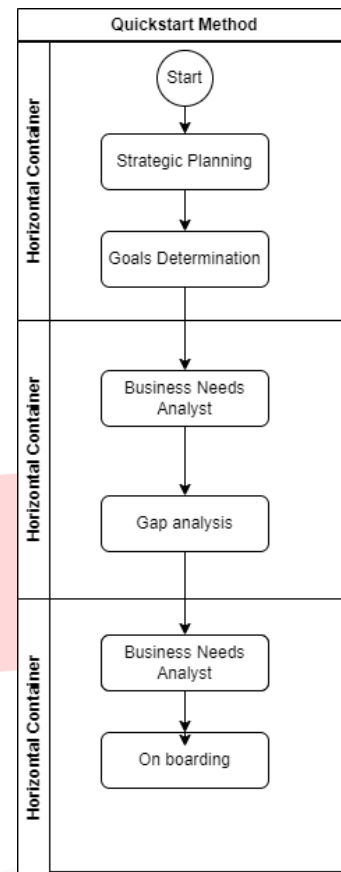


FIGURE III.2
Quickstart method

Quickstart implementation is an accelerated approach to deploying an ERP system in an organization. This method is designed to streamline and expedite the ERP implementation process, allowing businesses to start benefiting from the system's capabilities more rapidly. Here's an explanation of the Quickstart method for ERP.

C. Data Collection

Data collection in this research necessitated the acquisition of two distinct types of data: primary data and secondary data. Primary data is directly gathered from primary sources, which involves methods like interviews, surveys, and experiments. On the other hand, secondary data is supplementary information acquired from external sources. This type of data can encompass published resources such as journals and e-books, print books, magazines and interview results. In this research, the writer uses a lot of secondary data types from the results of previous research interviews related to the accounting department.

No	Data Type	Data Collection technique	Data Source	Obtained Data
1	Secondary Data	Literature Study	Previous Research, Article, Journal	Related to Circular Economy Concept
2	Primary Data	Interview	Interview the company in the accounting department.	Information related to PT Elco Sejahtera Indonesia Profile which explains the history, vision and mission, address and means and infrastructure of the company.
3	Primary Data	Interview	Letter of willingness to become a research partner	Letter of permission from PT. Elco Sejahtera Indonesia as a research partner

FIGURE III. 1
Data Collection

D. Evaluation Method

Evaluation methods in this research carry out 2 types of evaluation, namely Unit Testing and Integrated testing. Following are the details of the process carried out at the Evaluation Method stage, Unit Testing for this stage of testing consist of evaluating the smallest testable parts of an application, called units are individually and independently for proper operation. As for Integrated testing researcher need to test the system of Odoo as a whole integrated system including sales, warehouse, purchasing, reverse logistic, manufacturing and accounting modules with the concept of circular economy in the implemented system.

IV. RESULT AND DISCUSSION

A. Kick-Off Call

The Kick-Off stage, an analysis of research needs will be carried out for the development of the Circular Economics system ERP in the Accounting Odoo module at PT. Elco Sejahtera Indonesia. In this phase, the goal is to define the methodology and phases of the research. The final results of the research are expected to meet the needs of the company. This process is divided into two phases, namely strategic planning and goal setting.

Organization	
Vision	Committed to creating high-quality leather products so that consumers are satisfied and the company can benefit through customer satisfaction.
Mission	Serving the needs of industrial consumers and end users for garments, gloves, and various small leather crafts.
Purpose	
Short Term	Develop an accounting ERP module with a reporting system using a real time dashboard by implementing circular economic concepts in accounting business processes that occur at PT Elco Sejahtera Indonesia
Long Term	- Integrate all accounting-related business processes into ERP to reduce data redundancy, increase transparency, and simplify data-driven decision making. - optimizing the use of raw materials in the leather tanning process. This can be done by identifying and reducing the waste or remnants generated during the tanning process helping to provide leather products that are more durable and recyclable, reducing the need to over-produce new materials. - Reporting and transparency in financial reports in the process of recycling leather tannery factory resources in order to get better company profitability

FIGURE III. 2
Strategic Planning

Based on Figure III.3 the conditions at PT. Elco Sejahtera Indonesia, which has not yet implemented the odoo ERP

system in business processes that are running, especially in the accounting division, to carry out financial reporting by applying the circular economy concept to the accounting system processes. Based on the existing environment, an ERP odoo accounting system will be developed with real-time dashboards that can be integrated with other divisions and get real-time access to financial reporting with real-time dashboards. In the goals determination stage, the researcher determines the goals of this research. The goals of this research are to develop an ERP system and a real-time dashboard using the circular economy concept in the accounting module using the Odoo ERP and the Odoo Dashboard using the Quickstart method.

B. Business Needs Analyst

The Business Needs Analysis phase is a systematic process of identifying and assessing needs and opportunities within an organization to align business processes with the ERP system development. By using a comparison of existing business process (As is) and targeting business processes (To be) will produce results to compare requirements.

C. Fit and Gap Analysis

Fit gap analysis is a process used to identify the difference between an organization's current state business process (As Is) and its desired future state of business process (To Be). It involves assessing existing processes, systems, and capabilities to determine what changes or improvements are necessary to achieve specific goals or requirements.

No	Current State Business Process	Requirement	Indicator			Information	Solution
			N	P	F		
1.	Business Process Payment Customer Invoice	There is an integrated system from the sales division to the accounting division in collecting customer payments and a system for validating payments from customers through the accounting division.	√			As Is : Existing business processes still use excel records to input transaction data and there is no accounting validation system that is integrated directly into the sales division To Be : Sales and accounting will be integrated and accounting can validate customer payments through the Odoo application so there is no need for a third-party application to input transactions data	Implementation of accounting modules in the payment billing process. Accounting staff and accounting managers can capture payments, validate invoices from sales, and generate them directly into financial reports.
2.	Process Business Existing Vendor Bills Payment	Requires an automation system from procurement to the sales division without the need for a back and forth process from procurement and accounting to validate vendor bills payments	√			As Is : In the existing validation process, vendor bills still use physical documents and are validated manually. To Be : Accounting will have an automated system in validating the process of purchasing raw materials. Direct transactions recording is done through the Odoo system and then each	Implementation of odoo accounting in validating and recording purchase of raw material transactions directly and the accounting module as well as being integrated directly into the procurement division in the process of paying raw materials

FIGURE III. 3
Fit and Gap Analysis

Based on Figure III There are three indicators that can be used to analyze business processes, namely N (Never) These indicator mean that these are the areas where the organization's current state falls short of the requirements or expectations of the desired future state. These gaps highlight the deficiencies or shortcomings that need to be addressed to align with the organization's goals. P (Partial) Gap signifies that the organization has made some progress or has partial implementation of a requirement or capability

needed for the desired future state. F (Full) The full gap indicates that the organization has successfully implemented or fulfilled a specific requirement or capability needed for the desired future state. In this case, there is no gap or discrepancy between the current state and the desired state.

D. Configuration

1. Configuration Chart of Account based on Circular Economy

Odoo's Chart of Accounts is a complete list of all accounts used in a company's accounting system. This chart of accounts organizes and categorizes accounts by type. B. Assets, Liabilities, Equity, Income, Expenses, etc. This configuration creates a chart of accounts list according to your needs and requirements.

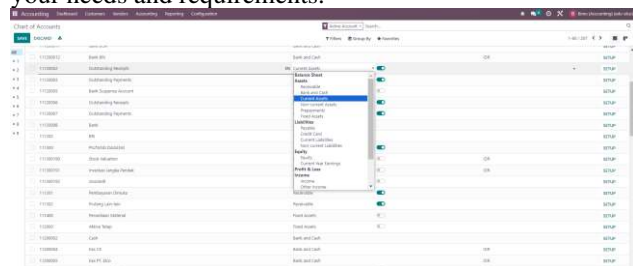


FIGURE III. 4
Chart of Account Configuration

2. CE Journals Configuration

In the journal configuration, a series of detailed configuration actions are carried out to align the accounting system with the company's needs specifically circular economy process at company that need certain journals to record circular economy process. The initial stage involves access to the "Journals" menu within the interface of the Odoo Accounting application. Within this scope, a new journal is created by carefully considering important elements such as the name of the journal, the appropriate journal type, and the journal code that defines a particular transactional entity.

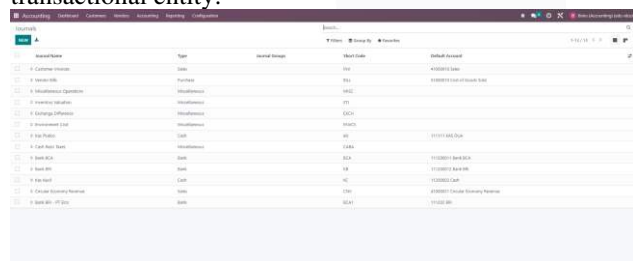


FIGURE III. 5
Journals Configuration

3. Financial Report Configuration

Within the scope of setting up financial reports in the Odoo Accounting module, a series of in-depth configuration steps have been carried out to ensure the presentation of appropriate and informative financial information. By accessing the "Financial Reports" menu, I managed to create financial reports by inputting the accounts that will be the main data for circular economy-based transactions.

Odoo, a comprehensive Enterprise Resource Planning (ERP) solution, offers a robust accounting module that enables businesses to streamline their financial processes. The module allows us to configure financial reports tailored

to our specific needs, providing us with valuable insights into our company's financial

4. Balance Sheet Report Configuration

The balance sheet in the accounting module is a representation that gives a precise picture at a certain point in time of all financial transactions that occur within the company when applying circular economy principles in the leather tanning process, this balance report becomes more than just an illustration. This reflects a commitment to minimizing waste and maximizing the use of natural resources in operations.

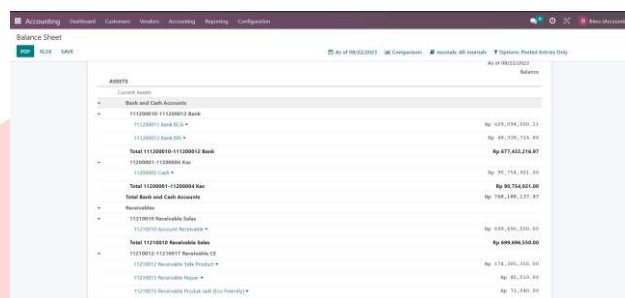


FIGURE IV.1
Balance Sheet Report

In the context of leather tanning, circular economy implementation includes strategies such as reuse of waste from the tanning process, selection of more sustainable raw materials, and more environmentally friendly practices in waste management. When reflecting this in the balance sheet, it is like looking at how efficient and sustainable it is at using financial and natural resources for operations.

5. Profit and Loss Report Configuration

The Profit and Loss report, commonly referred to as the income statement or statement of earnings, constitutes a pivotal financial document deeply rooted in the principles of financial accounting. This essential report comprehensively evaluates the financial performance of an entity within a designated timeframe. It systematically elucidates the intricate interplay between the entity's revenues, expenditures, and the consequential net income.

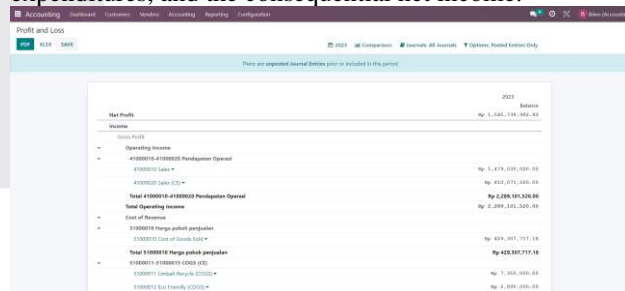


FIGURE IV.2
Profit and loss report

Within the framework of profit and loss reporting, numerous accounts play a pivotal role in assessing a company's adherence to the circular economy concept. Notably, the operating income account serves as a fundamental indicator, encompassing both general categorizations and specifically delineated segments associated with sales transactions rooted in circular economy

products. Additionally, within the cost of goods sold account, there exists a detailed categorization that affords insights into manufacturing expenses attributed to various product categories.

6. KPI for Accounting Module Based On Circular Economy Concept

Within the framework of developing a performance measurement strategy, a series of Key Performance Indicators (KPI) have been determined in the Odoo Accounting module. This process involves the identification and selection of parameters that are critical to scientifically reflect the achievement of the company's financial objectives.

No	Key Performance Indicator
1	Measurement of gross profit margin on sales of CE products
2	Measurement of revenue based on side products
3	Ratio of operation profit margin on based on CE products
4	Percentage of return on asset on CE products
5	Percentage of Return on Equity based on CE product
6	Comparison between Expense and Revenue value based on CE Products
7	Expense on Environment Cost Operational

FIGURE III. 6
KPI for CE Accounting

The initial stage is to determine relevant KPIs with a focus on financial performance and operational efficiency. Some examples of defined KPIs include performance ratios, for example gross profit margin based on Circular economy side product to maximize profitability in implementing circular economy.

7. Circular Economy Accounting Monitoring Dashboard

In an effort to integrate Circular Economy principles into the accounting system, an innovative Accounting Dashboard configuration has been carried out in the Odoo Accounting module. This approach aims to promote efficient use of resources and optimal reuse of existing resources, based on current scientific writings.

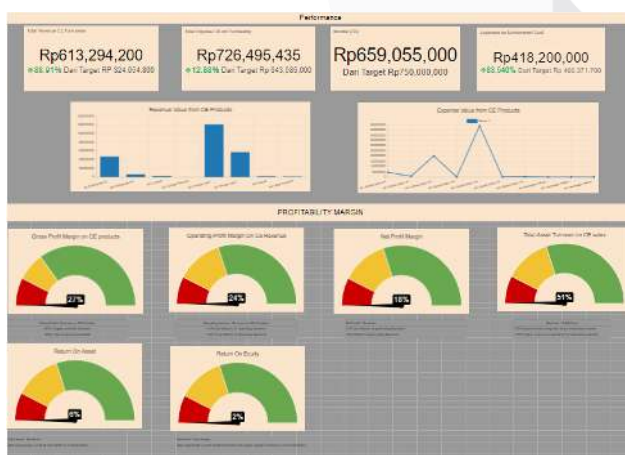


FIGURE III. 7
Circular Economy Accounting Monitoring Dashboard

III. CONCLUSION

In order to develop an accounting module based on Circular Economy in the Odoo Accounting module, the results show that the integration of the Circular Economy

concept in the accounting system has great potential to optimize a company's financial performance in a sustainable manner. Through careful use of accounting dashboards, metrics and KPIs relevant to the Circular Economy can be integrated with company financial and operational data, providing a comprehensive picture of the efficient use of resources and environmental impact.

In conclusion, the development of an Economic Circular-based accounting module in the Odoo Accounting module has proven useful in providing a broader view of company performance. With better monitoring of environmental aspects and financial performance, companies can identify new opportunities, reduce environmental impact, and increase efficiency in order to achieve sustainable growth.

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