Integration Between ERP Software and Business Intelligence in Odoo ERP: Case Study A Distribution Company Yulia Kendengis1,*, Leo Willyanto Santoso1 1Informatics Department, Petra Christian University, Indonesia Abstract. Odoo is an open-source ERP software. Odoo has advantage in price because it’s free. And from the functional side, Odoo has been equipped with more than 4500 modules, one of them is business intelligence (BI). BI is a solution and technique that helps company to understand about the business situation to make effective business decisions and meet their objectives. A study about the integration between Enterprise Resource Planning and BI in Odoo ERP will be explained in this paper. In the case study, we used sales data from a distribution company. 1 Introduction BI transforms raw data into meaningful metrics reflective upon historical, current and
predictive business operations and performance. In the past, the activities of BI were performed through gathering data from multiple sources manually, manipulating data in spreadsheets, with a static report output.

The data should be gathered from some functional areas. These activities are takes so many times. But today, ERP solutions come with integrated BI modules that enable company to provide dynamic report. It provides the users with something what they want to see and whenever they want to see it. The benefit is its ability to give company a real-time look at the data they need to make intelligent decisions in the short and long terms. For example, a sales manager want to get data about sales analysis, which products are harming the company. With a quick glance at the dashboard, the sales manager will be able to see the information about the sales analysis. He or she can analyze the factors that cause the products loss. One of the ERP software available today is Odoo. Odoo is an open-source ERP Software integrated with BI module. It provides robust analytical capabilities, such as access to reports and dashboard management. It also has advanced analytical features that allow us to view data from different sources. 2 Literature 2.1 Business Intelligence Business Intelligence (BI) is a term consisting of technologies and processes for gathering, storing and analysing data to improve decision making.

[1-3]. Some researches about BI implementation in industries had been done, for examples in healthcare field [4], implementation BI in some industries in Norway [3] and BI implementation for SME [5] and BI implementation for mobile application [6]. The BI and analytics platform market's shift from IT-led reporting to modern business-led analytics. Data and analytics leaders face countless choices from traditional BI vendors that have closed feature gaps and
innovated, to disrupters continuing to execute

[7]. Some BI vendors are SAP, Oracle, Pentaho, Odoo, SAS, IBM, Microsoft, etc. BI applications have capabilities: analysis, such as

**online analytical processing (OLAP), information delivery**, such as dashboards and reports; and platform integration,

such as a development environment and BI metadata management. BI application helps company to readily access and analyses the reliable company information timely to help company make insightful business decisions and meet their objectives. However, implementing a BI application can be an expensive and how can company ensure that they will get the return on investment from BI application implementation. Some best practice guidance that will help company implement BI application that meet their needs and add value to the decision-making process [8]:

1. **Identify business needs**
The first step in implementing an effective BI solution is to identify as clearly as possible the business need that will be addressed.

2. **Involve business users**
Affected business users should be encouraged to identify the reports that they currently run together with the system that provides the data.

3. **Select the right system**
Identify which of the many solutions available will best meet the needs of the business and the end-users

4. **Decide on migration method**
A decision will need to be made about the best way to integrate data from existing databases and applications.

5. **Incorporate familiar environments**
Business users prefer BI applications that provide them with a familiar environment in which to work.

2.2 Open Source ERP
Open source ERP software has privilege in cost. Open source software is software that is freely available with source code. Anyone can edit, modify and distribute to anyone for any purpose and with a free license and no ownership permit [9]. Some types of open source ERP are Compiere, OpenBravo, ADempiere, Odoo, WebERP, Dolibarr ERP, Sugar CRM, etc. The software is a license-free web-based software using languages like Phyton, Javascript, Php, Frappe, etc. Each has various modules such as human resources, sales management, inventory, finance, etc. Customization process can also be done to adjust to company business process.

2.3 Odoo ERP
Odoo (formerly known as OpenERP and before that, TinyERP) is an open source platform that is used for business purposes. Odoo has existed since February 2005 under the name Tiny ERP. Integrated modules are built on the platform, covering all business areas ranging from CRM, sales, accounting and stock [10]. Odoo is classified as Enterprise Resource Planning (ERP) software. This software was developed by Odoo S.A, which has more than 250 employees. Odoo's representatives are spread across

**Belgium, San Francisco, New York, Luxembourg, India and Hong Kong.**

Odoo

is built open source and modular, so Odoo supports the reuse of existing libraries and everyone can be involved in the development. Odoo is released under the AGPL (Affero General Public License) license. More than 1500 developers joined in the Odoo community. There are over 4500 modules to address the business needs of more than 2,000,000 users worldwide [11]. The Odoo platform consists of three main components, the PostgreSQL database, the Odoo server application, and the web server. The PostgreSQL database holds all data associated with the data and the Odoo configuration. The Odoo application server
contains libraries and compiler modules built using the Python programming language. The web server handles client requests from the web browser. Odoo Architecture can be seen in Figure 1. Fig 1. Odoo Architecture [11] Odoo is built using the OpenObject framework [11]. OpenObject is a framework that is modular, scalable, and supports Rapid Application Development (RAD). Odoo provides basic modules that support basic business functions within a company. Odoo has an open architecture. The developer team has the ability to design, develop and deploy a software system that exactly matches the intended companies’ operations. Odoo is also web-based responsive and able to support all devices and operating systems. 2.4 Odoo Business Intelligence Odoo has limited features of BI. To extract very specific information out of the system developers are needed. External packages are often used (such as Pentaho or Jasper Reporting) to analyse and process Odoo data. The features of Odoo BI are [12]:

1. **Tabular chart** Get an overview of all data in one single table that is fully adaptable to the field of research.
2. **Bar, line and pie charts** Switch between different view styles for the same data to capture the most demonstrative view.
3. **Filter data** Use built-in filters to gather informations within your research field, and create custom filters that you can save and use later.
4. **Export data** Create Excel® spreadsheet documents from the collected data in just a few clicks.
5. **Customize board** Create custom board containing only information that you consider more relevant to business.
6. **Save Favorites** Create filters and save them in a favorites list to instantly access them afterwards.

3 Case Study In this section, will be piloted a BI module in Odoo ERP. A case study was taken at a distributor company in Surabaya. Figure 2 is some of the sales order data that occurred in May 2017. These sales data are taken from Sales Modules in Odoo ERP [13]. Fig 2. Sales Data Fig 4. Filtering Process Fig 2. Sales Data Fig 5. Report per Customer and Product – Pivot View For sales report, it can be seen based on some measure, e.g. for sales data per supplier, size can be based on total invoiced, quantity invoiced, quantity delivered etc. It can be viewed in the form of pivot table or graph as in Figure 3. Fig 6. Report per Customer – Graph View Fig 3. Sales Analysis in Pivot Table View We can do data filtering process group by any fields (Fig 4), such as group by customer and product in pivot table or graph view, as in Figure 5, 6 and 7. The report includes the total sales per customer per product, total orders per customer(Fig 6), total sales per product (Fig 7) Fig 7. Report per Product – Graph View For each filtering that has been done can be stored in favorites and / or inserted into the dashboard of the Sales module. Figure 8 is a dashboard example for the Accounting module. We can quickly find out some information such as where the bills of both debt and receivables are due, how the current cash position etc. on this dashboard. Fig 8. Accounting Dashboard Fig 9 is an inventory dashboard, where we can find out what items will be in and out both from outside the company and between warehouses within the company. Fig 9. Inventory Dashboard We can also
The integration between ERP and ERP module in Odoo ERP has helped to provide information for the company and assist in decision making. Company can also create specific reports and analysis on the go in a few simple clicks, based on existing templates or on personalized criteria.