

Implementation of Business Intelligence In Data Superstore Sales With Online Analytical Processing Method

Dandy ^{1)*}, Rino ²

¹⁾²⁾ Universitas Buddhi Dharma

Jl. Imam Bonjol No.41. Karawaci Ilir, Tangerang, Indonesia

¹⁾Dandywijaya08@gmail.com

²⁾ Rino@ubd.ac.id

Article history:

Received 20 November 2020;
Revised 22 November 2020;
Accepted 10 December 2020;
Available online 27 December 2020

Keywords:

Business Intelligence
Business Intelligence Roadmap
OLAP
Superstore Sales

Abstract

Transaction data in superstore sales data are very useful for company development, can be used to describe and forecast or predict future sales transaction data and to study the past about business opportunities and challenges. The use of Business Intelligence (BI) technology can help analyze large amounts of data, in addition, BI is a powerful tool for quality analysis and company analysis. This study designed an information system using the BI approach to analyze transaction data on superstore sales data. The research focus is on report data, namely superstore sales data regarding sales transactions. This study uses the OLAP method to describe data visualization so that it provides benefits and competitive advantages. This system can improve the quality of decisions taken in solving the problem of abundant data accumulation, monitoring operational activities, fulfilling information needs and effective data management. Business intelligence is expected for company leaders to be able to understand the data that will have been processed in understanding visual forms and can easily absorb the information needed to make decisions for the company. In addition, with the design of website-based business intelligence that is effective and efficient to produce opportunities in making decisions to predict the increase or decrease that will occur in the coming years using the histories in the superstore sales data of the previous years.

I. INTRODUCTION

Information technology can be used as a tool for storing large amounts of transaction data (Sunday 2013). Data in the form of transaction results carried out from year to year which constitute transaction history, of course, are very useful for company development, can be used to describe future forecasts (Forecasting). (1) The rapid development of information and communication technology makes business competition in each segment tougher from the increase in transactions, causing large amounts of data to be accumulated. This data will be difficult to use to support decision-making. (2) The rapid development of information and communication technology has made business competition in each segment tougher from the increase in transactions, causing large amounts of data to be accumulated. This data will be difficult to use to support decision-making. (3) To support this problem Superstore sales need a website-based dashboard so that it helps in making decisions and managing data so that they can see a very valuable advantage to support the existing business process. The next stage is as good as possible to be further processed using business intelligence to see sales information visually as well as a summary of transactions that have been made in order to see profits and see a new opportunity in the transaction process.

II. METHODS

Online Analytical Processing (OLAP)

* Corresponding author

OLAP (Online Analytical processing) is a tool used to perform multidimensional data analysis and provides the ability for complex calculations, trend analysis, and sophisticated data modelling [1]. OLAP stands for Online Analytical Processing, which is an approach method that provides various answers to analytical queries quickly. OLAP can collect, store and manipulate multidimensional data for analytical purposes. OLAP [2] is the ability to efficiently manipulate data from several perspectives (perspectives). The main operational structure of OLAP is based on a concept called a cube. Cube in OLAP is a multidimensional (actual / virtual) data structure that allows fast data analysis. The data arrangement on the cube serves to overcome the limitations of relational databases.

Business Intelligence Roadmap

According to [3] The design of Business Intelligence is carried out through the Business Intelligence Roadmap approach which is divided into 6 stages, namely:

1. Justification

To implement Business Intelligence, the first step must be done by examining and gathering the necessary information such as strategic objectives, company strategies, and suggestions.

2. Planning

In implementing Business Intelligence, a structure is needed so that the application can run properly. In addition, the completion of Business Intelligence must be built in a timely manner regarding project work.

3. Business Analysis

In this stage, the existing infrastructure is in accordance with the required infrastructure, both technical and non-technical, so that if it meets the requirements or is appropriate it can be implemented. In addition, existing data will be analyzed so that it can be seen whether the data that has been received is of good quality or not.

4. Design

The design of the database that will be used to support the dashboard that will be built, while the database design designed is the star schema.

5. Construction

The stage for preparing the implementation of business intelligence includes the migration of existing data, so that the data can be processed for the purposes of the business intelligence dashboard for sales of the new needs to be built.

6. Deployment

This is the stage of implementing business intelligence so that it can be used by users, including maintenance and conducting a post-implementation review of the sales business intelligence dashboard.

[4]

Proses OLAP

The online analytical processing method algorithm generates dimension tables and fact tables such as item dimensions, customer dimensions and fact transactions. The data is obtained by the Kaggle website [5]

a. Item Dimensions

This table contains the product id, category, subcategory and product name

b. Customer dimension

This table contains the customer id, customer name, segment, country, city, state, postal code and region

c. Transaction Fact

This table contains the id, order id, order date, delivery date, delivery type, customer id, product id, sales, quantity, discount and profit.

Table 1. Total Sales Data for 2014 by Sub-Category Machines

Row	Order ID	Order Date	Product ID	Category	Sub-Category	Sales
1	CA-2014-139892	2014-09-08	TEC-MA-10000822	Technology	Machines	8159.952
2	US-2014-106992	2014-09-19	TEC-MA-10000822	Technology	Machines	3059.982
3	US-2014-106992	2014-09-19	TEC-MA-10003353	Technology	Machines	2519.958
4	CA-2014-164973	2014-11-04	TEC-MA-10002927	Technology	Machines	3991.98

5	CA-2014-101476	2014-09-12	TEC-MA-10000029	Technology	Machines	69.99
6	CA-2014-146969	2014-09-29	TEC-MA-10004241	Technology	Machines	686.32
7	CA-2014-122882	2014-09-07	TEC-MA-10004679	Technology	Machines	399.54
8	CA-2014-145317	2014-03-18	TEC-MA-10003626	Technology	Machines	821.3
9	CA-2014-145317	2014-03-18	TEC-MA-10002412	Technology	Machines	22638.48
10	CA-2014-138317	2014-06-21	TEC-MA-10004521	Technology	Machines	206.991
11	CA-2014-166863	2014-06-20	TEC-MA-10001972	Technology	Machines	418.8
12	CA-2014-110849	2014-04-18	TEC-MA-10002859	Technology	Machines	287.968
13	CA-2014-110786	2014-12-29	TEC-MA-10003183	Technology	Machines	767.952
14	CA-2014-127299	2014-09-19	TEC-MA-10001127	Technology	Machines	2624.985
15	CA-2014-128839	2014-09-08	TEC-MA-10000029	Technology	Machines	209.97
16	CA-2014-125829	2014-11-04	TEC-MA-10003246	Technology	Machines	447.968
17	CA-2014-160766	2014-09-14	TEC-MA-10003979	Technology	Machines	2799.96
18	CA-2014-104402	2014-06-17	TEC-MA-10000423	Technology	Machines	65.97
19	CA-2014-145541	2014-12-14	TEC-MA-10001127	Technology	Machines	6999.96
20	CA-2014-158281	2014-09-02	TEC-MA-10002210	Technology	Machines	559.71
21	US-2014-131275	2014-03-18	TEC-MA-10001148	Technology	Machines	1279.968
22	CA-2014-131947	2014-09-17	TEC-MA-10004086	Technology	Machines	29.925
23	US-2014-115196	2014-09-09	TEC-MA-10002073	Technology	Machines	1299.99
24	CA-2014-121629	2014-11-28	TEC-MA-10004679	Technology	Machines	998.85
25	US-2014-105137	2014-10-10	TEC-MA-10002694	Technology	Machines	101.994
26	CA-2014-152618	2014-03-14	TEC-MA-10003626	Technology	Machines	574.91

From the results of the data processing that has been done, a result is obtained in the form of product sales information.

DASHBOARD

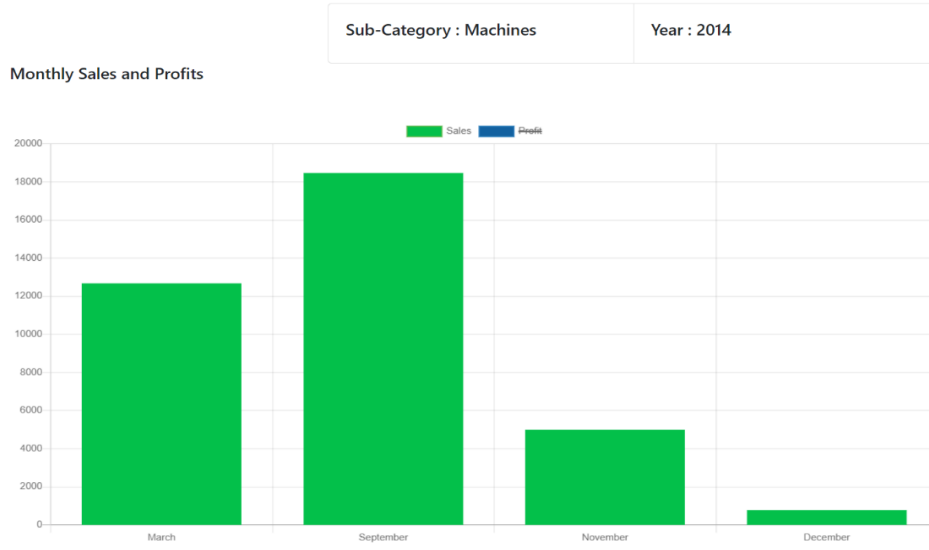


Fig 1. Process OLAP

III. RESULTS

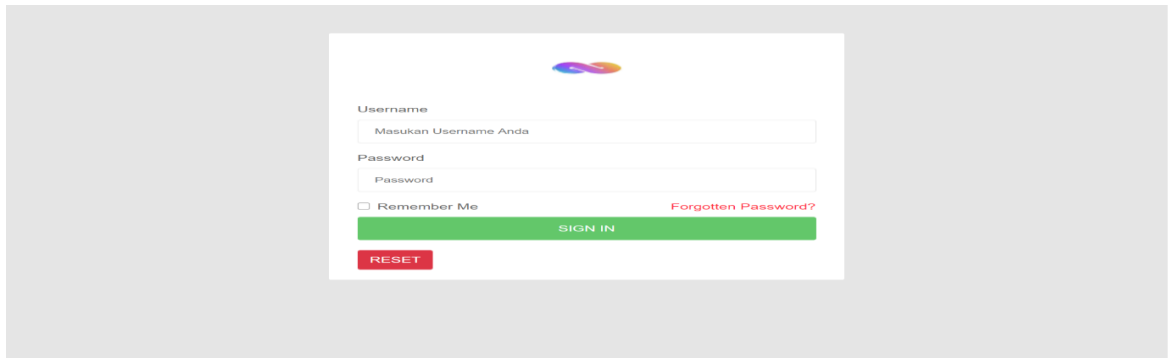


Fig 2. Login Page views

To be able to enter the main page you must enter your username and password, this login page is for security so that unauthorized people cannot enter the web page.

DASHBOARD

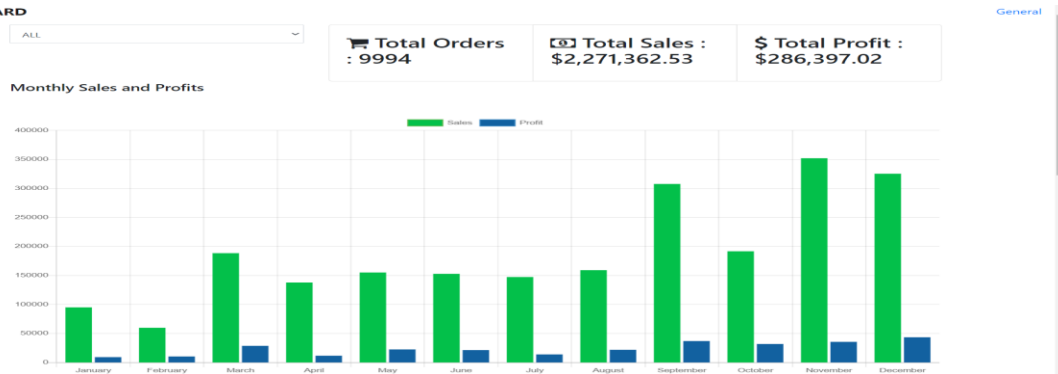


Fig 3. All Years Sales and Profit Dashboard views

The page Fig 3 explains the monthly sales and profit from 2014-2017 and the ALL combobox, which will display the entire total from 2014-2017.

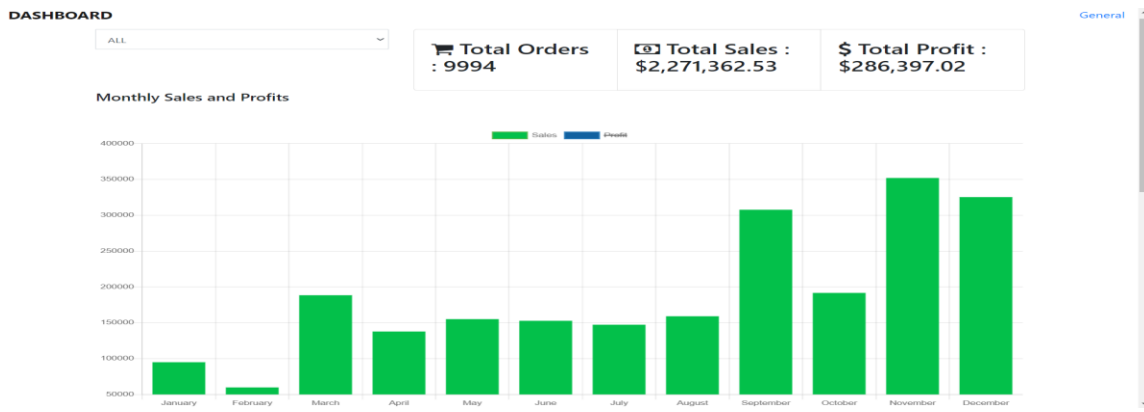


Fig 4. Sales All Year Dashboard views

The page Fig 4 explains the monthly sales from 2014-2017 and the ALL combobox, which will display the entire total from 2014-2017.

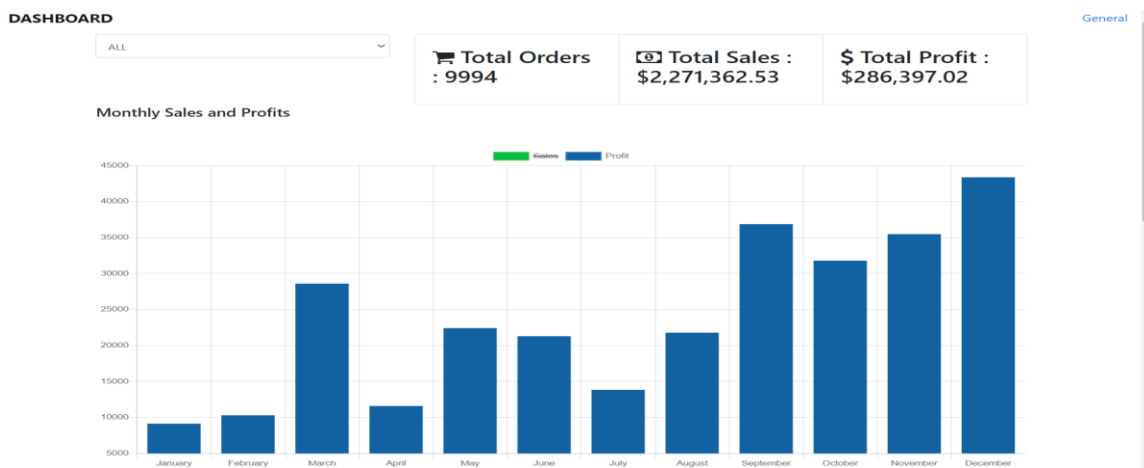


Fig 5. All Year Profit Dashboard views

The page fig 5 explain the monthly profit from 2014-2017 and the ALL combobox, which will display entire total from 2014-2017.

DASHBOARD

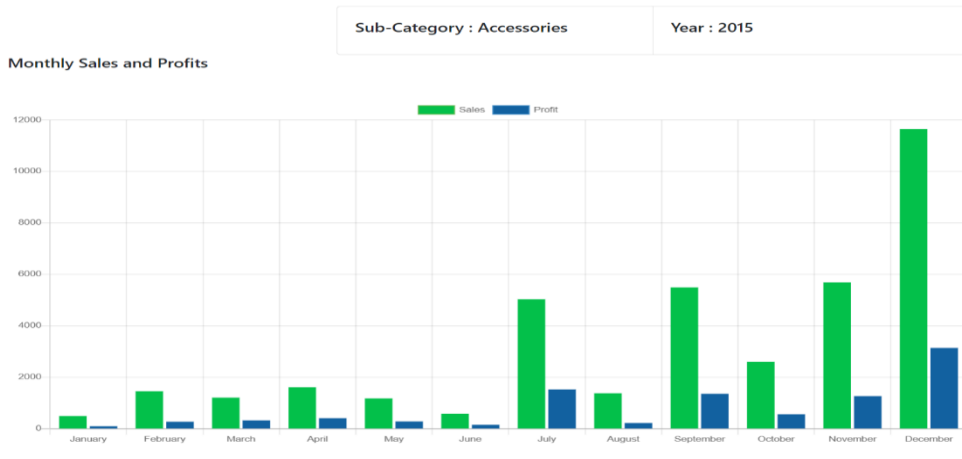


Fig 6. Sales and Profit Dashboard views for 2015

The page fig 6 explain sales and profit in the subcategory accessories per from from january to december 2015.

DASHBOARD

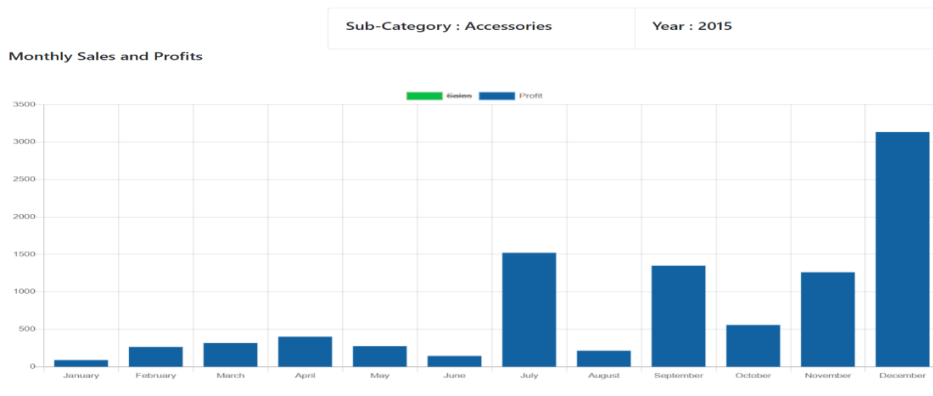


Fig 7. Dashboard views Profit in 2015

The pages of Fig 7 explain the profit in the monthly accessories sub-categories, namely from January to December 2015.

IV. CONCLUSIONS

After going through the business needs process, designing, manufacturing, testing and assessing the dashboard business intelligence data Superstore sales using Online Analytical Processing (OLAP), researchers can draw conclusions, namely:

1. By using web business intelligence, data can be processed quickly and make it easier to make decisions to improve business processes.
2. This study produces a business intelligence dashboard for superstore sales data processing.

REFERENCES

- [1] anaktik.com, "Apa itu OLAP (Online Analytical Processing)," 26 Maret 2020. [Online]. Available: <https://anaktik.com/online-analytical-processing/>.
- [2] T. S. D. and K. , *Business Intelligence Dashboard*, Yogyakarta, 2011.
- [3] L. T. Moss and S. Atre, *Business Intelligence Roadmap : The Complete Project Edition 12*, Addison-Wesley, 2011.
- [4] medium.com, "Pengenalan Business Intelligence," 23 Agustus 2019. [Online]. Available: <https://medium.com/@jrendz/pengenalan-business-intelligence-c36232510531>.
- [5] F. Folat, "Sales Data," Kaggle, [Online]. Available: <https://www.kaggle.com/fehmiyaratpolat/sales-data/tasks>.