

# CHAPTER I

## INTRODUCTION

### 1.1. Background

Nowadays, in the era of the Internet as disruptive technology and way of industrial revolution 4.0, all industrial companies compete in the competition atmosphere to increase their sales with the help of the latest technology and the latest science called industry 4.0. Industry 4.0 means the industrial revolution 4<sup>th</sup> generation.

Industry 4.0 is the information-intensive transformation of manufacturing and other industries in a connected environment of data, people, process, services, systems, and IoT-enabled industrial assets with the generation, leverage and utilization of actionable information as a way and means to realize smart industry and ecosystems of industrial innovation and collaboration.

It is also the digital transformation of manufacturing, leveraging third platform technologies and innovation accelerators in the convergence of IT (Information Technology) and OT (Operation Technology) to realize connected factories and industry, smart decentralized and self-optimizing systems and the digital supply chain in the information-driven cyber-physical environment of the 4<sup>th</sup> industrial revolution (sometimes called 4IR) (i-scoop. 2016).

The industrial revolution began at the first era in the United Kingdom that has been updated and upgraded until now in the era of the 4<sup>th</sup> industrial revolution by the application of internet, robot, automation, artificial intelligence, etc. Parts of industry 4.0 are big data analysis, data science, data analytics and Business Intelligence (BI). BI helps industrial players to analyze many things using databases which are also part of big data analysis. BI is widely used for a lot of analysis. BI is defined as systems which collect, transform, and present structured data from multiple sources (Negash, 2008).

BI has broadened its horizon because of the concept of Industry 4.0. It is because the concept of Industry 4.0 gives new sources of data which never been taken up until now. There also new approaches and uses have also appeared, such as real-time monitoring and predictive analytics. The current environment of Industry 4.0 brings new levels of knowledge that allows us to gain new competitive advantage, how we obtain and use this information, not which data we collect. It is all about the rich of data, information, and knowledge.

The success of these kinds of projects depends on the power of the tools (integrating analysis and prediction), the speed of the deployment, the capability to adapt to any needs and the savings obtained which are mostly included in their BI use. It is because an important element behind the boom of Industry 4.0 is the ability to analyze the collected information immediately, enabling real-time decision making.

Another factor that comes into play in Industry 4.0 projects is data processing. The main challenges here are to distinguish between relevant and redundant data, define whether we need to keep the information or all possible meaning has already been extracted and define the level of aggregation. We also need to consider the use we intend to do with the information, especially if we are talking about real-time analytics or predictive analysis projects. (Techedge, 2018)

Then, once data are processed, the last thing that we have to conduct is data visualization. There are many solutions and options that enable the development of data visualization in Industry 4.0 projects. They have the capacity of analytical representation of information from the dashboard to real-time data monitoring and alert management through decision-making tools.

Thus, a BI system can be called a decision support system (DSS). BI provides historical, current, and predictive views of business operations. Common functions of BI technologies are reporting, online analytical processing, analytics, data mining, business performance management, benchmarking, text mining, and predictive analytics. Yet, BI nowadays called as traditional BI will have problems when the data volumes and the usage frequency of a traditional BI system increase. (Lennerholt, et al., 2018). Then comes up the new BI called as Self-Service Business Intelligence (SSBI).

Self-service Business Intelligence is a concept that was proposed by Claudia Imhoff and Colin White. They stated that self-service BI is a facility in BI environment that enables BI users to become more reliant and less dependent on the IT department. Moreover, Self-service BI can also be called as Do-It-Yourself BI (DIY BI) which shows that the environment provided is easy to access, analyze and share data with less IT dependency (Imhoff & White, 2011).

Nowadays, in the era of technology that moves rapidly, SSBI is no longer a new item. Many enterprises are competing to create the best SSBI tools. Then the new problem arises after all of this. Many professional users that need that are most suitable for them are confused in choosing among many tools on the market.

Therefore, the researcher conducted a comparative study to analyze the two most famous SSBI tools on the market based on several experts and articles such as Gartner Magic Quadrant. It is because, based on many articles that discuss the advantages and disadvantages of some SSBI tools, no one specifically explains using standard parameters. The advantages of this research result are the end-user which comes from beginner to professional user that would like to use SSBI tools will know the best and most suitable for them. Especially for them who confuse to choose whether to use Power-BI or Tableau. Gartner Magic Quadrant 2019 and Gartner Quadrant Trends 2017-2018 will be shown in Figure 1.1 to 1.3:

الجامعة الإسلامية  
الاستاذ الدكتور

Gartner's Magic Quadrant For BI and Analytics Platforms (As of February 2017)

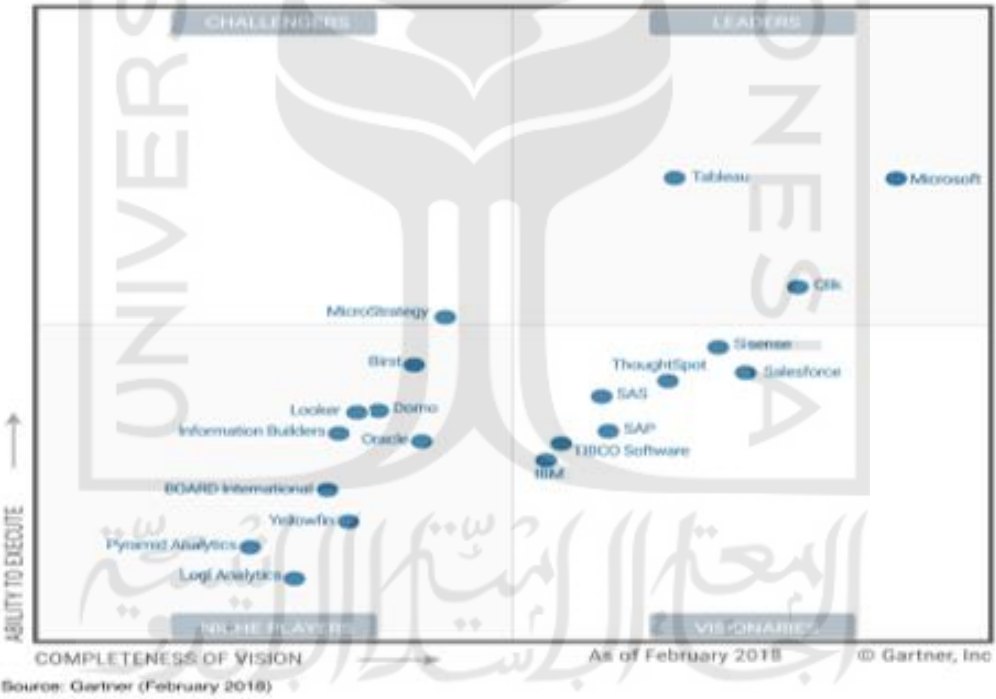


Figure 1.1 Gartner Magic Quadrant Trends 2017-2018

Figure 1. Magic Quadrant for Analytics and Business Intelligence Platforms



Figure 1.2 Gartner Magic Quadrant 2019

Based on the Gartner Magic Quadrant and the Trends, Power BI and Tableau are market leader nowadays. They stand at the top over others as BI analytics tools. In this research, the researcher would analyze the datasets from secondary data using Microsoft Adventure Works database 2017 to conduct deeply comparison study analysis. This research will be supported by several parameters as the comparison goal. Based on a few references, the researcher limits the research to conduct a comparative study of several parameters between the two most famous SSBI tools which are Power BI by Microsoft Corporation, and Tableau Desktop by Tableau Software. The result of this research is there are several results of the comparison analysis. The researcher compares 5 standard or Must-Have SSBI Tools parameters. The comparison of the standard parameters shows the equal rating of both tools. Yet, the comparison does not stop there. the differentiator parameter will be added as the additional parameter and to be the benchmark parameters. Then, the differentiator parameters show there only one tool which has a better rating than the other one.

## **1.2. Problem Formulation**

Based on the above background and many professional user choices, the problems of this research are:

What is the general comparison study's result between those two most-famous Self-Service Business Intelligence Tools using apple to apple comparison and the result based on the standard parameters? Beside of that what is the researcher conclusion based on the result data of this comparison study of both most SSBI Tools?

## **1.3. Research Objectives**

The objectives of this research are to compare the development of Self-Service Business Intelligent using two most famous SSBI Tools which are Power BI and Tableau based on the standard parameter for decision support systems. There is also the importance to give the decision-maker the most suitable and most valuable SSBI-Tools for their companies.

## **1.4. Scope and Research Limitation**

To avoid fewer ineffective discussions, the researcher has several scope and limitation:

1. This research conducted a comparison study between SSBI Tools using “apple-to-apple” comparison to get the real data result using another researcher's example compilation of the development on Self-Service Business Intelligence.
2. This research used legal sample data from Microsoft which is Microsoft AdventureWorks2017 database.
3. This research limited the parameters to avoid ineffective discussion. Based on the research, the research only compared all specific parameters for “SSBI” Tools.
4. Due to complexity features, several differentiators will be added as the additional parameters between Power BI and Tableau Desktop.

## **1.5. Research Benefits**

1. The professional users can easily choose between those two most famous Self-Service Business Intelligent Tools based on their specific personal needs.
2. A deeper analysis of the comparison study based on some standard and important parameters between those two SSBI Tools will give the information for the professional users to know the most suitable for their companies.

3. The researcher can gain deeper knowledge about the advantages and disadvantages between Power BI and Tableau Application.
4. This research also will give the benefit of current knowledge about the implementation of Self-Service Business Intelligent based on some example in this research analysis.

### **1.6. Systematical of Thesis Writing**

Writing this study was based on the rules of scientific writing in accordance with the systematics as follows:

#### **CHAPTER I**

#### **INTRODUCTION**

This chapter contains a preliminary description of this research activity from wide to narrow explanation, on the background of this thesis problem, formulation of the development and comparison problem, the objectives to be achieved, the benefits of this research and systematic writing

#### **CHAPTER II**

#### **LITERATURE REVIEW**

This chapter elaborated on the theories of reference books and journals about BI and SSBI as well as the results of previous research related to the research problem which is used as a reference for problem-solving

#### **CHAPTER III**

#### **RESEARCH METHODOLOGY**

Contains the description of the framework and lines of inquiry, the research object to be studied and the methods used in the study.

#### **CHAPTER IV**

#### **COLLECTION AND PROCESSING DATA**

Contains the data obtained during the research which is Microsoft Adventure Works database and how to analyze

the data. Data processing result is displayed either in the form of tables and graphs calculated in both tools. What is meant by processing the data also includes an analysis of the results obtained? In these sections is a reference to the discussion of the results to be written in Chapter V.

## **CHAPTER V**

### **DISCUSSION**

Contains discussion of the results of data processing that has been done in research. Compatibility with the objectives of research so as to produce a recommendation.

## **CHAPTER VI**

### **CONCLUSIONS AND RECOMMENDATIONS**

Contains the conclusion of the analysis made and any recommendations or suggestions on the results achieved in the problems identified during the study, so it needs to be done or assessed in future studies.

## **REFERENCES**

## **APPENDIX**

