

CHAPTER I INTRODUCTION

I.1 Research Background

Recent days, big data have a lot of roles to increase the business. Big data could give various value added to the companies that could implement it. The term “big data” itself is the exponential growth and wide availability of digital data that are difficult or even impossible to be managed and analyzed using conventional software tools and technologies (Xue-wen Chen & Xiaotong Lin, 2014). Based on Gartner’s survey in 2015, the result shows that 64% companies implement big data technologies to increase customer experiences, and 47% uses it to make the current process more efficient (Gartner, 2015).

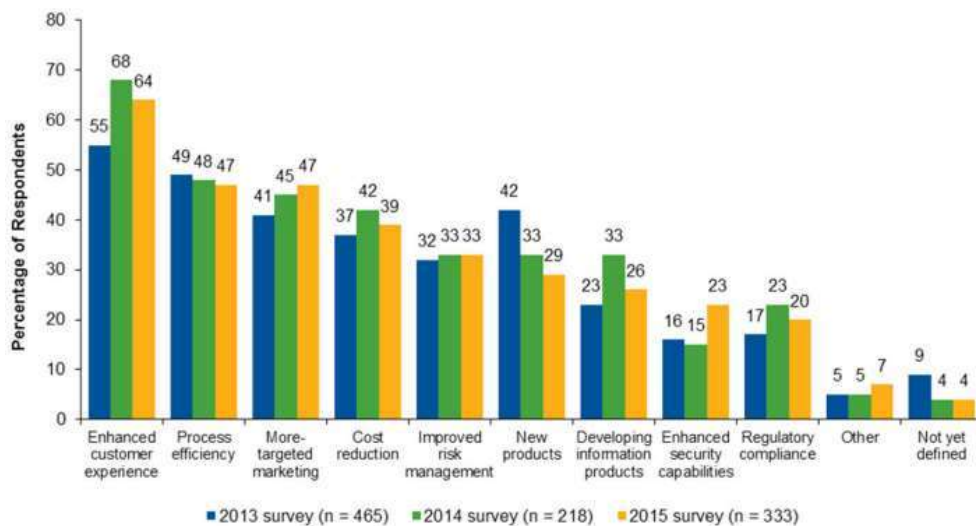


Figure I-1 Big data usage trends on companies (Gartner, 2015)

To make big data useful and have benefits to the companies, big data should be well processed and well analyzed. One of the ways is, to present the data within a dashboard. Dashboard is a set of visuals of valuable information, it presented in a single screen, so the information could be monitored at a glance (Few, 2006). The visual display of a dashboard usually shows set of texts and graphics. But mostly focused on the graphic. Graphic chosen because they show information more efficient and easier to understand rather than only using text. That’s because human eyes can take graphic quickly and the brain can easily the valuable and important

information. Research done by The Data Warehousing Institute (TDWI) shows that 77% of the correspondent companies, using data visualization like dashboard, could increase their operational efficiency, followed with 62% companies say that they could response the business change quickly with the data visualization helps. Then 59% said that the data visualization help them to identify new business opportunities (Stodder, 2013).



Figure I-2 Advantages of using data visualization in the companies (Stodder, 2013)

One of the company that want to implement the big data technology to their dashboard is Telekomunikasi Indonesia International Hong Kong Limited (Telin Hong Kong). Telin Hong Kong was established on 2010 and becomes subsidiary with 100% of its shares owned by PT Telekomunikasi Indonesia International (Telin). Since March 1st, 2011, Telin Hong Kong has obtained Unified Carrier License (UCL) and since July 27th, 2011 has obtained Services-Based Operator (SBO) License for Mobile Virtual Network Operation (MVNO) Services and operating money service (remittance) license on July 18th, 2012.

Telin Hong Kong's dashboard is a billing system dashboard. This dashboard used to show any information related to operator or partner companies of Telin Hong Kong that uses the international SMS and send it through Telin Hong Kong's SMX. The data recorded in the billing system's database is huge. Each day, the system could record up to 900MBs file. To process the files, the billing system dashboard needs more than two hours after the data pulled from the server, to be shown in the dashboard. The statistic about how long time spent for data processing can be seen in Figure I-3.

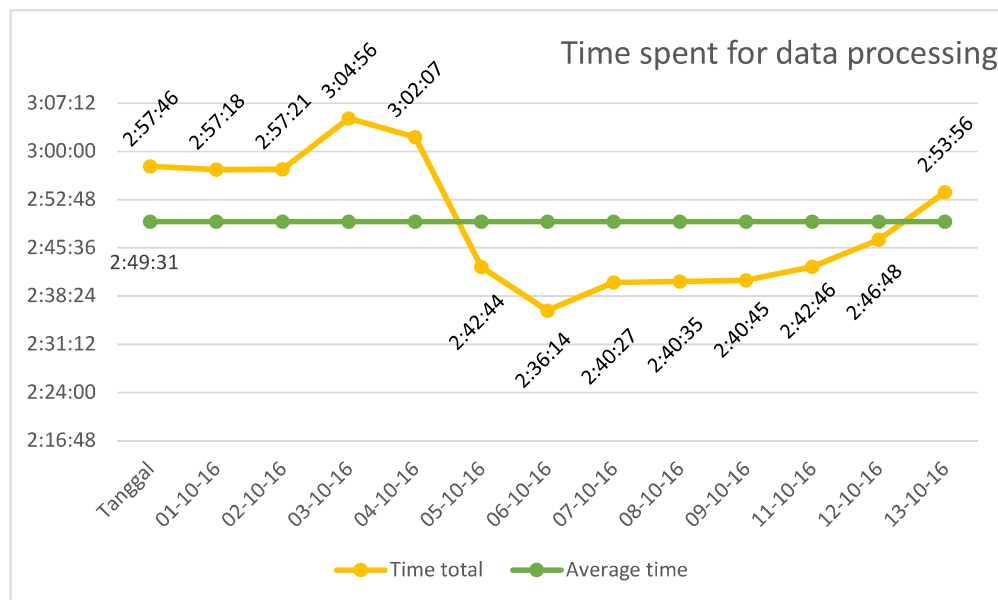


Figure I-3 Time spent for transactional data processing (Telin Hong Kong Ltd., 2016)

As seen in those figure, the time needed for data processing is quite long, 2 hours 49 minutes in average, and in some cases, even more than 3 hours. Whereas, decisions that must be made based on the dashboard is needed as soon as possible. This long time to process the data will lead to delayed decision making. Which might be not good for a company like Telin Hong Kong Ltd to their business.

There are several ways to fix this. One of them is by reform the data processing architecture. Instead of using the current architecture, it is better to use a renewed architecture that used to handle a big data, which way more complex than Telin Hong Kong's transaction data. With the expectations that a big data technology could perform better to process a data that have a large volume, even though not classified as big data. The tools that available to reach this goals also vary. There are Pentaho, Tableau, Apache Zeppelin, and some other tools.

Based on those analysis, then the research titled **“Data Processing Architecture Analysis and Design Using Big Data Technology to Increase Transaction Data Processing Speed in Telin Hong Kong Ltd”** is initiated to know that is the data processing architecture design using big data technology could increase the processing speed faster than the conventional way that currently used, so the

dashboard that used by Telin Hong Kong could increase the operational process efficiency, and leads to faster decision making for the company.

I.2 Problems Definition

Based on the research background that have been stated before, then the problem that could be identified are:

1. What kind of big data technology that can be used to develop a better data processing architecture for the billing system?
2. How much the data processing speed can be improved by using the big data technology in data processing architecture design?

I.3 Research Objectives

The objectives of this research based on the problem definition are as follows:

1. To find out, what kind of big data technology that can be used to develop the data processing architecture of billing system.
2. To find out, how much the implementation of big data technology affects the processing speed of the billing system dashboard.

I.4 Research Limitations

The problem scope of this research are as follows:

1. The focus of this research is to find a suitable tool to develop a better data processing architecture, not to build a new dashboard.
2. Analysis and design of the data processing architecture are limited in identification of the success and failure SMS by operators and partners.
3. Data processing that used in this research is in batch processing.

I.5 Research Benefits

The result of this research hopefully could bring some benefits both in theoretically, and practically, which are:

1. Theoretically

Theoretically, the result of this research hopefully could become a reference or suggestion for the big data technology development, especially in form of implementation for increasing the data processing speed. The research also can be used by the others as a reference or further development.

2. Practically

For Telin Hong Kong, the result of this research could be used as consideration to implement big data technology in transactional data processing for their dashboard in the future.

I.6 Writing Systematics

The writing systematics of this research is divided into six chapters, which is introduction, literature review, research methodology, analysis and design, result and discussion, then conclusion.

First chapter is an introduction, in this chapter, given explanations the research object generally, research background that follow up the phenomenon that become the issue so it is worth to research on it followed by the theoretical argument that exist, problems definition, the research objectives, also the benefits of this research, and the writing systematics.

In literature review, discussed the relationship between the concept and the description of the research study contributions. Also, related researches to the problems studied and the results of related research.

The chapter III described the conceptual model and research systematics. Conceptual model contains model that identified the used data in the research process to define the problems. The conceptual model illustrated by a figure and explained in a narrative way.

The next chapter, analysis and design, defines the steps of data analysis and the result of analysis that got by using analysis tools needed is discussed. In the result

and discussion, explained and discussed the result of the research, then compared with the previous or the existing condition.

The last, is conclusion, shown the research conclusion that got from the research that have been done. Besides there is suggestion included for further research or development.