

# Small Data and Big Data: Combination make better Decision

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**Abstract:** This paper aims to explain the combination of the use of big data and the data small which would create more value for the company. Giving example both from big company (Apple and Huawei) and small Enterprise (Twiddy & Company, Point Defiance Zoo & Aquarium Tacoma, and RichRelevance) this paper presents evidence that they are using a combination of big data and small the data is believed to be provide competitive advantage for the company. For some companies use small data can become more practical and useful, but for another company could even happen in reverse. With all the benefits associated with big and small data, it is proper to know that over reliance on either big or small data all times will hinder the progress of an organization. This paper also propose solution for the company in which level they suppose to combine the data big and small data. in the end, this paper pointed out that for company doesn't matter whether is big data or small data. What matters is having the data, of whatever size, that helps us solve a problem or addresses the question we have and for many problems and questions.

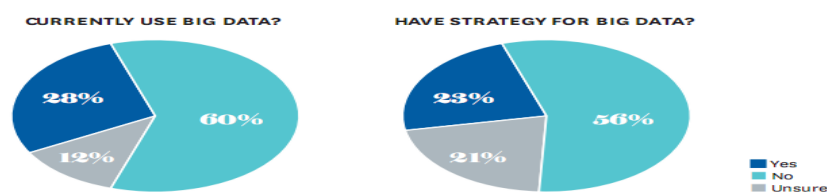
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## I. INTRODUCTION

Data has become a catchall phrase for company. The amount of data pouring into company through ever expanding channels is staggering. Last two years more data have been produced in all of prior history (Davenport et al, 2013). "The speed, at which business are moving today, combined with the sheer volume of data created by the digitezed world, requires a new approaches to derive value from data. Since the speed of businesses and the massive amounts of the speed of business today and the massive amounts of data being generated, company must find new ways to figuring out what is in it and what to do with it. The data itself can be divided into two types; one is big data and other is small data. When used correctly, data (no matter big or small) can yield insight to develop, refine or redirect business initiatives. Moreover it can discover operational roadblocks; streamline supply chains; better understand customers; as well as develop new product, services and business models (Smith & Willson, 2011).

Successfully leveraging toward combination of big data and small data insight requires a real investment in proven technologies, updated workforce skills and leadership focus. Company must combine three facets of strategy-technical, organizational and cultural in order to implement a data platform that suits the business and its objectives. Several articles highlight the importance of using big data in their business. According to a May 2011 McKinsey Global Institute's report, company embracing big data has the potential to increase its operating margin by more than 60 percent (Manyika et al., 2011). Some of the other presents data that their company/organization are not doing much with big data, in a 2013 survey of 951 Harvard Business Review readers, many respondents said they were familiar with the concept of big data, but only 28% said that their organization were using big data to make decisions or create new business opportunities (see: Figure 1).

Current Use of and Strategy for Big Data



**Figure1: Current Use of and Strategy for Big Data (Source: Smith & Willson,2011)**

Big data initiatives are all the rage, but most companies don't see a return on their analytics investment. It is because very few companies know how to exploit the data already embedded in their core operating system. From this reason, companies' better use evidence-based data, data driven decision making (small data) to provides the answer (Ross, 2013).

The combination of the use of big data and the data small believed would create more value for the company. This is because sometimes there are some information that can not be explained by small-small the data, and vice versa. Organizations must confront a new philosophy about decision making. Today we live in world where the consumer preferences change even by the hour. They can cross channels at once and take a range of unusual and different paths to make purchase. This means that company must be prepared to deploy new way for decision making, some of them could be automated, that allow fast and agileresponse to customer information. Likewise, the entire organization will face new pressure to make decisions based on data and quick experimentation rather than intuition and estimates.

This paper presented examples of large companies and SMEs that combines the use of big and small data in order to resolve the problems they face and also to understand consumers needs better. Examples case studies mentioned in this paper also broke the myth that big data which only can be used by large companies, was no longer relevant, because explained that some SMEs small scale can also take advantage of big data and the use of big data can bring big profit for them.

## II. LITERATURE REVIEW

### **Big Data Definition**

Big Data describes a holistic information management strategy that includes and integrates many new types of data and data management alongside traditional data. While many of the techniques to process and analyze these data types have existed for some time, it has been the massive proliferation of data and the lower cost computing models that have encouraged broader adoption (Heller et al. 2015).

Big Data typically refers to these types of data:

- Traditional enterprise data – transactional ERP data, includes customer information from CRM systems, general ledger data, and web store transactions.
- Machine-generated /sensor data – includes manufacturing sensors, Call Detail Records (“CDR”), equipment logs (often referred to as digital exhaust), weblogs, trading systems data, and smart meters.
- Social data – social media platforms like Facebook, micro-blogging sites like Twitter, includes customer feedback streams (Pierre, 2013).

Big Data also have the definitions relating to: Volume, Velocity, Variety, and Value. The task of the Big Data itself is to transform data into a low-density, high-density data, so the data has a valueable information. Own size depending on the needs of the company.

- Volume. Big Data also has something to do with data volume. Volume indicates more data, it is the rough nature of the data that is unique. Big Data requires processing high volumes of low-density data.
- Velocity is the rate of data is received and how it reacts thereafter. For example, e-Commerce applications customers want to use the location as a determinant of bids in order to fit the target. Operationally, synchronizing the location of the given type of bid is expected to occur within a short time.
- Variety refers to a data type that is called: unstructured, semi-structured (audio, text, video still needs further processing to be able to support metadata), and structured the data (data that has been summarized, audibility, lineage, and is privacy).
- Value, basically any data has intrinsic value that must be discovered. To be able to transform the data into anvaluable information which has required some techniques, for example of the determination of the preference of the customer to provide appropriate bids locations. The present invention requires a process that involves clever and insightful analysts, business customers and executives (Oracle, 2015).

### **Small Data Definition**

There is an evolving definition of small data as the few key pieces of meaningful, actionable information that we can uncover by analyzing big data. Those insights you extract from your big data become the last steps along the way to making better decisions (Shea 2014). Small data is data that is small enough for human comprehension( Pollock, 2013). About one quarter of the human brain is involved in visual processing, and the only way to comprehend big data is to reduce the data into small, visually appealing objects representing various aspects of large data sets or data features such as histograms that can be easily understood by humans. A formal definition of small data has also been proposes by former analyst and current actuate Vice President of innovation, Allen Bonde : "small data connects people with timely, meaningful insights (derived from big data

and/or local sources, organised and packaged—often visually to be accessible, understandable and actionable for everyday tasks.

### **III. EMPIRICAL STUDIES: The Story of Apple & Huawei Combining Big Data and Small Data**

Apple, big company which popular as the most profitable tech company in the world, apple found itself have catch-up both with small and big data. Apple had always used white as the color of its products, including iPod. White is the color of washing machines, and of bathroom appliances. Many Apple costumers and potential costumers simply do not like white, for psychological or simply aesthetic reasons. Many customer complained, they want their iPod or iPhone to be black (Anonim, 2014). For several years, their requests ignored by Apple. Then, finally, Apple understood, and made their first black iPod. It was huge success. Moreover, one of the machine learning apple named Siri is a result of the use of Big Data by apple. The Siri voice recognition features of iDevice have proved popular. Voice data captured by the machine is uploaded to its cloud analytics platforms, which compare them alongside millions of other user-entered commands to help it become better at recognizing speech patterns (machine learning) and more accurately match user to the data they are seeking. Apple correspondingly offers cloud-based storage, computing and productivity solutions, for both consumer and business use. In April 2015, it was reported that Apple had purchased FoundationDB, a popular database architecture widely used for big data applications. This could be used to bring increased analytical prowess across its suite online services such as iCloud, Apple Productivity Works (formerly iWork) and its upcoming streaming music service (Marr, 2015). Apple using Big Data for generally improve Apple products and services.

Another big company who have big using big data and small data in same time is Huawei. Huawei industry grew tremendously as 4G was rolled out worldwide. Technological innovations in cloud computing, Big Data, and the Internet of Things (IoT) accelerated, with smart devices connecting the lives of more and more people. Huawei Technologies Co. Ltd the largest mobile device manufacturer in China and one of the largest networking and telecom manufacturers worldwide, this industry grew tremendously as 4G was rolled out worldwide. Technological innovations in cloud computing, Big Data, and the Internet of Things (IoT) accelerated, with smart devices connecting the lives of more and more people. Huawei and SAP are continuing to strengthen their relationship with the former company's recent launch of its Appliance for Large Database in support of the SAP Business Suite 4 SAP HANA (SAP S/4HANA). The appliance is based on Huawei's FusionServer RH8100, a mission-critical server offering enterprise management and cloud services (Hamshar, 2015). Huawei has set up over 480 data centers around the world, including 160 cloud data centers, while their agile networks and S12700 agile switch now serve hundreds of top-tier industry customers.

In same time, to develop products, starting from its inventor, Ren Zhengfei (followed by the director of Huawei today) to develop research and development RnD products, they have a habit of asking the weakness of their products directly to users. The company always make improvements of drawback submitted by users of their products. The products they produce are becoming increasingly well liked by consumers. As a result, Huawei's sales revenue is expected to reach US\$46 billion in 2014, an increase of over 15% year-on-year (Hamshar, 2015).

### **Bring the Power of Combination Big Data and Small Data to Small Business**

Combination of Big Data and small data also offers significant benefits for small companies. Up to today, most probably the way a small organisation runs the business is based on knowledge of how the market behaves; intuition or gut feeling and years of experience. However, today there are many Big Data startups that allow companies, with relatively little effort and money, to base companies' decision on data. For example, a small retailer can analyse social media conversations and combine it with their sales data to discover new trends or sales opportunities, a small online company can track how a visitor behaves on their website in order to understand what drives that visitor and how they should engage with their visitors to improve conversion.

Twiddy & Company is a family owned and operated property management business, who has been helping guests find vacation rentals in the northern outerbanks of north Carolina since 1978. In their three decades plus of business, Twiddy has grown to managing over 900 properties and over 100 employees. Big Data has made a difference in this family owned enterprise. Like many enterprise, Twiddy had amassed years of operational data inside spreadsheets, where it all was buried. Twiddy settled on SAS's business analytics tools, which distilled the company's spreadsheets into a customizable format the company could share with homeowners and contractors. Previously, Twiddy used to tell homeowners the dates when their property would be available to rent. But now, the company can offer pricing recommendations pinpointed down to the week, on the basis of market conditions, seasonal trends, and the size and location of a home, among other criteria. Armed with that knowledge, Twiddy started letting its homeowners tweak prices in January for that week. Demand from customers has been increased since the company uses these ways, even many homeowners recommend Twiddy as property manager. In addition to the inventory of Twiddy alone has increased more than 10 percent within three years. Twiddy also save costs as much as 15 percent compared with other companies. Investment expectations the use of Big Data \$ 40,000 can be paid off in three years, it can be fulfilled only within a year.

This small enterprise using big data for big decision and small data as daily operational decision making(Kelleher, 2014).

Another example is case of Point Defiance Zoo & Aquarium Tacoma, Washington, A zoo tames the Pacific Northwest's notoriously variable weather. Weather fluctuations in the Pacific Northwest region often thwart the weather forecast, which in this situation is very difficult to predict the number of visitors to the zoo, so the staffing problem. Many years the zoo has used information from weather forecasts and the results were not good. Until then Point Defiance decided to collaborate with IBM and Analytics Company Bright Star Partners. By using historical data of visitors during the year and also the history data from local weather, making the Pacific Northwest successfully predicts how the number of visitors. Knowing the number of visitors, they be able to determine the number of staff assigned. In addition, the zoo is also studying the behavior of purchasing tickets for the zoo online, which is where most of them bought at late evening or early morning, because at the time normally parents do not busy working, at these time they plan their vacations. By knowing such behavior, company became known to plan bids to boost ticket sales. Since then, ticket sales be increased by 771 percent in two years (Kelleher, 2014).

Small companies should focus on their local environment that you deal with. This seems obvious, but combination using big data and small data enables business to zoom in on the preferences and likes/dislikes of local crowd a lot more. Small retailers can easily adjust their stores based on local preferences when they combine and analyse all sorts of local drivers. RichRelevance for example, RichRelevance is a company, based in San Francisco, California, that offers personalized shopping experiences for large retail brands, including Wal-Mart, Sears, Target and others. This small company has developed a tool kit for optimizing the in-store experience, also for small retailers, to drive product discovery, consideration and sales and be able to stand-up against for example Amazon. They have developed 125 algorithms that analyse in real-time a variety of inputs such as on site shopper behaviour, geography, referred keywords and other attributes to offer specific recommendations for the retailer. Combined with local preferences, a retailer can as such better target their customers.

#### **IV. SOLUTION PROPOSED**

Data is important no matter the size of the organization. Both big size and small size companies need data. Organizations don't just have use big data. Sometimes, data obtained from small samples can be very useful. This is especially true when information is gathered on a particularly important focus group such as a board of directors, executive management team, or high profile clients. Information gathered on these so called specialty groups can still inform practice even though headline researchers will often argue that the bigger the data the better. It is important to remember however that not all findings made from data need to be generalized to the larger population. In many cases information is sought from small populations that exist within a company. Any information garnered from such small populations (i.e executive board, disabled clients, angry suppliers) only need to be generalizable to the population itself.

Some people think big size companies succeeds mainly because of the size of their big data. This has resulted in almost all organizations employing people and using analytics software solutions to instantaneously analyze, capture and manage data. This is not necessarily required. The organization instead could seek out specific data and ask questions about only that data. These data may take few days and be limited to only a small number of variables. It does not mean that these small and less time consuming data analytics projects don't provide information that is as useful as what massive people analytics systems can provide. It is important however, that organizations consciously decide what types of data they want to capture and how they will capture this data. Small projects often make use of convenience data (data that is captured passively as part of the running of the organization) or data is captured as part of a project (where data is actively sought out). When Big Data can be analyzed and understood properly, management can have the opportunity to develop themselves to get better performance.

Understanding that has been described in this paper, these two types of data both big data and the small data can be complementary, because most of what can not be obtained from small data can be obtained from big data, and what is missed by big data can be explained by small data. For some companies use small data can become more practical and useful, but for another company could even happen otherwise. A small data approach can be a great fit under these smaller circumstances. Yet, given the range of company size and marketing activity within the small to medium sized businesses segment, a one size fits all approach doesn't work. Any approach needs to have some built in flexibility so companies/enterprises can scale up or down to be appropriate for the size of the strategy budget being measured. The combination of the use of these two types of data will be able to provide comprehensive data which can help companies to make the right decisions at the right time.

Small data can be as useful as big data if the right questions are asked and the right data is gathered to answer the right questions. With all the benefits associated with big and small data, it is proper to know that over reliance on either big or small data all times will hinder the progress of an organization. Management has to blend both big and data to ensure organizational growth. When the company suppose to use small data or big data also depends on the size of the budget strategy. If the budget to implement the strategy is very large, then it is very unwise if the company only uses small data. Additionally, large corporate companies are using big data as a tool to make decisions or implement corporate strategies are not always just use big data only within the company's operations. The combination of the use of big data and the data small believed would create more value for the company.

So that we shall suggest that the company uses two-level data in below:



**Figure2: Solution Proposed**

In corporate level strategy, if required, the company must use big data, this is because the company's corporate strategy level should think about growth, stability, and the retrenchment of the company. While at the business strategy level, companies can use a combination of big data and small data. This will help the company in deciding which strategy to be applied, whether the cost leadership, differentiation, focus, or a combination of the two options. In functional level strategy, companies can better employ the use of small data, because here the strategies companies have started sharpened and focused (marketing strategy, financial strategy, RnD strategy, and operation strategy), therefore, the use of small data will be very helpful in the formulation and implementation of strategies at this level. Companies that use data to make decisions and understand their customer's need better are going to be smarter companies. It's just about understanding what you do and taking advantage of the information company collect as part of the act of doing business.

## V. CONCLUSION

From the discussions that we explored above, it can be concluded that:

1. For using big and small data, first of all should be more focused on business value. Must be identified goals and challenges existing business. Size does not matter, more important is to have the data and analyze it to resolve the existing problem.
2. When company suppose to use small data or big data also depends on the size of the budget strategy.
3. A combination of both big and small data is the perfect solution to conflicts relating to big and small data. So be it a large or small company, they need both big and small data to solve their diverse data related issues.
4. A model has therefore been proposed to further explain when big or small data is needed in an organisation.

### Implication of future research

This paper discusses the implications of the focus of the combined use of big data and small data for decision making both for large companies and small companies. In this study were not given an example of small company apart from the USA small enterprise. Thus future research is expected to explain more example from all company all around the worlds. Further research is expected to explain that the combined use of small data and big data are the right combination for the Integration worldwide.

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