THE STUDY OF INDULGENCE AND RESTRAINT VALUE IN BIG DATA ANALYSIS FOR ASIAN BANKS

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Abstract - The cultural value – Indulgence vs. Restraint (IVR), the latest dimension from Hofstede's study, influences on how the customers think and react on financial service companies' various initiatives. The paper links these two important phenomena by exploring business cases of Asian banks in from which it concludes that, even though a similar project of big data has been deployed in two countries, in terms of the methodology of implementation and application to their customers, there were a noticeable difference mainly due to the different level of IVR in each country. The value of this paper lies, not only on its finding from the business cases, but also on its the attempt to open a new avenue of cultural studies on big data.

Index terms - Big data, Cross-culture, Financial Service, Digitalisation, Customers behaviours

I. INTRODUCTION

The importance of big data is indubitably increasing due emerge of digital universe, in which our paradigm of lifestyle is changing rapidly. For instance, in 2015, there were 3.2 billion internet users (ICT, 2016); 1.49 billion active users on Facebook per month (Facebook, 2016) and 6 billion hours of video are watch on Youtube per month (Youtube, 2016). With this trend, by 2020, the digital universe will have grown nearly 20-fold of that in 2010, and should be approximately 35 zettabytes of data (IDC, 2011). In addition to this, only on China, where Facebook and Google are prohibited, weChat has more than 806 million users, Alibaba has 434 million active online customers and people use search engine of Baidu more than 9.1 billion annually (StatisticBrain.com, 2016). Subsequently, the academics and practitioners were deluged with various articles and research that highlight the usage of big data. These articles and research, especially in the context of financial service sector, focus mainly on how big data can be utilised to optimise the profit to financial service providers (McAfee, et al., 2012) or methodology from information system perspective (Abbsi, et al., 2015), however yet relative limited in scrutinising its application in managerial practices.

Big data being a part of essential factors in traditional information value chain, it transforms into information which then develops into knowledge that becomes a basis to making decisions and executes the required actions (George, et al., 2014; Bhimani, 2015). In this value chain of utilising big data, most of commentaries, editorials, and journals exposit frequently on epistemological concerns of processing big data, but seldom pinpoint on empirical application of big data in decision making and action planning (Sharma, et al., 2014). Nevertheless, there is lack of research or even attempts to incorporate these cultural influences with the study of big data. It may due to the fact that there is a discontinuity in the processing of big data and its application to the management. For instance, most of research on processing big data conducted by researchers in the field of information system, whereas the application to decisionmaking and action planning were performed by those who explore big data from business or management perspective.

Therefore, this paper aims to initiate a discussion on how cultural value can influence on the usage of big data by delineating comparative business cases in two countries, where different level of cultural dimensions exists. China and Singapore have been chosen as two countries in which a similar business case on big data has been deployed but with different outcomes. This paper focus on cultural dimension of Indulgence vs. Restraint (Hofstede, et al., 2010), from which the paper would construe a managerial implication to academics and practitioners.

II. LITERATURE REVIEW

There are multiple definitions on big data, corresponding to the increased volume of data and the interest from various stakeholders. One of the most common definitions is that big data is data sets with sizes beyond the ability of commonly used software tools to capture, curate, manage, and process within elapsed time (Snijders, et al., 2012). In more operational definition is to define big data based on four Vs, which differentiates big data from common analytics. The 4s represents the volume of data sets, the velocity of data creation and availability, the variety of data types and the veracity of the data with trustworthiness and integrity (Mauro, et al., 2015; McAfee, et al., 2012; Goes, 2014). The volume of data, the first V, represents a large amount of data that are calculated in petabytes and exabytes which now is being replaced by terabytes (McAfee, et al., 2012). The second V, which is the variety of data, includes not only traditional transactional data and user-generated text or image but also social network data, sensor-based data, web and mobile clickstreams

and spatial-temporal data (Chen, et al., 2012; McAfee, et al., 2012). The velocity of data, the third V, is becoming a crucial factor accelerated by fast growing technological innovation. The speed of data creation and such information formed by these data has to be implicated for "real-time" predictive analytics in various sectors including financial service arena (Mayer-Schoneberger & Cukier, 2013). In addition to this, analysing "data in motion" presents new challenges as the desired patterns and insights are moving targets, unlike those static data in the past (Abbasi., et al., 2016). Lastly, the veracity of data, the fourth V, deals with the credibility and reliability of different data source, which highly susceptible to spam (Kaushik, 2011; Kitchin, 2014). Big data's four Vs brought about several consideration mainly on technical management and technology to store data (Abbasi., et al., 2016).The firms and organisation are increasingly interested in collecting social media and sensor-based data to supplement the internal data sources (Chen, et al., 2012), meanwhile there is a phenomenon to shift the physical on-premises data centres to cloud-based infrastructure-as-service, platform-as-a-service, and database-as-a-service as to meet organisation's elastic computing and storage needs (Phillips-Wren, et al., 2015). Big data also triggers a paradigm shift towards computational social science (Chang, et al., 2014), and to enhance customer data to better understand "voice of customers" and the dynamics of their influence (Aral & Walker, 2012). Thus, in accordance to its comprehensive definition of big data and its frequent usage in marketing arena, various aspects of people's behaviours and actions are needed to be involved in the processing and concluding the outcome from big data (Sharma, et al., 2014). It is because what people live, work and think are all related to four Vs of big data (Mayer-Schoneberger & Cukier, 2013; Mauro, et al., 2015). To this extent, there is a necessity of understanding the role of cultural values and the influences of these values to the study of big data.

Culture can be defined in various terms. Tylor (1920, p. 1) referred culture as "the complex whole, which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by humans as members of society". Trompenaars and Hampden-Turner (1995) defined culture as a series of methods and rules created by a group of people in order to help them solve problems, particularly connected to relationships, time and the environment. In obvious and conclusive terms, culture value influences how people think and behave. Therefore, people from different cultural backgrounds may react differently towards the same services from even the same service providers (Hong & Lee, 2014; Leonidou., et al., 2013; Petersen, et al., 2015; Zhang, et al., 2014). One of representative studies and theoretical frameworks to measure cultural values are the cross-cultural dimensions by Hofstede (Mooij, 2014; S. & Larimo, 2016; Hong & Lee, 2014; Hofstede, et al., 2010; Sagi, 2015). Hofstede has categorised national cultural values into six cross-cultural dimensions such as - Power distance index, Individualism vs. collectivism, Uncertainty avoidance index, Masculinity vs femininity, Long-term orientation vs. short-term orientation (Hofstede, 1984; Hofstede, 2001) and recently added Indulgence vs. Restraint (Hofstede, et al., 2010). These cross-cultural dimensions are utilised to measure the differences among 93 countries in terms of their national culture and organisational behaviours. Among these cross-cultural dimensions, Indulgence vs. Restraint – IVR - is one of noteworthy dimensions to consider. Hofstede (2010) explains that Indulgence stands for a society that allows relatively free gratification of basic and natural human drives related to enjoying life and having fun. Restraint stands for a society that suppresses gratification of needs and regulates it by means of strict social norms. The IVR is the newest cultural dimension added by Hofstede (Hofstede, et al., 2010) in his previous five cultural dimensions (Hofstede, 2001), for which not many academics or practitioners have deployed this dimension on their studies.

People in a society with high-Indulgence put higher importance of leisure and having friends, more likely to remember positive emotions and with more extroverted personalities (Hofstede, et al., 2010; Yang, et al., 2016; Griffith & Rubera, 2014). In their behaviours, those people who are categorised as highly-Indulgent people (Hofstede, et al., 2010) tends have higher approval of foreign music and films, use email and internet for private contacts and frequently in interaction with foreigners and view freedom of speech as relatively important than the people in a society of high-restraint (Yang, et al., 2016).

In the context of service marketing, the IVR – Indulgence vs. Restraint – may influence the customers' response to vulnerability. The customers with high indulgence response more directly to vulnerability and may strongly identify the need to participate in programs and efforts to communicate their personal concerns about their experiences of vulnerability (Upadhyaya & T.L., 2015). In the countries with high Indulgence, the customer service is perceived to be more visible and reflected by a friendly smile in a friendly manner. However, in more restrained countries, this could be considered as an appropriate social norm and be seen as overly unnatural (Shanker & N., 2015). Based on these literature review on big data and the importance of cultural value, specifically the IVR dimension from Hofstede (Hofstede, et al., 2010), there is a legitimate reason to concatenate these two concepts; big data and IVR in one study. Especially upon the point of its managerial implication of big data, the consideration of the cultural value – IVR – must be worth to be

explored and contemplated. This leads to the objective of this paper, which is to find the links between big data and IVR by investigating the business cases of big data in two countries with different level of IVR.

III. RESEARCH AND BUSINESS CASE

In the IVR Index Scores based on factor scores from World Values Survey of Hofstede (Hofstede, et al., 2010, pp. 282-284), there are two countries that show an interesting index scores and ranking. Singapore ranks [41] in the world with IVR score of [46], whereas China ranks [75] in the world with IVR score of [24]. If the IVR score of a country is high, then it indicates that the country has high level of Indulgence and less Restraint. This means that from this survey (Hofstede, et al., 2010), Singapore has almost two times higher level of Indulgence than China.

The IVR rankings of these two countries become more interesting if the geographical scope is limited to Asian countries. Among Asian countries on same survey, Singapore is top three Asian countries of high level of Indulgence and China is in top three countries with high level of Restraint. Therefore, these two countries were selected as to explore how the distinctive level of IVR can influence on a similar business case in each country. Table 1 exhibits the ranking and the level of IVR for Asian countries investigated in Hofstede's study (Hofstede, et al., 2010).

Ranking	Country	IVR Scores
1	Malaysia	57
2	Taiwan	49
3	**Singapore**	**46**
4	Thailand	45
5	Philippines	42
6	Japan	42
7	Indonesia	38
8	Vietnam	35
9	South Korea	29
10	India	26
11	**China**	**24**
12	Bangladesh	20
13	Hong Kong	17

Table 1 Ranking and Index of IVR for Asian countries

In Hofstede's cross-cultural dimension (Hofstede, et al., 2010, pp. 291, 297), the measurement of IVR are listed with the characteristics in the below Table 2.

Indulgent Culture	Restrained Culture
Higher percentage of happy people	Lower percentage of happy people
A perception of personal life control	A perception of helplessness in life
High importance of leisure	Low importance of leisure
High importance of having friends	Low importance of having friends
Saving is not very important	Saving is important
Less moral discipline	Moral Discipline
Equal sharing of household tasks	Unequal sharing of household tasks
Loosely prescribed gender roles	Strictly prescribed gender roles
In wealthy countries, less strict sexual norms	In wealthy countries, stricter sexual norms
Smiling as a norm	Smiling as suspect
Freedom of speech is viewed as important	Freedom of speech is not a primary concern
Maintaining order in the nation is unimportant	Maintaining order in the nation is important

Table 2 Characteristics of IVR in National Culture

Based on this research, the paper investigates on two case studies in China and Singapore with the conceptual model. The objective of the paper is to identify the impact of the IVR measurements in the outcome from these case studies. The first business case is from China Merchant Bank in China, and the other is from OCBC bank in Singapore. The findings and analysis for each business case is conducted in qualitative approach.

OCBC Bank (Singapore)

OCBC is the second largest bank in Singapore with history of 32 years. The bank had a basic analytics function even from the late 1990s with a warehouse, campaign management tools which gradually became a basis of CRM – Customer Relationship Management – tool in early 2000s. In 2004, OCBC was able to build its core infrastructure of enterprise warehouse, which allowed the bank to monitor every single customer, every single product, and every single transaction that occurred. The bank has developed a deep analytics Centre of Excellence called; the Group Customer Analytics &Decisioning (GCAD) team, which is responsible for all analytical activity across the banking group. The objective of this team was not only to produce information on managerial decision based on big data, but also embed a practice of insight-based decision making to the wider team in OCBC.

This establishment is resulted from the strategy of OCBC, which believes that distributed analytics is the future for maximum use of the bank's big data. This is to empower front line business managers with greater ability to self-serve for simple analytics and insight, which eventually required the bank to release

valuable GCAD resources to focus on deeper analytical studies. Concurrently increasing the "speed to insight" for the front line business managers helped to democratise the insight and decision making more responsive and efficient.

China Merchant Bank (China)

China Merchant Bank – CMB – is one of fast growing banks in China with its core values of service, innovation, and stability.CMB decided to implement the next generation of big data platform to process large quantities of data across various perspectives. CMB focused to strengthen the performance of the big data platform in terms of reliability, security and easiness of usage. In addition to this, CMB enhanced its data platform to support classified protection for financial data together with remote disaster recovery.

Through this development and enhancement of data platform for big data, CMB has implemented data-driven operation and decision-making. Case in point, with a new big data strategy, CMB can quickly develop a variety of financial service applications for historical data queries, credit investigations, and customer forecasts for small and micro credit, contingent financial asset forecasts, with precise recommendations for financial products. In parallel, CMB could also improve service efficiency by practicing the online historical detail function that supports queries for of the previous seven years, compared with one-year data queries in the past.

With these functions in place with big data platform's support, CMB has achieved the potential customer forecast for small and micro credit improves the conversion rate by 40 times. The error rate of contingent financial asset forecast is reduced by half. Effective purchase customers can be covered by less than 20% of the original amount of recommendation texts. The credit investigation duration for credit cards is reduced from two weeks to less than 10 minutes (TelceomAsia, 2015).

Comparison of two business cases from Cultural Value – IVR - perspective

Both projects are recognised as most successful business cases of big data in Asia in banking and financial service arena (TheAsianBanker, 2016). Nevertheless, in the view of its outcome, there are noticeable points that to be reconsidered from cultural value - IVR perspective. As for the case of CMB in China, even though the benefit of implementing big data platform has been well-appreciated, but mainly from enhancement of data processing platform and not sufficiently led to commercial production. For instance, there is a tangible improvement in a turn-around time of processing the data, improvement a security and quality of data, and increase the level of potentiality in certain customer segments, but lack of information on how these has been transformed into actual sales and production.

The reason may cause from the fact that a society with high restraint, such as China, the people are less likely be emotional, more pessimism with more neurotic personalities (Hofstede, et al., 2010). At the same time, the people are more discipline and prefer to maintain the order which restricts the effectiveness of data-driven decision making (Kumar & Pansari, 2016). This caused the customers to continuously follow traditional way of selecting financial products rather than customised products.

CONCLUSIONS AND FUTURE STUDIES

This paper started from a simple question of "Will machine-generated correlation on big data be enough to specify inherently meaningful and truthful patterns and relationship?" (Kitchin, 2014, p. 135). The answer being not fully replied; this paper opens a new avenue of focus from the cultural value perspective. From literature review and findings of two business cases, it is concluded that the response from the customers in financial service to big data implication could be different due to their level of IVR. Furthermore, in the process of implanting a platform for big data, the financial service company may take different approach based on its underpinned cultural value, which may crucially determine a success of the project.

Nevertheless, the paper inevitably constrained with the following limitations. Firstly, only the IVR – Indulgence vs. Restraint – dimension has been utilised to measure the cultural value in the model. Individualism vs. Collectivism dimension by Hofstede (Hofstede, 2001) is also one of frequently used cultural values in conjunction with the IVR (Upadhyaya & T.L., 2015; Hong & Lee, 2014).

Secondly, in the selection of countries, the findings could have been more distinctive if the countries were chosen between Western and Asian countries, where the difference of IVR or other cultural values are more significant. Lastly, the paper remains at qualitative approach based on theoretical framework built from literature review. A rigorous and empirical research with quantitative analysis should be proposed in the future studies. Big data is here to stay. Cultural values remain same and shall continue to influence on how people work, live and think. Despite the limitations of this paper, the value of this paper lies upon its contribution to academics and practitioners who wish to embark on a new chapter of research by understanding the influence of cultural value to big data, a crucial and unavoidable strategy in financial service sector.

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