NON-DATABASE CUSTOMER AS SPATIAL ISSUES OF ESTIMATING HYPERMARKET'S LIFETIME VALUE: AN APPROACH OF SURVEY-GIS METHOD

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ABSTRACT

Prospecting hypermarket lifetime value is vital important to predict how long the business will be survive in the marketplace as important as measured the profitability of the business. Mostly, the hypermarket has been used database customer as main resources of predicting their customer without consider any data from non-database customer, which also called "free customer". In fact, non-customer is spatial-based information where never tied with hypermarket database of customer. This is actually the gaps that exist in prospecting customer lifetime value where most of study was aimed on database customer and also lacks in tied spatial-based information to the hypermarket's customer database. The objective of this paper is to discuss non-database customer as spatial issues during estimating the profitability of hypermarket business. Secondly, this study is aimed to demonstrate the location of non-database customer as base platform for further works on prospecting customer lifetime value. The method use in this study is combination survey-GIS as solution for handle non-database customer in spatial environment. Specifically, Arcview software (GIS) is used as main method for modelling the physical location of marketplace. Meanwhile, a postal address of non-database customer which is collected from survey is used for testing under the physical model of marketplace location. The Seberang Perai Tengah of Penang in Malaysia is setting as location of the study. One of the result shows that non-database customer can visualized individually by specific location that based on street and road. This study will suggest on how to used spatial data as a part of predicting lifetime value of customer where it can produced results in more precise and concurrently.

Keywords: *Non-Database Customer, Spatial Issues, Hypermarket, Lifetime Value, Survey-GIS Method*

1. INTRODUCTION

Prospecting hypermarket lifetime value is vital important to predict how long the business will be survive in the marketplace as important as measured the profitability of the business. Currently, customer lifetime value (CLV) is maintain as the top most issues during the world wide economy crisis with special attention on the sustaining the profitability of business. The hypermarket business is one of business segment that has great impacts from this economy phenomenon where it depends on huge number of customer. Many scholars discussed about CLV in practical aspects of prospecting business profitability, as well as Glady, Baesens and Croux (2009), Graf and Maas (2008) and Setijono and Dahlgaard (2007). In practice, estimating the CLV of every hypermarket can estimate by using CLV model that purposely for understanding how much contribution of customer to the hypermarket future prospect. As evident there are some major CLV model have been introduced and tested by Venkatesan and Kumar (2004), Bolton, Lemon, and Verhoef (2004), Gupta and Lehmann (2003), Reinartz and Kumar (2003), Rust, Lemon, and Zeithaml (2004), Rust, Zeithaml, and Lemon (2000) and many more with aimed to cope with CLV issues and profitability. However, most of the CLV model has constrain in understanding CLV as spatial problems. In fact, understanding CLV as spatial problem is vital important to hypermarket because lifetime value actually has relationship with spatial factors such as location, physical environment, accessibility, and many more.

Currently, there are two category of customer where establish by contract term between firm and customer. Customer under contractual setting is tied by contract that establish by formal contract between them, while non-contractual setting is opposite that the customer has no contract with firm. Reinartz and Kumar (2000)

had mention relationship marketing emphasizes the need for maintaining long-term customer relationships. It is beneficial, in general, to serve customers over a longer time, especially in a contractual relationship. However, it is not clear whether some of the findings observed in a contractual setting hold well in non-contractual scenarios, where relationships between a seller and a buyer that are not governed by a contract or membership. As support, Jahromi, Sepehri, Teimourpour and Choobdar (2010) coined that although different studies have focused on developing a predictive model for estimate CLV under contractual settings, performing in a non-contractual setting in which customer churn is not easy to define and trace, has always been neglected in such investigations.

In addition, non-data based customer is fall under category of non-contractual setting customer where particular information about them is almost not available to hypermarket database. Although them have not registered with any membership program, even, them are not used credit or debit card for purchasing products from the hypermarket, but this type of customer have attention to continue their transaction with the hypermarket. Therefore, un-ability to evaluate the contributions of them as a part of sources of business profitability, possibly make the business are not really make sense about their lifetime value. As implications, the hypermarket is not really produced accurate results about how much this type of customer can affecting them, both current and long terms of business performance. The issue is to predict the future profits when the timing and the profit of future transactions is not known, that is in a non-contractual setting. This issues is discussed by scholars Mulhern (1999) and Bell, Deighton, Reinartz, Rust, and Swartz (2002) that identified non-contractual setting as one of the barriers for generating precise results on the actual CLV of business. Based on this point, this study specified to focus on non contractual setting of customer, where there contribution is less evaluated compared to customer in contractual setting based.

2. LITERATURE REVIEW

Retail profitability and customer lifetime value (CLV) are vital important issues in the world of retailing industry around the world (Fader, 2009; Glady*, et. al.,* 2009; Epstein, *et. al.,* 2008; Baum & Singh, 2008; Berman & Evans, 2008; Gilbert, 2007); and vast literature was found on its definitions, measurements, and approaches of studied, as examples of Aeron, Bhaskar, Sundararajan, Kumar and Moorthy (2008); Kumar, *et. al.,* (2006); Gupta, *et. al.,* (2004); Gupta and Lehmann (2003); and many more. Obviously, retail profitability valuation are always dominating by financial and accounting based measurements and approaches with highly focus on maximizing the finale value of CLV. However, surprisingly, only a little attention has been given to using others non-financial based measurement (i.e location and accessibility) whereas it also has great power to revolutionize the approach of prospecting the retailer profitability.

Strategically, CLV is a key concept for any business, includes retail and marketing based business and understanding on it will transform the business perspective to a great performance, both current and future prospects (Glady*, et. al.,* 2009; Epstein, *et. al.,* 2008; Baum & Singh, 2008; Berman and Evans (2007); & Kumar, *et. al.,* 2006). Fundamentally, retailer can use CLV to estimate the current value of all its customers, excluded non-database customer, also called free customer. Projecting the current value of the customer, retailers have ability to categorize customers into different categories based on different point of CLV value. However, Bejou, Keiningham and Aksoy (2007) argued the CLV is extensively changing the way today's business is managed where it provides the best way to gain the competitive edge in business with final aim to maximize their profits. The question is how the business can manage for competitive advantages without understanding the environment geographical marketplace of customers?

In perspective of customer valuation, the Marketing Guru's Peter Druckers stressed that *Customer is a King* and Philip Kotler notes that customer is important stakeholders for every businesses. Customer is an asset to the business (Gupta & Lehmann, 2003) and retailers must now how to valuing their customers that contributes the business performance (Gupta, Lehmann, & Stuart, 2004). However, prospecting CLV of free customer needs a new approach because traditional ways always 'missed' take into accounting any spatial variables into it. Although most of extensive research works done in CLV and business profitability, however, sadly, there are some critical issues and problems that cannot answers until todays. As example, the issues are (i) CLV and Limitations in Managing Competitive advantages (Recklies, 2006); (ii) Constrains in CLV Valuation Approaches (Graf & Maas, 2008); (iii) Lacking of Relation between CLV Operationalization with Geographical Based Customers (Lucas, 2008); and so on. Implicationally, new capabilities for prospecting CLV of free customer in the real geographical marketplace are vital important to established, especially to sustainability CLV of the business performance where it will become a new key performance for future.

Valuing customers is a central issue for any commercial activity and the establish method as well as CLV is used to projected the discounted value of the future profits that this customer yields to the company. In order to compute the CLV, one needs to predict the future number of transactions a customer will make and the profit of these transactions. With the Pareto/NBD model as exampled, the future number of transactions of a customer can be predicted, and the CLV is then computed as a discounted product between this number and the expected profit per transaction. Usually, the number of transactions and the future profits per transaction are estimated separately (Glady, Baesens & Croux, 2009). However, the Pareto/NBD model is not ever consider any kind of spatial instruments and the projected values comes form this model actually still lack of accuracy, especially in term of geographical manners. Suppose future profits should directly relate to spatial based information because every thing changes in geographical based will affecting the future value projected from CLV (Abdul Manaf Bohari, Ruslan & Malliga, 2009). This is similar as noted by Venkatesan and Kumar (2004) where measures like CLV provide a forward-looking picture, but less is known about the factors that affect CLV and about the cost of maximizing CLV. As implication, too many marketing managers fail to identify the most valuable customers and are either spending their marketing budget on the wrong customers or in the wrong channels of communication.

The measurement of CLV should be able to guide marketing managers make three key decisions, as well as (i) which customers should they contact; (ii) what channel should retailers use to contact them; (iii) How much do retailer contact a customer. Typically, customer metrics such as Past Customer Revenue (PCR) and Past Customer Value (PCV) are used to accomplish the task of identifying profitable customers. But these metrics are backward looking and do not provide a future picture of customer profitability (Venkatesan & Kumar, 2004). The question is how the hypermarket business can capture and counting the effects of non-database customer into their CLV valuation. As evident, GITA (2005) coated that information has a spatial reference if it can be tied to a map. Typically, over 80 percent of an organization's information necessary to support its business has a geospatial reference. This is similar to ESRI (2007) and ESRI (2002) that mention most of information in spatial platform has not used by the business for their strategic uses. As solution, Abdul Manaf Bohari *et al* (2009) suggest to use geographical information technology for meet the purposes for capturing and analyzing CLV of customer, as different from traditional method as before.

Managing profitability in retailing business has taken on a particular role, especially in the onset of the economic meltdown, as well as the late 1980s, 1998 and currently 2008. The performance of retailers can be improved by reduce costs of production, number of employees, operation costs, and many more. However, this is not necessarily for a long term solution and for that, more proactive approach may be taken to improving both profitability and customers spending activities. Walters and Laffy (1996) develops a model based upon management ratios typically used in retailing businesses for planning and control purposes. The model encourages the use of existing performance data to evaluate overall company productivity and profitability together with performance characteristics of individual functions. As additional, impact of changes to the retail offer suggested by customer research responses also consider as important factors. But, sadly, this model is not taking any spatial measurement as set for understanding the customers spending in the marketplaces. This model is also not geographical friendly because of lacking in integrating spatial factors into their basic measurement.

In reality, the hypermarket has been used database customer as main resources of predicting their customer without consider any data from non-database customer, which also called "free customer". In fact, non-customer is spatial-based information where never tied with hypermarket database of customer. This is actually the gaps that exist in prospecting customer lifetime value where most of study was aimed on database customer and also lacks in tied spatial-based information to the hypermarket's customer database.

3. THEORETICAL BACKGROUND

Historically, the term CLV was first fully described in Arthur M. Hughes in his book entitles Database Marketing, formerly called as Customer Lifetime Value. After that, CLV is in widespread use among almost all small, medium and large firms in the marketing field in every sectors of business. There are three generic strategies for increasing CLV includes (a) increase customer spending rate; (b) increase customer retention rate; and (c) increase customer referral rate. But, these are multi-way for increasing CLV for every customer and for that, some factors must consider when business want to used LCV as strategic tools for helps them in improvise their current and future performance. Sumathi and Sivanandam (2006) exampled that almost 90l of the companies in UK do not apply this basic principle to their companies. Applied basic principles on customer value is important, as coined by Gupta and Lehmann (2003) that CLV is a key element of the company perspective, which is the present value of all future profits generated from a customer.

However, most of CLV studies are focused on database customer as resources of prospecting lifetime value of the business with results in financial-based value. As mention in literature review, most of business is neglect non-database customer as their sources of income that is because of information of non-database customer has not capture by the business. To the best of knowledge, most of CLV model is not developed on spatial platform and also never counting of any spatial variable as one of profitability measurement. It mean that there is no ways to used tradition CLV model for estimate non-database customer where really exist in the specific location of marketplace.

4. RESEARCH METHODOLOGY

The method use in this study is combination survey-GIS as solution for handle non-database customer in spatial environment. Specifically, Arcview software (GIS) is used as main method for modelling the physical location of marketplace**.** GIS software tools, as well as ArcGIS tools will be use for modelling the physical location of with high consideration in accuracy of actual location of non-database customer. Basically, they are two types of variables involved in developing spatial based CLV, likewise non-spatial variables (as such demographic information) and spatial variables (as such street and road systems). GIS has ability to composing these two variables through some procedures. Meanwhile, a postal address of non-database customer which is collected from survey is used for testing under the physical model of marketplace location. The Seberang Perai Tengah of Penang in Malaysia is setting as location of the study.

5. FINDINGS

The finding will demonstrated some part of the results, as such as geographical location of Seberang Perai and spatial location of non-database customer (free customer). This basic finding, RFM/CLV of non-database customer can visualized individually in specific geographical area via current postal address with finale aimed for estimate their CLV.

The output in Figure 1 shows that social-demographic variable as such as hypermarket, alternative store, public infrastructure, and so is used as a baseline of the study where it become a platform for better understand on how spatial environment can contribute to the real lifetime value of each customer in that area. Specifically, demographic variable is important for understand free customer purchasing activity, as well as produced data about CLV in individual form. In addition, these variables will used with spatial and non-spatial variables in visualizing the CLV of free customer in the specific geographical location.

Figure 1: A Social-Demographic of Location.

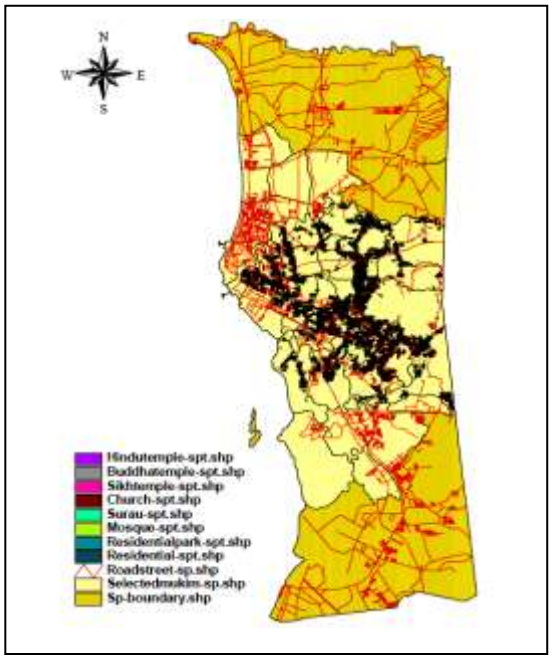
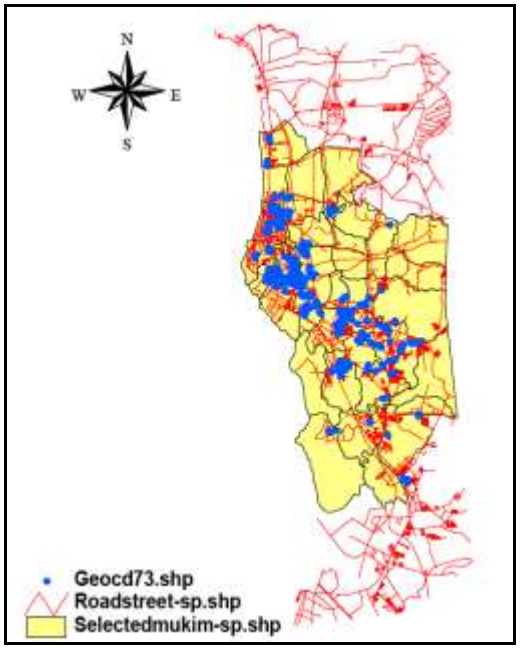


Figure 2: Geo-Referenced Results.

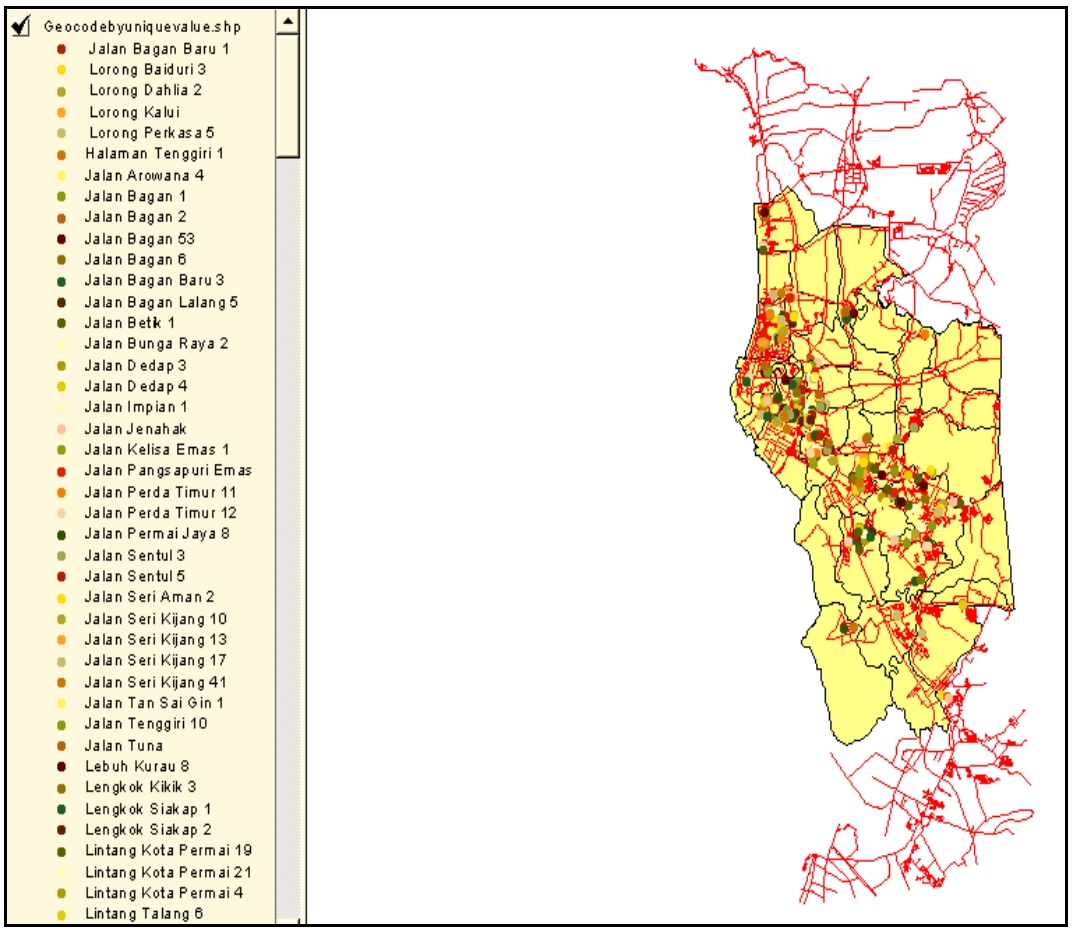


The output in Figure 2 shows how the location of free customer can determine by using geo-referencing technique. Determine the exact location of free customer is vital important where can solved the main

problem regarding the non-database customer. By using specific procedure, as identified as adding coordinate into a map and geo-coding the address, most of the location of free customer can projecting into a map as in Figure 2. The map is representing the real location of free customer as appears in a dot blue point.

In addition, the spatial data as such street, selected boundary and district are composing with postal address to perform some analysis where it tied to location. The process, called spatialization has create new ways in transforming CLV from traditional to spatial that make it available for spatial based analysis. The output in Figure 3 shows the location of each free customer where it CLV can visualized based on their specific address, as appears in left box. Every single of postal address has identified by unique colour with specific geographical references. Meaning that, CLV value can project under the specific location, with integrating the data of recency, frequency and monetary value of every single free customer. For that, another map can produce based on these data.

Figure 3: Spatial Location of Individual CLV of Free Customer.



In addition, with regard to Figure 1 and Figure 2, CLV can analyzed with socio-demographic that can indicated association between CLV, any spatial variables, and socio-demographic variables. There efforts will make a news contribution how CLV must prospected in today's environment with take into account of spatial and non-spatial variables in one platform. For example, spatial factors as such location and accessibility that have potential to be introduced and used as new variables for in-cooperating with the non-spatial variables, as shows in CLV model. By applied such kind of technique, all of these major variable are available to operationalized with CLV and then prospecting them to produced spatial lifetime value of free customer.

According to Bult and Wansbeek (1995) individual profitability of customer can predict as it exist in the location of marketplace. Some studies as such Babak Sohrabi and Amir Khanlari (2007), Buckinx and Van den Poel (2005), and Fader, Hardie and Lee (2005) coined that CLV can predict accurately based on individual setting of non-database customer. Actually, this study had contributed new knowledge on how to

utilized spatial platform of predicting CLV of non-database customer, where it is 'missing' in previous studied and literature review.

6. CONCLUSION AND SUGGESTIONS

CLV is an important weapon in every retailer arsenal. Most of retailer knows what prospecting the CLV are vital important for their survival ability in the geographical marketplace. How much the business valuing the customers is more important, rather than how the business values them. The CLV profitability models have exists for almost more than 50 years, with 'solids component' of non-spatial instruments, thus, now is the best time to enhance it into the real time based value by combined financial with spatial constructs. This research will chance the paradigm of measuring the firm profitability, from traditional platform to latest platform, as well as refers to GIS approach. So far, they are no other approaches that can change the methodology of prospecting CLV as performed by GIS approach which produced precise, accurate and real time value of information to the business, compared to current practices.

Successful long-term CLV implementation requires going beyond traditional geographic boundaries. But, sadly, traditional CLV approaches still not applicable linking with spatial platform, both local and global locations. Particularly in cross boundary of business environments, business may deal with customers that operate in multiple countries or regions of the globe. Understanding how to develop, implement, manage, and monitor CLV across the globe is a critical issue for future research. For that GIS technology are ready used for managing and estimating every event and issues regarding the spatial environments, as noted by Toppen and Wapenaar (1994). It is believable to used GIS in establishing spatial CLV for multi business environment where can support the operating of CLV model under any kind of customer background and marketplace around the globe. Given the size, and the geographical, cultural and socio-economic of Seberang Perai of Penang, as a sample of geographical marketplace environment, there is basic model of spatial CLV for retailers to adapt or expand it, both into the other area of Malaysia and multicultural customers in different location around the world.

In future, research in spatial CLV is highly significant because of the industry and businesses are really needs and requested time based and precise information regarding their profitable customers. By adopting the spatial based CLV, it not just supply accurate information on CLV, but the most important is ability in produce high values of information, such as identified as timely, currently and precisely, and using geographical view as main platform. This study will be a fundamental of establish and developing any spatial based CLV, both for commercial and non-commercial sectors. In addition, a generic model of spatial lifetime of business is potentially to establish where some of spatial-non spatial factors can used and integrated into GIS platform. This future model is not impossible to realized because society, geographical (human and physical) and all business activities is already exist in spatial environment. Moreover, it is possible to evaluate the sustainability of business in future where GIS technology will become more sophisticated and more business-friendly.

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