

THE UTILIZATION OF GEORAPHICAL INFORMATION SYSTEMS (GIS) FOR MANAGING THE CUSTOMER VALUE IN THE GEOGRAPHICAL MARKETPLACE

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ABSTRACT

Geographical Information Systems is widely used and applied in the real world business operation because of its capabilities to manage customer, by visualizing customer value in the geographical platform. The increase of GIS usage for managing customers are become new approaches to business because this technology can cope with the real environment of marketplace. Because of managing the customer in the marketplace are become more challenge, especially in the economic meltdown situation, Geographical Information Systems are identified as a new resources for helps business to deal with customer challenges. This paper discussed the usage of Geographical Information Systems with specific concentrate on application, tools and benefits. Finally, future prospect of Geographical Information Systems will discussed with priority on the latest application and tools for managing customer in the real marketplace.

Keywords: Geographical Information Systems, Customer Value

INTRODUCTION

Geographical Information Systems or GIS is widely used and applied in the real world business operation because of it has capabilities to manage customer, by visualizing customer value in the geographical platform. The increase of GIS usage for managing customers are become new approaches to business because this technology can cope with the real environment of marketplace. Because of managing the customer in the marketplace are become more challenge, GIS are identified as a new resources for helps business to deal with customer challenges. International business firm, as such Baystate Health, Kaiser Permanente, Lamar Advertising, Rand McNally, Southern Company, Sears Roebuck, and Sperry Van Ness are realizes on sophistication of GIS for managing their customers geographically. Pick (2008) note that usability of GIS in business firms are vital important because every single of business asset is geographically dispersed and needs to be managed using GIS tools. According to ESRI (2002), GIS technology is a tool for making maps, analyzing data, and reporting results. Since 1969, GIS has been helping people solve real-world geographic and business problems. Until today, more

than 100,000 organizations around the world use GIS technology through ESRI Company to manage location, information and any types of knowledge related to spatial.

In today's highly competitive environment, customer value is a strategic resource for setting sustainable business with specific focused on utilization of customer lifetime value for struggle in the marketplace. From global perspectives, as examples, managing the customers are highly challenges because many factors must consider into their analyses. ESRI (2007) stated that successful businesses use GIS tools purposely to integrate, view, and analyze data of customers from geography view. These applications can be used across an entire organization, in the field, and on the Internet. Thus, retail business processes, including market analysis, site selection, merchandising, distribution, delivery, and facilities management, actually involve geographic relationships. GIS enables retailers to understand and visualize these geographic relationships toward the end for improve productivity, effectiveness, and efficiency in these processes. At the same time, predictive investigators such as market and customer analytics are also enhanced by GIS capabilities. In addition, many different forms of real-world and modeled data can be used with it to understand the demographic, competitive, and psychographic interaction of consumers, suppliers, and the geographic space in which the data is distributed. However, the beauty and power of GIS is that it allows companies to consider many possibilities, understand potential, review the impact of different investments, store and produce configurations, and analyze changing trends in the retail landscape.

GIS have been grown rapidly in every single of segment of business. In today's marketplace, many of the world's leading commercial organizations, as well as Pest Control Company, Levi Strauss & Co., HSBC bank, Suzuki Motor Corporation, Kentucky Fried Chicken, Domino's Pizza, and many more are relying on GIS technology to enhance strategic competitiveness and improve efficiency in how they operate in the real environment of business and establishing the strategic business planning for the future performance. According to Pick (2008) GIS spatially enabling the business to create unique advantage to competing in market environment, acquiring new customers,

retain customers, grow the business performance, make better decisions, develop new products and services, and optimize workflow of business processes.

In reality, the trends for business uses of spatial technologies are change and move towards high platform such as web based services, mobile spatial devices, advanced visualization, multi-tasking, but simpler functionality of user interfaces. In practical view, more sophisticated and complex technology applied and used in marketing and retailing areas and really advance rather than before. On the one hand, Longley, Goodchild and Rhind (2005) estimated the total revenues for spatial technologies and associated products and services has been reach at over \$15-20 billion. On the other hand, Miller (2007) indicates the value of GIS technology for the business and marketing industry has never been greater than it is today. Small and large businesses alike are finding GIS to be an indispensable analysis tool in site selection, market area analysis, sales territory management, customer profiling, sales and service-call routing, and merchandising strategy development.

THE CHALLENGES OF CUSTOMER VALUE MANAGEMENT

Generally, most of leading retailers as well as Tesco, Carrefour, Giant, and many more actually understand and sharply projecting their customers exceptionally well. Better understanding customer values will lead the retailers to the higher performance, specifically in generating their long term profits. Hoffman, Wildman, Rebollo, Clarke and Simoes (2008) believe that when retailers come to global business retailer landscape, the sheer diversity of customers can confuse the best of product brands. Thus, to success in a global marketplace requires a fine balance of two essential capabilities which is refer to a global approach to the business and a local view of the customer. However, as mention by Laudon and Laudon (2008); Berman and Evans (2007); Miller (2007); Toppen and Wapenaar (1994); and Beaumont and Inglis (1989); to analyzing the market and customers either international and local based perspectives, retailers need to utilize GIS to helps them better understanding and analyses on real needs and expectation of customers. GIS facilitates retailer with spatial based solution and make close relation between predictive and real situation of customers.

Plainly, there is no single route to transform in higher performance for retailers and all successful retailer such as Giant, Tesco, Carrefour, and many more, however, will have maintained the integrity of their core customer by combining some of marketing fundamental elements especially customer value. Managing customers value are identifies as strategic factors for retailer success, moreover, will reflect a strategic planning on customer relationship management that is fully aligned with their business objectives and an operating model that is standardized, streamlined and globally implemented by their global layout. According to Fabel *et. al.*, (2008), retailers should be setting high response to differentiate different face of customer then lead them to tackle the challenges of globalization successfully. However, to get more precise about customer value from the real marketplace, GIS view as high priority technology because GIS supply an indispensable analysis tool (Miller, 2007) for analyse customers in every stage, and ability to integrate, view, and analyze data from geography view (ESRI, 2007).

Specifically, GIS is an important technology in analyzing the CV and Customer Lifetime Value (CLV), but not really maximum utilization by retailers or business firms. Most of researchers such as Epstein, Friedl and Yuthas (2008); Baum and Singh (2008); Berman and Evans (2007); Long, Trouve, and Blackmore (2005); Gulati and Garino (2000); Peppard (2000) and many more noted that customer is crucial part that contributes to retailer profitability for a short and long term business life cycles. Moreover, others researcher, as well as Aeron, Bhaskar, Sundararajan, Kumar, and Moorthy (2008), and Epstein *et al.* (2008) mention that by using CLV they can estimate contribution of every single customer to firm profitability for future prospect of business continuously performance. In addition, customer and CLV is interconnected activity and that is a reason why Glady, *et al.* (2009) stress valuing customers is a central issue of any commercial activity. Further more, Gilbert (2007) stated that it is important to maintain CLV because it surely changes over the time. In perspective of competitive advantage, Bejou, Keiningham and Aksoy (2007) believe that understand CLV is the best way to gain the competitive edge in business.

Estimating CLV is becoming increasingly important in order for firms to identify and invest on prospective profitable customers. This is because of some reasons, such as (1) customer is not equally contributes same values (Epstein, Friedl & Yuthas, 2008); (2) to understanding crucial customer touch of point and the most important expectations of customer are first step in establishing high-quality and effective customer services (Baum & Singh, 2008); (3) today's consumers are more demanding and also more diverse (Accenture, 2007); (4) to maintain long-term bonds with customers (Berman & Evens, 2007); (5) to facing the some key challenges for managing customer (Kumar, Lemon, and Parasuraman, 2006); (6) to estimates profitable performance tomorrow by matching the right product mix at the right time to customers (Long *et. al.*, (2005); and (7) to understand customer behavior (Gulati & Garino, 2000). According to Aeron, Bhaskar, Sundararajan, Kumar, and Moorthy (2008), CLV estimation can help a firm in making some of these crucial decisions. Sources of information can generate from a credit card customer and a metric for CLV produce as a final result. This metric has been designed specifically for credit card customers and different states of a customer actually demonstrate how the proposed metric works.

All this challenges will lead to establishing new ideas on formulating and developing new model on prospecting customer lifetime value by using Geographical Information Technology approaches.

GIS APPLICATION IN CUSTOMER'S VALUE MANAGEMENT

Generally, GIS plays important roles in marketing, including in retailing and customer management. According to Zhao (2000), the application of GIS in business has grown rapidly and major retailers, automobile dealerships, video rental companies, media organizations, and fast food corporations are just some of the many businesses around the world that have discovered the value of GIS. Research has shown that since more than 80 per cent of all information in an organization can be geographically referenced and that why the business strategists are finding GIS to be an ideal tool for identifying and expanding markets, and increasing profits. In addition, combining GIS and other techniques will create appropriate and diverse approaches to problem solving. For

examples, by linking statistical methods with GIS this are be able to enhance GIS capabilities with the power of statistical analysis, and effectively use data from different sources for market analysis. GIS allow users to visualize spatial data in different form, including visualizes the spatial distribution of data on maps prior to further statistical analysis. By doing this, the potential of GIS application in market analysis have been seen as a tool for reaching a desired solution as expected by the firms.

In addition, GIS is not limited used for operation level of retail or marketing department. Currently, GIS actually is applicable for management and executive level of business with more analytical tools and capabilities. GIS helps the management level regarding the middle based issues such as decision support, capacity planning, materials planning, and so on. On the other hand, GIS offers better prediction, analysis and forecasting tools for facilities the executives facing the strategic level challenges. In ESRI (2002) GIS is finally able to address the key issues of top management such as marketing, competition, and profitability. Senior management needs GIS for understand their best markets, customers, and markets situations. Specifically, they want to follow, through time and space, the competition in relation to their best markets and determine if the competition is growing or shrinking. However, they also want to site new businesses and track sales in existing locations as well as determine profitability of a new or proposed location. With this information, marketing executive know which stores are under producing relative to potential. According to Berman and Evans (2007), this relates to the retail trade area zone where the revenue is actually generated from. By using GIS analysis on retail trade, they can predict where the best prospects instead of increasing retail profitability. Finally, GIS can help the retailer in term of understand the best allocate their resources, such as retail locations, sales force, promotion tactics, marketing activity, advertising incentives, include mail based campaigns with final aimed to grow their businesses.

From executive or senior management point of view, Laudon and Laudon (2008) argue that IT is important tools for gaining business competitive advantages because IT offers valuable tools to solve the business problems and GIS is one of the important

applications for it. The important to analyses the geographical perspectives and spatial data are transforming GIS as become relevance IT tools for achieving the aimed business profitability and friendly links to organization internal databases and systems as well. While, SBL GIS (2008) listing the applications of GIS services in retail sector, including (a) evaluate current market position and identify under and over invaded submarkets; (b) estimates the number of locations a market can support; understand the effects of competitive market moves; (c) identify the optimal expansion opportunities in a market; (d) evaluate existing stores to spot over and under performers; (e) measure the impact of new store (openings, relocations, remodels, closures, and competitive acquisitions); (f) identification of a series of existing locations that resemble the proposed location; (g) compilation of maps and reports that highlight the crucial information about a potential site in a consistent and comparable manner; (h) score potential locations (based on the quality and composition of the expected trade area); (i) assess the size and shape of a proposed store's trade area (based on urban city and competitive intensity); (j) store networks and prioritize capital investments (based on predictive), multi-factor trade areas; (k) optimize store networks; (l) localize marketing and merchandising; and (m) prioritize markets (either to enter, expand or exit).

Certainly, GIS provides the small and medium sized firms with analysis tools the business core and secondary activities; which is functionally for analyzing the customer value. GIS supply analytical, visualization and in-dept function for meeting the requirement related to business customer analysis. Bastedo (2008) stated that GIS are enhancing business value in a complex organization, which are includes understanding values related to place, customer, organization (revenue), shareholders, and brand. Further more, Andronikov (2008) mention that GIS functionally in enhancing the business decision making process in many area of business, such as site analysis, market analysis, analysis of demand, supply chain management, risk management, and network routine modeling. In addition, Zwillinger (2008) stress that one of the primary benefits of GIS is that it allow businesses to improve decision making by using spatial analysis. That why, in term of customer management, GIS highlighting the proximity between the

location and key potential customers and provide some insight into the potential daytime customer demand.

Increasingly, more sophisticated and advance GIS technology will introduce to the business area with aimed to create highly impact on business operation and performance, including marketing value. In essence, GIS provide three essential capabilities which are identified as visualize and modeling the real phenomena, in-depth analysis of spatial aspects, and manage and utilize the information for better decision making execution. This ability actually vital important to solve common business problems, such as market analysis, retail site selection, territory design, logistics, business continuity, risk analysis, and many more. Harries (2008) argue that GIS delivers value to the business by generate useful information regarding product and services, perform analysis and modeling, share common data, support multiple business application, integrate work, and manage data. More over, GIS plays important roles in create geographic awareness, reused business knowledge gained, share knowledge and integrate with other enterprise business systems. Thus, the business will more competitive, better informed, faster, more defensible decisions, better service, lower costs, and at the end gained higher profits.

From research point of view, Thum (2008) noted that GIS identified has had play important roles in market forecasting and management, target store sales predictions, competition gravity modeling, sales territory modeling (resources prioritization), supply chain modeling, optimization modeling, store layout analysis, product placement, and customer analytics. Moreover, spatial and predictive analytics can be integral to corporate strategy for aimed the long term profitability, such as business growth, and then enhanced profitability in core business areas, delivering needed product and services to customers, and providing a competitive advantage for future business performance. While, Abdul Manaf Bohari (2008) stated GIS are becoming a part of mainstream business and marketing include retailing management around the world. Beside that, Toppen and Wapenaar (1994) explain the importance of the GIS in the businesses and outsource marketing with by focus on extending business intelligence technology with GIS. Thus,

many of organizations are beginning to explore the use of GIS in their decision making processes by generating maps that convey information gleaned from their respective GIS databases. In the end, GIS is important in business intelligent research because most business problems include significant spatial components and GIS enables decision makers to leverage their spatial data resources more effectively.

Obviously, the top 200 retailers alone account for 30% of worldwide demand. Retail sales being generally driven by people's ability (disposable income) and willingness (consumer confidence) to buy, compliments the fact that the money spent on household consumption worldwide increased 68% between 1980 and 2003. The leader has in-disputably been the USA where some two-thirds or \$ 6.6 trillions out of the \$ 10 trillions American economy is consumer spending. About 40% of that (\$ 3 trillions) is spending on discretionary products and services. Retail turnover in the EU is approximately Euros 2000 billion and the sector average growth looks to be following an upward pattern. The Asian economies (excluding Japan) are expected to grow at 6% consistently till 2005-06. Positive forces at work in retail consumer markets today include high rates of personal expenditures, low interest rates, low unemployment and very low inflation. Negative factors that hold retail sales back involve weakening consumer confidence (Anand & Nambiar, 2004). Thus, it's important to utilize the customer value information because it has some impacts on retailer profitability. Due to precisely valuated, precise information is vital important that is can supply by GIS. Generally, GIS provide accurate, currently, and update information about market situation and customer locations that lead to development of customer spatial informational database. GIS can realize the customer's valuation precisely, as well as the important of customers as business asset.

Not surprisingly, customer focus is always identified as the key to successful retailing in any marketplace. Obviously, successful retailers apply customer based strategy globally for gearing many more customers for contributes to firm profitability. To ensure retailers get more details on real customer situation, GIS should considered as important strategic tools for any reason, such as, GIS is an ideal tool for identifying and

expanding markets, and increasing profits (Zhao, 2000); GIS provides answer for question about demand (customers) and supply (retail outlets and shopping centers) (Beaumont,1991); and GIS purposely used for target store sales predictions, sales territory modeling, product placement, and customer analytics (Thum, 2008). By using GIS technology, retailers enable and performing such kind of customer based strategy, as well as market differentiation, customer value identification, and streamlining and integrating their global customers to achieve high profitable market.

FUTURE PROSPECT OF GIS

Practically, spatial technologies and GIS have significant impacts on productivity of business performances. The significant of GIS is dramatically increase from time to time, according to innovation on previous applications of business based Information Technology (IT). In the business world, Pick (2008) stated that GIS as information technologies have become more pervasive, interactive, mobile, internet-based, and diffused throughout the enterprise, likewise spatial technologies have done so. Moreover, Clancy (2008) stated enterprise GIS now become important application in business sectors. This is because of enterprise GIS is integrated, multi-departmental system of components used collect, organize, analyze, visualize, and disseminate geographic information. Indeed, the goal of an enterprise GIS is to implement interoperable technologies, standard and methods so that GIS data and services can support core business needs more efficiently and more effectively.

CONCLUSION

Customer is the greatest asset to retailer, specifically, the current customers who will remain as customer in future also. In common understand that the customer is the fundamental reason for the company's existence and operate in the market place. The importance of customer is known to everyone in business, but what's surprising is the fact that many businesses do not know the value of the customer in terms of financial matters. ESRI (2002) estimates that approximately 50 percent of today's retail stores do not capture customer information as part of the business transaction. Without this find of information, it is difficult to quantify the demographics of your customers or market

areas. So, GIS application is powerful and useful which provides one means of identifying characteristics of a mathematically generated market area. Other analyses can be performed to add to the value of these areas including drive time and ring analyses.

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