Google: achieving industry-wide product leadership essay

Design, Photography

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ABSTRACT Value disciplines are key factors in determining market leadership in any given endeavour. The three widely accepted value disciplines are

operational excellence, customer intimacy and product leadership. These disciplines have their peculiar features and requirements in terms of IT support. In studying Google as a company, it is evident that while it implements all three strategies to a certain degree, it leans more towards product leadership and leverages on that to establish a formidable presence in the search engine market. Google has a sound IT infrastructure in terms of hardware and software that supports the product leadership value discipline. INTRODUCTION 1 Overview of the three value disciplines According to Treacy & Wiersema (1993, p. 85), there are three ways an organization can attain market leadership in its industry. These disciplines are operational excellence, customer intimacy and product leadership. For a business to dominate the market regardless of the sector it operates in, that business must strive to achieve mastery in at least one of these disciplines while being proficient at the other two (Eichen 2006, pp 33-34). Each of these disciplines will be studied exhaustively. 1 Operational ExcellenceThis entails delivering excellent products and services at minimal cost to the organization. Companies that pursue this strategy strive to minimize overhead and transaction costs, reduce the number of production steps and optimize business processes all in bid to ensure that products and services are delivered to the customer at minimal inconvenience (Treacy & Wiersema 1993, p. 85). This implies an emphasis on business processes and procedures to make them as effective as possible. Zero tolerance for error is usually the norm in firms that practise this strategy. Eichen (2006, p. 3) agrees with Treacy & Wiersema (1993) that operational excellence involves providing customers with excellent products at the lowest total cost.

Although Haddock, Mizuno & Ngai (2006) agrees that practising operation excellence in China involves providing quality service, it maintains that this could be at high costs as traditional low labour costs in China's coastal cities do not always offset disadvantages such as logistic costs and lack of scale. Haddock, Mizuno & Ngai (2006) gave an example of Haier as a company that never compromised the quality of their products in China not minding the cost. Haier's CEO was known to destroy products that did not meet with set standards and as a result, in 2005 Haier was ranked first of China's Top 10 Global Brands by Financial Times (Haddock, Mizuno & Ngai, 2006). 2 Customer Intimacy Companies that engage in customer intimacy always seek to tailor their products and services to suit the continuous changing requirements of the customer (Treacy & Wiersema, 1993 p. 87). Customer intimacy is about creating a trusting and long-term relationship with customers. It gives marketing professionals the opportunity to know, in detail, what their customers want and this in turn ensures continued customer loyalty. Cost is not an issue here as the business is ready to do whatever it takes to get the customer satisfied. According to Morais (2009), customer intimate companies promote themselves as the one that helps their clients to be successful. Such a company is a partner, not a supplier and this should be an essential component in the company's thinking. These firms deeply understand their customers and have detailed information on their customers' needs/challenges/buying habits. Being a customer intimate company is also about selecting one or a few high-value customer niches and doing an extensive effort at getting to know these customers in detail. This requires anticipating the target customer's needs and sharing risks with

them when the development of new products/services is required. Morais (2009) further stated that the core competencies of such companies include exceptional skills in discovering customer needs, problem solving proficiency, flexible product/solution customization, using collaborative (win-win) negotiation skills and to have a customer relationship management mindset. In bringing out some of the benefits of this strategy, Clemmer (2001) opined that most innovations arise from a deeper level of customer and market understanding. In other words, customer intimacy drives innovation. Business-wise, customer intimacy impacts revenue growth and earnings per share, by creating long-term edge over competition through early identification of unsatisfied needs (Abraham, 2006). This means that creating close relationships with key customers enables companies to identify the unmet needs of the customer and keeps them ahead of competition. Such companies invest in a highly skilled workforce and give them great freedom in solving customer problems (Eichen 2006, p. 34). 3 Product Leadership Businesses that pursue product leadership strive to always deliver innovative products and services. This involves being creative by embracing new ideas that may spring from unconventional sources, ability to commercialize these ideas quickly, and a drive to always outdo one's own technology (Treacy & Wiersema 1993, p. 89). According to Morais (2009), the focus of a product leadership driven company is on development, innovation, design, time-to-market, high margins in a short time frame. Core competencies would be to have excellent marketing skills, to be able to rapidly exploit market opportunities and to implement research geared towards product development. Culture-wise, the company is concept and

future driven, focused on action and cultivates the " outside of the box" mindset (Morais, 2009). Such companies could engage in research activities in search of pioneering solutions to existing problems in the industry. Employees of such firms are always encouraged to think outside the box to bring about new ideas that eventually lead to innovative products and services. They are usually given the freedom to innovate, and holding internal competitions to create products that will make obsolete current best-selling products are the kind of initiatives nurtured in the organization. To secure this setup, the company should maintain a dynamic internal development structure, with overlapping, self-organizing teams and placing low importance to job titles (Morais, 2009). Product leaders always avoid bureaucracy as this can impede their progress. Using this strategy also requires shrewd market knowledge to ensure that the new product or service will sell (Ward & Peppard 2002, . 114). According to Kaplan & Norton (2001, p. 87), prices of product leadership companies are usually high. Customers generally patronise such products because of the unique capabilities and functionality. Services rendered by such companies are usually adequate though not exceptional. In preparing this report, it will be shown for the sake of argument that Google dominates the search engine market by applying the strategy of product leadership rather than customer intimacy or operational excellence. BRIEF HISTORY OF GOOGLEGoogle began in January 1996 as a research project by Larry Page and Sergey Brin when they were both PhD students at Stanford University in California. According to Wall (n. d.), Larry and Sergey had begun collaboration on a search engine called BackRub, named for its unique ability to analyze the " back links" pointing to

a given website. Afflicted by the perennial shortage of cash common to graduate students everywhere, the pair took to haunting the department's loading docks in hopes of tracking down newly arrived computers that they could borrow for their network. A year later, their unique approach to link analysis was earning BackRub a growing reputation among those who had seen it. BackRub ranked pages using citation notation, a concept which is popular in academic circles. If someone cites a source they usually think it is important. On the web, links act as citations. In the PageRank algorithm links count as votes, but some votes count more than others. Your ability to rank and the strength of your ability to vote for others depends upon your authority: how many people link to you and how trustworthy those links are. In 1998, Google Incorporated was launched. Google gained search market share year over year ever since. Its net income has been increasing, $6, 985, 000 in 2001, $99, 656, 000 in 2002, $105, 648, 000 in 2003, and $399, 199, 000 in 2004 (Botella, n. d.). Today, Google has become one of the world's most recognized brands in search technology. GOOGLE: TAKING THE THREE VALUE DISCIPLINES IN PERSPECTIVE In terms of operational excellence, Google strives to deliver quality search results in the least possible time and at reduced overhead cost. Rather than go the conventional way of using large, expensive servers for its data processing, Google uses numerous cheap, everyday servers. According to Carr (2006), Google runs on over 450, 000 servers racked up in thousands of clusters and spread across dozens of data centres around the world. Google also developed multiple software products that harness the processors of these servers to produce a processing power similar to supercomputers. Barroso, Dean & Holzle (cited in

Arnold 2005 p. 72) gave a comparison that the high-end multiprocessor server is about three times more expensive than a cluster of inexpensive personal computers (PCs) but has 22 times fewer processors, three times less memory and slightly more hard disk space. In the business world, this means that when Microsoft or Yahoo! spends US$3. 00 for better performance, Google spends less than US$1. 00 (Arnold 2005, p. 72). This results in huge cost savings for Google while delivering very fast search results. In terms of speed, Arnold (2005, p. 67) maintained that Google search is fast with results coming back to the user in less than a second. At this juncture, it should be noted that about 340 queries are handled each second from users all over the world in different languages (Arnold 2005, p. 59). So speed and efficiency are not sacrificed on the altar of cost reduction. Rather the reverse is the case. In terms of customer intimacy, Google strives to deliver exactly what the user wants. According to Chaffey (2009), one of the three key commitments illustrated in the Google SEC (Security Exchange Commission) filing is that ' We will never stop working to improve our user experience, our search technology and other important areas of information organization'. Google has a simple, clean, minimalistic user interface with just the logo and the search box – easy and fast to load. This was a key feature with the slow internet connections of the early years 1999-2001 – while Yahoo! nd most of the other search engines were more like general portals, full of features, links, banner adverts, heavy and slow to load. In terms of product leadership, Google is firmly established as an example of both business and technological innovation. With the invention of the PageRank algorithm, Google has changed the way searches are being

conducted on the web. According to Cusumano (2005, p. 15), Google uses PageRank, along with other algorithms that analyze hypertext links, to offer a much superior way of searching the web compared to conventional methods used by other search engines. In the business angle, Google has also demonstrated innovation. It started the idea of ' Sponsored Links' where advertisers could pay to have their products displayed as part of search results. This is based on the idea that about 40% of web searches have a commercial motivation and that about 75% of online purchases begin with a web search (Cusumano 2005, p. 15). Google has made most of its income from its innovative advertising model than it has made from applying the other value disciplines such as customer intimacy or operational excellence. GOOGLE'S PRODUCT LEADERSHIP STRATEGYOne of the dictionary definitions of the word Google is ' to search for information on the Internet' (Google, n. d). This gives an idea of how much Google has dominated the search engine market. The knack for creating innovative products is largely due to the fact that Google requires its engineers to spend one day in a week on a personal project. This has given rise to several products such as Google News, Google Maps, Google Earth to mention but a few. Some of these products where Google demonstrates product leadership will be discussed below: 4. 1 Search TechnologyIn terms of speed, it only takes a fraction of a second to get the information that one needs when performing a search. Google has worked very hard on getting rid of excess bit and byte from their pages to make it go as fast as it possibly can, it has been breaking its own speed records. While other companies thought large servers would be the quickest way to deal with huge amounts of data Google realized that networked PCs were faster.

While other search engines are stuck with the speed limits of their search algorithms, Google developed new algorithms which proved there was no limit as to how fast you could go. Google still is trying to make it faster (Botella, n. d). Google has also released a product called Google Search Appliance. This enables a user to incorporate the power of Google search engine on his application. This can then be made available to one's customers, employees or business associates on a portal, website or desktop. This makes the huge amount of data on one's database, file system or web servers available at a single click. Users will then be able to search through two hundred different file formats in any language and fifteen million documents will be indexed (Botella, n. .). This product is a bit expensive but customers patronise it because of the functionalities it offers. Also you do not need a computer to perform a search on the web as this can now be done via a mobile phone. 4. 2 AdWords This is currently Google's flagship product and its biggest revenue earner. Adwords is Google's innovative advertising network. The way the Google Adwords operates is by allowing advertisers to bid on an endless selection of keywords that they believe may be typed into the Google search engine in search of information. When an advertiser bids on a specific keyword, and they bid a high enough price, the result is that their ad will appear in a special segment of the search engine results pages for that keyword which is located both above the regular search engine results (shaded in yellow) and along the right side of the page as well. If an advertiser does have an advert appear in one of these places, and a search user happens to click on the advert, travelling to the advertiser's optimized landing page, then the advertiser will be charged

based on the bid amount. This means that the advertiser is only paying when the advertisement is actually being clicked rather than simply for having it displayed (How Does Google Adwords Work? 2009). This is also known as Pay Per Click (PPC) advertising. This has made Google stand out as a market leader by delivering quality search results to viewers and realising huge profits at the same time. 4. 3 Google Maps/Google Earth Google Maps is a basic mapping application that provides street maps, a route planner for travelling by foot or by car, and an urban business locator for several countries around the world. It uses satellite imagery and aerial photography to produce these maps. Some locations are blurred for security reasons, Google Maps cannot show areas around the poles but Google Earth can. Google Earth is a virtual globe, amp and geographic information program that maps the earth by the superimposition of images obtained from satellite imagery, aerial photography and GIS 3D globe. Users for the first time can view 3D buildings in major cities and terrain such as mountains and valleys for most cities around the world. It can also be used to monitor traffic speeds located every 200 yards in real time. GOOGLE'S IT SUPPORT STRATEGY The company mission of Google is simple: " To organize the world's information and make it universally accessible and useful". In order to achieve this mission, Google has a well developed IT infrastructure in terms of hardware and software that is indeed capable of organizing the world's information and making it readily available to users at the shortest possible time. Google has been leading the pack in the search engine territory and this is possible because of the sound IT strategy in place. 5. Hardware Technical Support Rather than making use of huge multi-processor servers in its data centres,

Google makes use of ordinary PCs that are readily available anywhere. A typical Google ' server' is shown in Fig 5. 1 below: [pic] Fig 5. 1. Google's server design (Shankland, 2009) Google purchased thousands of these servers and turned them into an unmatched distributed computing platform. Since these servers are everyday machines, Google has taken steps to incorporate failover strategies in its design of both hardware and software. According to Shankland (2009), each of these servers has its own 12-volt battery to supply power if there is a problem with the main source of electricity. Typical data centres rely on large, centralized machines called uninterruptible power supplies (UPS) to provide power when the main supply fails and before generators have time to come up. Building the power supply into the server is cheaper than huge centralized UPS and means costs are matched directly to the number of servers. Efficiency is another financial factor. Large UPSs can reach 92 to 95 percent efficiency, meaning that a large amount of power is squandered. The server-mounted batteries do better since the actual usage is greater than 99. 9 percent efficiency. Also the design of the power supplies of each of these servers goes a long way to cut costs. Power supplies convert conventional AC (alternating current) electricity into DC (direct current) electricity, and typical power supplies provide computers with both 5-volt and 12-volt DC power. Google's designs supply only 12-volt power, with the necessary conversions taking place on the motherboard meaning that the power supply can be run closer to its peak capacity (Shankland, 2009). . 2 Software Technical Support Google uses the PageRank algorithm in its search engine to determine the relevancy of each page on the web. This is done by calculating the number of links

pointing to that page. A page with a high ranking is usually considered when retrieving search results as this page is bound to contain the best information content when compared with other pages of similar content. This algorithm has been used by Google to produce relevant search results to users at the fastest possible time. The Google File System (GFS) is used by Google to replicate the same data multiple times across different server or data centres. This is meant for redundancy in the event of failure. So if a hard disk, server or even a whole data centre fails to come up, the whole system is not affected as the GFS can easily retrieve the same data from another source. The GFS is also used for high speed data read and write operations from commodity hardware. MapReduce is software developed for internal use by Google to support parallel computation. It is used by Google for indexing the web and computing PageRank, for processing geographic information in Google Maps, for clustering news articles and a host of other applications. It is the software power horse that drives most of Google's products. It is also used by Google programmers to speed up their work through distributed/parallel computing. CONCLUSION The three value disciplines widely recognised all over the world for attaining market leadership in any given endeavour are Operational Excellence, Customer Intimacy and Product Leadership. It is required that any organization seeking market leadership must excel in at least one of these disciplines while being good at the other two. Google Incorporated fits the description of a company who adopts the product leadership strategy both in terms of business and technology, to rise above its competitors while still practising the other two strategies at a certain level. The IT strategy that supports this product

leadership discipline consists of both hardware and software infrastructures which are combined to provide a solid IT backbone that drives all of Google's innovative products services.

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