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The Battle Between Apple, Microsoft and Google:
Strategic Lessons from a Converging Internet Industry 2000-2010

Case study
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Introduction

From the first discussions of a "galactic network" in 1962, the Internet has developed into an enormous information infrastructure. While it has initially been a governmental research tool, its full public access in 1994 propelled the network into a global cultural phenomenon. Four years after its public initiation, already more than 50 million private users were online, followed by an unlike larger number in the years thereafter. With about 2 billion users in 2009, the Internet has also grown into an own global economy of unprecedented size. This new economy is driven by a relentless force of technological and conceptual innovations stemming from an innumerable number of parties scattered around the globe. Its speed of change and innovation make it to a highly competitive arena.

Apple, Microsoft and Google have been the most successful companies within this arena for a long time. Throughout the previous decades, they have internalized the economic laws and technological characteristics of the Internet in their business thinking. Their strategies and competitive moves did not only form the information economy as we know it today, but do also provide showcase examples of how profitable market positions can be achieved in the Internet.

This case study covers a decade of information economy market evolution and answers some very fundamental and insightful questions: How did Apple, Microsoft and Google successfully navigate and define the competitive arena of the Internet? Which roles did their unique strengths play for their strategies? Which specifics of the Internet did they have to account for? How could they sustain their competitive advantages within such a hostile environment?

Apple, Microsoft, Google and the Internet Industry in 2000

Apple was founded in 1976 by Steve Jobs and Steve Wozniak; stressing the importance of making computers easy for all customers. The first proof of this was the revolutionary Apple II computer, which consumers could use straight from the box. Before IBM entered the PC market in 1981, Apple was the industry leader. The company went public in 1980; the largest IPO since Ford Motor Company in 1956. Apple has traditionally relied on proprietary design that only it can use. One of Apple's advantages is its capabilities in both hardware and software development. Hardware was traditionally designed "from scratch" to differentiate it from competitors' products. This made the cost structure quite high. Software, such as Apple's own operating system and applications, was developed and bundled with Apple products. In this way, Apple has been able to deliver complete solutions to customers, leading many to favor Apple products and allowing the company to charge premium prices. Apple is strong in multimedia due to its early focus on relevant technologies in that area. Today, most people interested in media-related areas, such as movie editing and music development, use Apple. Under Steve Jobs, Apple has always been very secretive about its actions, in both terms internal development and external partnerships and acquisitions. The company has thus acquired something of a "control freak" image about its technology and knowledge. This, together with the more idealistic approach, has made Apple a fascinating and rather mysterious company that always attracts a lot of attention in the market.

Microsoft was founded in 1975 by Bill Gates and Paul Allen. The company's core area has become the development of operating systems, ever since IBM in 1980 asked Microsoft to create such for a new line of PCs. By buying existing operating software and customizing it to work exclusively with Intel microprocessors, Microsoft gained a fast entrance into the market of operating systems development. The system of an IBM PC - in comparison to that of others - was more open and made it easy for producers to duplicate for scale efficiencies. Microsoft aimed at licensing its operating system to any manufacturer that was IBM compatible. For this reason, Microsoft's operating system gained dominant market share and continued to grow in the following years. Today, roughly 90% of all worldwide personal computers run Windows software.[1] The early success of Microsoft opened the door to expansion. Microsoft has also seen the potential for application development for other

computers, such as those from Apple; an integration strategy that has helped the company to further developing Windows systems. From the beginning, Microsoft has been able to move quickly into markets with its solutions. This speed has often been achieved by purchasing existing technology and know-how and improving it in-house to fit with Microsoft's own ideas. In this way, Microsoft has used past successes in moving on to even bigger accomplishments. This has led to frequent software upgrades, increased applications development, and movement into related areas for growth. Inevitably, the company linked its products to a network view, where the use of servers opened file sharing between PCs. In turn, these could be linked to other networks via the Internet.

Larry Page and Sergey Brin launched the search company Google in 1998. With the simplest mission, to organize the world's information and make it universally accessible and useful, the two founders started to download Web content into computers for organization. With its revolutionary link rating system PageRank, Google quickly established itself as a strong search engine on the Internet. Today, Google has become an essential part of the everyday life for many internet users. Google's goal has been to bring higher quality and improved search functions to the world. Because the company's growth has primarily been through word of mouth, no costs were associated with marketing of the search engine. This has helped the company to focus on improving search techniques and building up hardware farms to cope with increasing data and information fast. The company's philosophy has always been "openness". Although the PageRank system's codes are more secretive due to the danger of copying, information and data are distributed free. This fosters an open source environment, which Google believes helps create better products and solutions than any in-house development model. Armed with three corporate values, "don't be evil", "technology matters," and "we make our own rules", Google has continued to leverage its strengths with strategies to be the ultimate search and communication company.

By the year 2000, the Internet has already become a multibillion dollar industry with Apple, Microsoft and Google being its major players. By this time, the direction of the Internet's further development has also already been set. The Internet was showing signs of becoming the melting pot of media and entertainment, business and workforce collaboration, telecommunication, knowledge and other markets. It also became apparent, that within this converging industry, personalized service provision on a global scale would be the key success factors. Apple, Microsoft and Google were the first and most successful in taking action to integrate massive services in their product worlds. In 2000, with Internet stock prices being down after the burst of the dot-com bubble, Apple, Microsoft and Google found themselves as strong survivors within a deeply distressed industry. This situation, however, offered a rich menu of opportunities. Various IT firms were for sale or willing to cooperate under more favorable conditions. Drawing on these opportunities, Apple, Microsoft and Google set out to adjust their positionings and capabilities in preparation of the inevitable recovery of the Internet.

The Internet Industry and its Most Recent Phases of Development

2000 – 2003: Strengthening the Core and Building Footholds in Related Industries.

With its uncertainty after the bubble, the Internet was the new world with unlimited potential, making it important to focus on core competences to get a foothold in the industry. In their build-up phase, companies tried to avoid aggressive moves resulting in counterstrikes and waste of resources. Instead, firms tried to capitalize on unique differences providing an advantage, and build on these by accumulating knowledge and information to construct a differentiated power center. Apple positioned itself in digital media, where both hard- and software played a crucial role, while Google built up its search and communication franchise for future expansion. Microsoft, already huge, anchored itself in entertainment, as well as building a presence with future-oriented servers and platforms.

Apple: Arming Itself as the Digital Media Leader.

Apple had build up a strong foothold in production of extraordinary designs and user-friendly products. The company had been in digital media since 1999, when it introduced Final Cut Pro. The company wanted to scale up in this area; although new introductions were just beginning, Apple wanted to build up its internal capabilities, especially in software development. A new market trend with lower R&D costs and outsourcing created a sense of urgency. In 2000, Apple had R&D expenses of $380 million and integrated the engineering team of DVD authoring software company Astarte in October, 2000. Apple did not reveal details of this acquisition until 2001, when it introduced IDVD and DVD Studio Pro as part of its digital media offerings, offering nicely designed applications with stand-out new capabilities, aggressively priced at just under $1,000. Both products complemented Apple's video editing tools, so you could capture and edit in iMovie or Final Cut Pro, and then author and burn DVDs in iDVD or DVD Studio Pro. Buying an Apple computer with such expanded offerings then seemed smarter, despite a higher price than a traditional PC.

Apple's computers sold through online retail, where the company could charge more for their products - not only because of the computers' capabilities, but also for stunning and fashionable designs. Additionally, the company managed to reduce costs by outsourcing manufacturing, trimming inventories, and substantially reducing number of retailers.[2] Then, in a surprising move, Apple bucked market indicators to focus on traditional retail stores. The PC retail market had experienced a decline, with customers leaning more towards online retailers and the accompanying costs advantages. Apple's main emphasis, however, was to provide consumers with an experience and brand identification rather than boosting sales on the spot, and having their own retail stores helped achieving this. In May 2001, Apple opened its two first retail stores, which were organized based on design and ease of use.[3] This proved beneficial; Apple focused strictly on the bottom line of consumers' needs. During the first two-day weekend, the stores reported sales of $599,000.[4] Apple had captured consumers' hearts, and quickly expanded their offering with the release of ITunes and the IPod. ITunes was a music entertainment program readily installed on computers, offering unique capabilities in music storage. The IPod was Apple's answer to the rising trend of mp3 players. An easy-to-use, well designed, and strong music player that offered exactly what a customer needed, the IPod proved a perfect fit with the rest of the "lifestyle" products Apple offered. Not only were Apple computers strong challengers to Microsoft offerings, but the company's extended offerings in the entertainment sector put an increased pressure on Microsoft through proprietary music programs and additional hardware fitting perfectly in the Apple package.

Apple continued its retail strategy; and by 2002, the company had 51 flagship stores across the United States. Apple's desire, however, was to increase its foothold in digital media, and this time the professional market was targeted. In February 2002, Apple acquired Nothing Real, a high end special effect software producer, for $15 million.[5] Nothing Real was the creator of Shake, a 3D animation compositing application extensively used in production of big-budget Hollywood films. After the purchase, Apple discontinued the Windows version of the application. As many users refused any substitutes for the Shake application, high-end visual effects companies had to bring a Mac into their workflow. In a next step, Apple cut prices for Shake by 50%. The rationale is simple; selling at lower prices so that products are affordable for the masses, and then selling more units to generate better profits. And most important: eliminate competition as you progress. Apple also built up the professional media segment through the special effects software acquisition of Silicon Grail Technologies.[6] Apple's interest in digital media evolved also in the complementary music sector and the company then acquired Emagic, a leading provider of professional software solutions for computer-based music production, in July 2002 for $30 million.[7] Emagic's most popular product, Logic, was actively used by over 200,000 musicians around the world. Again, Apple announced that it would discontinue Emagic's Windows offerings.

Apart from the media market, Apple had an intense in-house focus on the production of FireWire technology, seen as the fastest and most reliable means to transfer data in high-speed. For this reason, Apple no longer wanted to rely on third parties for this function. Bolstering this philosophy, Apple acquired the producer of these technologies, Zayante, for $13 million.[8] Speed in

transferring capabilities could bring enormous advantages in future offerings and this move secured Apple the technological opportunities of FireWire.

The introduction of the stylish, white IPod served as a perfect complement for the entertainment segment of media products, and was designed to fit seamlessly with the ITunes music player on the computer. Although Apple's 2002 sales were still dominated by sales of Mac products, the IPod and related music products represented 2,5% of the total $5,7 billion in net sales.

In 2003, Apple moved online with its key features. The company focused solely on increasing research and development, whose budget in 2003 accounted for approximately 8% of the $6.2 billion in sales. In another introduction to the overall computer experience, Apple introduced its first edition of ILife, a multimedia and creativity software package that bundled most of Apple's products within music, video, photo, and web solutions. This software came packaged with every Apple computers and made it easier for consumers, who acquired an integrated solution. Products such as Garageband, created by the know-how from the Emagic acquisition, were released later the same year and integrated into the ILife package. In the second quarter of 2003, Apple introduced the ITunes Store, offering online music for a small sum per song. This helped the further integration of the IPod to the Apple portfolio, where IPod sales jumped by 140% to $345 million. In another ITunes store-related move, Apple introduced a free downloadable Windows version of ITunes. This move helped switch 85 million songs in a couple of weeks to the ITunes Store. The success of ITunes was clear; initially, Apple made sure that if a user wanted to transfer songs from ITunes to a portable audio device, they had to use the IPod. Due to the specific song formats in Apple's proprietary standard, an IPod did not function with any music software other than ITunes. By now, Apple had an efficient, easy-to-use, and user friendly system within the digital media arena, and locked it in.

Google: Aggressive Focus on Search and Communication.

Google, only two years old in year 2000, had been very busy. The search company already provided search in 10 languages, and gave away their search engine for free. The desire to expand further was paramount, but Google realized that a profit point had to be defined: advertisement in search. Google launched Google Adwords in October 2000, one of its flagship programs.[9] Adwords allowed any advertiser to purchase individual and affordable keyword advertising that would instantly emerge on the search results page, based on relevance and content. Google thus offered a fast market entry by linking the innovative PageRank search system to words selected, in addition to performance feedback. In Adwords' launch, Google started with 350 businesses and advertisement agencies worldwide. Advertisement in search required Google to increase its presence in channels. Although the company had a strong growth from its base, competition in search was intense. Clearly, users were not using only Google when they wanted to search the Internet, and Google needed a solution. Google Toolbar, a browser plug allowing a search without visiting the Google homepage, was launched.[10] The toolbar needed to be downloaded and installed separately on whatever browser consumers were using. To promote and secure a fast adoption of the toolbar, Google thus established various distribution deals with PC vendors like Dell. In this way, the Google toolbar came pre-installed on a newly purchased PC. With the toolbar and Adwords, Google initiated a strategy to monetize consumers' intentions. From startup, the company relied on proprietary technologies to control and shape its future infrastructure and strategies, giving freedom to build more products without serious threat to future endeavors.

Staying the course towards organizing the world's information, Google pursued options step by step. In February 2001, Google acquired Deja, which had a news research service archive of messages posted to Usenet discussion groups.[11] Google acquired the entire Usenet archive, gaining valuable news archives, as well as domains and software. Google reintroduced the deja.com archives as Google Groups, a discussion product that helped groups of people communicate using email and the web. By acquiring an entire archive of over 500 million discussions and adding its search and browser features, Google could launch a diversified, but complementary, product, and challenge competitors with a strong pool of users. In the third quarter of 2001, Google acquired Outride, which

created state-of-the-art technology that Google could use to increase its capabilities within relevance search, and thus more intensively personalize searches in its engine. Google saw the value in information retrieval, and Outride's technology complemented Google's for incremental innovation in search.[12] In July the same year, Google launched Google Images, where users could search and access 250 million images on the web. Google launched Zeitgeist in December, 2001; the program was implemented in the search utility, as a way to discern patterns over time and detect most frequently occurring searches during specific periods. This would prove valuable in advertising, to gain improved knowledge of user trends. In its first two years, Google experienced a net loss, since they did not establish a business model until the introduction of Adwords. After 2001, however, Google achieved the breakthrough as a profitable business. Although there is no specific report on profits, Google earned at least $86,426 million from advertisement sales.

Google made no acquisitions and formed no partnerships during fiscal year 2002. The company allocated most of its resources to extending its portfolio of search and communication products. The company made major modifications to their Adwords program in February, eliminating the old cost per-impression method, and introduced cost-per-click (CPC). This pricing model made search advertising very cost-effective both for smaller and larger businesses. Google emphasized the importance of relevant ads for consumers, and dictated that advertising should not limit slow-downs on the search site. Only text-based ads were allowed, and Google's ranking system rather than price paid per ad determined the exposure of ads to users. This system of non-biased advertisement gave Google increased credibility; the company gave a strong signal that one could not buy a top spot in search advertisement. In addition, Google made sure prices remained low for advertisers, thus generating more clients. In 2002, Google generated $439.5 million in sales through Internet advertising solutions. Another release in 2002 was Google Labs. Google wanted to outsource the decision on relevance to the public, and Google Labs gave in-house engineers the opportunity to present their ideas to an outside audience, who again could test prototypes and give feedback to the company. Through this process, Google enlisted users in the production process, making it easier for the company to present later releases with a greater chance of being adopted. The company also released Google News, offering access to 4,500 news sources worldwide, and Froggle (later called Google Product Search), where users could search for products and locations of stores nearby.

After its financial upswing in 2002, Google entered 2003 with the necessary resources to reach its goals in search, and then zeroed in on increased value in communication, especially blogging, by now a major activity for Internet users. In February 2003, Google acquired Pyra Labs, a small company in San Francisco that developed Blogger, a self-service weblog tool used by more than a million people.[13] Bearing similarities to the earlier purchase of Deja, Google focused on a firm already possessing user-friendly tools to help weblog and other readers find and collect material from a variety of sites. Blogger software was implemented into the Google family. To strengthen communications services, Google also acquired Neotonic Software in June 2003, creating CRM technology.[14] Google wanted to bring this in-house for two reasons; it was important for Google's move to build services for e-mail discussion groups, and such a support channel assisted development of Google's E-mail service Gmail, released in 2004. Second, Google saw the future value of CRM technology for mobile usage implications.

Google saw advertising potential in content focus, introducing AdSense in March 2003, the next major release after Adwords.[15] AdSense was a content-targeted advertising service, where any website publisher could let Google place ads on its pages in exchange for a share in revenues. AdSense expanded the advertising model by allowing web publishers to provide Google web search on their own pages. This was a service for all websites in its network, allowing web publishers to place highly targeted ads alongside their content. AdSense was particularly helpful for smaller businesses. Advertisement click results were used to generate revenues for the publisher, and Google retained a small portion of the fee. To bolster AdSense services, Google acquired Applied Semantics, a context-sensitive advertising company, in April 2003, for $102 million.[16] Google integrated Applied Semantics' CIRCA technology, a system that understands, organizes, and extracts knowledge from websites and information repositories by mimicking human thought, enabling more effective information retrieval.

In addition, the company acquired Kaltix for speed and simplicity,[17] and Sprinks,[18] which developed relevant ads on content pages. The latter acquisition was an important move, and helped Google in three ways. First, it worked as a pre-defense mechanism to discourage competitors like Yahoo from purchasing the company and entering content-based search faster. Second, Sprinks' technology and focus broadened the market scope for AdSense. Finally, Google secured an ally for network lock-in, with a potential significant impact on the search business. The content focus also helped Google to introduce more vertical solutions to search, e.g. Google Grants, an advertising program for non-profit organizations. Google had also been active scanning books in university libraries, to make these available through the Internet and in December, this feature was introduced as Google Print. A year later, a reintroduction of Google Books was a reality; Google had partnerships with universities like Harvard and Stanford to scan and publish books. With no meaningful competitors in the field, Google had a unique opportunity to connect search to the publishing industry. The program was financed through paid listings and affiliation agreements with online retailers selling books identified in search results.

Google was now a strong actor in search advertising and communication. AdSense enabled them to generate significant revenues in search advertising, where 2003 sales in the area leapt to $1,465 billion, an increase in sales of about 233% from the previous year. How would Google now use its capabilities in emerging areas that would re-define Internet competition?

Microsoft: Reformation towards Entertainment and Business Sector.

Microsoft took steps into Internet-based services in the mid 1990s. The company's products were widely used by business enterprises, thus important for retention. The media and entertainment sectors held growth potential for Microsoft in the Internet arena. MSN (Microsoft Network), launched in 1995 as an Internet service provider and web portal, was to become one of Microsoft's key links to expansion in several areas. Through this venture, Microsoft acquired key actors to help build related offerings in the arena quickly. Some of these acquisitions included Visio,[19] Telewest,[20] Netgames,[21] and the media and entertainment company Pacific Microsonics.[22] Due to its substantial resources, Microsoft could follow more ambitious steps. The company introduced ClearLead, an Internet-based platform - built from the ground up - to provide help for e-businesses trying to build lifetime customer relationships through the flexibility and power of the web.[23] A month later, bCentral was released; a new web-based business portal especially designed for small and growing businesses, providing assistance in marketplace dynamic auctioning.

Microsoft looked for ways to bolster growth and sustainability in the Internet market. In the second quarter of year 2000, Microsoft introduced the Pocket PC, an operating system for mobile Pocket PCs. In a related move, Microsoft expanded MSN with the introduction of MSN Mobile and MSN Media Center. Increased consumer experience was emphasized, and three consumer-related web products were introduced and integrated; the MSN Music Video Guide for easy search on music videos, Windows Media Technologies 7 platform for efficient distribution of content, and PictureIt digital imaging software for creation of scrapbooks and personal web pages with special effects.

> *"The big thing that Apple is providing now is leadership in colors. It won't take us long to catch up with that" William Gates, Chairman, Microsoft. Business Week, July 31, 2000.*

Ignoring Apple, Microsoft continued to focus on the media and entertainment sector in its own ways, continuously improving servers and search solutions capitalizing on the business segment. In 2001, the company entered the market for video games consoles, and invested billions integrating its resources to introduce the Xbox. The Xbox was a powerful home video game console with Internet access and the ability to play CDs, DVDs, and MP3s, and possessed three times the processing power of competing consoles.[24] With the acquisition of Ensemble Studios,[25] a developer of award-winning games, and partnerships with well known games developers such as Sega[26] and Namco,[27] Microsoft

aimed to develop and publish its own games from its fully-owned subsidiary, Microsoft Games Studio. A partnership was also initiated with NTT Communications to deliver online gaming services for the Xbox in Japan.[28] Eight months after the Xbox release, Microsoft reported sales of 3.9 million consoles and 20 million video games.[29] The company, however, had strong competition from existing brands.[30] Due to decreased demand, prices had to be cut, and Microsoft suffered significant losses from the Xbox.[31] Despite this, Microsoft never gave up on the gaming division. In fact, the company allocated further resources to make Xbox a profitable business, releasing Xbox Live in 2002,[32] becoming the first video game company with a comprehensive online game platform. To guarantee delivery of interactive games that could be used as a live function, Microsoft acquired the knowledge pool of Rare for a $375 million cash exchange.[33] Microsoft could thus continue delivering games pushing the boundaries of consumer experience. Further consoles like the Xbox 360,[34] Xbox 360 Elite,[35] and Xbox Kinect[36] in 2010 have been released. In addition, Microsoft has scaled up the Xbox Live by integrating video and entertainment services, notably through Partnerships with actors such as Walt Disney Studios,[37] as well as acquiring exclusive technology from online game developers like Big Park.[38] The hope was to increase platform sales with extended services, making Xbox an ultimate console for home entertainment; however, the Xbox did not turn profitable until the second quarter of 2007, when the Xbox Entertainment and Devices division reported a profit of $524 million.[39]

Microsoft successfully released its new operating system, Windows XP, in February 2001.[40] It was expected that this would offset some of the initial losses associated with Xbox. Microsoft also realized the importance of search functions, and wanted to build this up through its MSN services. An extension to this was MSN Music, a free service and an easy way for music consumers to search for, listen to and discover music they liked.[41] Additional launches included Visual Studio, a platform whose technology provided a widespread customization of web applications,[42] and Microsoft Visio, taken from the acquisition of Visio in 2000.[43] Visual Studio required a management system that could quickly deploy applications, and Microsoft achieved this through the acquisition of N Compass Labs in April 2001.[44] To secure fast adoption, Microsoft acquired Great Plains in December 2001 for $1,1 billion, and thus took over the entire customer pool of the software company. The deal was controversial, as Microsoft broke its commitment not to compete with its present partners in business applications development. Microsoft therefore offered Great Plains a share in products from some of its existing channels, (e.g. through the earlier introduced bCentral).[45] Further, a partnership was established with eBay to jointly expand global online presence and improve e-commerce.[46]

Two months after its launch, Windows XP experienced sales of 17 million copies, making it the fastest-selling version of Windows ever. In addition, consumer shopping through the MSN services in the holiday season in 2001 generated sales of $5,6 billion.[47] These success stories were used as a strong incentive to further create new solutions for user experience. In January 2002, Microsoft released Windows CE, an operating system for rapidly building the next generation of small-footprint smart devices such as handhelds, Smartphones, set-top boxes, retail point-of-sale devices and displays.[48] Microsoft also increased search server capabilities directed toward small and medium enterprises. The MSN services were extended with MSN MapPoint,[49] so that users did not have to go to external sources such as AOL MapQuest. MSN was also upgraded to MSN 8 in the third quarter of 2002.[50] Microsoft wanted to differentiate their MSN advertising features from others with moving pictures and other features, and decided to form a partnership with Eyeblaster and Point Roll to implement rich media ads.[51] One of the most significant introductions in 2002, however, was the introduction of Visual Studio Net and the Net Framework, integrating the company's current offering into a multipoint platform. These two platforms provided businesses with a new way to employ the Internet as a development platform, and enabled businesses to seamlessly inter-operate across disparate systems and platforms.[52] In addition, Microsoft developed complementary products like CRM Business Solution[53] and Commerce Server,[54] offering more profitable business relationships and enhanced global business support. Microsoft relied on acquiring actors that fitted into Microsoft Business Solutions. The main acquisition in this area was Navision for $1,45 billion, which developed technology for the business dynamics division[55] and Vicinity for $96 million, which provided Microsoft with tools for location specific applications necessary for the mapping platform.[56]

In January, 2002, Microsoft entered into the telecom business, acquiring Korea Telecom, a prominent South Korean integrated wired/wireless telecommunication service provider, for $500 million.[57] Korea Telecom had the largest share of the South Korean local telephone and high-speed Internet business. The incentive here was to extend the area and usage of mobile PCs like the previously released Pocket PC and Tablet PC.[58] Together with partners like VoiceStream Networks[59] and TCL Mobile,[60] Microsoft wanted to enable customers to make phone calls and get wireless access to any Internet site, and wanted a sustainable platform to provide this. Microsoft's introduction of the Mobile2Market service, enabled a process for the certification and market delivery of network-ready wireless applications, built on this idea.[61]

In 2003, Microsoft signaled a stronger focus on search- and communication-related services with MSN. However, most of the MSN services came from outsourcing partners; Inktomi had the search engine, whereas Overture served the advertisement function. Because of this, MSN provided no profits to Microsoft; the company realized that building its own search capabilities would be necessary. Initial options included acquiring the outsourcing partner. However, Microsoft's final solution was to build a search engine from scratch. Unfortunately, few Microsoft developers were skilled in creating an efficient search engine, and getting external help was difficult; building the search engine required more R&D expenses, which jumped from $4,7 billion in 2003 to $7,8 billion in 2004. Some acquisitions helped the development process, such as the Internet software developer DCG, and G.A. Sullivan, a business technology solutions provider. In addition, Microsoft sought its own advertising network. The initial aim here was to acquire Overture. However, Yahoo pre-empted Microsoft, and acquired Overture in July 2003.[62] As Yahoo was a serious rival to MSN, it was unlikely that Microsoft could continue to rely on Overture's advertising network in the long run. Microsoft then developed its own network internally, called AdCenter. This service adopted the successful Google approach, and relied on payments per click. Soon Microsoft would have its own search engine with its own services. The success of MSN, however, was soon challenged on several fronts.

2003 – 2009: The Mobile War and Platform Integration

The mobile handset industry has experienced exponential growth since year 2000. As technology advanced, so did the potential to integrate numerous extra functions. It was expected that the worldwide mobile commerce market would generate revenues totaling $210,8 billion. Of the most popular wireless Internet activities, e-mail, games, news, and entertainment were among the top five.[63] In a related trend, the computer industry quickly saw demand to make computers smaller and with greater wireless capabilities, so that they could work as portable devices for any purpose users chose. Due to the enormous market potential, Apple, Microsoft, and Google wanted to tap into the mobile scene. Armed with different core capabilities and positions, the three giants needed to transform their current offerings for creative uses in the mobile era, winning them a sustainable competitive advantage. Apple, Google, and Microsoft entered the mobile war, a period in which dynamic capabilities and outstanding solutions would determine a radical shift in power in the information economy.

Going mobile: The Incumbents' modes of entry

Apple, Microsoft, and Google looked at the value points for mobile integration. Apple had the advantage of being both a software and hardware producer. How the company would penetrate the mobile handset industry, however, remained unclear. Then, Apple saw a way to increase usage area for their media products ITunes and IPod which, in turn, could be transferred into the mobile scene by complementarities. With co-branding strategies as an initial step, Apple partnered with Pepsi-Cola for the Super Bowl,[64] and allied with BMW, where IPod adapters would come pre-installed on the auto maker's new 3 series cars.[65] The extended usage areas of ITunes and IPod, both in new industries and in the computer arena,[66] made Apple solutions lucrative as extended offerings for the Smartphone industry. Apple then established a partnership with Motorola, where the media giant created a mobile

version of ITunes, which would be a standard for the next generation of Motorola phones.[67]Apple entered the mobile market fast as a provider of programs, leaving the main power of the handheld manufacturers intact.

Microsoft and Google made software, and it was clear that their entry into the mobile market involved development of mobile operating systems and platforms. Microsoft planned early to enter the mobile market with software solutions. Windows CE, for instance, was introduced as a solution targeting all mobile devices, and was used in pocket PCs as an attempt to get a first mover advantage as a mobile operating system. However, the mobile industry resisted adoption of Microsoft's solutions. Fearing that Microsoft would take too much power in the mobile industry, the big mobile players[68] developed a joint venture software, Symbian, which could serve as a standard operating system for handheld devices. As a result, Microsoft went up the value chain and formed partnerships with mobile network operators, thus putting a pressure on manufacturers to implement Windows operating systems on phones. In a partnership with Vodafone, Microsoft agreed to deliver services for fixed and wireless networks.[69] Further, a partnership with Openwave followed an agreement to bring MSN Mobile services to mobile operators and handset vendors.[70] With a continuous focus on the business segment, Microsoft secured further support through acquisitions and launch of solutions and servers; moves initiating further pressure on mobile manufacturers (New Fragment). For instance, Microsoft acquired PlaceWare in April 2003.[71] PlaceWare was a leading provider of web conferencing services enabling businesses to conduct real time, interactive presentations and meetings over the internet. Microsoft also launched the Mobile Developer Solution for mobile application technology,[72] and Windows Server 2003,[73] which served as cornerstones in the enterprise strategy and foundation of solutions to connect information, people, systems, and devices. By providing operator-specific phones with Windows software, Microsoft secured its entry into the mobile scene. This strategy, however, required partners who would produce such devices. In 2003, a similar partnership was set up in Asia, where the Smart Amazing Phone introduction featured a Windows operating system.[74]

Google's idea was the convergence of photo, mapping, and mobile under a single platform provision. This implied service expansion and, consequently, financial leverage through search advertising. To accomplish this, Google released three new services in 2004 to increase search advertising revenues: Google Orkut, a social networking service,[75] Google Local for building relevant search, and Gmail, a service providing unlimited storage and supported by paid listings.[76] In addition, Google filed for its initial public offering in April 2004. Google went public with impeccable timing after building up its search platform, and the company's share price shot up.[77] With better financial backing, Google could continue its growth. Picasa, a digital photo management company, was acquired in July 2004, and re-introduced under the same name.[78] Shortly after, Google acquired Keyhole,[79] a digital satellite and image company, as well as Where2Technologies to acquire technology for building its mapping services.[80] In order to integrate the picture and mapping services into mobile solutions in the future, Google acquired Zipdash,[81] a company providing navigation assistance for road traffic on mobile in real time via GPS. Google now had the resources to build related services for the mobile industry, releasing Google SMS, a simplified service to perform search through SMS on mobile phones, in late 2004.

The Complex Race between Google and Microsoft

Understanding the mobile integration race requires a multipoint competitive observation of the situation. Microsoft and Google engaged in various battles and maneuvers to win the race. After all, the two companies were fairly equal when it came to services offered. The clear difference, however, was organization and structure. It was predictable that Google and Microsoft's mobile platform integration during this time included application development for initial integration to dynamic platforms.

Microsoft had previously claimed that by 2005, 2% of its revenues would come from cell-phone-related sales and that 25% of cell phones would carry its software platform.[82] In 2004, it had been busy in creating and launching portals and servers,[83] as well as introducing new features to the

MSN service with a focus on music. The MapPoint Location Server,[84] as well as the new Media Center Edition,[85] was specifically designed for mobile use. In 2005, Microsoft reorganized its previous seven business units to three broader divisions to cope with the advantage Google had in its flexibility.[86] Most important was the reallocation of MSN services from entertainment to platform products. The new MSN Search engine - built from scratch - was finalized and introduced in this division in February 2005.[87] In addition, Microsoft acquired Groove Networks in March 2005, to integrate a network based development approach to all three divisions.[88] For mobile integration, this was important. In May, Microsoft announced the release of the new Windows operating system Windows Mobile 5, targeting all mobile devices, such as PDAs and mobile phones. The newer version also created a flexible common platform supporting all kinds of devices, and enabling all Windows software to run on the new model.[89]

Meanwhile, Google focused on challenging the software giant by offering solutions that would hamper Microsoft's mobile integration. Google Maps was launched in 2004,[90] a search function that could easily be used on mobile phones. Later, Google Earth was launched, a 3D application giving a powerful, interactive user experience and offering more tools for location information.[91] These moves forced Microsoft to strengthen its MSN services in addition to the mobile platform itself. To reinforce, Message Cast was acquired for $7 million in May 2005 to quickly expand the MSN services and capabilities.[92] MSN took over the message technology company's customers, and acquired expansion opportunities with a stronger information channel; they were strengthened with the purchase of Teleo[93] and Media Streams,[94] providing software and applications to voice over Internet protocol (VOIP). By breaking down communication barriers, Microsoft hoped for greater lock-in effects. In addition, market expansion was pursued with the acquisition of 5th Finger;[95] an Australian award-winning mobile service provider specialized in mobile marketing. Google did not wait passively; they integrated some of their successful products into mobile solutions. This included Google Local for Mobile and Blogger Mobile. In addition, following up on Microsoft's expansion in VOIP services, Google launched Google Talk,[96] an equivalent service to Internet communication, offered for free. The successful mail service Gmail for mobile was also introduced late in 2005.[97] A further, six acquisitions directly related to mobile were Reqwireless,[98] Dodgeball, [99]Android,[100] Skia,[101] allPay,[102] and bruNet.[103] The three first were very important. Reqwireless was a maker of popular mobile applications for email and the web on wireless devices, and could help improve various software products for mobile phones. Dodgeball was a social networking site for mobile phones, and could extend services with mapping and local search on a handset. Android was a software provider for mobile telephones, making operating systems for mobile that included middleware and key applications.

The Windows software for mobile phones had brought a revenue increase to mobile and embedded services (including MapPoint services) of 36%, but still remained a small fraction of overall revenues.[104] To enhance its services, Microsoft entered Mobile search with the $17.5 million purchase of Motion Bridge's mobile search technology.[105] Microsoft aimed to expand in mobile by providing a powerful search engine for mobile users, and Motion Bridge's customers (Orange, Sprint, and O2) were implemented for fast market penetration. Vexcel Corporation was also acquired in May 2006 to tap into the huge potential for mapping services.[106] To increase leverage in search and communication, as well as to reduce Google's power in the area, Microsoft established a co-opetitive partnership with Yahoo: an agreement to connect users of their consumer instant messaging services on a global basis. This led to a multipoint offensive. In December 2005, Google aggressively acquired a 5% stake in AOL with a $1 billion offer.[107] AOL, a Time Warner Group company, focused on broadband access in the entertainment sector, was provided with premium video service within Google Video and displayed advertising throughout the Google network. In return, Google got exclusivity as the only shareholder in AOL other than Time Warner. In addition, Google and Sun Microsystems formed an alliance to share technology that competed with Microsoft's MSN, as well as its Net solutions and Office system.[108]

Having Google Maps and Google Earth, Google also strengthened these. First, it acquired Measure Map, with a user friendly interface.[109] This could be used in mapping to help track user

experience in the service. For the Google Earth application, @Last Software was acquired with its complementary 3D technology of Sketchup, software used widely by architects and engineers.[110] In addition, Google strengthened Google Earth and Maps in Europe through the purchase of Endoxon, providing the company with strong technology in mobile services in the area.[111]

Feeling the pressure, Microsoft needed to expand swiftly. A wider set of offerings could ultimately be integrated to servers and platforms suitable for wireless networks and mobile usage. The company strengthened the gaming division through further acquisitions for exclusive games development.[112] Further, the company acquired Massive for games network solutions, a move that would deliver dynamic, relevant ads across Microsoft's online services, starting with Xbox Live and MSN Games.[113] This was an effective means of reaching specific demographic groups of consumers in the rapidly growing and interactive medium of online gaming. Due to poor demand, Microsoft decided to shut down the MSN Music service, and redirect the service into the Zune online Marketplace, where the company also scaled up with the release of its own handheld music player under the same name.[114] With this move, Microsoft tried its luck with Apple, offering a wireless 30GB music player featuring the opportunity to go online for file sharing of music, photos and videos. The idea was to create a network of portals and servers implementing multiple offers, and Microsoft acquired additional producers of applications, management software, and communications technology to scale up. Examples are: Iview Multimedia and its MediaPro application (originally created for the Apple portal), which facilitated entry into the digital media market.[115] This was again in direct competition with Google's Picasa services.

The media focus was also strong within Google. The company entered an exclusive partnership for search and targeted advertisement sales with Fox Interactive Media in August 2006, where the revenue potential within digital media was significant, considering the mobile integration in which the media company was involved.[116] In October 2006, Google made its biggest purchase ever and acquired YouTube for $1,65 billion in stock.[117] Although Google had superior in-house technology in video through Google Video, YouTube was a valuable addition to Google with its popularity and large number of users. Synergy was strong because YouTube videos were imbedded in blogs and similar communication channels. As search advertising was the deciding factor in Google's business model, YouTube fitted well as a muscle builder for the search company's extended domain. In the following year, YouTube was extended and further integrated into Google's plans for the mobile market.

By 2006, Microsoft's operating system had a 5.6% market share in Smartphones. This was more than double the 2,2% share the software giant had the year before.[118] A lot of this had to do with HTC, Microsoft's major mobile manufacturing partner from the early days of the Pocket PC.[119] It looked as if Microsoft had finally made a breakthrough in the Mobile scene by providing an integrative platform. In February 2007, Microsoft presented Windows Mobile 6, improving usability and adding support for Microsoft Office features previously available only on PCs.[120] The operating system was strongly linked to Windows Live and Exchange 2007 products, integrating the entire Microsoft communication channel where a consumer could access all offers in gaming, search, music, video, VOIP services, mapping, and more. Then, MSN Mobile was launched, a portal that opened the entire MSN palette to those using Windows-driven mobile phones.[121] Acquisitions like mobile software provider TellMe Networks[122] and Screentonic,[123] a mobile advertising provider, helped the extension.

Google, on the other hand, had waited with its platform integration, and focused instead on generating product extensions and new search functions by building internal capabilities. The company wanted to make sure that its mobile platform would be adopted fast. Having operated with the open platform solution since the beginning, the company wanted to continue this successful strategy in the mobile scene. However, the profit point also had to be factored in, and Google introduced AdSense for mobile in September 2007.[124] The same month, Google acquired Zingku, a social network startup for mobile.[125] With Zingku, Google aimed to reach more people on their mobile phones with ads. A partnership with China Mobile was also established in order to expand Google services to the great Chinese mobile population.[126] Such expansions led to impressive revenues in

search advertising services; in 2007, $16.6 billion. Now, as platform integration to mobile, Google's purchase of Android in 2005 was to be the key strike for the company. Instead of creating a platform and trying to license it to mobile manufacturers, Google focused on regulatory measures, opting for a standard mobile platform that could be based on open source. At the FCC,[127] Google successfully influenced the rulings of network ownership by stressing the fact that whoever owned a mobile network had to open it to any compatible applications and devices. The byword was; elimination of proprietary obstacles hindering mobile innovation. Google's success in influencing the rulings led to the Open Handset Alliance.[128] After this, the Android Mobile Platform, the first open platform for mobile devices, was introduced in November 2007.[129] Developed in cooperation with more than 30 technology and mobile leaders, Android provided a better position for mobile manufacturers to develop innovative solutions at a far lower cost. Android was a perfect addition to Google's vision of information organization and distribution. Further, by implementing the search and advertising services in mapping, video, books and photos, Google made a strong entry in the mobile market.

Apple's Disruptive Coup

Having successfully managed to integrate ITunes into mobile phones, Apple had gotten a small start in the mobile market. The first Motorola phone with ITunes pre-installed was released in September 2005.[130] Except for this, it seemed that Apple was busy further integrating IPods in the automotive industry – partnering with 11 new car companies[131] – and increasing the IPod family with new versions of the music players, which in 2004 generated sales of $4,5 billion. However, Apple's mobile entry with Motorola was a clever ploy. Its incentive was not only to create software and portal solutions for the Smartphone industry, but also to enter the industry with its own phone. After all, being a developer of highly sophisticated computer and music devices, Apple had what it took to create such hardware. In addition, the partnership with Motorola provided Apple with valuable insight in Smartphone development. To create its own mobile phone, Apple needed to innovate to create a device with technical and functional superiority, combined with sleek design and complementarities to existing Apple products. In the second quarter of 2005, Apple acquired Fingerworks, a gesture-recognition company that created touch screen solutions for computer devices.[132] Technology and know-how from Fingerworks were implemented in Apple's R&D center. In 2006, the company increased it R&D expenses by 33% to $712 million, signaling a strengthening of its products for movies and videos. New partnerships with actors such as Showtime Networks,[133] Warner Brothers,[134] and E! Entertainment[135] helped Apple successfully integrate popular television programs and series into the ITunes Store, and offer these at affordable prices to consumers. Apple acquired video asset management company Proximity in December 2006.[136] Although the technology was expected to be used in Apple's Final Cut programs, a bundle of Apple products added value.

Then, in June 2007, Apple showed the world what convergence of information, entertainment, communication and media looked like in terms as a device. The Smartphone market was taken by a storm as Apple redefined the industry with the IPhone, a device that combined three products: a revolutionary mobile phone, a widescreen IPod with touch controls (thanks to the Fingerworks acquisition), and a breakthrough Internet communication device with desktop class email, browsing, search, and maps.[137] Product design and simplicity mattered to consumers in the mobile market, and Apple was more aware of this than anyone else. The uniqueness of the IPhone was that it assembled all features into one simple package that captured consumers' attention, and this package complemented the successful portfolio of well designed and highly functional products and services that Apple already offered. The simplicity of the high tech IPhone device was a triumph for Apple.

On A New Growth Trajectory - The Years Following the IPhone:

The mobile war has really just begun; success in this market is about fierce competition in applications. Apple, Google, and Microsoft entered the Mobile market in three different ways. Apple

was its own developer of a highly popular device with its own software. Microsoft and Google worked as software providers with different integration strategies.

The success of the IPhone was immediately obvious. By the end of 2007, Apple had captured 5,2% of the worldwide Smartphone market, and increased its share to 10,7% a year later.[138] Apple generated net sales of $24 billion in 2007 and $32,479 billion in 2008. Of this amount, sales of the IPhone and related products represented $123 million and $1,844 billion, respectively.[139] Updates for the IPhone were released the following years, with the IPhone 3G in 2008, the IPhone 3GS in 2009,[140] and the new IPhone 4 in June 2010.[141] During this time, Apple has simplified its entry in markets through partnerships with global mobile operators.

The first Smartphone released with Google's Android technology came in September 2008.[142] Built by HTC, the phone was introduced by T-Mobile, one of the operator members of the open handset alliance. Shortly after, more phones emerged with the Android technology. By the second quarter of 2009, Google Android operating system had a global market share of 2,8%.[143] Although this number was fairly low, it increased steadily. Only one quarter later, Android experienced a market share of 3,5%. Google's gain can be said to have been Microsoft's loss, whose highly standardized Windows Mobile platform saw a Q3 market share of 8,8% in 2009, a 4,8% decrease from the previous year. One reason was the greater freedom and control that the Android platform offered, which led Microsoft partners HTC and Motorola to switch.[144] The mobile war is a complex race, especially between Google and Microsoft. The winning formula in the mobile scene implies not only operating platforms and phones, but also, crucially, applications to successfully run a handheld device like a Smartphone. With this skirmish, the mobile war stepped up a level as the application battle began.

2007 – 2010: Application War & Cloud Integration

> *"As the web grows, so does the breadth and depth of the curiosity of those searching. I expect our search engine to become much "smarter" in the coming decade."*
> *Larry Page, Google 2008 Annual Report, p. 2.*

At least as functional as a personal computer, Smartphones redefined the way people worked everyday, making it easier to get information on the run. Apple, Google, and Microsoft had all pursued moves that could put them in strong positions. Apple had successfully expanded its offer to a Smartphone integrating its current offerings. Google had created strong ties with the mobile industry by offering an open source platform that was free for anyone to use and modify. Microsoft had used its strong operating system knowledge to create mobile solutions integrating its large servers and offerings. No matter which operating system used, the bottom line is that a Smartphone is useless as an operating device without applications; all the tools that a Smartphone needs to perform various duties, whether checking your mail or the stock market, or playing an interactive game with your friends. For Apple, Google, and Microsoft, being able to provide and control a large set of applications meant new information and knowledge systems for redefining market power. With the Internet's low entry barriers, anyone could enter as service providers with unique applications for computers and handheld devices. Therefore, integrating these providers under a consortium for revenue sharing would prove beneficial. In addition, a Smartphone, just as a computer, has limited storage capabilities; the Internet does not. Flowing from this was the idea that everything your phone could do in terms of playing music, watching videos, or storing larger sets of information, was actually provided to you as a web service. Using this logic, cloud computing entered the scene. This, however, required storage room, speed, and cross platform capabilities.

Apple's Great Advantage in Popularity

After creating computers, IPod music players, and eventually the IPhone, Apple was established as a highly popular provider of integrated services. Apple's unique feature was the operating systems terminal, relying heavily on outstanding design, breakthrough technology, and

ease of use for the consumer. Essentially, what Apple offered was a great user experience in its software and hardware.

The IPhone had large revenue potentials, and it was clear that Apple wanted to control the flow of applications to its devices. Soon after the release of the first IPhone in 2007, Apple announced that its new Smartphone would run third party applications that looked and behaved like those Apple currently offered.[145] Further, Apple would provide a software developer kit, so that third parties could develop and test the "appropriateness" of the applications.[146] Although third parties were allowed to create applications, and set their own prices for them, Apple held tight control through two mechanisms. First in order to get an application loaded successfully onto an IPhone, a third party had to pay a membership fee to Apple's developer connection network.[147] Second, Apple controlled the distribution of applications, and could halt distribution if it felt that the application was inappropriate or duplicated existing applications from Apple. On July 2008, Apple launched the App Store. This was to be the exclusive market place for applications developed for Apple products, and gave Apple full control of the distribution.[148] Due to the popularity of the IPhone, the App Store became a lucrative market for service providers. Apple ensured a large pool of application service providers by offering them 70% of revenues. For Apple, the various applications extended the usage areas of the IPhone, something that could boost sales of the device. The App Store proved to be a giant success. Only a month after the opening of the store, Apple reported sales of about $30 million.[149]

Google's Platform and Network for Control

Google did not have any terminal like Apple's to set it apart. However, Google's main weapon was its search engine platform, which in 2007 had ruled the market with a 53,6% market share.[150] Google applications included the myriad products and services related to search that the company had released so far.[151] The applications had been developed from various groups and acquisitions, and were thus less uniform. Therefore, shifting the applications to a common infrastructure was important. Google offered its applications for free, where the profit point was, as mentioned, directed to online search advertising. As development for applications emerged, Google also had to make sure that the advertising function was implemented with it. A partial solution to integration was Universal Search, where Google integrated applications for video, books, image, news and local results under one search function.[152] For applications, terminals were needed, and Google's Android platform proved valuable in this sense. As an open source platform, individual vendors could use the open codes and develop individual terminals and applications inside the platform. This provided synergy, providing a cost-effective method of development. The codes came partly from Google's acquisition of Peakstream, a parallel processing firm that developed tools improving the performance of single threaded applications.[153] Although an open platform, Google held control through support networks. In February 2007, Google introduced Google Apps Premier Edition, a cloud network where businesses paid a fee of $50 a year per account, and could access and use applications on a need basis.[154] Instead of downloading all applications needed for operations, Google stored applications and data for businesses, and provided universal access. One of the challenges of the cloud solution was browser speed where Google had previously relied on third-party browsers. These could be slow and unreliable, spurring Google to create its own browser in 2008, Google Chrome, to cope with high traffic on the web.[155] By integrating this with Google Gears, an application release the previous year, Google also opened up to offline application creation and usage. To integrate search advertising into various applications, a number of acquisitions were performed relating to expansion in ads directed to games, display advertising, and the media market, in particular, where three major players – Adscape,[156] DoubleClick,[157] and Feedburner[158] – were purchased for a total of $3.2 billion. The Android platform gained popularity thanks to the open source, and saw a fast increase in number of applications stored. Google, however, knew that Apple's IPhone was very popular. As a result, Google moved fast to provide applications on its competitor's App Store portal, starting with the popular Google Maps application for IPhone. As Apple did not have such an application itself, Google's mapping service got a prime spot. Also, since the application

was free, Google saw a high adoption rate, which meant that it had successfully penetrated the popular IPhone market with its search and advertising services. Google soon extended to provide Google Search, Earth, Mail, and other applications on the popular IPhone from Apple.[159]

Virtual Servers from Microsoft

Like Google, Microsoft aimed at expanding applications within search and advertising. Microsoft's platform for application development was Visual Studio, where individual vendors could develop applications using the Net Framework from Microsoft. The difference, however, was timing and degree of standard solution. Visual Studio came years before any idea of standard Smartphones and high tech devices existed. When it did, Google went the right direction to get lead players in the alliance of development, requiring full openness of the network. Microsoft had focused on direct integration of standard operating systems, and then to open development of applications as long as one coped with the standard Windows Mobile solution.

Microsoft's concept was to provide tools for best user experience, and to provide this, the company wanted to create an infrastructure environment where everything could be reached. The company wanted to do everything itself; a strong search and advertising platform for control, as well as terminals/servers to integrate applications for a wide array of needs. The company acquired devBiz Business Solutions in March 2007 to get necessary tools for strengthening the Visual Studio applications development.[160] For search and advertisement applications, Microsoft aimed to leapfrog Google with a series of acquisitions. The company first purchased adECN in July 2007, and acquired technology that worked as a hub where advertising networks could come together in a neutral, real-time auction marketplace for buying and selling display advertising.[161] Then, the software giant made its largest acquisition with a $6 billion purchase of aQuantive, the largest player in digital advertising, consisting of three major businesses.[162] The deal was an answer to Google's purchase of DoubleClick, and would allow Microsoft to earn more money from selling ads from its own websites and online services. Linked to this was the $1,2 billion purchase of Fast Search & Travel the following year, from which Microsoft acquired strong enterprise search solutions.[163] Putting the two acquisitions together, Microsoft aimed to operate as a single vendor with solutions that spanned the full range of customer needs. In addition, Microsoft strengthened its capabilities in digital media by acquiring Rapt, which helped media companies with advertising efficiencies.[164] The company further tried to differentiate its search technology by acquiring Powerset, a semantic web search technology providing new experiences to search.[165] The rational here was simple; acquire strong search and advertising services to challenge the open platform Google had as a unique selling proposal.

In April 2007, Microsoft unveiled Silverlight, a web application framework working as a cross-platform for full integration of media experiences.[166] Virtual Earth 3D was also launched. This was a free application for which users could create realistic buildings and structures, and then post these in Microsoft's Virtual Earth community.[167] This application had many benefits, but of course required users to cope with the Microsoft network as the exclusive platform. Further, Microsoft shopped externally to acquire strong applications. The purchase of Parlano strengthened Microsoft's unified communication portfolio. Microsoft got the rights to MindAlign, a leading application for enterprise group chats, most used in financial services and other vertical markets.[168] Mapping service applications were also built through the purchase of Multimap, where the technology complemented offerings in Virtual Earth, MSN, Windows Live services, and the newly purchased aQuantive platform.[169] To compete with applications for mobile phones, Microsoft purchased Mobicomp, a mobile application company that created tools for backup, social networking, and news for handheld devices.[170] By acquiring these tools, Microsoft could offer valuable applications on its Windows-driven handsets that the IPhone could not. Further acquisitions followed to strengthen applications for the business segment, aimed at business effectiveness and cost management.

For Microsoft, any application could be integrated as a web service to make the user experience complete. No matter whether working in an office or on the move, access to necessary applications for various tasks should be universally accessible. The most important mission for

Microsoft was developing cloud servers to provide this accessibility. In this context, space was a key term, and Microsoft acquired Savvis in 2007 in the hope of creating a globally scaled data center infrastructure. To boost virtual computing of its application services, Microsoft acquired Calista, whose technology helped Microsoft to enhance its desktop offering in their cloud-based server system. Further, Microsoft purchased Kidaro and its desktop virtualization solutions, which were implemented in virtual PC solutions. The idea here was clear; to integrate and centralize all Microsoft services and applications, and charge users for these. For users, the reason to buy was Microsoft's capacity to handle and store all data for everyday usage, and provide necessary tools on demand to use this data for different needs. The proposition did not only relate to business applications, but also entertainment and digital media. In September 2009, the offerings for the Zune music player went into the cloud, where users could enter the Microsoft network to download applications as well as video and music data directly on their portable music players.[171] The Azure Platform, Microsoft's cloud platform for quickly downloading data and applications at one location, was released, as part of the cloud initiative, Microsoft formed a partnership with Chunghwa Telecom to deliver convenient, value-added mobile and cloud software applications.[172]

Microsoft did not take advantage of Apple third-party openness to applications. The company preferred the adoption of its solutions on mobile phones. Therefore, Microsoft bought the technology from Teamprise, which helped those working on non-Microsoft operating systems to build applications with Visual Studio.[173] With this tactic, instead of tapping into the possibilities that the Apple platform provided, Microsoft tried to use its framework strength to acquire Apple clients for application development and usage.[174]

Apple and Google go Head to Head

> *"We did not enter the search business. They entered the phone business. Make no mistake they want to kill the iPhone. We won't let them. This don't be evil mantra: 'It's bullshit.'." Steve Jobs, Internal Town Hall Meeting, January 2010.*[175]

Google and Apple had both been building up strong control points for their services through portals and terminals. The IPhone's popularity provided revenue sharing potential for Apple, whereas Google relied on open source and search advertising as its profit point. In addition, Google tapped into the Apple portal with its superb services in mapping, mail, chat, and so forth. Google continued to focus on its open source capabilities, and built on advertising through mobile applications. The $750 million purchase of AdMob, for instance, provided Google with a collaborative opportunity for products and services directed to advertisement on mobile websites and in mobile applications.[176] In addition, Google released the Picasa application for Apple computers, further strengthening imagery and mapping offers. Apple realized that Google's open source approach and free software could be a future threat in the mobile market; Google could eventually entice users to favor Android-driven mobiles. Google search products' presence on IPhone had proved valuable, but also gave Google an increased power in relation to Apple. To counter, Apple tried to gain independence from Google in the valuable mapping services. As a first step, Apple acquired Placebase, a company that produced the application programming interface for mapping solutions.[177] Soon after this silent move, iMap was released on the App Store as a substitute to Google Maps and Earth. The mobile advertising business of Google was also targeted. By acquiring Quattro Wireless, Apple made its move to challenge Google with one of the world's leading mobile advertising companies,[178] directly challenging Google's position in advertising space. Apple also started to shift its focus from terminal strength to network integration because further Apple innovations in products similar to the IPhone required a cloud focus. The company acquired Lala, a hub for online music discovery and purchasing,[179] whose technology would help Apple to launch its own cloud-based streaming music service. And that's exactly what Lala was — an iTunes in the cloud. Apple's cloud intentions for application services were further signaled when information about the company's plans to build a $1 billion server farm

was revealed.[180] Although no specific information has been disclosed, it would be a natural development following the continuously growing number of services on the App Store and ITunes. This hypothesis was further strengthened when Apple launched the IPad device in 2010.[181] This device needs cloud services to work efficiently.

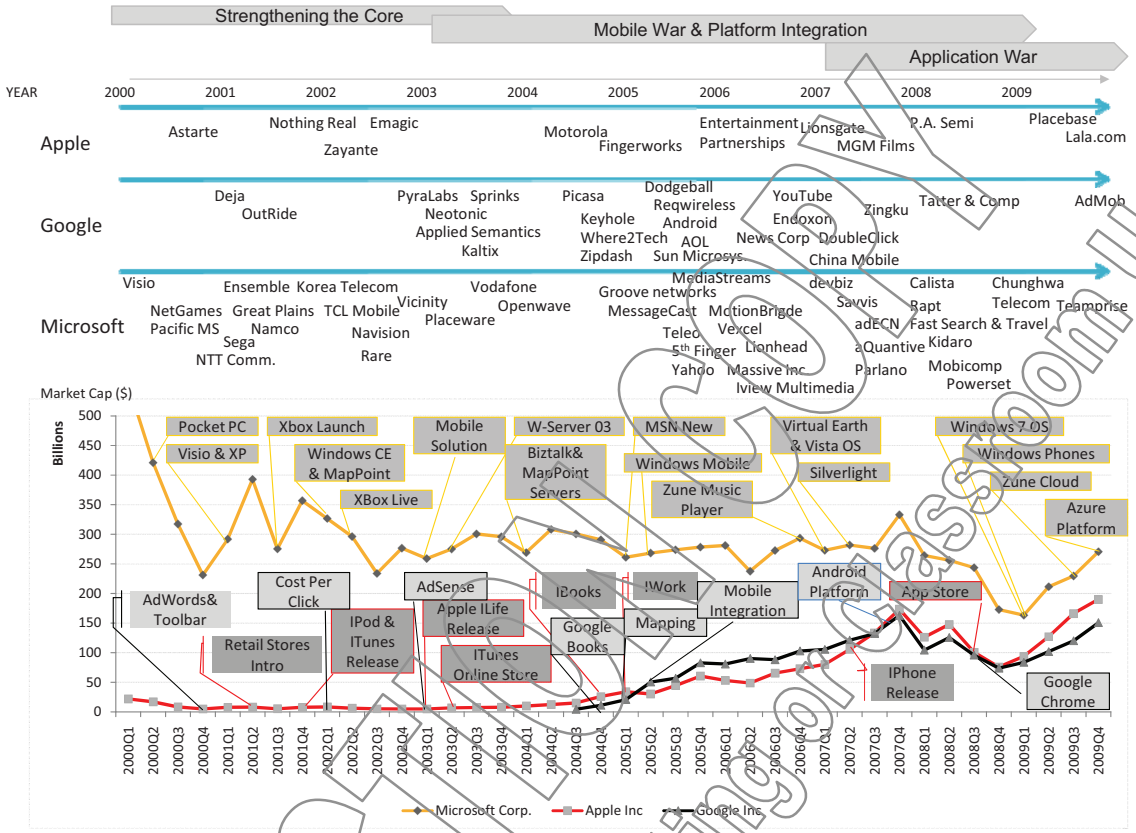
Google answered Apple's approach by challenging the company in direct applications. In 2010, a series of application and cloud-oriented acquisitions were made to exert pressure. In February, for instance, Google purchased Remail, a company making popular mail search applications for IPhone devices.[182] After the purchase, Google discontinued the function for IPhone devices, and focused on delivering these on Android given phones. In addition, Google attacked Apple in the music scene by acquiring Simplify Media, a startup company whose applications made it possible to stream music directly from an ITunes library to an Android phone. A clear battle had begun over functional approaches, and the increased volume of applications needing re-allocation. All players need to hold their application gates secured while allowing coalitions with development partners to evolve into a dominant position. Who will pick the longest straw, however, remains to be seen.

How the Capital Markets Responded: Outcome Indicators

Some companies have been more successful as others, and factors such as timing, specificity in moves, and implementation may have had a strong impact on success. In order to assess the moves in relation to an outcome, we put the time periods side by side, and relate them to important strategic moves. These will be related to the firms' respective quarterly market capitalizations from 2000 to 2009,[183] and then discussed in relation to convergence. It is important to note that market capitalization figures from Google emerge first in 2004, as this is the year in which the company went public.

The following figure shows the respective market capitalization curves for each company over the years (See exhibit 9 for figures). Embedded in the lines are selected product/service launches that have contributed to the increase/decrease in market capitalization. For recognition, the lines which corresponds to specific time periods to which any introduction was done bear the same color that represents each company. Note that some introductions from Google look as if they belong to the red colored capitalization line (which represent Apple). These introductions bear a black line, and are embedded only because of their importance to Google success. They have thus nothing to do with Apple's market capitalization. Above the market capitalization lines are the most important acquisitions and partnerships to which the companies have engaged. These are represented in bulks per company, and are placed in accordance to the specific time in which they took place. This organization makes it possible to vertically compare all the strategic actions against real market values as outcome indicators.

Figure 1: Strategic Moves & Outcome Indicators



Apple shows consistency in its focus on the multimedia market. The company has pursued one step at a time in this niche market, and related its capabilities to complementary areas as it went ahead. The first steps in cost reductions through outsourcing, and further exclusive technology acquisitions, gave Apple a unique position in the multimedia market. Solutions previously too expensive on an individual basis could be implemented in Apple's portfolio, where cost synergies led to better package offerings in computers. The constant customer focus and emphasis on simple solutions seem to have paid off for Apple. Retail strategy increased their long term advantage on the consumer market, where brand awareness was the goal. Constant pressure from cost-efficient computer manufacturers running Windows systems forced the company to think differently with every step. The strength of competitors still held Apple's market capitalization flat in the first three years. Expansion with the IPod and ITunes was Apple's natural way to consolidate computers with handheld music devices. Individually, Apple's actions do not reflect specific changes in market capitalization, although we know that the IPod experienced tremendous sales shortly after release. It is more realistic to look at the bigger picture for convergence, where integrative actions such as ILife and ITunes Store, as well as partnerships with strategic similar and dissimilar companies, triggered growth. For Apple, this happened in 2004, when synergy effects of the company's competitive success in media technology ultimately found its place in mobile. These actions led to a real increase in Apple's value; market capitalization in 2004 went from $10 billion to $25 billion in one year. Apple also experienced increased value through further IPod versions and updates, and related software products such as IBooks and IWork, both tailored for Internet purposes.

By focusing on its core competences in multimedia and gathering valuable knowledge in related fields through partnerships, Apple has been successful in the converging Internet industry. For mobile, the partnership with Motorola provided the company with valuable know-how, that Apple could use with existing and acquired technology to develop further. Linking entertainment to current services worked in the same way, as partnerships brought further information for sector scaling. When these elements were secured, Apple reallocated its resources in computer and music player development, and entered the mobile device market with the IPhone in second quarter 2007. At this point, Apple was worth $105 billion. By the end of the same year, Apple's market capitalization had

leaped to $173 billion. In order to achieve a sustainable competitive advantage, however, the company needed to secure applications to run the holistic offers in computers, IPods, and IPhone. The secured gate for Apple would be App Store, released in third quarter of 2008 together with a new version of the IPhone. Although the figure shows a decrease in Apple's market capitalization from the beginning of 2008, this comes from factors unrelated to Internet convergence, like Steve Jobs' illness. This aside, Apple has managed further convergence well, being at the right place at the right time.

Google has pursued an approach similar to Apple's, keeping its focus on search and communication. The difference, however, has been Google's focus on open source for product/service creation and information control. A major move by Google in the early phase was the launch of Adwords, an effective way to centralize clients for advertisement services. Linked to this was the important step in introducing cost-per-click as a payment method, increasing Google revenues in keyword sales for advertising. For Google, convergence meant delivering sources in as many areas as possible. Google had a strong innovation house, where various search products could be created swiftly. In addition, Google Labs 2002 made it easier to forecast adoption rates for products. Where the possibility has presented itself, however, Google has acquired companies like Deja and Pyra Labs for faster entry. This, however, has only been the case when the company has realized the unique position of an acquired company. Another important move for Google was the introduction of AdSense in 2003. Google's sole profit point is advertising, and the AdSense extension increased Google's revenue stream and, consequently, the company's capabilities to acquire technology for scaling in context and expansion in new fields of search.

Google moves have not only been oriented around serving present needs, but have also focused on future market implications. Company acquisitions have been pursued only if the technology, know-how, and customers acquired can serve multiple purposes, both present and future. Google has always been open about this philosophy, which was confirmed when the company went public in the third quarter of 2004. Only one year after Google's IPO, the company's value jumped from $4 billion to $56 billion; a result of the former, successful source extension with products like as Google Books and Picasa, leading to increased demand for advertising services. Along the line, technological superiority in search consolidation has been critical for success.

By the beginning of 2005, Google offered diverse services in information and communication. In addition, with the purchase of Zipdash late 2004, Google had the technology to transform current services and, create new offers for mobile devices. Google's intentions of Android in Q3 2005, gave very positive market feedbacks. Three months after the purchase, Google's market capitalization jumped from $56 billion to $82 billion. Further consolidation was pursued by leveraging successful services and technology for full integration, including mapping, entertainment, and media. A good example here is YouTube in Q4 2006; integrated into the full search and advertisement function and tailored for handheld devices along with AdSense for mobile. Services were tailored to meet the needs of any Smartphone with Internet access. Therefore, when the Android platform was released in late 2007, Google's value had leaped to $162 billion.

Google's approach to convergence has followed the same rational in securing applications. By taking advantage of the open market to bolster search advertising, as well as giving full support for the future of its platform to a cloud initiative through, for instance, Chrome - for distribution, the company continues to improve the integration of its services, leading to further market adoptions.

Microsoft's market capitalization curve is the most volatile of the three companies. Viewing the company's ambitious moves, this is not surprising. Microsoft has traditionally focused on maintaining the enterprise segment, where introductions such as ClearLead and bCentral, as well as acquisitions such as Great Plains have signalized further dedication. Not everything, however, has gone according to plan. The introduction of Pocket PC in Q2 2000, for instance, contributed to a market value drop from $420 billion to $231 billion in only six months.[184] In other words, the first-mover attempt in mobile did not pay off probably because of external contingencies, where the software giant tried to establish itself in a market it could not control. Further, the company has had a tendency to embark on multiple opportunities simultaneously. Often, these have lacked a common reference point for convergence, making them difficult to integrate.

Microsoft's core area, development of operating systems and office suites, is successful. The introduction of Windows XP in Q1 2001 with integrated technology from the acquired company Visio, for example, is one of the main reasons for Microsoft's value increase to $393 billion in three months. However, Xbox, showing no relation to this area – even in operating system used – has been standing alone through the period with its own enormous investments and competition, contributing to an overall downward shift in market capitalization before the function finally turned profitable in 2007, helping towards a Q4 2007 firm value of $333 billion.

As far as convergence, Microsoft is a classical example of a firm shifting radically among focus areas. Unfortunately, none of these have been harmonized on a long term view. In mobile, Microsoft has been given market support through the resemblance of the operating systems' features to that of the computer systems. However, with multiple segment solutions on the table, as well as continuously pushing the failed first mover attempt further for success, the company demonstrated its lack of direction, resulting in a value decrease from $326 billion in Q1 2002 to $259 billion a year later. Another factor is the constant focus on first securing presence, without establishing final support systems. For search systems, this is a recurring pattern. Building and rebuilding of MSN services has made the process very long for Microsoft. When the service was finally ready in 2005, the market responded tepidly, as users had gone to competitors like Google, taking advantage of the free services. Microsoft's insecurity was again confirmed when it shut down MSN Music and substituted it with Zune market place and media player. Perceived as a desperate attempt to start over by imitating Apple's IPod and ITunes, this strategic move did not go Microsoft's way.

In the bigger picture, Microsoft failed to follow a steady line in the game of convergence. By constantly changing systems, market focus, and providing new portals and network solutions, the company stalled in the market before it settled with a unified offer. Operating systems for computers still represent a main profit area. However, moves taken by the software giant in this decade represent only short-term advantages. The near future, however, is interesting, when cloud focus may provide Microsoft with a new opportunity to reallocate its great pool of resources. Does the company still have time?

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Exhibit 1: Yearly R&D Expenditures: Apple, Microsoft and Google.

Year	Apple	Microsoft	Google
2000	380	3.775	n/a
2001	441	4.379	n/a
2002	447	4.307	40
2003	471	4.659	230
2004	489	7.779	395
2005	534	6.184	600
2006	712	6.584	1.229
2007	782	7.121	2.120
2008	1.109	8.164	2.793
2009	1.333	9.010	2.843

Source: Thompson Financial; Currency: US Dollars ($); Scaling factor: Millions

Exhibit 2: Yearly Net Sales: Apple, Microsoft and Google.

Year	Apple	Microsoft	Google
2000	7.983	22.956	n/a
2001	5.363	25.296	n/a
2002	5.742	28.365	440
2003	6.207	32.187	1.466
2004	8.279	36.835	3.189
2005	13.931	39.788	6.139
2006	19.315	44.282	10.605
2007	24.006	51.122	16.594
2008	32.479	60.420	21.796
2009	42.905	58.437	23.651

Note: Net sales representing Google Inc. are equivalent to total sales in Internet Advertising Solutions, as this is the only profit segment for the respective company. Although not listed as net income due to uncertainty in factors, sales in Internet Advertising Solutions for fiscal year 2001 for Google is $86 million.

Source: Thompson Financial; Currency: US Dollars ($); Scaling factor: Millions

Exhibit 3: Yearly Net Income: Apple, Microsoft and Google.

Year	Apple	Microsoft	Google
2000	786	9.421	n/a
2001	-25	7.346	n/a
2002	65	7.829	100
2003	69	9.993	106
2004	276	8.168	399
2005	1.335	12.254	1.465
2006	1.989	12.599	3.077
2007	3.496	14.065	4.204
2008	4.834	17.681	4.227
2009	8.235	14.569	6.520

Source: Thompson Financial; Currency: US Dollars ($); Scaling factor: Millions

Exhibit 4: Yearly Sales, Apple IPod & Music Related Products.

Year	IPod	Music Related Products
2002	143	4
2003	345	36
2004	1.306	278
2005	4.540	899
2006	7.676	1.885
2007	8.305	2.496
2008	9.153	3.340
2009	8.091	4.036

Source: Thompson Financial; Currency: US Dollars ($); Scaling factor: Millions

Exhibit 5: Full List of Acquisitions & Partnerships, Apple.

Year	Acquisitions & Partnerships	Area of Focus / Incentive
2000	Astarte	DVD Authoring Software
2001	Bluebuzz Spruce Technologies Powerschool	Internet Service Provision Graphics Software Internet Based Management
2002	Nothing Real Zayante Silicon Grail Corp Chalice Propel Software Emagic	Special Effects Software Firewire Technology Graphics Software Motion Graphics Software Music Software
2003	No Acquisitions or Partners	-
2004	Hewlett-Packard* Pepsi-Cola* Panasonic* Walt Disney* Founder* BMW* Motorola* U2 (Universal Music)*	Pre-installment ITunes Marketing (Super Bowl) Firewire Integration Music Distribution Pre-installment ITunes (China) IPod Integration Mobile Integration ITunes Special IPod Development
2005	Fingerworks Multiple Car Companies* Harry Potter Books* NBC Universal*	Gesture Recognition IPod Integration Books on ITunes Store TV Shows on ITunes
2006	Silicon Color Proximity Multiple Car Companies* ShowTime* CBS Sports* Warner Brother* E! Entertainment* Coca-Cola* BMG Japan* Telemundo* Airlines*	Color Correction Software Video Asset Management IPod Integration TV Series on ITunes Store Tournaments on ITunes Store TV Programs on ITunes Store TV Programs on ITunes Store Music Promotion Collaboration Japanese Music on ITunes Store Spanish Programs on ITunes St. IPod Integration
2007	Lionsgate* MGM Films*	Movies on ITunes Store Movies on ITunes Store
2008	P.A. Semi	Computer Chip Development
2009	Placebase Lala	Mapping Software Music Streaming Software
2010	Quattro Wireless Intrinsity Siri	Mobile Advertising Software Mobile Chip Technology Voice Search Technology

Partnership (*)

Sources: If not given in endnotes, Thompson Financial, News, Company Press Releases

Exhibit 6: Full List of Acquisitions & Partnerships, Microsoft.

Year	Acquisitions & Partnerships	Area of Focus/Incentive
2000	Visio	Drawing Software
	Peach Networks	Digital TV Services
	Travelscape	Internet Travel Services
	Titus	Cable Technology
	Bungie	Computer Software
	Netgames	Gaming Software
	Mongo Music	Online Music Search
	Pacific Microsonics	Media Entertainment
2001	Design Intelligence	Design Software
	Vacation Spot	Vacation Portal
	N Compass Labs	Web Management
	Great Plains	CRM Software
	Ensemble Studios	Games Development
	Intellisol International	Performance Software
	Maximal Intelligence	Visualization Tools
	Yupi	Spanish Internet Sites
	Materna*	Mobile Software Integration
	Onyx*	CRM Alliance
	eBay*	Market Consolidation
	NTT Communications*	Broadband Gaming Initiative
	Sega*	Games Development
	Namco*	Games Development
	Samsung*	Computer Development
	KT*	Korean Web Services
2002	Korea Telecom	Telecommunication Services
	Classic Custom Vacations	Online Travel Agency
	Sales Management Systems	Software
	Navision	Network Software
	Mobiliocity	Computer Consulting
	X Degrees	Security Software
	Rare	Games Development
	Vicinity	Application Technology
	Beijing Centergate*	Technology Expansion (China)
	Intel*	Pocket PC Enhancement
	BMW*	Operation System Integration
	VoiceStream Networks*	Pocket PC Improvement
	Akamai*	Application Delivery
	TCL Mobile*	Mobile Integration
	Tandberg*	Broadcasting Initiative
	Eyeblaster & Pointroll*	MSN Differentiation
2003	Connectix	Virtualization Software
	DCG	Internet Software
	Place Ware	Web Conferencing Services
	G.A. Sullivan	Technology Solutions
	GeCAD Software	Antivirus Technology
	3DO	Video Gaming Software
	Music Choice*	Music Subscription Services
	eBay*	Extended MSN Initiative
	Vodafone*	Mobile Integration
	IBM*	Licensing Processors
2004	Encore Business Solutions	Business IP Assets
	Active Views	Ad Hoc Reporting Systems
	Lookout Software	Local Search Applications

	Giant Company Software Openwave* ISOFT* Dassault Systems*	Anti-Spyware Solutions MSN Mobile Integration Healthcare System Integration Collaborative 3D Solutions
2005	En'tegrate Groove Networks Message Cast Tsinghua-Shenxun Sybari Software Teleo Frontbridge Alacris Media Streams 5th Finger Foldershare Siemens* Yahoo**	Resource Planning Software Virtual Office Solutions Messaging Technology Internet Software Development Security Technology VOIP Software Services Messaging Technology Internet Certificate Services VOIP Technology Mobile Marketing Solutions Synchronization Software Building Media Solutions Customer Sharing
2006	UMT Software Motion Bridge Seadragon Software Apptimum Onfolio Lionhead Studios Assetmetrix Massive Inc. Vexcel Deepmetrix Proclarity Iview Multimedia Softricity Winternals Azyxxi Whale Communications Gteko Desktop Standard Colloquis	Portfolio Management Software Mobile Search Technology Display Technology Application Transfer Systems Information Management Games Development Software Management Video Games Advertisement Imagery Technologies Web Analytics Server Technology Digital Media Applications Application Virtualization System Recovery Solutions Health Intelligence Software VPN Applications Support Software Information Control Systems SaaS Solutions
2007	Medstory Devbiz Screentonic TellMe Networks Enygro Stratature Savvis adECN aQuantive Jellyfish Parlano Global Care Solutions Multimap Teradata* Walt Disney Studios* Nokia* Facebook* Morningstar*	Internet Search Engine Visual Studio Solutions Mobile Advertising Voice Services Synchronization Software Management Software Data Centers Advertising Exchange Platforms Digital Advertising Search Technology (Shopping) Chat Applications Health Information Systems Mapping Services Business Intelligence Initiative Films on Xbox Live Windows Live Integration Extend Advertising Platform Video Streaming Initiative
2008	Calista Technologies Caligari Corporation	Graphics Technologies 3D Animation Software

	YaData	Customer Segmentation Tech.
	Rapt	Digital Media Advertising
	Credentica	Authentication Software
	Komoku	System Control Technology
	90 Degree Software	Software Systems
	Farecast	Online Travel Search
	Danger	Mobile Software & Phones
	Fast Search & Travel	Enterprise Search Solutions
	Kidaro	Virtualization Solutions
	Navic Networks	Television Advertising Solution
	Mobicomp	Mobile Application Creation
	Zoomix	Data Quality Software
	Powerset	Semantic Web Solutions
	DATAllegro	Data Warehouse Applications
	Greenfield	Price Comparison Software
	Mayo Clinic*	Healthcare Solutions
	Sony Ericsson*	Mobile Integration
	SAP America*	Healthcare Expansion (SQL)
	OLPC*	Social Initiative
	NBC Universal*	Olympics Coverage on MSN
	TenDigits*	CRM on Mobile Phones
	NTT*	SaaS Initiative
2009	Big Park	Online Gaming
	Interactive Supercomputing	Parallel Computing Software
	LS Retail	ERP Products
	Teamprise	Cross Platform Solutions
	Opalis Software	IT Process Automation
	Sentillion	Healthcare Software
	Chunghwa Telecom*	Cloud Initiative
2010	Yahoo*	Search Partnership

Partnership (*), Co-opetition (**)

Sources: If not given in endnotes, Thompson Financial, News, Company Press Releases

Exhibit 7: Full List of Acquisitions & Partnerships, Google.

Year	Acquisitions & Partnerships	Area of Focus / Incentive
2000	No Acquisitions or Partners	-
2001	Deja	Discussion Archive Software
	Outride	Data Mining Software
2002	No Acquisitions or Partners	-
2003	Pyra Labs	Blogging Software
	Neotonic Software	CRM Technology
	Applied Semantics	Advertising Technology
	Kaltix	Search Technology
	Sprinks	Search Technology
	Genius Labs	Weblog Software
2004	Ignite Logic	Web Template Technology
	Picasa	Digital Photo Management
	Keyhole	Satellite Image Mapping
	Where2 Technologies	Mapping Software
	Zipdash	Navigation Software
2005	Urchin Software Corp.	Web Analytics Software
	Akwan Info. Tech.	Search Engine Brazil (R&D)
	Reqwireless	Mobile Application Technology
	Current Communication Group	High-Speed Internet Access
	Android	Mobile Operating Systems
	Transformic	Search Technology
	Skia	Mobile Graphics Software
	AOL	Broadband Internet Access
	Phatbits	Widget Engine Technology
	AllPay	Mobile Software
	bruNet	Mobile Software
	NASA*	Building R&D Center
	Sun Microsystems*	Technology Sharing
2006	dMarc Broadcasting	Radio Advertising
	Measure Map	Weblog Software
	Writely	Word Processing Program
	@Last Software	3D Modeling Software
	Orion	Search Algorythm
	2Web Technologies	Online Spreadsheets
	Neven Vision	Mobile Recognition Software
	YouTube	Online Video Sharing
	JotSpot	Web Applications
	Endoxon	Mapping Solutions (Europe)
	News Corp*	Exclusivity in Media Search
	Intuit*	Sharing of Expertise
2007	Xunlei	Chinese File Sharing
	Adscape	Games Advertising
	Trendanalyzer	Visual Statistics Software
	Tonic Systems	Document Conversion Software
	Marratech	Video Conference Software
	DoubleClick	Display Advertising
	Greenborder	Web Security Software
	Panoramio	Photo Sharing Service
	Feedburner	Media Advertising Software
	Peakstream	Parallel Processing Software
	Zenter	Online Presentation Software
	Grand Central	Voice Communication Software
	Image America	Aerial Imagery Cameras

	Postini Zingku Jaiku China Mobile* IBM*	Security Solutions Mobile Social Network Tech. Live Streaming Software Mobile Search in China Computing Partnership
2008	Omnisio Tatter & Company	Online Video Service Korean Blogging Software
2009	On2 reCAPTCHA AdMob Gizmo 5 Teracent AppJet	Video Compression Software Interpretation Software Mobile Applications Ads. VOIP Technology Display Technology Application Server
2010	N/A	-

Partnership (*)

Sources: If not given in endnotes, Thompson Financial, News, Company Press Releases

Exhibit 8: Quarterly Market Capitalization: Apple, Microsoft and Google.

Year and Quarter	Apple	Microsoft	Google
2000 Q1	22,04	553,02	n/a
2000 Q2	17,05	420,99	n/a
2000 Q3	8,38	317,39	n/a
2000 Q4	5,00	231,29	n/a
2001 Q1	7,64	291,78	n/a
2001 Q2	8,11	392,89	n/a
2001 Q3	5,44	275,40	n/a
2001 Q4	7,70	356,81	n/a
2002 Q1	8,36	326,64	n/a
2002 Q2	6,30	296,23	n/a
2002 Q3	5,20	233,85	n/a
2002 Q4	5,15	276,63	n/a
2003 Q1	5,10	259,08	n/a
2003 Q2	6,99	275,28	n/a
2003 Q3	7,51	300,63	n/a
2003 Q4	7,86	295,94	n/a
2004 Q1	10,00	269,10	n/a
2004 Q2	12,37	308,30	n/a
2004 Q3	15,03	300,63	4,35
2004 Q4	25,89	290,72	11,15
2005 Q1	34,05	261,14	20,71
2005 Q2	30,33	268,38	50,36
2005 Q3	44,49	273,89	56,69
2005 Q4	60,59	278,36	82,77
2006 Q1	53,22	281,17	80,77
2006 Q2	48,71	237,69	90,13
2006 Q3	65,47	272,68	88,09
2006 Q4	72,90	293,54	102,87
2007 Q1	80,08	272,91	105,42
2007 Q2	105,56	281,93	120,99
2007 Q3	133,46	276,20	132,12
2007 Q4	173,43	333,05	162,84
2008 Q1	126,12	264,13	104,28
2008 Q2	147,62	256,21	125,59
2008 Q3	100,69	243,69	95,77
2008 Q4	75,87	172,93	73,69
2009 Q1	93,62	163,32	83,63
2009 Q2	127,06	211,55	101,64
2009 Q3	166,06	229,63	119,98
2009 Q4	189,92	270,64	150,65

Currency: US Dollars ($), Scaling Factor: Billions

Source: Thompson Financial

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