
The Tablet Evolution and Diffusion

James A. Sena
jsena@calpoly.edu
Orfalea College of Business
California Polytechnic State University
San Luis Obispo, CA 93407, USA

Mark P. Sena
sena@xavier.edu
College of Business
Xavier University
Cincinnati, OH, USA

Abstract

This paper examines the development, evolution and diffusion of the tablet. An overview of the Innovation Diffusion Technology [IDT] model is presented. Using this as a framework the PC industry is categorized from multiple perspectives. Foremost is the evolution of the tablet. The direction, durability and mutations (the diffusion) of the industry are presented.

Keywords: Personal computer, innovation diffusion technology [IDT], diversification, tablets

1. INTRODUCTION

In August of 2011 Hewlett-Packard, the world's largest seller of PCs, confirmed it was looking to sell off its personal computing business -- getting out of the hardware game altogether, dropping its tablet and smartphone operations, as well. This event along with IBM's decision in 2004 to sell its PC business line to Lenovo, a China-based firm, were harbingers that the low-margin PC business may no longer be worth pursuing. Concurrently the rise of alternatives to traditional PCs, the tablet(s), continued unabated -- with forecast through 2011 at 60 million tablets and in 2012 to be 90 million units (Ogg, 2011). There still would be hundreds of millions of PCs sold worldwide over the next few years because people needed them for specific tasks (Oswald, 2011). Many of the habits we associate with personal computers can be carried out with touchscreen and an internet connection-- done anywhere, and quickly. The

iPhone demonstrated what could be done with a relatively small device that could single task well. With Android and Apple netbooks being circulated, the idea of a small, relatively inexpensive device connected to back-end services became a leading edge for a paradigm-shifting platform -- along with the application layer in the private cloud (Enderle, 2009).

According to (Brodin, 2009) "since the personal computer debuted in 1971, a Darwin-esque evolution process has lifted the PC from modest beginnings to its prevailing role as an indispensable part of life in the 21st century" -- "evolving from clunky commercial flops to slick, high-powered machines that play a vital role in our daily lives, both for work and play." Personal computers have been the technology engine drivers -- from Intel to Microsoft to Dell to HP to Google to Facebook. The rise of mobile computing is upending the technology business and is simultaneously redefining what is a

personal computer and how we use it (Ogg, 2011), (Volmer, 2009).

This paper is a sector case study that seeks to examine the development, evolution and diffusion from the PC to the Tablet and beyond. The remainder of this paper proceeds as follows. First, we give an overview of the Innovation Diffusion Technology [IDT] model and discuss innovation characteristics. Then we classify the PC and tablet from multiple perspectives using this as a framework. Finally, we comment on the direction, durability and mutations (the diffusion) of the tablet.

2. OVERVIEW OF DIFFUSION OF INNOVATION

Diffusion of innovation theory (Rogers, 2003) describes the process through which new ideas, practices, or technologies spread into a social system. According to (Murray, 2009) diffusion of innovation theory holds that innovation diffusion is a general process, not bound by the type of innovation studied, by whom the adopters [are], or by place or culture, such that the process through which an innovation becomes diffused has widespread applications to all fields that develop innovations. Diffusion is the process through which an innovation is communicated along certain channels over time among the members of a social system. Innovation is an idea, practice or object perceived as new by an individual or other unit of adoption. Innovation does not necessarily mean better or that the new idea is more beneficial to an individual. Whereas innovation can refer to something abstract, like an idea, it can also be concrete, like a new piece of technology. This article focuses specifically on tablet computing as a particular type of innovation of interest.

(Rogers, 2003) suggested that there were/are four main elements in the diffusion process:

- the innovation,
- the communication channels through which the innovation is diffused,
- time, and
- the social system.

The end results (Dusenbury, 2004) of diffusion are adoption, implementation, and institutionalization. Diffusion researchers across many academic disciplines have identified a consistent process through which innovations

enter into social systems. There is a period of slow growth, followed by a rapid expansion, then a plateau or another slow growth period. Different characteristics of the innovation, communication channels, and social system are likely to have varying influences at different times throughout the diffusion process (Moore, 1991).

Individuals differ in their willingness to embrace new ideas and change (Valente, 1996), (Rogers, 2003) classified adopters into the following five categories on the basis of their rates of adoption:

- innovators, who are among the first 2.5% in the population to adopt the innovation and establish an adventurous, cosmopolite nature;
- early adopters, who fall into the next 13.5% of adopters and are integrated closely into the social network and are often opinion leaders;
- the early majority, who are the following 34% of adopters and described as intentional followers;
- the late majority, the next 34% who are often skeptical of innovation at first but eventually succumb to peer pressure; and
- Laggards, who are the ultimate 16% and who tend to be more traditional and isolated in contrast with earlier adopters. Individuals who are among the last to adopt an innovation often indicate the longest decision-making processes prior to deciding.

3. THE PC AS A FORERUNNER

The PC did not magically appear in its current wide-screen, multicore, viewing form overnight. It took many years to evolve from the IBM PC of 1981 to the high-powered tech gadgets. The original idea of the PC was sound: using off the shelf parts combined with a relatively open, but curated set of standards to avoid reinventing from one version of the PC to the next. There are a number of milestones passed along the way, from the introduction of the IBM PC in August 1981, and moving on to the appearance of the first PC clones in 1982, leading to the "post-PC" tablets of 2010-2011. Microsoft, AMD, and Intel have outplayed and outlasted their rivals. Plus, many of the hundreds of "PC clone makers" have either been left by the wayside or absorbed into larger conglomerates. Apple has been friend, rival, and self-appointed nemesis during this period, and without that competition,

it is unlikely that we would see the technology move in the directions it has. There is an wealth of time-line and papers addressing the evolution and eras of the PC. We have constructed a timeline fitted to the Diffusion Innovation of Technology curve -- products, and way stations in the journey through PC technology are depicted. Our intention was not to be exhaustive but to mention key events, as well as game-changing/legitimizing turning points. The timeline is depicted in Figure 1.

The use of the term "laggard" is probably not appropriately used in this presentation of the PC diffusion – another interpretation would be the deployment of the basic technology and ideas rooted in the PC as it evolved from a desktop to a laptop and currently the variety of devices that make use of and expand on the PC platform – the tablets, the smartphones and even the virtual PC.

The first significant event in the PC era was the introduction of the IBM PC. IBM dominated the computer industry during the pre-computer era (machine-accounting); championed the many generations of mainframes (e.g. the 360 – 370); operating systems and most other software applications; extended and expanded the minicomputer industry (System 32, 34, 36, 38.). IBM subsequently entered the PC arena on a major scale – setting a standard for operating systems and controlling the overall market in its early stages. These were the "early adopters" – primarily computer professionals that transitioned from the mainframe to the minicomputer. Many users had experienced the computer as a stand-alone, special-purpose desktop (e.g the graphics machines created by HP).

The PC at this point was a computer without a clear purpose --- the accompanying event was the spreadsheet – VisiCalc – followed closely by Lotus 123. Abruptly businesses and the general computer population had a tool that legitimized the use of the PC. This was closely followed by the introduction of word processors and database managers and graphic/presentation software. The speed, storage capacity and communication channels still were lacking. General business users and professionals began to use the PC for individual and departmental applications and analysis – they formed the nucleus of the "early adopters".

With the introduction of hardware enhancements and network connections the capabilities of the PC made possible the use of the GUI – obsoleting the use of the PC as a terminal to the mainframe. This marked the rise of Microsoft not only as a provider of operating systems but also the visual aspects of Windows 3 and the business acumen of Microsoft Office – the suite of products for the business at the individual and department level. As hardware technology enabled more complex software and system operation, the PC became a standard within most businesses, the "early majority" embraced the PC as their primary desktop tool for basic tasks along all levels of business activity.

Closely following these enhancements was the introduction of the World Wide Web [WWW] browser as an overlay over the internet. Prior to this introduction, the internet existed for an extended period but did not have widespread use except at the business level for file transfers and email-type commerce. Netscape was the killer-ap that started the paradigm-shift – followed by Microsoft's Internet Explorer. In effect, the PC became the vehicle for everyman to communicate – no longer just a business-level system. This marked the peak of the PC era the diffusion of PC use to the general public – "the majority". Not only was the PC the inherent tool in the office but also the home and school.

The culminating event was the rise of the networks –the local area networks in businesses and later the homes – but also the wide area networks for businesses and ultimately the utilization of the complex already in place, the internet. The operating system and router/switch defined by Cisco became the vehicle for communication worldwide. That combined with the WWW browser enabled access for business and the general public ("the late majority"). Following this accessibility the introduction of the search engine (Yahoo and then Google) made the web a pervasive tool. Lastly the social networks (MySpace and Facebook) involved an extensive array of the population as participants.

4. THE TRANSITION TO THE TABLET

At the beginning of the 1990s, the stability of the personal computer structure and industry changed. IBM dominance of the PC industry and its role as a standard bearer started to erode in

the late 1980s. By the early 1990s, the market structure was one in which a number of firms possess the capability to supply interoperable components. Throughout the 1990s and beyond, thousands of manufacturers built PCs around hardware and software components mainly supplied by Microsoft and Intel. The foundation for the tablet market had its roots in the desire for more mobility in computing.

The evolution of the tablet came about in many ways. Figure 2 shows the transition of the tablet from its beginnings to the present. Early tablets were rather expensive to make and bulky. They had limited memory and limited functionality (ONeill, 2012). Several paths converged – the eBook reader, especially Amazon's Kindle, handheld devices including Personal Data Assistants [PDAs], the business users – Blackberrys, portable music players including MP3 players and the iPod, and foremost the initiatives of Steve Job's Apple Inc. in the confluence of the iPod, the iMac, the iPhone and ultimately the iPad.

Steve Jobs noted that one of the things he was most proud was resisting the desire to launch a new tablet device without first putting into place the ecosystem needed to sustain it (Isaacson, 2011). The 'multi-touch' screen, and something that Jobs wanted to advertise as the biggest draw for their product. The Tablet market was not hugely profitable idea until Apple introduced the iPad. As in the evolution of the PC, the iPad was the "killer" product that legitimized the tablet industry, and which brought in competition. Samsung and its Galaxy line focused more on software development and updates rather than blockbuster releases. Samsung also reintroduced the stylus as a feature with their 'Note,' and has found this to be popular. What makes this ironic is Steve Jobs was adamant about leaving a stylus behind in his concept of the iPad. The iPad continues to focus on their premium brand image as their competitive advantage. The Kindle 'Fire' focused on price as their competitive advantage whereas Apple stood by their pricing -- providing a high quality product.

For the first time Microsoft, as part of the late majority, has decided to enter the Personal Computer and tablet vendor markets with the launch of the Microsoft SurfaceRT and Surface Pro. Microsoft has always licensed its software out to other manufacturers while Apple has made their hardware in-house. This new position

in the market will doubtlessly change the relationship between the two companies since they are now competing in more direct ways.

While tablet shipments have exploded in the past few years, Android tablets have not fared so well. The iPad accounted for 65 percent of shipments at the beginning of 2013 while Android represented only 15 percent. Amazon's Kindle Fire and Barnes & Noble's Nook Tablet both run highly customized versions of Android without any links to Google services. This does not make any money for Google. Google needed to enter the market to give Android tablets a jump start with their ChromeBook (CocATOS, 2012).

In a survey conducted in 2010 by eWeek (Boulton, 2011) one in 5 U.S. adults surveyed said they planned to own a tablet by 2014. The survey included Application use on tablets, including the iPad and machines/tablets based on Google's Android platform. Some 78 percent of respondents said they planned to use their tablets to surf the Web. Three-quarters of people said they would use their machines for e-mail. Other uses included electronic reading of books and newspapers, (53 percent), social networking (50 percent), consuming TV and other apps (43 percent). Tablet use was attractive for enterprises as well, with 37 percent of respondents planning to use their machines for business concerns. In a report titled "Tablet & eReader Evolution: Strategies & Opportunities 2011-2016," (Tablet & eReader Evolution, 2011) Juniper Research assessed the growing tablet market. The number of tablet shipments will reach 253 million by 2016, which would be nearly a fivefold increase from the 55.2 million tablets shipped in 2011.

In 2013 consumer spending on Internet-connected smartphones, tablets and other devices has surpassed home broadband service fees. In four years, nearly 286.7 million in the U.S., or 87% of the population, will have mobile Internet devices; about 85% of homes will have broadband (Global Entertainment and Media Outlook, 2013). Mobile Internet access spending will top \$54 billion in the U.S. in 2013, compared with \$49.6 billion in home Internet spending. Consumer adoption of digital devices is driving growth across the entertainment and media spectrum. Total spending on Internet access will see the biggest growth, up 11% in the next four years. Spending on video games, movies, TV and radio — all delivered digitally — will also rise (Snyder, 2013).

Much of the growth will come from emerging market. These markets are expected to account for up to 46% of worldwide shipments by 2017. The tablet surge may not be courtesy of the iPad alone. Some older brands like Dell are contributing to the overall tablet growth. In addition to the growth in emerging markets, other growth will come as the tablet platform itself evolves through technological advances. The changes will segment the market into "premium" and "value" category tablets. Another reason why Microsoft is in the running as a tablet, according to the survey of U.S. commercial tablet owners, 39% indicated that having a Windows OS option as a part of their next tablet purchase was "very important" to them (Perez, 2012). Microsoft and their tablet-friendly Windows 8 OS, along with the MS Office suite could push enterprises to adopt tablets.

Although most tablets sold currently are Wi-Fi only, more than a half of all tablets shipped in 2016 will have a cellular connection. At present, carriers ask customers to commit on two contracts – one for their mobile phone and the other one for tablet. It is expected that this will change soon with mobile operators introducing multidevice plans. In addition, emerging markets will help push sales of tablets with cellular connection due to lack of fixed-line infrastructure. Business users, according to the Juniper forecasts, will account for nearly a fifth of annual tablet shipments by 2016. (Tablet & eReader Evolution, 2011)

5. DIVERSIFICATION—THE DIFFUSION

Diffusion takes on many forms that may best be described by diversification. Diversification is the name given to the growth strategy where a business markets new products in new markets; introduces variations and extensions of existing products in existing markets; or, related products that complement their existing products. For a business to adopt a diversification strategy, it must have a clear idea about what it expects to gain from the strategy and an assessment of the risks. Diversification in new markets concerns the inclusion of activities other than those directly relating to the product or associated services. There are a four underlying reasons why companies diversify (Ansoff, 1987).

- When their objectives can no longer be met within the product-market scope defined by expansion -- even if

attractive expansion opportunities are still available and past objectives are attained, a firm may diversify because the retained cash exceeds the total expansion needs. (The pressure may be on the firm to invest money more profitably). There are many examples here that explain and portray the tablet diffusion such as the recent introduction by Microsoft of the Surface Pro (a combination of the tablet features and the power of the PC) and Google's simple internet device, the Chromebook.;

- When diversification opportunities promise greater profitability than expansion opportunities. This may occur under several conditions;
- When the firm's research and development organization produces outstanding diversification by-products; and,
- When synergy is not an important consideration and therefore the advantages of expansion over diversification are not important.

Firms may continue to explore diversification when the available information is not reliable enough to permit a conclusive comparison between expansion and diversification.

In light of these reasons there are several different diversification forms that can be employed (Ansoff, 1987). These are depicted in Tables 1 and 2. Table 1 depicts Horizontal Diversification and Vertical Integration. Horizontal Diversification consists of moves within the economic environment of the diversifying firms. It is complementary with existing activities. Marketing synergy is strong as the firm continues to sell through established marketing channels. Many of the firms competing in the Tablet sector continue to introduce new or extended versions of their products (e.g. the iPad5 by Apple).

Vertical Integration refers to the development of activities involving the preceding or succeeding stages in the firm's production processes. It is often more sensitive to instabilities and offers less assurance of flexibility and increases the dependence on a particular segment of economic demand. Most of the main competitors are able to channel some of their related products and distribution channels to provide a competitive edge. This has been the lexis for changes in the supply line, customer relations and expectation

management in the PC-Tablet competitive environment. For the tablet diffusion, it is not quite as clear whether vertical integration has a similar impact. Google and Microsoft deployment of Android has fostered the growth of apps being offered to tablet and other mobile users. In addition, the ability to have these apps operate on all of a user's devices (e.g. the tablet, the phone, the PC.) without having to load them onto each device. Apple offers a similar array of apps through the Apple store that provides an integrated source for a user's devices (e.g. the iPad, iPhone, and the iMac.)

These two diversification strategies offer limited potential for objectives; they make a limited contribution to flexibility and stability and can contribute to the other objectives only if the present economic environment of the firm is healthy and growing. This inflection point is just as dramatic as when the PC came on the scene and cut the cord between the mainframes and mini's and made the personal computing local. Another way to think of this is that we are moving into a phase in which people want a PC on their desktop and in their pocket (Dalrymple, 2011).

Table 2 depicts Concentric Diversification -- having a degree of common thread with those firms that possess marketing and/or technology capabilities. A concentric strategy is generally flexible and usually more profitable and less risky due to synergy. In the PC-Tablet industry sector, key players can utilize resources from their other product lines to enhance their competitive position. We can see that the introduction of products both similar and new have impacted the diffusion phenomena.

PCs are being replaced not only by Tablets at the center of computing but by new ideas about the role that computing can play in progress. According to (Burt, 2011) "it's becoming clear that innovation flourishes best, not on devices but in the social spaces between them, where people and ideas meet and interact. It is there that computing can have the most powerful impact on economy, society and people's lives. Software and technology-based companies need to understand the direction of computing and to embrace that which is technologically inevitable -- a future of varied devices connected to the cloud. The days of the PC-centric environment and the follow-on tablet, which helped fuel Microsoft's success, are declining as the use of mobile devices and cloud computing rises. One

example is Google Glass -- an augmented reality eyewear controlled in part by voice. It can take pictures, videos, search, gets directions and more. Developers are working on apps to add functionality (Baig, 2013).

At the unveiling of the iPad 2 in March, 2011, then Apple CEO Steve Jobs affirmed that the post-PC world would be dominated by such devices as smartphones and tablets (Isaacson, 2011). Some other vendors view tablets as something new in the PC market, but that "is not the right approach to this," Jobs said, "these are post-PC devices that need to be easier to use than a PC, more intuitive," he said. "Hardware and software need to intertwine more than they do on a PC." Given the diffusion it is well to note that the smartphones and tablets are hybrids -- variations of not just the PC but other technologies. A smartphone is a mobile phone that combines the functions of a personal digital assistant [PDA] and a mobile phone-- also serving as portable media players and cameras with high-resolution touchscreens, web browsers and mobile broadband access. A tablet PC is just that -- tablet-sized computer that has the key features of a full-size personal computer -- with the introduction of the iPad and later the Samsung tablet these devices have taken on many of the features of the smartphone and iPod-like devices.

Two other related directives altering the Tablet evolution are virtualization and the cloud. These concepts are somewhat intertwined. Cloud computing delivers applications via the internet and the web browser-- the business software and/or user data are stored at remote location. Virtualization is the creation of a virtual (rather than actual) version of something, such as a hardware platform, operating system, a storage device or network resources.

Virtualization can be viewed as part of an overall trend in enterprise IT that in which the IT environment is able to manage itself based on perceived activity, and utility computing, in which computer processing power is a utility that clients can pay for only as needed. With virtualization any device connected to the web and linked to the appropriate cloud data (e.g. Google Drive or more appropriately a firm's private network) can emulate an internal device in terms of capabilities. Conversely virtualization allows the corporate systems to respond in a manner that mimics a virtual set of hardware and software. Changes to any application within

the firm's information array have little or no effect on the interface or device accessing the array.

The impact of the cloud is similar to that of virtualization in that access to corporate data is transparent to the user. Beyond this, the cloud has already become a part of most businesses and almost all users of the web. The pervasiveness of Google mail, Google-drive, Microsoft Office 365 has rendered the mobile device, be it a tablet, a phablet, iPhone, or "Fire", as capable as any desktop computer connected to the corporate network.

For the *everyman* user of the cloud, there is a myriad of ways that it is already being used from music to art to social networking. In education, the introduction of the iPad and related devices in the classroom, the eBook as a substitute for the printed form, and the ability to search and view the world of business and beyond have changed and enriched the face of education.

These innovations extend the PC by enabling any web enabled device to serve as a conduit to an organization's applications and data. For the consumer, we already see this trend with Google's Gmail and apps being stored on Google servers – these are just the tip of the data and application iceberg.

PC sales are decelerating in the U.S. due to the same technological advances that fueled the PC industry's rise. Faster processors and lower costs are now benefiting the devices that usurped it. Consumers can now use smaller gadgets to do many of the same things they once did with PCs, such as surfing the Internet, storing photos and sending e-mail. Apple even boasts that users can edit home movies on an iPad (Robertson, 2011).

In summary, just as with the PC-Tablet evolution the diffusion is marked by several significant diversifications. The PC mutated into many products ranging from laptops to mini and micro PC-laptops to Tablet-PCs. Accompanying this mutation is the software that supports this array of devices – much of it can be found on other hand-held devices such as the BlackBerry and the smart phones. The promotion and progression of the array of Apple products ranging from the iPhone to the iPod to the iPad has created and fostered not only a market niche but moreover an extension into a

worldwide set of devices – engendering other software and hardware companies to follow suit – the tablet and Android. The iPad has come to be a multiuse product – serving as an access point or portal to the web; a gaming device; a communication medium; and perhaps a substitute for media devices such as the burgeoning eReader market – going directly against the Amazon Kindle. The way that firms now do business is changing – this also has fallout to the consumer that can now use a hand-held device to access a plethora of data anywhere, anytime and anyplace. The PC-Tablet is in some sense becoming a virtual machine.

6. REFERENCES

- Evolution of the Tablet. (2011). (Total Info 365) Retrieved May 16, 2013, from Total Info 365:
<http://totalinfo365.blogspot.com/2012/12/evolution-of-tablet.html>
- (2011). Tablet & eReader Evolution. Juniper Research.
- (2013). Global Entertainment and Media Outlook. PriceWaterhouseCoopers.
- Ansoff, I. (1987). Corporate Strategy. Penguin, Harmondsworth.
- Atkins, T. (2002). The next round's on us. The Observer Magazine, 22(September).
- Baig, E. (2013, June). Glass has a rose colored future. USA Today.
- Boulton, C. (2011, June 20). Galaxy Tablet10.1: Great for Media Consumption. eWeek.
- Brodin, J. (2009, May 27). Evolution of the PC. Network World.
- Burt, J. (2011, August 8). IBM Exec: The End of the PC Era Is Here. Retrieved from eWeek:
<http://www.eweek.com/c/a/Desktops-and-Notebooks/IBM-Exec-The-End-of-the-PC-Era-is-Here-609114/>
- CocATOS, a. (2012, June 28). This Is Why Google Unveiled A Tablet Yesterday. Retrieved from Business Insider:
<http://www.businessinsider.com/google-tablet-2012-6>
- Collins, J. (2000). Good to Great. Harper Publishing.
- Dalyrmples, J. (2011, July 22). The Future of the PC Industry. Retrieved from The Loop:

-
- <http://www.loopinsight.com/2011/07/22/the-future-of-the-pc-industry/>
- Dusenbury, L. a. (2004). Pursuing the course from research to practice. *Prevention Science*, 5, 55-59.
- Enderle, R. (2009, April 6). 3rd Rebirth of Computing: The End of PCs and Game Consoles. *Tech News World*.
- Isaacson, W. (2011). *Steve Jobs*. New York: Simon & Schuster.
- Jobber, D. (2001). *Principles and Practices of Marketing*. Maidenhead: McGraw-Hill.
- McCarthy, E. (1960). *Basic Marketing*. Homewood, IL: Irwin.
- Moore, G. a. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, Vol.2 No. 3,pp 192-222.
- Murray, C. (2009). Diffusion of Innovation Theory: A Bridge for the Practice Gap in Counseling. *Journal of Counseling and Development*, Winter, Vol. 8. Iss:1, Pg 108 (9 pages).
- Ogg, E. (2011, August 18). The end of the PC era. Retrieved from GigaOM Pro: <http://pro.gigaom.com/>
- O'Neill, S. (2012, October 12). The Evolution of the Tablet PC. *Network World*.
- Oswald, E. (2011, August 11). IBM Declares the end of the PC era. *PC World*.
- Perez, S. (2012, January 30). Tablet Shipments To Reach 383.3 Million By 2017, 46% In Emerging Markets. Retrieved from *Disrupt: Tech Crunch*: <http://techcrunch.com/2012/01/30/tablet-shipments-to-reach-383-3-million-by-2017-46-in-emerging-markets/>
- Porter, M. (1990). *The Competitive Advantage of Nations*. London: Macmillan.
- Robertson, J. (2011, July 23). Rebooting the PC Industry: Tablets force a shift. *Associated Press*.
- Rogers, E. M. (2003). *Diffusion of Innovation (5th Edition)*. New York: Free Press.
- Snyder, M. (2013, June 5). Mobile Users Cast a Wider Internet. *USA Today*, pp. c-1.
- Valente, T. (1996). Social network thresholds in the diffusion of innovations. *Social Networks*, 18, 69-89.
- Volmer, C. (2009). *Digital Darwinism. Strategy-Business*.

Appendix

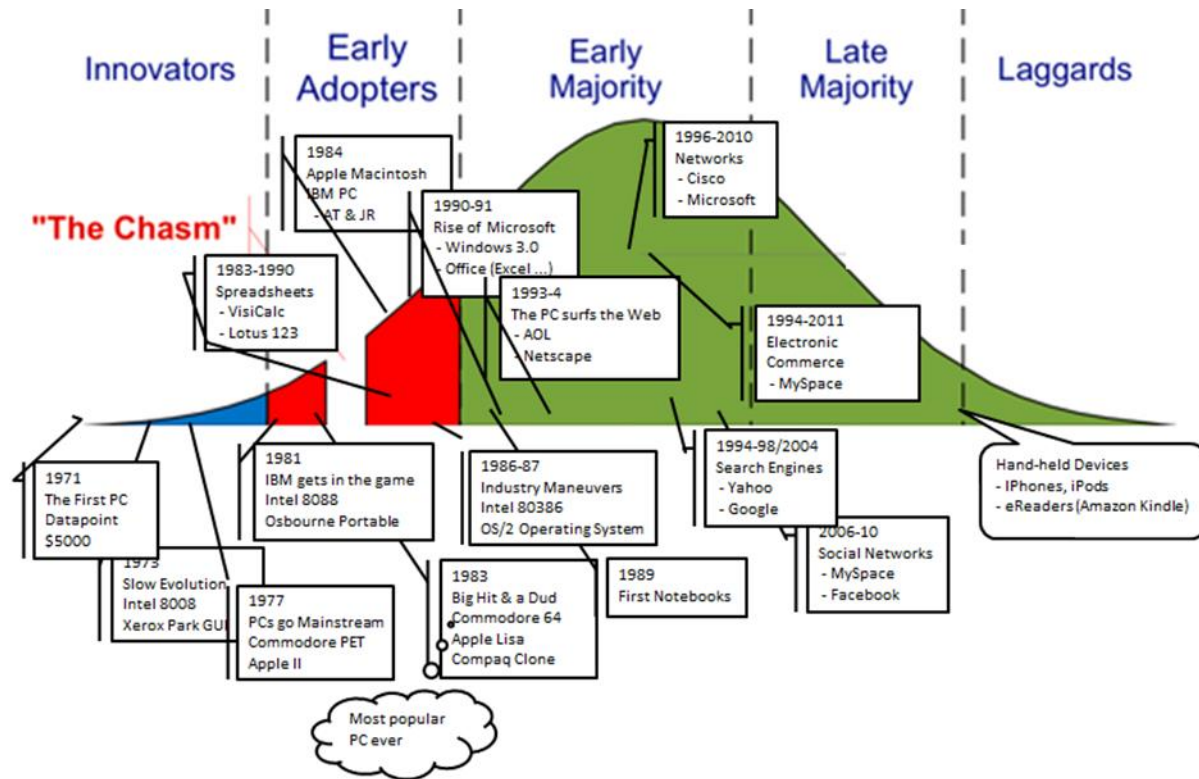


Figure 1. Drivers of Growth for the PC

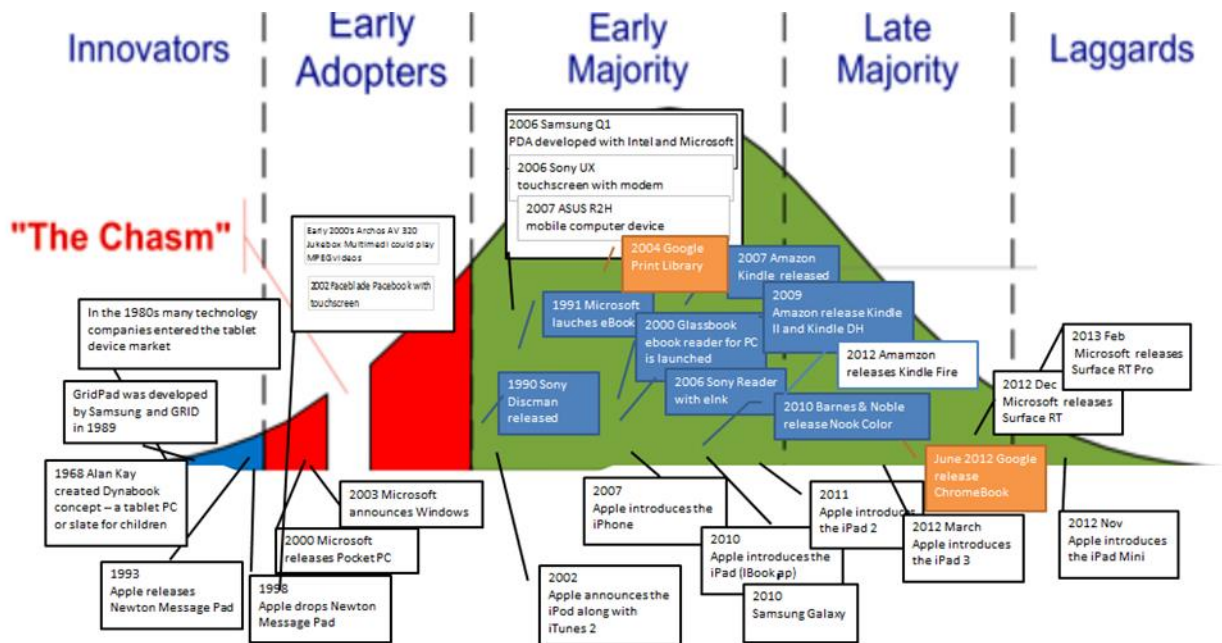


Figure 2. Transition to the Tablet

	New Products	
New Markets/Mission	Related Technology	Unrelated Technology
	Horizontal Diversification	
Same Type	Barnes & Noble – Amazon -- sale of books for eReaders Google - Samsung - HP Slate -- Intel Ultrabook -- enter tablet market Barnes & Noble -- Amazon Kindle and Tablet -- software for PCs & other devices Apple iPad & iPod – and Android -- sale/use of Books, pdfs, music, video as Aps -- Apps for Business (~ office tools) -- Apps for Games, Personal Use -- Apps for alternative Media (Newspapers, etc) • Apps – Forced Apple to be more open in what apps they allow – Relaxed rules for developers: easier to make apps for both Apple and Android – Both have over 80,000 apps available	Google - Amazon - HP Cloud Computing – offer services to existing customers Microsoft Cloud Computing -- Office 365 -- Windows 8 Google Glass
	Vertical Integration	
Firm its own customer	Amazon is able to use its web-based ordering and electronic distribution system without incurring additional costs Microsoft, Google use products internally as development tools for new/ revised products	Google's - commitment to digitize most books in the public domain provides a ready audience for ereading devices and other medium - use of network infrastructure created for search engine as competitive alternative for – online office products – social networks (Google +) Publishers can Partner with Amazon and Barnes & Noble distribution and other supply chain capabilities

Table 1. Horizontal and Vertical Integration

New Products		
New Markets/Mission	Similar Types	New Types
Marketing & Technology Related	<p>Amazon eReader has capabilities for reading not offered by any other device</p> <p>Apple -- iPad</p> <ul style="list-style-type: none"> - Apple's B2B volume purchasing agreement <p>Gaming Industry-- companies will be pressed harder and harder to come up with new ideas, which could make for an uphill battle (Caron, 2009)</p>	<p>A number of new technologies for tablets are being applied and used for business applications</p> <ul style="list-style-type: none"> - PC manufacturers are designing Hybrid Tablet PCs able to perform heavy duty work <p>Cloud Services --high cost of power and space is going to force the IT world to look at cloud services, with a shift to computing as a cloud resource (Infoworld,2008)</p> <p>Consumers can now use smaller gadgets to do many of the same things they once did with PCs, such as surfing the Internet, storing photos and sending e-mail. (Robertson, 2011)</p> <p>Mobile Workers and related products</p> <ul style="list-style-type: none"> - telecommuting -- the home office - pressure to provide tools and access to corporate system
Marketing Related	<p>Apple -- iPad (Rawson, 2011)</p> <ul style="list-style-type: none"> - Apple's retail stores - use by Children - deployed in Higher Education <p>Microsoft Surface RT and Surface Pro</p> <p>Google Chromebook</p>	<p>internet and technology companies taking a different approach:</p> <ul style="list-style-type: none"> - introducing a wide range of "smart" devices, from phones to TVs, become the access points to digital information, which resides in the "cloud" (Nutall and Waters, 2011) <p>for aspirant writers the ereader medium now provides a channel/outlet for private label media publications (Castro, 2007) (Egol, 2009)</p>
Technology Related	<p>Apple -- Google</p> <ul style="list-style-type: none"> -- introduce Operating Systems for devices -- Google Android available other systems <p>PC makers are countering the threat is with iPad-style tablets running Android</p>	<p>Advances in network medium will reduce delivery time and cost and provide speed of access</p> <p>Virtualization</p> <ul style="list-style-type: none"> - Desktop Virtualization (Fogarty, 2010)

Table 2. Concentric Diversification