Strategic ICT Trends: Investing in Technology to Compete in a Sea of Change and Innovation

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บทคัดย่อ

เทคโนโลยีสารสนเทศและการสื่อสารมีการเปลี่ยนแปลงอย่างต่อเนื่อง โดยมีแรงผลักดันทางการตลาดหลายด้านที่กดดันให้องค์กรต่างๆ พยายามสร้างนวัตกรรมใหม่ขึ้นมา เพื่อตอบสนองความต้องการของผู้บริโภคและเก็บเกี่ยวผลประโยชน์ที่ได้รับจากโอกาสทางการตลาดใหม่ๆ ในบทความนี้กล่าวถึงแนวโน้มไอซีที 6 ประการ ที่อาจนำมาซึ่งการเปลี่ยนแปลงการลงทุน

ในเทคโนโลยีขององค์กร ได้แก่ **1) คลาวด์คอมพิวติ้ง (Cloud Computing)** ซึ่งทำให้เกิดการเปลี่ยนแปลงในต้นทุนรวมของการลงทุนในสาธารณูปโภคด้านไอซีที โดยเฉพาะอย่างยิ่งการเพิ่มขีดความสามารถการทำงานในรูปแบบต่างๆ เช่น การเติบโตอย่างรวดเร็ว ฤดูกาล และการเกิดความต้องการที่ไม่ได้คาดหมาย เป็นต้น **2) นวัตกรรมเพื่อการเติบโต (Innovation for Growth)** เป็นแรงผลักดันทางธุรกิจที่มีอำนาจสูง ซึ่งองค์กรต้อง

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สามารถแยกความแตกต่างได้ว่า นวัตกรรมไอซีทีชนิดใดสามารถทำให้องค์กรก้าวขึ้นเป็นผู้นำในอุตสาหกรรมได้ **3) ธุรกิจอัจฉริยะ (Business Intelligence)** เป็นแรงผลักดันที่ช่วยให้เกิดการผสมผสานข้อมูลต่างๆ ในองค์กรให้เกิดความจริงที่เป็นหนึ่งเดียว ซึ่งจะสามารถทำให้เกิดการเปลี่ยนแปลงอย่างสำคัญในกลยุทธ์องค์กรและการวางตำแหน่งผลิตภัณฑ์ **4) การบริโภคเทคโนโลยีไอที (Consumerization of IT)** ทำให้เกิดการคาดหวังในแผนกไอทีที่สูงขึ้น และขยายความต้องการในโครงสร้างพื้นฐานและเครื่องมือต่างๆ ในการวางกลยุทธ์ **5) การมีปฏิสัมพันธ์อย่างเป็นธรรมชาติ (Natural User Interfaces)** คือ การเปลี่ยนแปลงในเรื่องปฏิสัมพันธ์ระหว่างผู้บริโภคและเทคโนโลยี และมีการขยายวงกว้างขึ้น อันเกิดจากความก้าวหน้าของนวัตกรรม สุดท้ายคือ **6) การบริการผ่านเครือข่ายทางสังคม (Social Network Service)** ซึ่งทำให้เกิดกระแสของการปรับเปลี่ยนการมีปฏิสัมพันธ์ทั้งในสังคมและผู้เชี่ยวชาญ รวมทั้งความสามารถของนักโฆษณาและผู้จัดหางานในการสื่อสารกับผู้บริโภคอีกหลายล้านคน

คำสำคัญ : แนวโน้มตลาดไอซีทีคลาวด์คอมพิวติ้ง นวัตกรรม ธุรกิจอัจฉริยะ การบริโภคเทคโนโลยีไอที การมีปฏิสัมพันธ์แบบกราฟิก การมีปฏิสัมพันธ์อย่างเป็นธรรมชาติ เครือข่ายทางสังคม

Abstract

Information and communication technologies are constantly changing. Key market drivers have forced companies to be at the cutting edge of innovation to meet customer demands and take advantage of new market opportunities. There are six strategic ICT trends that are changing how companies invest in technology.

Cloud Computing is changing how companies invest in ICT infrastructure dramatically lowering total cost of ownership, especially for a number of optimal workload patterns such as rapid growth, seasonality, on and off, and unpredictable bursting. **Innovation for Growth** is a powerful business driver and companies must be able to differentiate what type of ICT innovation will help establish themselves as industry leaders. **Business Intelligence** is driving the consolidation of corporate data into a "single version of the truth" enabling major changes in corporate strategy and product positioning. **The Consumerization of IT** has dramatically raised the expectations placed upon corporate IT departments and expanded the need for platform and device agnostic strategies. **Natural User Interfaces** are altering how people interface with technology and expanding access to the masses through new and innovative solutions. Finally, **Social Network Services** has taken the world by storm transforming both social and professional interactions as well as the ability for advertisers/recruiters to directly target hundreds of millions of customers.

Keywords : ICT market trends, cloud computing, innovation, business intelligence, consumerization of IT, GUI, NUI, social networking

Introduction

The ICT (Information and Communication Technology) industry consists of all technologies that aid in the management of information and communication; including software, computer hardware, mobile technologies, and network equipment. The ecosystem also includes enabling entities that link the key industry players together such as system integrators, infrastructure and service providers, and government agencies.

To better evaluate key success factors and study how companies have adapted in a sea of change and innovation; one needs to understand six strategic ICT trends that are changing how companies invest in technology (1) Cloud Computing, (2) Innovation for Growth, (3) Business Intelligence, (4) Consumerization of IT, (5) Natural User Interfaces, and (6) Social Network Services.

Trend 1: Cloud Computing

Cloud Computing is being talked about by everyone in the ICT industry. In its simplest form, Cloud Computing represents any type of ICT service (database, application server, custom code, mobile application, PC, etc.) that can be delivered over the Internet or "the cloud". An example of such a service is free email which has been provided for over a decade by companies such as Google, Microsoft, and Yahoo!. However, dating back to MIT's Compatible Time-Sharing System (CTSS) in 1961, email was not always so simple. Email was a luxury for those that actually understood what it was and for corporations that could afford it. Dedicated email servers were set up behind corporate firewalls. Access was only granted to key executives and those needing to send critical time sensitive information. Today email is a commodity, hosted for free over the Internet, and a representative example of the prolific growth of Cloud Computing.

The scope of Cloud Computing extends well beyond email. Other services that can be easily hosted on the Internet include Enterprise Resource Planning (NetSuite, 2011) systems, Customer Relationship Management (Salesforce.com, 2011) systems, Data Centers (Microsoft, 2011), and E-Commerce Platforms (Block, 2007).

The business case behind Cloud Computing is substantiated by the business benefits gained from moving from a traditional hardware model to a scalable cloud model.

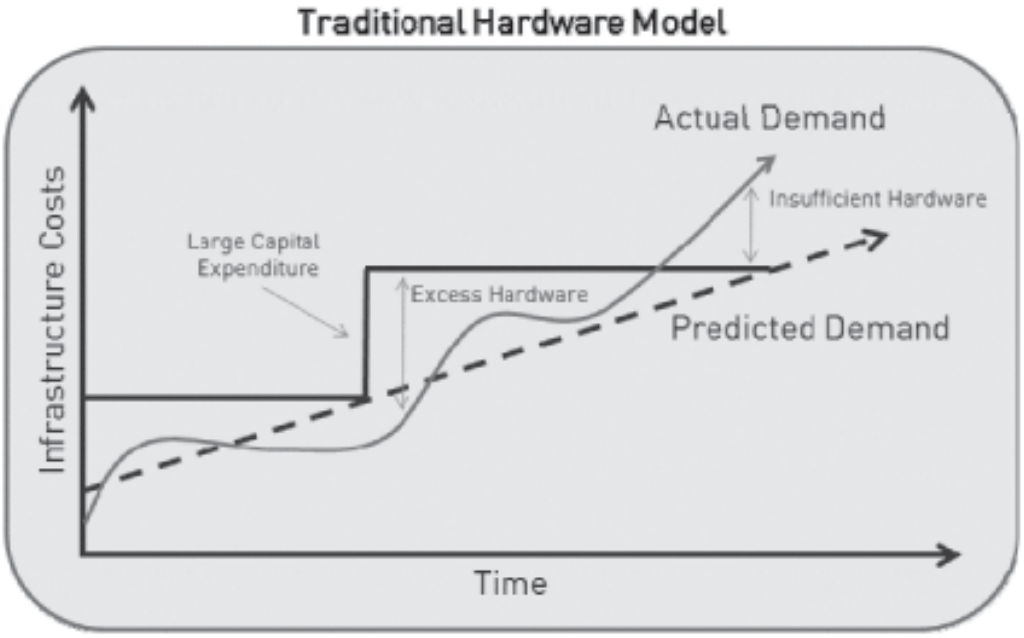
Traditional Hardware Model

In the traditional hardware model (Figure 1), IT infrastructure investments are characterized by large capital expenditures which expand capacity in discrete blocks. Actual demand for any business can be somewhat unpredictable. Rather than follow a linear growth in predicted demand, actual demand will have peaks and valleys. The challenge with the traditional hardware model is that during the valleys in actual demand, there is excess hardware (too much capacity) resulting in a lost opportunity cost. Even worse, during the peaks in actual demand,

there is insufficient hardware (too little capacity) to meet customer demand leading to customer dissatisfaction.

Prior to the availability of Cloud Computing, companies that invested in the traditional hardware model were forced to work within the boundary conditions of this less than ideal business model.

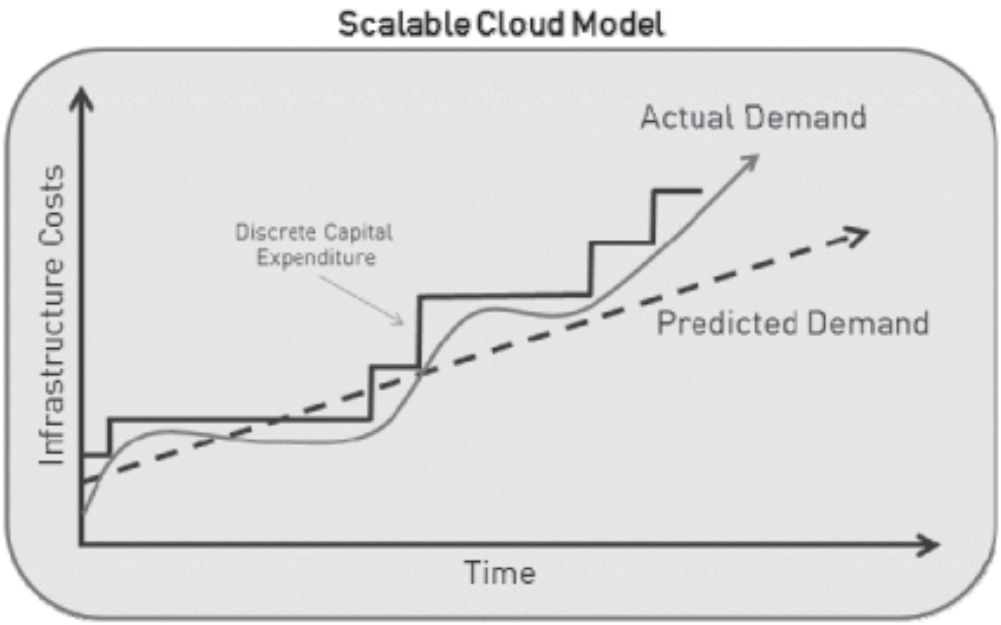
Figure 1



Scalable Cloud Model

In the scalable cloud model (Figure 2), IT infrastructure investments are done in discrete steps based on predicted customer demand. Doing so allows companies to plan based on predicted demand but scale in incremental steps based on actual demand. Opportunity costs are minimized and companies avoid situations of customer dissatisfaction.

Figure 2



Optimal Workload Patterns

There are a number of workload patterns that are optimal for Cloud Computing (Rhoton, 2011). Examples include:

- Rapid Growth
- Seasonality
- On and Off, and
- Unpredictable Bursting.

Successful startup companies are the easiest examples of **rapid growth**. For these type of operations, keeping up with growth is a big challenge and they often cannot afford the large capital investments linked to the traditional hardware model. Cloud Computing provides the benefit of rapidly scaling to meet customer demand with the lowest possible total cost of ownership.

The retail business is synonymous with **seasonality** fluctuations in customer demand. For these companies, Cloud Computing gives them the ability to increase computing capacity during the peak Christmas holiday season and then scale it back down during the non-peak season. Other seasonality scenarios include payroll and collections. For most companies, the payroll cycle is done once or twice a month. Beyond those timeframes, minimal computing capacity is needed to maintain those operations. For collections, it is very often the case that more than 95% of all customers will pay their utility bills on the last day of the month, especially in emerging markets. This is a classic scenario where massive computing power is needed for a very short period of time then no longer needed until the next payment cycle.

Some workload patterns are characterized as **on and off**. One example is a ski resort which is only in operation during the winter season, three months a year. Another example is the New York Stock Exchange with very set hours of trading. During the evenings, it is almost completely shut down. These workloads also greatly benefit from Cloud Computing given its ability to scale up and down without fixed capital expenditures.

Unpredictable bursting often happens during a natural disaster or political unrest. During these unpredictable periods, a burst in computing power is needed to manage rescue efforts, coordinate between government agencies, and provide help to citizens.

Summary

Cloud Computing is poised to achieve significant growth as software services offered by vendors provides competitive advantages at the lowest total cost of ownership to end customers. Cloud Computing services are rapidly expanding beyond software to also include infrastructure and development platforms.

It is also important to note that there are several hindrances to the growth and adoption of Cloud Computing, especially in emerging markets. The first is basic access to the Internet. Without high speed and reliable access, Cloud Computing will not be able to deliver the full business benefits previously discussed. Data security and data sovereignty are also critical factors. Enterprises are less likely to invest in Cloud Computing if there are concerns over the security of their corporate data. With information being hosted in one country, travelling across the world, and accessed in another country; the issue of data sovereignty is a complex one. A company or government needs to accept the fact that by investing in Cloud Computing, critical information and services are no longer under its full control, and may even be outside of its borders. Theoretically, this information may be accessed by the government where the data center physically exists through legal means such as search warrants or Congressional legislation such as the USA PATRIOT Act.

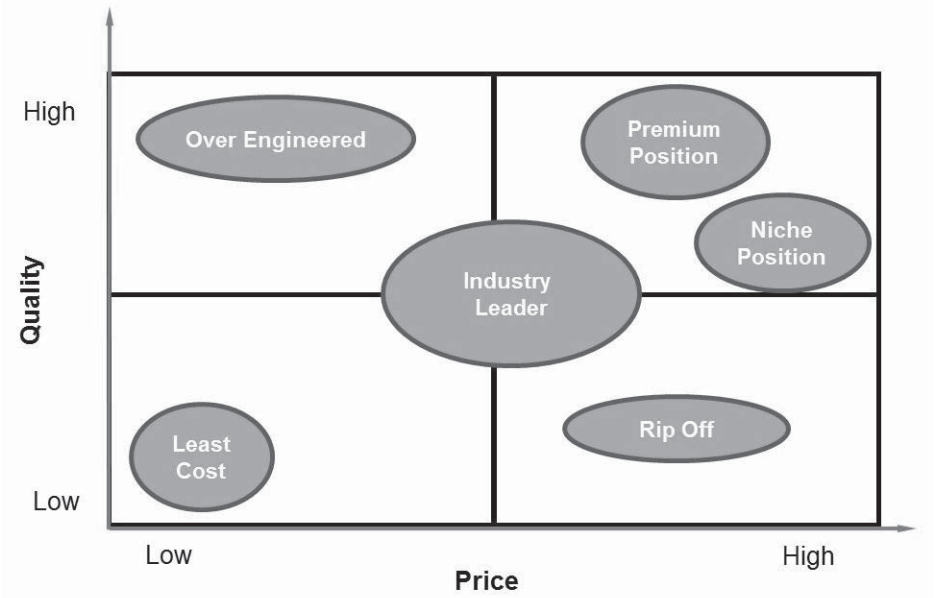
Even with these limitations, Could Computing is experiencing tremendous growth. According to a report by WinterGreen Research, Inc., called 'Worldwide Cloud Computing Market Opportunities and Segment Forecasts 2009 to 2015 (Winter Green Research, Inc., 2009), the worldwide Cloud Computing market is expected to reach $160.2 Billion by 2015.

Trend 2: Innovation for Growth

Importance of ICT Innovation

Innovation is a critical to the success and continued growth of many companies. Increased competition has led organizations to rely on innovation as a way to accelerate time to market and create a sustainable competitive advantage. The importance of innovation can also be represented by a framework introduced by Jean-Jacques Lambin (Lambin, 2000) shown in Figure 3.

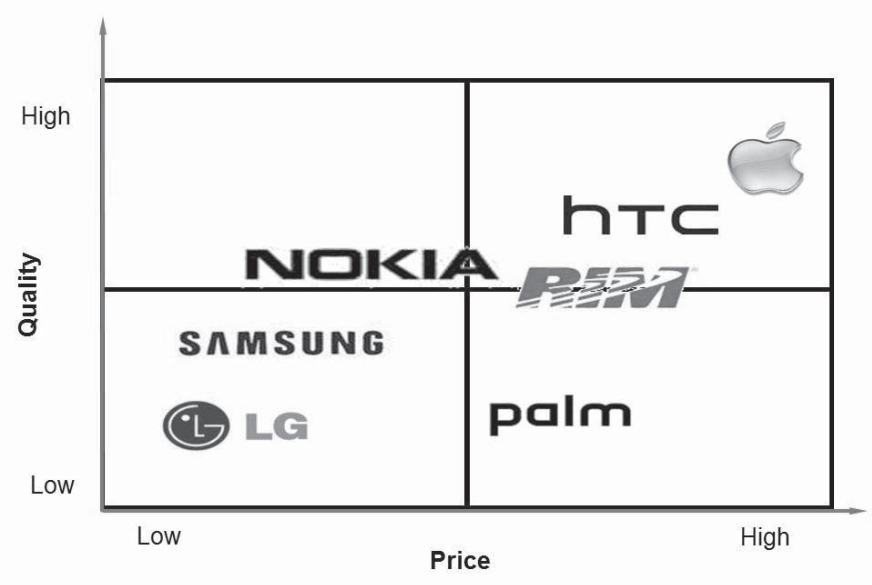
Figure 3



In this framework, companies can choose their market position based on price and quality. ICT innovations allow companies to establish themselves in the premium and niche positions. The benefits of this strategy include thought leadership, higher margins, and brand equity.

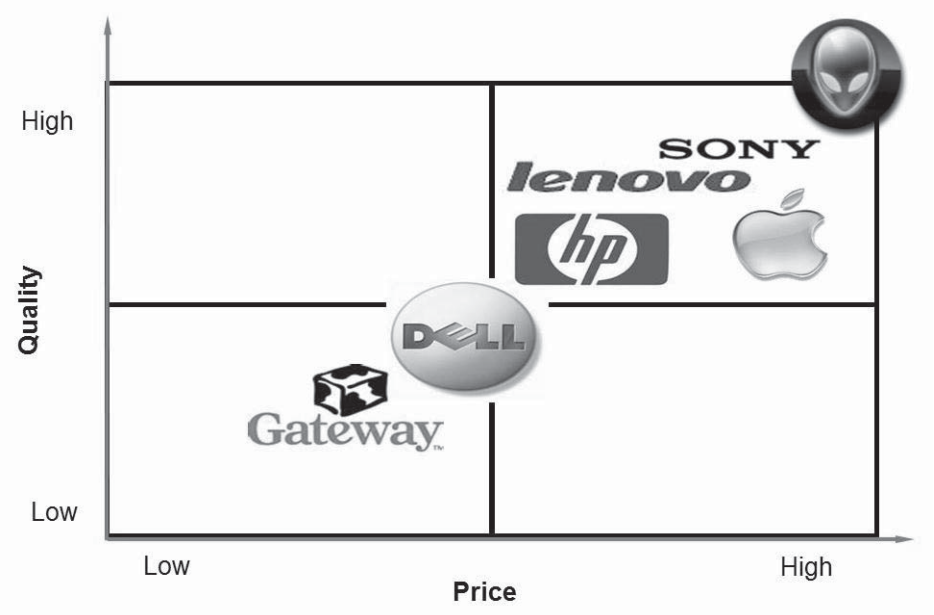
If we plot some of the major manufacturers of mobile phones on this grid in Figure 4, we can see how different companies have positioned themselves along the key diagonal that runs from the bottom left to the top right. Companies such as Apple and HTC, both invest heavily in innovation, research, and development. Both have been able to position themselves as premium and niche players, dominating the rapidly growing smartphone market which is forecasted to grow by nearly 50% in 2011 (IDC, 2011).

Figure 4



We can also perform this exercise for some of the major manufacturers of personal computers shown in Figure 5. Here Sony and Apple are the premium and niche players with their focus on innovation and design. One other player, Alienware, can only be characterized as off the grid. As a niche provider to the high end gaming market, Alienware's focus on innovation in this space allows them to sell ultra-premium desktops that contain CPUs with the highest overclocked speeds and cooled by high-performance liquid cooling systems in the $3000 to $5000 price range (Alienware, 2011).

Figure 5



Three Types of ICT Innovation

There are three types of ICT innovation (Christensen, 1997):

- **Evolutionary Innovation** is an innovation that improves a product in an existing market in ways that customers are expecting.

- **Revolutionary Innovation** is an innovation that creates a new market by allowing customers to solve a problem in a radically new way.

- **Disruptive Innovation** is an innovation that creates a new (and unexpected) market by applying a different set of values and forces the user to change behavior. A disruptive innovation is a technological innovation that improves a product or service in ways that the market does not expect, typically by being lower priced or designed for a completely different set of consumers.

Some examples of the three types of ICT innovation are shown in Table 1:

Table 1

Evolutionary	Revolutionary	Disruptive
• Brick & Mortar Stores	• Online Stores	• Online Auctions
• Cash	• Credit Card	• Online Cash
• Chemical Photography	• Instant Photography	• Digital Photography
• Recorded Music	• CDs / DVDs	• Digital Media
• Mail / Fax	• Email	• Blogging
• Newspaper	• Website	• Social Networking

Cash is an interesting example of evolutionary innovation. Many years ago, Thailand had a 10 Baht bill. With inflation, these bills were phased out and replaced with a 10 Baht coin. Recently the Bank of Thailand introduced a 2-Baht coin providing benefits such as fewer coins in circulation and the ability for vendors to increase prices from 11 to 12 Baht without much physiological impact to end customers – even with the 1 Baht increase, customers are only using 2 physical coins to make the purchase. This evolutionary innovation improved the use of cash in an existing market in ways that customers were expecting.

The use of credit cards created a new market by allowing customers to make a purchase decision in a radically new way. No longer did consumers need to have cash in hand or even in their bank accounts to make purchases. As long as they had credit, purchases could be made easily and securely with this revolutionary innovation.

An example of online cash is PayPal (PayPal, 2011). When PayPal was first launched in October 1999, it was a very complicated business model to understand. For $15, PayPal paid customers to sign up on their website and link their credit card and bank accounts together. Customers were then able to send money to their friends via PayPal. The funds would be deducted from their credit card at no charge. On the receiving end, customers would receive the funds in their PayPal account and have the option to withdraw the funds to their bank accounts. Not only did this disruptive innovation create a new (and unexpected) market by applying a different set of values, it also forced the user to completely change their behavior in how payments were made.

In evaluating the differences between the three types of ICT innovation, there is often no definitive right answer as it is highly dependent on the particulars of the market in which we are targeting. However, a simple way to assess the type of innovation is to ask the following questions:

- **Evolutionary**
  - o Does it improve a product in an existing market?
  - o Do customers expect it?
- **Revolutionary**
  - o Does it create a new market?
  - o Does it solve a problem in a radically new way?
- **Disruptive**
  - o Does it create a new and unexpected market?
  - o Does it force the user to change behavior?

Answering "Yes" to both questions will give a good indication of what type of innovation it is.

Crossing the Chasm (Moore, 1991, revised 1999)

Knowing what type of innovation you are launching to the market provides the best strategy to be successful. Both evolutionary and revolutionary innovations are considered continuous innovation. Adoption follows the traditional technology adoption lifecycle where the process of adoption over time follows a classic normal distribution or "bell curve". Customers are segmented into the following 5 groups:

- **Innovators** who pursue new technology aggressively and are less price sensitive,
- **Early Adopters** who easily adopt new technology, but are not technologists,
- **Early Majority** who are driven by a strong sense of practicality,
- **Late Majority** who normally wait for technology to become established standards, and
- **Laggards** who do not want anything to do with new technology.

A key difference in marketing disruptive technologies is that it is a discontinuous innovation and as outlined by Geoffrey A. Moore, the adoption process is split into three distinct phases:

(1) An **early market** inclusive of innovators and early adopters,

(2) A **mainstream market** ranging from early majority to laggards, and

(3) A period of time between the early and mainstream markets called the **valley of death**.

Confusion between continuous and discontinuous innovation is a leading cause of failure for high tech products due to the inability to cross the valley of death. To successfully establish a disruptive or discontinuous innovation, companies need to focus on one group of customers at a time, using each group as a base for marketing to the next group. Successful companies can then create a bandwagon effect in which enough momentum is built to cross the valley of death and establish itself as a de facto ICT standard.

Take for example, Research in Motion when they first launched the Blackberry smartphone in 1999 (Research in Motion, 2011). RIM recognized that the Blackberry was a discontinuous innovation

since it (1) created a new and unexpected market and (2) forced the user to change behavior. No longer did executives need to call their administrative assistants for important messages or an updated schedule while they were in transit or on the road. The information was pushed to them in near real-time increasing productivity and changing the way people communicated and worked. In its early days, RIM remained focused on its Early Adopters, corporate executives with the need for mobile and secure email communication. With this focus, so much market momentum was built up that it became the de facto standard in corporate mobile communications. Eventually, the growth of the Blackberry expanded to the rest of the enterprise, consumers, and worldwide smartphone market.

In regions with accelerated mobile access such as Southeast Asia, the number of BlackBerry devices across the Southeast Asian archipelago jumped from less than one million in 2009 to more than five million in 2011 (Rubbi, 2011). Indonesia's top telecommunications companies said that between 2010 and 2011, the number of BlackBerry users had more than tripled.

Summary

In today's competitive business environment, companies are always looking for that extra edge. Effectively investing in and managing ICT innovation allows them to gain that edge and possibly enter the premium and niche market positions.

Common pitfalls include a lack of understanding of the type of innovation a company is bringing to market. Marketing strategies need to adapt depending on if the company is introducing an evolutionary, revolutionary, or disruptive innovation. Successfully doing do can lead to market leadership and establishment as an industry standard.

Trend 3: Business Intelligence

The Value of Business Intelligence

Companies that have successfully leveraged Business Intelligence (BI) for the benefit of their business understand the importance of having a system that consolidates, manages, and controls the information within the enterprise. Maintaining a "single version of the truth" allows executives to have a complete view of the business and the data to back up strategic business decisions.

Protection of confidential information is a key requirement for all Business Intelligence solutions. They can be used to monitor Key Performance Indicators (KPI) and drive alignment across the organization. By objectively measuring performance at all levels, organizations are able to hold their employees accountable and provide executives with complete visibility though scorecard/report centers or real-time dashboards. Most enterprises have reached the point in the improvement of performance and costs where Gartner says they can afford to perform analytics and simulation for every action taken in the business (Cearley, 2011).

The following two case studies demonstrate the value of business intelligence for an organization. The first case study focuses on the demand side while the second case study focuses on the supply side.

Case Study #1 – Energy Drink Market

Energy drinks have rapidly growth in popularity in the Unites States and Europe and are typically marketed to students and extreme athletes (Red Bull, 2011). Americans will spend around $9 billion on energy drinks in 2011 (Phillips, 2011). These drinks typically contain caffeine and sugar combined with smaller amounts of natural substances like guarana, ginseng, and taurine.

In Southeast Asia, energy drinks have a much longer history. 20 years ago, drinks such as Red Bull, Lipovitan, and M150 were marketed to truck drivers in Thailand as a way for them to stay awake and alert during long hauls.

A common assumption is that the biggest customer for these companies would be distributors in the provincial regions of Thailand as it is very common for rural truck drivers to drink more than 5 bottles a day. However, through the use of Business Intelligence solutions, it is being discovered that while an office worker in Bangkok may only drink 1 bottle a week, the sheer volume of this customer base eclipses any other end customer segment. Thus the biggest customers for these companies are actually hyper-markets such as 7-11 and Lotus Tesco in the Bangkok metropolitan area.

Given this valuable business insight, you can see the active transformation of marketing for energy drinks in Thailand to cater to office workers, Generation X, and Generation Y (Osotspa, 2011). Rather than help keep you awake during long hauls, it helps you stay alert during office meetings and the energy to go out and enjoy a night on the town.

Case Study #2 – Oil and Gas

Oil and Gas companies are separated into upstream and downstream operations. Upstream operations are highly profitable and focus on the exploration, drilling, and refinery of crude oil. Downstream operations have very low margins and focus on the distribution of oil through gas stations. Take for example, Thailand's Oil and Gas conglomerate PTT. PTT's upstream operations are handled by PTT Exploration and Production (PTT EP, 2011). PTT's downstream operations are handled by PTT Retail Management (PTT RM, 2011).

With upstream operations being extremely profitable and downstream operations not, one might consider the need for companies such as PTT, Shell, Chevron, and Pertamina to have downstream operations at all. The answer lies in the necessity to have a distribution channel for their end products and ability to reach as many of their end customers as possible.

In using Business Intelligence solutions, Oil and Gas companies can analyze the profitability of their downstream operations and assess who their biggest suppliers are. While most gas stations

obviously sell gas, customer will typically perform several other activities while filling up the tank. These activities include going to the bathroom, stretching, and grabbing a snack.

It is the later that provides the highest margins for downstream operations, making their biggest suppliers companies such as Coca-Cola. PTT Retail Management has taken advantage of this, quickly diversifying into hyper markets with Jiffy and coffee shops with Amazon Caf?. They continue to expand their retail presence further proving the importance of Business Intelligence in driving a successful business strategy.

Summary

Business Intelligence has many benefits providing organizations with key insights that can greatly alter corporate strategies. However, can there be too much data? With the advancement of database technologies and the continuous tracking of both master and transactional data, organizations can quickly become overwhelmed with the petabytes of data they have collected. This is why it is also important for companies to utilize new tools and techniques in data mining (Han & Kamber, 2011) that are being developed to help streamline analysis and make sense of this explosion in data.

Trend 4: Consumerization of IT

The Rise of the Consumer

In the past, IT was predominantly driven by the enterprise. New technologies and innovations were driven by the need of businesses to increase collaboration, efficiency, and the speed of doing business.

With the maturity of Generation Z or the Internet Generation, all this has changed. Students entering college are now younger than the Internet. They have grown up in a world of ubiquitous computing using email, instant messaging, and mobile technologies as naturally as a pen and paper. According to Gartner, the average teenager sends 4,762 text messages per month (Cearley, 2011).

This demographic shift along with the explosion of the consumer IT experience has led to the Consumerization of IT, where IT is now driven by the consumer rather than the enterprise. An example is the Apple iPhone which started as a consumer devise. As more and more consumers bought the iPhone for personal use, they wanted to start using the same devise in the workplace. This forced corporate IT departments to start supporting this form factor as a corporate approved mobile devise providing secure email access through the embedded Microsoft Exchange (Microsoft, 2011) client.

The same has been seen with instant messaging, VoIP technologies, online collaboration, and social networking. All these technologies have their roots in the consumer space and have moved upstream to the corporate world. According to a Unisys-IDC study, 95 percent of information workers use at least one self-purchased device at work (IDC, 2010). For enterprises to successfully adapt to the Consumerization of IT, they need to

strike a balance between user expectations as consumers and enterprise requirements for security, privacy, and compliance.

Emerging Form Factors

The spectrum of form factors has continued to expand over the past several years leading to ubiquitous computing for the masses. Desktops still represent the best form factor for pure content creation but are however, becoming rarer in the market. There are laptops and Tablet PCs providing more mobility and flexibility.

The spectrum then begins to shift into form factors such as slates and mobile phones that are more suited for content consumption. Slates have emerged as a recent disruptive technology, especially since the launch of the iPad in April 2010 (Apple Launches iPad, 2010). While Apple iOS dominates the tablet market today, Gartner says it expects iOS/Android will dominate the market with 80% of tablets shipped by 2015 (Cearley, 2011). On the far end of the content consumption spectrum are e-readers such as the Amazon Kindle initially launched in 2007 (Block, 2007) which has also gained in popularity over the years due to the vast amount of content, battery life, and suitability for long periods of reading.

Most players including companies such as Samsung who launched the Galaxy Tab in 2010 (Ricknäs, 2010), have tried to address both ends of the spectrum providing different form factors catering to the different needs of end customers for both content creation and content consumption.

These emerging form factors have further accelerated the Consumerization of IT. As consumers demand devices that support content creation and content consumption, corporate IT departments will further need flexibility into incorporating these form factors into their corporate IT strategy and budget.

Summary

Not all organizations have openly embraced the Consumerization of IT. Platforms and standards in the enterprise have been developed over many decades. Especially in high security environments such as the military, government, and defense; the Consumerization of IT can lead to unwanted security risks. Transforming to a platform and device agnostic organization can also increase support costs. Companies that have IT organizations that are unable to cope will experience reduced service level agreements instead of increases in productivity. It is for these reasons that each organization needs to determine how quickly they will be able to adapt to the increasing Consumerization of IT.

Trend 5: Natural User Interfaces

Graphical User Interfaces

Graphical user interfaces or GUI (Galitz, 2007) were a breakthrough in computing. It allowed users to interact with electronic devices with images rather than text commands.

A GUI represents the information and actions available to a user through graphical icons and visual

indicators, as opposed to text-based interfaces. Commonly used graphical user interfaces in personal computing are Microsoft Windows and Apple Mac OS.

Natural User Interfaces

Natural user interfaces or NUI (Wigdor & Wixon, 2011) is a relatively new term used to describe a user interface that is effectively invisible, or becomes invisible with successive learned interactions, to its users. This invisibility is linked to the word natural, since users feel that the interaction is part of their everyday or natural motions, movements, and activities.

Natural user interfaces have quickly expanded into popular mobile devises with Google Android and Apple iOS. One example of a NUI is the ability to decrease the size of a photo on many smartphones by pinching your fingers together. While this motion is a learned one, the link between pinching and decreasing the size of an image becomes so closely intertwined that it quickly transforms to second nature to the user. In 2009, with the advent of Microsoft Surface, Windows 7, and Xbox 360's Project Natal (now called Microsoft Kinect for Xbox 360), Microsoft was looking to make NUI pervasive with a vision for the future that involved computing surfaces that blend seamlessly into everyday objects and that require nothing more than voice, touch or gesture to understand commands from the end user and to perform the associated tasks (Oiaga, 2009).

Back in 2006, the Nintendo Wii was a fabulous innovation that took natural user interaction to the next stage for gaming consoles. For the first time, players could carry out relatively natural motions and movements that would control and manipulate the on-screen gaming content, rather than use a joystick and press a series of buttons on a controller.

The first buyer of the Nintendo Wii in the United States waited in line outside the store for more than a week (Svensson, 2006) and Nintendo sold more than 105,000 Wiis in the UK during its 2006 Christmas holiday season weekend launch (Smith, 2006). The Nintendo Wii transformed how people interacted with games through the Wii Remote which used a motion sensing technology, inclusive of accelerometer and optical sensor, to translate a user's movements to actions on the screen.

"The way we look at it, we're in the entertainment business consumers only have a limited amount of time for entertainment and so we compete with Apple, we compete with your program [CNBC], we compete with books and magazines, we compete with everything people do for entertainment", Nintendo of America President Reggie Fils-Aime said in an interview with CNBC in 2009 (Spencer, 2009).

Combined by Nintendo's manufacturing experience, lower cost of components compared to the Microsoft Xbox and Sony PlayStation 3, and strength of Japanese customer base, the Nintendo Wii became the only console in the market at the time that was sold for a profit.

Its dominance of first-party games also added to their success. First-party games are those that are published by the console maker themselves making them much more profitable for the console maker. Third-party games are those that are published by another company, such as Electronic Arts, THQ, or Sega. An example of a first-party game is Wii Sports produced by Nintendo (Wii, 2006) and sold exclusively for the Nintendo Wii console. An example of a third-party game is Medal of Honor produced by Electronic Arts (Electronic Arts, 2011) non-exclusively for two competing consoles, the Microsoft Xbox and Sony Play Station 3.

Other gaming console providers were blind-sided by the success of the Nintendo Wii and quickly followed in its footsteps. Microsoft and Sony have both responded with their own NUI technologies named Microsoft Kinect for Xbox 360 and Sony PlayStation Move respectively.

Summary

Natural user interfaces are changing how we interact with technology. It is also opening new avenues for competition. While the objective of natural user interfaces is to bring technology adoption to the masses, it is still currently cost prohibitive in many emerging markets. As the cost of technology decreases, natural user interfaces will become more pervasive and expand its influence on how both consumers and enterprises use technology in our daily lives.

Trend 6: Social Network Services

Market Overview

Social Network Services (SNS) have grown exponentially over the past five years. They are changing the way people get in touch, exchange ideas, and learn from one another. In recent years, the clear market winner in terms of US market share of visits has been Facebook while the biggest loser has been MySpace (Kallas, 2011).

Market Segmentation

In segmenting the Social Networking Services market, a number of frameworks can be used. A useful framework in analyzing this market is to segment based on two dimensions.

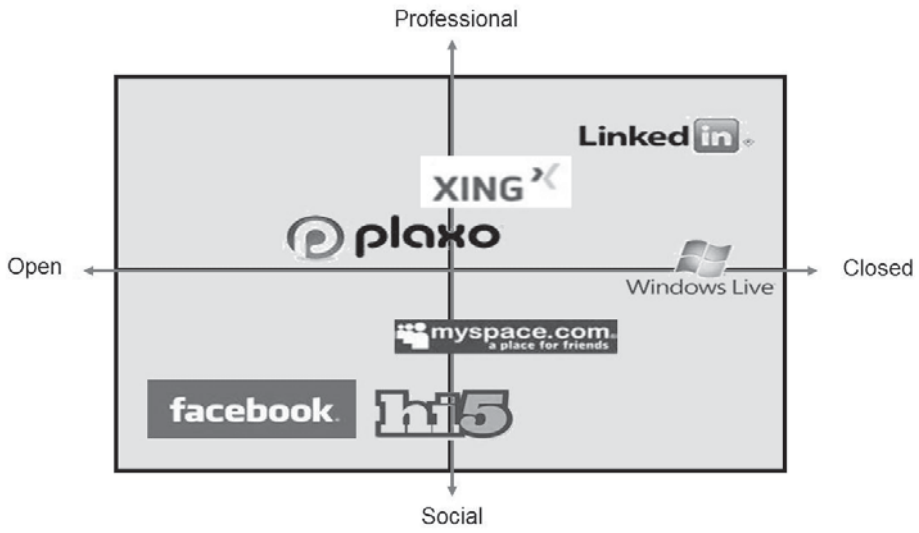
The x-dimension is the openness of the service. Open means that there is flexibility in the service to customize the content based on personal preferences. Closed means that there is limited flexibility in the service and the format of the content is relatively fixed.

The y-dimension is the scope of the service. Social means that it is used for social networking to keep in contact with friends and family. Professional means that it is used for professional networking to keep in contact with business contacts.

By plotting various Social Networking Services on this grid as shown in Figure 6, you can see a clear grouping towards the lower left to upper right diagonal. There are two companies that emerge from the pack. Facebook is an open service that

focuses on social networking with over 800 million active users (Facebook, 2011). LinkedIn is a closed service that focuses on professional networking with more than 120 million members in over 200 countries and territories (LinkedIn, 2011).

Figure 6



Demographic Profile

The demographic profile of Social Networking Services is very revealing. According to iStrategy Labs (Corbett, 2010), roughly 54% of Facebook users are female. Median age is surprisingly high at 35 - 54. Most users have at least a college degree and median household income for users in the United States is $50,000 - $75,000.

The demographic profile of LinkedIn users is equally impressive (Yoffie, Slind, & Nitzan, 2009). Average age is 41, 78% are college graduates, and average household income for users in the United States is $109,762. 5.2% of these users are classified as Vice President and above and 46.5% are classified as Business Decision Makers.

As compared to advertising via traditional channels such as newspapers, magazines, and television; this demographic profile allows for amazingly effective and accurate customer targeting in terms of advertising for Facebook and recruiting for LinkedIn.

From a customer-based competitor analysis, Facebook and LinkedIn can be classified as competitors along with other Social Networking Services such as MySpace, Xing, and Renren. However, from a strategic-based competitor analysis, Facebook's competitors are traditional media

advertising channels such as USA Today, People Magazine, and FOX. LinkedIn's competitors are the Wall Street Journal, Bloomberg BusinessWeek, and CNBC.

Summary

Social Network Services are changing how we interact. From a business perspective, companies have leveraged social networking services as a new advertising and marketing channel to reach new customers and audiences. However, there are also social implications of social networking and many concerns over how it has blurred the lines between an individual's personal and professional life. As such, companies have also created social networking guidelines as part of their employee handbooks specifying what can and cannot be shared on social networking sites.

Conclusion

Information and communication technologies are extremely dynamic and becoming ever more complex in nature. As customer demands continue to increase over time, companies are always looking to gain that added competitive edge and adapting how they invest in technology.

Companies are starting to invest more in Cloud Computing to reduce total cost of ownership and provide them with more flexibility as compared to traditional hardware models. Optimizing how companies invest in ICT innovation helps them reach premium and niche market positions as well as establish themselves as industry standards. Making sense of the mountains of information in an enterprise allow organizations to leverage Business Intelligence as a mechanism to improve internal operations, relationships with business partners, and corporate strategies. Embracing the rapid changes in technology and adapting to the Consumerization of IT helps companies increase productivity and flexibility for their employees. As natural user interfaces become more pervasive, competitive landscapes and the everyday use of technology will change. Companies need to start adapting to this trend to avoid losing out in key market opportunities. Finally, while companies need to balance new market opportunities with sensitive social implications, they have gained access to new and exciting channels through the explosive growth of social networking services.

To achieve continued success, companies need to understand and adapt to six key ICT trends (1) Cloud Computing, (2) Innovation for Growth, (3) Business Intelligence, (4) Consumerization of IT, (5) Natural User Interfaces, and (6) Social Network Services.

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