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The Age of Globalization: Impact of Information Technology on Global Business Strategies

The Honors Program
Senior Capstone Project
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April, 2007

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EXECUTIVE SUMMARY

Globalization has completely altered the way in which the world operates. The barriers that once hindered our ability to communicate and interact with people across the world have diminished. Globalization has become ingrained in all fields: business, government, economic, social. In this paper the role of globalization on society will be discussed and in particular, the impact of globalization on the business environment. Also, over the past few decades advancements in information technology have had a profound on the global landscape as well as on the progression of globalization. The argument will be presented, that innovation in information technology has been a major driving force behind globalization and that information technology has now become a key component of a corporation's global business strategy.

INTRODUCTION

It finally hit me in the fall of 2006 as I was getting ready to play my final year of collegiate hockey for my University. I was placing all of my equipment together, getting ready to go to my first practice of the year, when I glanced at my hockey stick made by, Sher-Wood Hockey, a well-known hockey equipment manufacturer based out of Canada. At the top end of the stick was some small white writing and it said, "Made in China." Now at first you might ask, why is this so unusual? There are all kinds of everyday objects that are made in China; however the "Made in China" inscription struck me as quite surprising. Why would a company based out of Canada, known for its quality hockey equipment, most notably its hockey sticks, be shipping its manufacturing processes half way around the world. It would seem that the company would be better off keeping all manufacturing facilities in Canada? China is not well known as a hockey power, so again why would a company based out of the country that invented the sport, manufacture its products in a country most-known for its martial arts? Common sense would dictate that the company would only make the decision to move production, if it produced positive and worthwhile results.

In order to understand why this is such a surprising story, one must look at Sher-Wood Hockey's history. Sher-Wood Hockey began as a family business in 1949 and slowly grew into a well known name in the world of hockey. Eventually the company began selling outside of Canada and to the United States and other countries around the world. In just under 60 years Sher-Wood has grown from a small family-owned business to a multi-national corporation. This is not a unique occurrence either. Companies all over the globe have transitioned from small-time businesses to global corporations at an ever-increasing rate. Perhaps a better known example would be the story of Wal-Mart Stores. Wal-Mart began as a small discount store in Arkansas in 1962 and in forty-five years the company has grown to the world's largest retailer and second largest company. It seems almost unfathomable that, in less than fifty years a home-town company could become the world's second largest corporation only behind Exxon-Mobil. These two examples and the thousands of others just like

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them are all part of the phenomenon, which has come to be known as “Globalization”.

The main purpose of this paper is to explore the role of globalization on society and in particular, the impact of globalization on the business environment. The argument will be presented that innovation in information technology has been a major driving force behind globalization and that information technology has now become a key component of a corporation’s global business strategy.

GLOBALIZATION

Six Processes of Globalization

Globalization is such an expansive and intricate concept that it is often hard to define, but in the same way, because of its breadth there are many different takes on just what globalization is. Two well-respected anthropologists define globalization as, “the intensification of global interconnectedness, suggesting a world full of movement and mixture, contact and linkages, and persistent cultural interaction and exchange”.¹ Just using one definition however, does not justly describe all that globalization is. In order to truly get a deeper understanding of globalization you need to delve deeper into what makes globalization what it is. In order to provide you with that background I will explain six processes that merge together to provide a solid foundation of what exactly globalization is.

- 1) Speeding Up of flows of capital, people, goods, images and ideas across the globe. Through increased communication, transportation and technology, flows have quickened immensely. Basically this is the quickening of actions that used to take much longer to complete. For example the mail system, it used to take weeks to transport a piece of mail during the period of the American Revolution, now you can mail objects across the globe instantaneously.
- 2) Intensification of the links, modes of interaction and flows that interconnect the world. Meaning, much more information is given to you at one time than ever before. For example in the 1940's all you had for news was the radio, now, on your computer screen you can have feeds from 10 different news sources, while getting news on your cell phone and watching the news on TV all at the same time.
- 3) Stretching Out of social, cultural, political and economic practices across frontiers. This means that practices and decisions made in one part of the world can have consequences on communities and cultures in other locations around the world. For example when North Korea began testing nuclear weapons it had a huge political

¹ JX Inda & R Rosaldo, ‘A World in Motion’ in JX Inda & R Rosaldo (ed), *Anthropology of Globalization*, Blackwell Publishing, Malden, MA, 2002, pp. 1-34.

and social affect on the rest of the world as many countries saw it as an imposing threat and gesture by the country.

4) Interdependency of the global and the local landscape such that, while everyone might continue to live their local lives, their actions made in their local environment have become global events that come back to have an impact on local spaces. Basically, whatever actions done locally, have an effect on the global landscape. For example using something as simple as sugar, can have a significant affect on the people of Brazil who produce the sugar we consume.

5) Anti-Eurocentric movement from the practices that take European or Western values, concerns, good and culture and place them on other countries located around the globe. By getting away from Euro-centrism, there is now also movement that occurs between periphery (smaller, less powerful) countries and from periphery countries to the Western countries. It used to be that all values, goods, and cultures came from the United States and European countries and were then passed to everyone else, but now values, goods, and cultures come from all over the world and are shared to any number of countries across the globe. A good example of this would be the medicine. Many of the medicines we use here in the United States come from natural treatments and resources found in other countries.

6) "Westernization" does not occur, in the sense that people absorb ideas, values and lifestyles from Western Civilization. People now customize there own ideas, values and lifestyles. Meaning that people do not just take what is provided for them, people now shape and form their own ways of living that was once not the case. For example in the early part of the 20th century when immigrants from Western Europe came to the United States they tried their best assimilate with the American lifestyle in order to provide a better opportunity for their families. Now immigrants assimilate somewhat to American life, but for the most part they make their own way of life that is unlike any others.

The six italicized terms are the names of the six processes that should be remembered when thinking of globalization. Now every action and event that occurs

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globally does not necessary have to involve all of these processes, some events may only incorporate one process while some may include all of the processes. In either case however, when all six processes are combined they form the basis behind globalization.

Globalization's Effects on Global Landscapes

There are some key terms that need to be made aware of, in order to better understand the broad effects of globalization. One over-arching effect that globalization has brought is called "time-space compression", meaning the transition between moments and distances between spaces are being shortened and reduced. It currently takes much less time to get tasks done than ever before and geographic distance is no longer an obstacle that must be overcome. The next term, "deterritorialization", means that physical locations no longer matter with respect to cultures and people. Different cultures can now communicate and connect with each other from all different parts of the world like never before. From a social standpoint these two factors contribute to the largest and most important effects of globalization.

It could not to examine all of the effects of globalization in a single paper, let alone this brief introduction. Instead I will provide a general overview by covering a few of the benefits of globalization, from a global perspective, as well as some of the drawbacks of globalization, to provide a brief background on the effects caused by globalization.

Benefits

Increase in Knowledge: with the quickening and intensifying flows of information and communication, people can now access more information from all over the world, all from the comfort of home.

Cheaper Products: the speeding up of flows of transportation and communication along allows companies to search around the globe for the least expensive labor and manufacturing costs.

Increased Competition: with the shift from Euro-centrism, trade occurs between all countries, leading to similar products coming from all different parts of the world, so companies have to continually keep up with global trends and changes in order to stay competitive in their market.

Drawbacks

Lower wages: companies can now search all across the globe for the lowest priced labor so in some cases you will receive lower wages for a job that should be paying a higher rate.

Higher Discrepancy between the rich and poor: the ones who are able to take advantage of all that globalization has to offer are the people who have the money to take advantage of it, unfortunately for the ones with little or no money are left in a cycle of poverty because they can not afford to utilize the benefits of globalization.

Destruction of local industries: in some cases companies take advantage of cheap labor in certain locations, which destroys local industries because these local companies can not compete with wages larger multinational companies offer.

Only covering a few effects of globalization, it is apparent that there are both positive and negative effects of globalization and many of these effects are much more complex and multi-dimensional. There is far more that could be debated on the benefits and drawbacks of globalization, but that is not the purpose of this paper. Whichever way you feel about globalization, globalization is not going away. It is currently affecting our lives more and more everyday and has immense implications on the way we live our lives.

Globalization's Effects on Business Environment

There is no specific event or timeline that marks when modern globalization began, because it was a gradual progression, but what needs to be remembered is that globalization means worldwide integration not just of social systems, but of political, cultural and business systems as well. It is possible to dissect each of these systems and examine the affects of globalization on them, for the sake of this paper I will only focus on its affect on the worldwide business environment. Over the past few decades there has been a sudden increase in international integration of goods, services, capital and economic activity, it is this worldwide integration that has lead us to come up with the term, globalization. Even, though this integration of worldwide markets and economies is relatively new, the evolution of globalization has had a profound affect on the global business environment. To keep this paper as "up to date" as possible I will only go over the effects of globalization at its current state of total worldwide integration when discussing the business environment.

One of the most beneficial aspects of globalization for businesses is that companies can now take skills and knowledge from across the globe and widen their horizon which leads to increased collaboration and breakthrough innovations. The ability to communicate and transfer information all around the globe lets companies focus on their main core competencies which in turn leads to better collaboration and innovation. Thomas Friedman argues, with the growing pressure of commoditization, collaboration and innovation are invaluable qualities that your company must possess. Being able to draw from experience, knowledge, skills from firms and individuals increases your chances of creating the next breakthrough product.² With globalization, this type of worldwide collaboration is possible, companies are now able to outsource and offshore sectors of their corporation or merge with companies from different corners of the world and are now able to communicate and transfer knowledge with almost no effort and at super-sonic speeds. There is a limitless talent pool that is out there waiting to be utilized and with globalization corporations now have the ability to use this talent.

² TL Friedman, *The World is Flat: A Brief History of the 21st Century*, Farrar, Stratus & Giroux, New York, 2006, pp. 439-440.

Globalization has also led to companies being able to lower costs and increase efficiency in their business functions. The terms “outsourcing” and “off shoring” have become common terms in today’s business world and are now part of almost every multi-national corporations business strategies. To be clear “outsourcing” means taking a specific business function that your company was doing in-house and having another company perform that exact same function for you. “Offshoring” by contrast, is when a company takes one of its factories that is has locally and moving the whole factory off shore. Outsourcing gives a company the ability to innovate faster and be more cost efficient this allows companies to grow larger and gain a larger market share, while hiring more varied specialists. A common misconception about outsourcing is that outsourcing cause’s job loss, when in fact if a company can outsource, it lets them innovate, save costs and gain a larger market share and grow and this growth creates jobs for people. With offshoring companies are now setting up manufacturing plants all around the world, whether it is because, that area is known for specializing in producing that product, cheaper labor, lower taxes, health-care costs, etc. In either instance a company can either increase efficiency by taking advantages of areas that specialize in manufacturing that product or lower manufacturing costs by finding the least expensive labor and resource costs and setting up a plant there. Higher efficiency and lower costs would not be available to companies if globalization was not affecting the global market. Globalization allows for quicker information transaction, quicker transportation, and a wider selection of mobility from country to country in order to find the most efficient and cost effective location.

Another major effect of globalization on business is a business’ ability to empower the consumer. Now at first this may appear to have a negative impact on businesses, when in fact it does the opposite. With globalization consumers are now able to find the product that fits them best, as products are now coming from countries all over the world as the ability to communicate has grown easier and the transportation of goods has become quicker consumers can find any type, size, price, customization of the product they choose. Friedman provides a prime example of giving power to the

consumer with the case of E*trade, the online bank brokerage house. What a company such as E*trade does is provide a platform for customers to view and update nearly every facet of their financial accounts, in doing so, it empowers the consumer because he or she feels that every product³, in E*trade's case their financial account information, is tailored specifically for them, when in fact all the company is providing is a platform for consumers to pick and choose what and how much information they want to view of their financial accounts. With the speeding up of information flows along with the intensifying of these flows, companies can now let consumers take control and decide on products and services that they feel are customized just for them.

Another major effect globalization has had on the business environment is that now small companies can join the global playing field. A recent IBM global study found that because of increased digital infrastructure, new wireless capabilities and changing integration of worldwide economic policies, barriers to global competition have nearly disappeared.⁴ This breakdown of global barriers has given smaller companies access to distribution channels that previously were only available to large corporations. At the same time larger corporations are able to act on a smaller scale as these smaller, specialized firms enter the marketplace, larger corporations can take advantage of the flexibility and fresh outlook these new entrants present. Both sides profit as larger corporations are able to specialize to reach smaller market segments, and smaller firms have the advantage of using the expertise and size of larger corporations to grow their own company.

Globalization also leads to increased competition due to the introduction of products from countries all around the globe with the ever-increasing lower prices. It used to be that firms would only compete against firms that were geographical close and of similar size. Now with globalization, companies are competing against other companies all around the globe and of all different sizes. This growing competition also leads to what is known as commoditization, where there are so many companies

³ Ibid, p. 437.

⁴ IBM, *Global Innovation Outlook 2.0*, IBM, Armonk, NY, 2006.

with so many similar goods that a company's specific good becomes a commodity in its market because there are so many others just like it. The rate at which commoditization has occurred was unanticipated as well; just a few years ago organizations were competing against a few companies with some similar products. Now organizations are competing against companies from around the globe that provide many unique and varying products and companies now have to find a way to develop products and services that differentiate themselves from the rest of the world.

Globalization has a major impact on the business environment which will only continue to increase and magnify as the years go on. After examining all of these effects the business playing field is being "leveled" so to speak in three different levels: firm, multi-national, and country. At a firm level, companies large and small from countries all over the world are now able to participate in global markets and it is almost a necessity that they do in order to survive. Small firms can compete in niche markets on global scales, and larger companies can merge or acquire these smaller firms to gain entrance into those niche markets, thus expanding their business. At the multi-national level, information technology opens doors for increased trade, the commerce then follows the technology infrastructure and then the countries must follow and engage the increased commerce in order to compete at the global level. The playing field is also being leveled on a country level because there are countries now that can enter in the global marketplace in just a few years thanks to advances in information technology. Countries such as Taiwan and Singapore are well on their way to becoming major players in the global landscape. The reason why, is that there is no pre-existing technological infrastructure present, so there is no need to retro-fit new technologies to pre-existing, outdated technologies. With improvements in the speed and functionality of implementing a technological infrastructure, these new countries such as Taiwan and Singapore, can enter into the global marketplace, with relative ease, in a matter of years.

Because of this "leveling" it continues to get more and more important for companies to take advantage of all that globalization has to offer or else they are sure to be left

behind. The day has passed when a company could rely on only a few established products and still survive, today a company must continue to assess and re-evaluate its business functions and competencies in order to stay ahead of the global market place and continue to develop new and differentiating products. There is one issue that is for sure however, in the days to come, companies will no longer be able to survive by doing business in a single nation, even if that company is located in the United States. Corporations must acknowledge the existence of globalization and the effects it has on their business, in order to stay afloat in a global marketplace that is becoming larger and larger and increasingly more competitive.

IMPACT OF INFORMATION TECHNOLOGY ON GLOBALIZATION AND BUSINESS

In the past few sections we have defined what globalization is, its effects on society and its relationship with business. The one topic I have yet to go over is how exactly globalization is able to have this much of an impact on the global landscape and the key catalyst for globalization is, information technology. The progression towards globalization has been around for centuries, but it really became noticeable in the early 1900's with technological advances. The telegraph and telephone allowed people to communicate across borders in seconds when previously it would take weeks or months to relay messages. The invention of the airplane allowed for much quicker international travel, while communication devices such as the radio allowed people all over the globe to listen to news from all over the world in near real time. Keep in mind however, that this is not what we consider globalization today. The early 1900's were one of the major stepping stones in helping us get to our current state of globalization, but during that period there was no collective worldwide integration as many of the global processes of that time were still one-dimensional.

Globalization really came to being in the latter part of the 20th century with advances in information technology. Information technology was the driver in creating the worldwide integration of various global markets that make up globalization. It would again be near impossible to discuss every influential technological advance over the past 30 years, but there are a select number of advances that truly have had a monumental impact on the progression of globalization and its relationship with business.

1) Rise of the Personal Computer – The rise of the Windows-based PC, which popularized personal computing, eliminated another important barrier that was restricting globalization: the limit on the amount of information that an individual could obtain, author, modify, and distribute. The PC allowed individuals to author their own digital content and share them with places all around the world.

What soon followed the PC was the invention of the dial-up modem in which users could connect to a phone line and send e-mails through service providers.

Separately, advances such as the PC, fax, and the dial-up modem were important advances, but when people started combining the PC, fax machines and dial-up modems together in the mid 90's, they created a new platform that started a global information revolution. This common platform gave individuals both reach and scale, as they could create and distribute information in so many different ways and send their information to so many more people around the world.

2) Invention of the World Wide Web – Perhaps the greatest influence on the progression of globalization was the invention of the World Wide Web in 1991. Before the World Wide Web, we had the internet which connected the globe, but with the World Wide Web individuals were now more than ever able to post their own digital content for anyone across the globe to see.

The internet is a series of networks that sends out 'packets' of information at supersonic speeds. What made the Web so important was that it created a link between the computer and the internet. The Web made the internet useful to people. Within 5 years of the invention of the Web, internet users soared from 600,000 to 40 million. A recent study claims, "...the rise in Internet use both by companies and in the population at large accelerates the pace of globalization".⁵ The internet accelerated the progress of globalization because of it allows for the sharing of knowledge and information almost instantaneously across the globe.

With the web now in place users needed a common way of viewing the web and a small company named Netscape would give users what they needed. Netscape created a browser that made the Internet accessible for almost anyone, because it gave everyone a common way of accessing and sharing information and digital content. In this way, people all over the world could be assured that someone across the globe was accessing similar information in the same way as they were and in that way people could communicate with people from all over the world like never before.

⁵ GS Yip, 'Global Strategy in the Internet Era', *Business Strategy Review*, Vol. 11, Iss. 4, 2000, pp. 2.

3) Fiber-Optic Cables – The first fiber-optic cable system was implemented in 1977, made of pure glass arranged in bundles that could be used to carry digitized packets of information. The most important benefit of the fiber-optic cable is that it has a much higher bandwidth signal capacity than other types of transmission cables.

The Telecommunications act of 1996 launched an enormous boost in the laying fiber-optic cables world-wide. Telecom companies saw a huge opportunity for investment in fiber-optic cables, as they felt that with the rise of the internet, people were going to be begging for increased speed and bandwidth power. As popularity continued to grow and advances on the cables continued, the capacity allowed by these cables continued to grow, making it even cheaper and easier to transmit information and digital content to any part of the world.

4) Creation of Work Flow Software – One of the first major information technology's that was geared to businesses was the creation of work flow software in the mid-1990's. Work flow software is basically a software package that automates business procedures as well as being able to pass along "workflows" such as documents, information, tasks, etc...from one employee to another. When work flow software was first adopted, it enabled employees in different locations in the same company to collaborate, manage and design business data that had previously had to be handled manually.

The first major breakthrough in increased workflow was when companies began to utilize the PC and its ability to e-mail. Previously, work flow progressed through a business manually as people in different departments passed information by having to physically walk to each department and that process continued until the final department received it. With the combination of the PC and e-mail work flow suddenly became so much quicker, easier and more effective. Everything could be passed electronically by each person, without ever having to leave their desks. The only problem was that when companies first began utilizing work flow software there were not many standards, even within the same company. To fix this problem software companies began creating transmission protocols and languages such as,

SMTP for email, HTML for web documents, and TCP/IP for a common transportation of electronic data within the company.

With businesses utilizing new work flow software and with the development of transmission protocols, companies were well on their way to becoming faster, more effective and more cost efficient. Along with this quickening of business processes, companies were now able to communicate with businesses in other countries because they knew they were using the same standards of transmission as their partners and this helped immensely in the progression of globalization.

5) Open-Sourcing- A community-driven software movement where companies and individuals make their source code available online, so that others could contribute to their work and in turn their software programs benefited because of it. One of the most successful open-source tools is 'Apache', a web server product owned by IBM, which powers nearly two-thirds of all the world's web sites. What is so fascinating is that anyone around the world can download the software for free and contribute to the source code; all they have to do is redistribute it back for further use.

What makes this so useful for businesses is that, if a company comes out with a new software product and they make it open-source, the company is gaining knowledge and expertise from specialists located anywhere around the globe for free. This has such an affect on globalization because you could be from anywhere in the world, India, China or South America and you could be just as effective at using or contributing to a certain software package as the person that may have created it in Silicon Valley. It gives enormous empowerment to the individual located anywhere across the globe.

6) Supply Chaining- A method of integrating horizontally between suppliers, retailers and customers to create value for the company. Wal-Mart is a perfect example of supply-chaining; as soon as a customer picks an item of the shelf and the cashier scans it, a signal is sent to the supplier of the product, no matter their location around the globe. The signal is received by the supplier and the supplier packs the item and ships it to the Wal-Mart store that sold the item, Wal-Mart never even touches any of

its products until they reach the store. Because of this supply chain, Wal-Mart can move 2.3 billion merchandise cartons world-wide per year.

Supply chaining has influenced globalization because as supply chains grow, the more global standards are needed, and as standards increase they begin to eliminate border frictions and as companies begin to feed off other companies, it creates a global collaboration for all to share. Globalization also helps companies build their supply chains as companies can find both the best producers as well as the lowest prices around the globe. In that sense supply chaining helps progress globalization as well, because now companies from countries all over the world can find and sell products from countries all over the world, the movement away from Euro-centrism as discussed before.

7) Digital, Mobile, Personal and Virtual Movement – More recently the world has been swarmed with digital cameras, mobile PDA's and cell phones along with personal laptops and this is having a profound affect on the progression of globalization. With the growing popularity of these types of technologies individuals and companies are able to collaborate with one another more frequently and in so many more ways than ever before.

There are technologies such as instant messaging that allow people to communicate instantaneously, and they can be located anywhere around the world as long as they have a running internet connection and a messaging service. In this way companies can communicate with clients and employees who are around the world and give them the latest news that they may need to know in order to do business with clients or other companies. There is also a relatively new technology called Voice-Over Internet Protocol, known as VoIP, which allows you to make phone calls over the internet. An employee on a business trip now can connect their laptop to the internet, open up either the business' network or a VoIP service such as Skype and call their company or client and communicate. You may be asking why not just use a cell phone, well the main advantage of VoIP is that is it makes almost all calls virtually free, while cell phones have higher costs, especially when making international calls.

There are many other technologies similar to these out there but, these two give you the general direction in which people are beginning to communicate and how much of an affect it is having on globalization and its relationship with business.

Alone, these types of advances have an affect on business and globalization, but when businesses start combining these advances together, they end up creating a global market place that is more level than ever before. Businesses are now adopting new habits, skills and processes in order to compete and maintain an advantage in today's global marketplace. Globalization's trend towards greater integration of mature and emerging markets and economic policies correlates with information technology's ability to create standardization of global computing platforms.⁶ This new platform that companies are using enables collaboration and innovation the likes of which have never been seen. This platform now operates with no regard for distance, time, or geographic location, which enables businesses to scour the globe for opportunities that can create value that were once unimaginable.

The one major point that must be remembered is that, companies just using the technologies will never get very far in this level global landscape. What businesses need to do to really boost productivity is to combine these new technologies with new ways of doing businesses. Businesses need to find ways to take advantage of the new, powerful platforms that are available to them. The relationship between information technology and new business processes is a cyclical one, new business processes make information technologies more valuable and new and improved technologies make the new and more valuable business process possible.

Looking back on my introductory story about the hockey stick made by a Canadian company in China, it has now become apparent to me as to why a company would feel the need to expand their business into other countries. The world is changing and the global business landscape is changing with it. If your business is not changing, you will get left behind. The globe has become a dynamic environment and

⁶ DO Stephens, 'The Globalization of Information Technology in Multinational Corporations', *The Information Management Journal*, Vol. 33, Iss. 3, 1999, p. 66.

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businesses must be able to adapt to the new and ever present changes that are happening at an increasing rate, not just on a commerce level, but also at social, economic and political levels. Businesses must have a commitment to globalization with their infrastructure, strategies, and processes, or else they will not be able compete in the global marketplace.

In summary, information technology has become the driving force behind globalization and has become an integral part of an organization's business strategy. The technology provides the means by which can move into the global marketplace. In the next section I will cover specific examples of how companies can use information technology to create global strategies that will help them compete and maintain a complete advantage in the global environment.

CATEGORIES OF INFORMATION TECHNOLOGY WITH CORPORATE EXAMPLES

Globalization is having a larger role in the global business landscape than ever before. Time is condensing, markets are integrating, and geographic barriers are disappearing. Companies must now adapt to the new global marketplace in order to maintain a successful business. Companies must now, if they have not already, design, implement and manage global business strategies that will not only help the company survive, but also create added value for the company. In order to achieve these global business strategies, businesses must utilize information technologies that are the backbone in creating and implementing global business strategies. Information technology creates the framework for which these global strategies can be built upon. Information technology facilitates the effortless exchange of information across borders, as well as the expansion of resources from countries all across the world. This expansion leads to new ideas and products, as well as new ways of doing business. Information technology is the catalyst for global integration in this age of globalization.

To examine the effects of information technology on businesses' ability to create global strategies, I will use a model developed in a study done by Alan McAfee.⁷ He classified information technology into three categories: function, networking, and enterprise. As I explore these categories in more detail, their meanings will become clearer, but I feel some information on the meanings of the categories will help when beginning to explore the categories in more detail.

Function IT (FIT) includes any technology that makes the execution of standalone tasks more efficient. Common examples would include word processors and spreadsheets. FIT enhances experimentation capabilities, meaning businesses have the ability to create many prototypes and versions of the same product before actually ever starting production. Companies are now able to see how different models of the same product will work in its environment without having to expend

⁷ A McAfee, 'Mastering the Three Worlds of Information Technology', *Harvard Business Review*, Vol. 84, Iss. 11, 2006, pp. 141-149.

time, money and resources on actually building these models. FIT also increases precision in business processes. Using functional technologies help take human error out of the equation. Software applications such as Microsoft Excel and other statistical software can produce results that would take humans a considerable amount of more time and would be error free, unless of course the human inputting the data made an error in implementation.

Network IT (NIT) includes any technology that allows people to communicate with each other. Network technologies include e-mail, instant messaging, video conferencing as well as group software such as Lotus Notes. NIT facilitates collaboration in corporations as now people are able to connect with each other across borders with the click of the mouse. Instant messaging for example, allows employees to communicate and exchange information and data anywhere in the world and at virtually any time. Companies can now have virtual meetings, with videoconferencing technologies, with employees located all across the world. Network technologies make space and time have also no relevance in today's business world. The ability to connect and transfer information regardless of location is what makes collaboration easier and more effective. NIT also allows for companies to view and analyze trends and patterns from both the high and low levels of the organization. Being able to connect and interact with lower-level operations, management has the ability to observe trends and patterns in data as well as in operations. This ability to observe and analyze trends allows companies to see how work is being done compared to how it is supposed to be done.

The third category, Enterprise information technology (EIT), includes any type of application that companies use to configure interactions between employees as well as with business partners. Applications that also define business processes such as Customer Relationship Management (CRM) and Supply Chain Management (SCM) software fall under EIT. Enterprise technologies are perhaps the most important and beneficial technologies that a company can utilize. EIT allows businesses to redesign business processes to lower costs and increase value for the company. Enterprise technologies allow companies to view existing processes and then make any

necessary changes to the process in order to increase efficiency. EIT also enables companies to standardize work flows. They automate and structure processes similarly across organizations, so when companies want to implement a new business process, the implementation of the new process is quick, simple and reliable. Enterprise technologies also let managers monitor activities and events more effectively. Many enterprise technologies provide accurate and up-to-date information that can be accessed at any time by managers, who can then obtain an accurate picture of what is happening throughout the organization. This is a very useful tool for managers as they are able to extract any kind of information for the enterprise application in order to evaluate how effective the current process is.

To further explore these three categories of information technology, I will examine real-life business examples that take advantage of these kinds of information technologies. I will examine some of the out-dated technologies, as use for comparison against what information technologies businesses are using today. In doing this, I plan to show how information technology is the key factor in a company's ability to implement a global business strategy.

Functional IT

Recapping, functional technologies are primarily technologies that assist in the execution of tasks. The nature of this category is such that, functional technologies do not play as big a role in companies' ability to create global business strategies, as networking and enterprise technologies do, but they still can help in creating global strategies. In more recent years function technologies have shifted from "push" to "pull" technologies.⁸ Push technologies are technologies where nothing happens until someone acts upon it. For example, e-mail, the technology is there but it is not enacted upon until someone wants to send a message and then that message gets "pushed" down the line. Pull technologies are technologies where everyone in the organization can pull out information and data at the same time to be used for collaboration. An example of a pull technology would be an electronic document

⁸ IBM, *DOV Pharmaceutical adds global reach, cuts costs, lowers risks with advanced clinical trial management system*, Somers, NY, 2006.

management system (EDMS). An EDMS organizes as well as provides the ability to access and distribute electronic documents across a network.

Many earlier functional technologies are still in use today, however these types of information technologies are not used in the same ways as they once were. Early technologies include spreadsheets, word processors, statistical software, fax and e-mail. All of these types of technologies fall under the “push” category of information technologies. These technologies were also primarily paper-based. When companies began utilizing these technologies; they were used separate from each other. If you wanted to e-mail someone you had to use a different application, than if you wanted use a word processor. While many of these technologies were beneficial to businesses, they were not used in helping to create global strategies. They were primarily used to speed up common business tasks and to reduce human error. Many of these technologies are still used daily in businesses world wide, the main difference being, they are used in a much different way. With companies increasingly going abroad and entering into global market, global coordination has become far more complicated than it was just a few years ago. In order for businesses to effectively coordinate on a global scale, they must utilize new functional technologies that are coming to the market.

In a recent article in Computerworld, documentation management was listed as second in the list of top five technologies being tested in 2007.⁹ Wolter Kluwer NV is a multi-billion dollar international publishing company with over 18,000 employees. Up until 21st century the company primarily worked with paper, everything came in paper form and everything went out in paper form. Then around 2000, they began receiving large amounts of electronic content and customers began requesting for an online presence. Being an international company, the firm was receiving electronic data in many different formats, at a more intense pace than ever before. The company needed a strategy to keep up with all of the new content they were receiving. After doing plenty of research the company decided on an enterprise content management (ECM) system. An ECM system is a set of technologies used to

⁹ D Robb, ‘Top Five Technologies Being Tested This Year’, *Computerworld*, Jan 1, 2007.

collect, store, maintain, access, distribute, and destroy documents and other content. ECM systems are used primarily for content that is imported or created from within an organization, during the course of its operations. The ECM system at Wolter Kluwer NV went live in March of 2005 with only 100 magazine titles. Less than a year later, the company already had achieved a six figure return on the system because the system had cut the costs of printing and delivering paper materials. By the end of 2006 the company had all of its publications in the system. With the capability of the ECM system, Wolter Kluwer NV is now able to accept content in a wide variety of formats, manage the workflow of articles as they pass through the system, and can output the content in a format the customer needs. Being an international company, Wolter Kluwer NV needed a global strategy to manage its global publishing operation and an ECM system provides the ability for a company to maintain a global presence in the wake of globalization. Without the help of the ECM system, Wolter Kluwer NV would not have been able to handle the amount of different kinds of content coming into the company on a daily basis.

Another function technology which has been in use by companies for many years now is the relational database, only recently have companies been using it to help in creating global business strategies. United Parcel Service, UPS, is a global provider of package delivery as well as specialized transportation and logistics services. Each business day UPS delivers 1.8 million packages to shipping customers and up to 6 million cosigners. Doing business in over 200 countries with 344,000 employees requires a highly integrated global IT infrastructure; luckily for UPS they have one. UPS's IT infrastructure synchronizes their global operation by coordinating the flow of goods, information and resources. At the heart of the IT infrastructure is their Data Center. The Data center is run by the world's largest DB2 database to track the 13.6 million packages that are shipped each day. UPS can store information about all packages shipped as well as other corporate functions such as sales, marketing and finance in its data warehouse. The company is able to extract data from operation all across the world in order to keep track of the enormous amounts of packages being shipped across the world. Having the ability to store large amounts of information

effectively so that it can be easily organized and extracted allows a global company such as UPS to manage and track the enormous amount of packages being transported across the globe. Without a database in place, a global company such as UPS would not be able to effectively manage and keep track of the vast amounts of information on packages being shipped across the world. A relational database such as DB2 allows a company to store and organize vast amounts of data that can be accessed from virtually any location. Any company that wishes to create a global business strategy must have an effective way of storing the mass amounts of data in a way that makes it easy to extract information, a relational database allows for that ability.

More recently function technologies have been created with the internet in mind. UPS has a document exchange system in place that sells products and serves customers. This document exchange system allows for quick and effective exchange of information between customers, suppliers, and business partners all over the internet. While this could be classified under network information technology, the functionality of the document exchange system, allows for it to be considered a FIT. This system allows customers to send and receive business documents and other content as well such as, video, audio and other types of text formats and gives them full control over the delivery of the digital content. This system falls in line with the concept of empowering the customers. With this system, customers have the capability of monitoring the digital content, as well as canceling or recalling the delivery. Also, customers now do not have to waste money and time by sending documents overnight or by fax. Customer Service is important for any business, but when dealing with customers of different countries, it is often hard to please all of them. When developing a global business strategy a company must not forget to keep customers in mind. UPS's document exchange system enables customers from around the globe to access a standardized system and send and manage digital content to anywhere in the world. Empowering customers is often an effective strategy for companies to undertake as it often makes for better customer reputation,

the document exchange system at UPS allows for this empowerment on a global scale.¹⁰

Globalization has had a profound affect on the amount of information and types of information that a company comes in contact on a daily basis. Keeping track of the amount of information and data a company receives on a national level is substantial task, on the global scale it becomes even harder. This sharp increase in information has made paper-based documentation such as spreadsheets, word processors and e-mail ineffective. In order to effectively implement a global business strategy a company must be able to store, manage, access and distribute the vast amounts of information coming into the company. Current functional information technologies allow companies to coordinate data and information flow on a global level.

Network IT

Networking technologies are any technology that facilitates interactions within a company. Networking technologies play a major role in a company's ability to implement a global business strategy. Running an organization with locations across the globe demands timely and efficient modes of interaction or else there would be no way to successfully run day to day operations. What must be noted about networking technologies is that they provide the means for increased interaction across a company, but they do not define how companies should interact. This freedom allows companies to experiment and come up with new and innovative ways of networking their organizations to achieve an optimal business solution that fits the company. The amount of new networking technologies that have come to the market over the past few years is astonishing and each new technology offers companies greater opportunity to enact their global strategic vision by allowing for faster and more reliable communication across the globe.

Similar to functional technologies, many of the early networking technologies are still in use by companies today but not on the same scale, as they are being replaced by newer more productive methods of interactions. The hardwired telephone is an

¹⁰ N Alghalith, 'Competing with IT: The UPS Case', *The Journal of American Academy of Business*, Vol. 7, Num. 2, September 2005, pp. 7-15.

example of an out-dated network technology that is still in use on a daily basis in companies. Before the age of the internet, the main form of relatively quick communication was by telephone. The main problem with telephones is that in order to communicate both the sender of the call and the recipient had to be at their desks. This does not work well with companies who have locations in different time zones as work hours may not be the same. Another problem is that in most cases employees are not at their desks for extended periods of time so trying to contact a person could take a few tries, wasting time and decreasing productivity. Also international phone calls are quite costly especially, and the total cost of making those calls can add up rather quickly, increasing total daily operational costs.

Another early network technology that made use of the telephone was the fax machine. The fax machine made it possible to send important documents over a telephone line, rather than having to send the documents by mail. The fax machine was a great improvement over having to send documents by mail; however fax machines are only useful for smaller sized documents. If you have a large document that is many pages in length it will take quite a while to fax each page one at a time and that costs the company time and money because you are wasting your time faxing sheets one at a time, rather than doing your job. Fax machines also pose a problem for large, multinational companies, in that you can only send documents through one line. If you have employees from locations across the world trying to send mass amounts of documents through fax lines, more than likely the fax lines will be blocked and it will take a few tries before you can connect to the other fax machine to send the documents and with the intensification of information that comes with having a global company, fax machines are a hindrance to productivity.

Another early network technology that used the telephone was dial-up internet. At the time of its adoption by the business community in the mid-90's it was a revolutionary technology that allows companies to transfer information at speeds never possible before. As companies began going global however, the amount and size of the data needed to be transferred often outweighed the capabilities of a dial-up connection. As business operations quickened due to increased competition, companies needed

to be able to send large amounts of information at quicker paces in order to stay ahead of the competitions, and with a dial-up connection the transfer rates were too slow. These kinds of networking technologies laid the groundwork for companies to be able to more effectively implement a global strategy. As the speed at which businesses needed to be run increased, companies needed to have faster, easier, and less costly forms of networking in order to effectively continue running a global business operation. With the invention of new networking technologies companies now have the ability to envision and implement global business strategies, because they are able to quickly and effectively communicate and interact in ways that were once not capable due to the limitations of early technologies.

Some of the newer networking technologies include: e-mail, instant messaging, blogs, and open source 'wiki' pages, web pages that employees can contribute to or edit without permission. A recent study looked at the usage of these types of technologies in the global investment banking firm, Dresdner Kleinwort Wasserstein.¹¹ DKW introduced instant messaging software, employee blogs and a company wiki-page in 2005. Having the instant message software, employees were able to message the firm's traders and analysts across the globe and immediately receive the information they required. As with any industry, fast transmission of information is a necessity, and it is even more so the case with the financial industry where a few minutes of delay can mean huge losses. Managers can now post blogs for employees as well as comment on their employee's blogs. The availability of these blogs allows managers to view progress and details of the work being performed by employees at the click of a mouse, rather than having to call meetings or converse via telephone or email which can be more time consuming. Employees can also receive information from managers instantaneously by visiting the managers blog, which helps in clarifying tasks that need to be done and by whom, which leads to increased productivity. The company also views its wiki-page as a way to deal with e-mail overload which can occur when a company is working on massive, global projects. The wiki-page allows employees or groups to post agendas, to-do lists,

¹¹ McAfee, op. cit., p.171

completed tasks as well as work in progress. All of this information can be gathered by many at the same time rather than having to send information down the line by email which takes much longer for everyone to receive the same information.

These types of technologies foster increased collaboration across a company. Employees working on global projects can access information from one central location which replaces the need of having to pass information down a long line. This increased collaboration allows companies to implement global business strategies because they can now communicate and utilize a central source of data that increases productivity by decreasing the amount of cost and time it would take to normally pass along information. Managers can now view what employees in other countries are doing by viewing their blog, traders and analysts can communicate instantly for the latest and most update information that is necessary in order to increase profits, especially in the investment banking industry.

In a recent survey conducted by InformationWeek¹², 500 top executives were asked, 'Which technology has your company utilized in the past 12 months to increase productivity?' 48% of the respondents said that 'increased network bandwidth or performance' was their most effective technology for increasing productivity. Air Products and Chemicals, a international firm who's main business is in selling gases and chemicals for industrial uses is one of the 48%. The company has annual revenues of \$9 billion, operations in over 30 countries with 20,000 employees' world wide. The company has experienced enormous growth over the past year adding four new offices and facilities a month, mainly to support new global product sales and distribution. The company needed a way to quickly link the new offices to the already existing voice and data network in place at Air Products. The company's strategy is to create what they call, "Offices in a box", which are a series of voice and data networking hardware and software which can link the new facilities and offices to the Air Products network in days. Their new strategy was put to the test during the aftermath of Hurricane Katrina, when one of their liquid hydrogen plants located in New Orleans was severely damaged. The company airlifted computer and

¹² E Chabrow, 'The Results Are In', *Information Week*, Sept. 11, 2006, p. 38.

networking equipment by helicopter, and installed a ground station and by using cellular technology the company was able to transmit data back to headquarters in days. With increased network bandwidth capabilities and performance a company such as Air Products can link a make shift or new office by any number of methods, whether it be by broadband connection, Wi-Fi, or cellular services, and have IT capabilities back up and running within a few weeks. When many companies build new sites, it takes months, but with increased networking bandwidth and performance, companies can now link new sites to exiting networks with in weeks. The amount of time saved in establishing the new facilities, creates tremendous cost and time savings for companies implementing facilities worldwide. When implementing a global business strategy it, is almost always necessary to have locations in the countries in which you plan to do business, with the help of increased network bandwidth and performance that comes from broadband connections, cellular services and wireless technologies, companies can be running operations in foreign countries much quicker. Being able to begin business operations before your competitors, gives your company a superior advantage in gaining customers and market share. In the same survey mentioned above, 30% of the companies said giving employees Wi-Fi laptops and other wireless devices as the most effective technology for increasing productivity, and UPS exemplifies this increase in productivity due to wireless connectivity.

UPS supplies all of their drivers with a Delivery Information Acquisitions Device (DIAD), which is a hand-held wireless computer that keep the drivers connected to the UPS network (you may better know them as the brown electronic clipboards you always see the drivers carrying around). This new wireless device tells each driver, where to load each package on the shelves of the truck based on their delivery location before they go out on their route. The DIAD also has a GPS navigation system, which tells each driver where the next location for delivery is, and if the package is accidentally delivered to the wrong address the DIAD will notify the driver. From a customer standpoint, a customer can go online and find out when the driver will be at their address, based off the GPS location of the DIAD. The DIAD can also

electronically capture all delivery information, including the recipient's signature. At the end of the day each DIAD, uploads all the information back to UPS, so they can accurately assess the packages delivered each day. The latest generation DIAD's also have internet access as well, so if a delivery needs to be cancelled or modified, managers are able to contact the drivers, which saves the drivers time and the company money. Having such an integrated network that connects locations worldwide, UPS has become a global leader in ground and air package deliveries. Employees using the DIAD have up-to-the-minute information on all of their deliveries, and with all the information they can receive from the wireless device, employees can more effectively do their job which increases productivity greatly. The use of DIAD's also increases business operations because information is transmitted back to the UPS network in real-time so managers and other employees are able to accurately track and keep control of the millions of packages that are in transit at one time.

These are just a few select examples that show network technologies abilities in aiding in companies trying to implement a global business strategy. There is a host of new technologies that companies are beginning to use as well, such as virtual private networks, VPN, which allow organizations to communicate securely over a public network, provides users access to the corporate network and lets remote networks communicate with each other across the internet. Companies are also beginning to use Global Wide-Area-Networks, which is a computer network that can cover broad geographic areas. While a Local-Area-Network is convenient for smaller locations such as an office or campus, Wide-Area-Networks allow global companies to create a seamless, interconnected network throughout their global locations.

Network technologies will continually be developed to meet the more demanding needs of organizations as they require quicker, safer, and greater bandwidth capabilities as the data amounts continue to grow. Network technologies have set in motion a cycle, where technologies of this nature are responsible for creating the intensification of information that is associated with globalization, but as the amount of information increases, newer technologies are developed to meet this increase.

However, once these new technologies are put into use, the intensification of information increases to meet the abilities of the newer technologies and the cycle continues to repeat itself. Companies will have to continually be aware of the latest network technologies available to be able to manage the continual increase and scale of data. Network technologies will continue to aid companies as they are sure to increase productivity and will allow companies to come up with innovative global strategies to stay a competitor in their market.

Enterprise IT

Enterprise technologies are technologies that define business processes within an organization. In any organization you have a CFO who's looking to reduce costs, a COO who's looking to manage processes better, a CMO looking to reach new customers and a CEO who needs to know this is all getting done. With enterprise technologies the CIO has the ability to meet all those needs and deliver quality results. Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), and Supply Chain Management (SCM) software are all examples of different enterprise technologies, which create and define different business processes within a company. Enterprise technologies represent the category of IT that best assists in a company's ability to implement a global strategy. Global operations require greater coordination and integration of business processes, because of the scale and sheer magnitude of running a business worldwide. More and more companies are realizing that maintaining a business unit focus on IT infrastructure is not cutting it in the global marketplace anymore. Companies are now realizing that company-wide IT infrastructure is the greatest way to implement a globally integrated operation and with enterprise technologies companies have that capability.

One of the earliest enterprise technologies to hit the market was the point-of-sale (POS) terminal in the mid-70's. A POS terminal is a computer terminal placed at a point of sales transaction; the terminal could instantly identify each item sold and retrieve pricing and other information from the stores database, and print out a receipt for the customer. Meanwhile the terminal is also able to simultaneously track the inventory reduction which allowed for faster re-supply of products. The POS

terminal was one of the first enterprise technologies to streamline business processes, sales transactions and inventory control. POS terminals are still in use in retail stores, restaurants, sports stadiums, and casinos and are a vital part of the larger scaled enterprise technologies currently in use today.

Another early enterprise technology that is still in use today is the Electronic Data Interchange (EDI). The EDI was established in the mid-90's, and it enables the "electronic communication of transaction information in a one-to-one link¹³." EDI allows global companies to establish electronic links with trading partners or any other external parties, along with the internal communication capabilities. The reason why EDI became so widely used is because it saves company a lot of money. The EDI technology provided an alternative to or replacement for information flows that required large amounts of human interaction and materials such as paper documents, faxes and e-mails. EDI also allows companies to store and control data electronically without having the cost of manual entry or scanning. While companies continue to use EDI, other technologies such as XML and the internet, are starting to replace data exchange needs. EDI also laid the groundwork for supply chain management technologies because it allows partners in the supply chain to exchange information electronically while also supporting the ability to transmit documents.

As companies began expanding their businesses and running global operations, they grew into a complex assortment of processes and operations running different IT infrastructures. The operational impact of these different systems was significant. Having business units running different systems and applications created a major impediment to cross-functional integration and lead to what has come to be known as business process "silos" within a company. Having a complex IT infrastructure along with a lack of standards makes application development and the deployment processes slow and very inefficient as developers must not only address business needs but also integration needs. With the advent of current enterprise technologies

¹³ N Singh, K Lai & TCE Cheng, 'Intra-Organizational Perspectives on IT-Enabled Supply Chains', *Communications of the ACM*, Vol. 50 No. 1, January 2007, p. 60.

these problems can be addressed and companies can begin to create cross-functional integration of business processes company-wide.

In the study that found the top five technologies being tested in 2007¹⁴, Server Virtualization was the top technology being tested. Virtualization technology allows one server to be partitioned into multiple servers to run a number of different applications. Server virtualization allows companies to shift resources, which lets capacity be reassigned to meet demand peaks, which takes away resources from lower priority services when they are needed for higher priority tasks. Dell has been using server virtualization over the past few years, and they have reduced the amount of servers they use from 16 to just 1. Dell has been trying to get rid of their legacy order management system, because it can not meet their demand needs. With the help of server virtualization Dell has put both its back and front offices on the same server. The front office can now process up to 12,000 orders at a time and up to 50,000 orders a day, doubling their previous capabilities. Their back office system processes 50,000 orders a day, double their previous capabilities, and 400,000 data records per hour, up 150,000 from their previous system. A typical order now only takes an hour, where it used to take four. The cost of owning and running the new system has been cut by 400% due to server virtualization. Dell reports that they save more than \$18 million annually because of this. Having the capability to decrease processing time on a global scale, by one-fourth, is a huge competitive advantage for a company such as Dell. Besides the immense cost savings, utilizing the new technology of server virtualization can truly make a difference when deciding on a global business strategy. Having the ability to shift resources when necessary on a global level can help companies reduce process time, which in the current business environment where speed and flexibility are essential, server virtualization can be the backbone behind implementing a global business strategy.

Another new enterprise technology that more companies are making use of is the Radio-Frequency Identification (RFID) microchips. These RFID chips use radio waves to automatically identify objects. Companies tag products with RFID tags so

¹⁴ Robb, loc. cit.

that it can uniquely be identified by use of radio waves. These unique RFID tags allow companies to actively track and locate any package sent out in real-time. Nissan has recently employed a real-time tracking system of its vehicles using RFID chips, in order to automate and streamline their supply chain. On the inbound side of the supply chain all trailers are tagged permanently, so when the trucks arrive at their main assembly plant in Canton, Miss, it is checked for authenticity and then authorized to come through the gates, without ever having to stop, and the system can track the trailers anywhere on site, and record all pertinent information such as, arrival time, departure time, load time, is the trailer full, empty, and what's inside. Being a global distributor, Nissan gets hundreds of truckloads and thousands of parts each year, so by automating the inbound supply process, the company can produce faster throughput of their trailers, and can increase flexibility through better utilization of equipment and labor, because they can accurately assess the location and information on each trailer in its plant in real-time. On the outbound side of their supply chain the company attaches a unique RFID tag to each vehicle that rolls out of its assembly line. The purpose of tagging each vehicle is to ensure that no vehicle leaves the plant with a defect; the system attached to the RFID tags ensures that the vehicle went through all proper steps in production and that the vehicle departs from the plant with exact customer specifications. With this capability vehicles with defects will no longer be included in the delivery chain which gets rid of rework costs at dealerships which can cost up to five times as much as factory repair. Having the capability to ensure quality products is a huge advantage to a company, because defects in any product cost a lot of money to fix and gives your company a bad reputation from suppliers and customers. When running a global operation, even a small percentage of defects can have huge impacts on profit and customer satisfaction, with the introduction RFID chips, companies have the ability to track and read information from any package or object sent out throughout its supply chain, leading to a streamlined process that can help in running a global operation.

RFID chips are just a small subset of a larger enterprise technology, supply chain management (SCM) technology. As companies began expanding horizontally among

suppliers, retailers and customer, supply chaining was the best way for companies to create value. As off shoring and outsourcing also became dominant ways of doing business, complexities in the supply chain grew as operations reached farther out than ever before, with more partners than ever before and there was a great need to be able to manage the whole process from beginning to end. With SCM technology companies have the ability to manage and make use of supply chains that can create added value for their company. SCM technologies give companies visibility in their supply chain, flexibility in their processes and a collaborative way of solving problems and innovating new processes. Without SCM technologies implementing a global supply chain would be a difficult challenge, but if companies are serious about implementing a global business strategy, being able to successfully run their supply chain is a must and SCM technologies provide them with that ability. There is no better company to look at than Wal-Mart when showing how SCM technologies can not only help run an effective supply chain but also help run a global business operation. Wal-Mart is the largest retailer in the world, moving 2.3 billion cartons of merchandise a year, and surprisingly they do not manufacture a single product of which they sell. From the very beginning stages Wal-Mart takes advantage of SCM technology, by turning inventory into information for the company. Wal-Mart invested in POS terminals to instantly track inventory deductions for quick re-stocking. The company also set up a private extranet, called the Retail Link System, for its suppliers so now they can see how its products are selling and if production needs to be increased. Having the ability to implement an extranet to empower suppliers, creates an instant boost in productivity as they can in real-time increase or decrease their production depending on how well their products are selling at Wal-Mart. Having the ability to instantly track and control inventory, along with suppliers gaining important information on their products, Wal-Mart was able to implement a just-in-time inventory which cut the costs of good by 5-10% compared to the rest of its competitors.¹⁵ The company is now capable of replenishing items on the shelves within 3-days, from manufacturer to the shelf. With the use of 'Advanced Information Technology', Wal-Mart can find where any product is at any time as they move along

¹⁵ Friedman, op. cit. p.161.

the supply chain. So if demand is high in one part of the country for a certain product, and lower in another region, the company can instantly re-route the products to the region where there is high demand for them. This can be done because Wal-Mart makes use of RFID tags in order to track and gather information from any of its products in the supply chain. With RFID tags Wal-Mart can find out which stores sell more aspirin on a Friday compared to ones on Sunday, or whether Japanese people prefer to shop on Saturdays or Wednesdays. With the amount of information their supply chain provides, employees can input the data into demand models and pinpoint exactly when, how much and where to send products. Being able to send the exact amount of products to the right place at the right time creates a great boost in productivity as you are not expending resources to ship items that are not needed. Having lower inventory also leads to lower carrying costs and greater diversity of products. Stores know exactly how many of each item they need on the shelves, so there is no wasted shelf space, in that way they can increase their product base because they have more room on their shelves for them. There is no doubt that Wal-Mart runs one of the greatest supply chains ever, and it is because they invested so heavily in a strong IT infrastructure along with SCM technologies which enabled them to run a global business with more effectiveness than a local mom and pop store.

Other kinds of SCM technologies that help in enabling a global supply chain include warehouse management systems (WMS), Vendor Managed Inventory (VMI) applications, and Order Management Systems (OMS). As inventory sits, the costs add up, being able to know what you have on hand in real-time and knowing when and where to ship it can increase productivity and lower inventory costs.

Implementing a WMS allows for visibility for both the buyer and the supplier as the buyer can control inventory levels and suppliers can see when new products need to be produced, so they can begin to manufacture the products days in advanced to meet the needs of its customers. With a VMI application, the manufacturer is responsible for maintaining the distributor's inventory levels. By use of EDI technology, the manufacturer can gain access to the distributor's inventory data and is then responsible for generating new orders. This drastically decreases the amount

of time to it takes to re-stock inventory, as manufacturers do not have to wait till the distributor sends them a purchase order, the manufacturer can now have the new inventory ready for the distributor when the distributor needs it. An OMS is a system where the distributor receives customer order information as well as inventory availability from the WMS, and then groups the orders by customer and order, determines inventory levels by warehouse site and determines delivery dates for orders. Being able to control inventory levels keeps costs down, and being able to know when and where to send inventory leads to increased productivity and added value, both a necessity when trying to implement a global business strategy.

Perhaps the best example of an enterprise technology would be Enterprise Resource Planning (ERP) software. ERP systems integrate all data and processes across an organization in a standardized structure. ERP systems typically cover all basic functions throughout an organization. In previous systems, companies would have different systems in place for each business unit which hindered collaboration and company-wide integration since each business unit had different standards and processes that could not be easily transferable to a different units' system. With an ERP system, businesses are able to replace different independent systems, and are able to combine different business unit systems into one common fully-integrated system. Common units that can now be integrated with an ERP system include: Manufacturing, Supply chain, Financials, Human Resources, Warehouse management and Customer Relationship Management. ERP systems are usually considered back-end systems because they often do not involve customers directly; these systems are more for tasks dedicated to running the company.

In a recent study done by Barry Shore, a professor of MIS at the Whittemore School of Business and Economics at the University of New Hampshire¹⁶, Shore examines an ERP system being implemented by IBM Global Financing (IGF); the world's largest financing company. IGF offers financial products and services in both asset financing and asset recovery. The company employs 3,200 people and has over

¹⁶ B Shore, 'Enterprise Integration Across the Globally Disbursed Service Organization', *Communications of the ACM*, Vol. 49, No. 6, June 2006, p.102-106.

125,000 customers in 43 countries. In 2002 the company began to realize that their old legacy system was not able to meet the demands of their current environment. With the help of an ERP system the company looked to: integrate customers, suppliers and partners, improve customer and partner satisfaction, establish a new asset recovery services brand, reduce administrative costs, raise productivity, lower IT operations and systems maintenance costs and enhance business controls. This new system would move the company from a geographically dispersed organization to one integrated enterprise. IGF was able to outsource some of its needs to SAP, a business software solutions company, in particular for their new asset financing system which controlled: finance controlling, fixed assets, sales, accounts receivable, accounts payable and loan/lease accounting. IGF's new asset recovery system and their CRM system were supported by SAP software as well. The rest of the software and application development was done in-house, and specifically tailored to IGF's global integration needs. When the project was completed, the company went from 800 different business processes to just 19 common processes company-wide and 290 separate IT systems were reduced to 36 including the SAP software solutions. With this new highly integrated system the company benefited from reduction in sales time from days to hours, improved inventory control and turnover, reduced administrative costs, improved customer and partner satisfaction and an increase in over business coming into the company. In one year alone their new asset-financing system produced \$200 million in gross profit, a considerable return for a project that cost just \$60 million. The benefits of this new ERP system extended beyond just cost savings and increased business, it also helps manage planning and control of operations. With the use of data warehouse technology which utilizes transaction data stored in the integrated database system, managers had views of data that they never had before. Having increased visibility had a significant affect on strategic planning for the organization.

An ERP system can have profound effects on a global business in today's environment. Having agility and speed in business processes is essential for keeping a competitive advantage over competitors located across the globe. An enterprise-

wide integration of business units and processes allows a company to quickly and effectively gather data, extract useful information from the data, and use that information to help plan and implement a global strategy that can help a company add value and maintain a competitive advantage. There is no doubt that running a global business is a difficult task, especially doing it effectively, having a fully integrated system using ERP technologies makes the task somewhat easier and allows for increase productivity and lower costs, which can aid in a company implementing a new global strategy.

As companies continue to grow and expand into new markets, the need for increased integration is a must. Enterprise technologies can be the backbone behind an organization's global operation. From, SCM technology that can create a quick, reliable and value added supply chain, to ERP technologies that can transform an organization into one fully integrated enterprise, enterprise technologies are essential components to a company's global operation. The speed and scale at which business is being done today requires intense coordination of business processes, enterprise technologies give companies the ability to operate at the speed and scale demanded in today's business world.

INFORMATION TECHNOLOGY AT THE STRATEGIC LEVEL

A decade ago, information technology was considered a support function to a company's success; today however, information technology has become an integral and vital component to a company's strategic planning. More and more CIO's are being asked to join other top executives when companies develop strategic plans. As the global environment continues to become more and more dynamic, the more companies must re-assess their strategic plans in order to meet the demands of the marketplace. In the realm of IT, constant re-assessment is commonplace, and because of this CIO's carry a unique ability to be able to react and make important decisions at a timely manner in order to effectively adapt to the changing environment. Other top executives are realizing this and thus making CIO's are key component to a company's strategic planning. Today companies that make information technology an integral part of their organization's strategic planning are creating a competitive advantage that is hard for other companies to overcome.

FedEx, a global provider of shipping services through its network of supply chains, transportation, business and information services, has become one of the leading shipping companies in the world, bringing in over \$32 billion in sales in 2006¹⁷. One of the main reasons for their dominance is their continuous effort to engrain information technology into their strategic planning. For FedEx, information technology is what connects, runs, and supports their business units to provide maximum efficiency in their processes and their carrying out of strategic plans. From the early 1970's when FedEx was founded, they believed in using technology as an integral part of their strategic planning. FedEx believed that the information about shipments, was just as important as shipments themselves, and implemented a package tracking system in 1978 that created a competitive advantage for the company that lasted almost 20 years until other companies realized the importance of information technology in strategic planning.

Recently in 2003, the company looked to improve business strategies through new technologies with a new initiative, FedEx called "6 x 6 Transformation". The goal of

¹⁷ FedEx, *2006 Annual Report*, FedEx, Memphis, TN, 2006.

this three year project was to transform business technologies by improving on six different strategies within the company. FedEx looks to align resources to the company's critical initiatives while improving cycle time and return on investment. The viewpoint at FedEx was that even though they were generating over \$20 billion dollars in sales at that time, they still could become a more agile company that can move IT resources to fit business requirements and respond to consistently changing customer needs. The company has managed to identify that the global marketplace is dynamic and they need to transform their organization to meet the needs of this changing environment. With this IT initiative the company will only add to their company culture that looks to engrain information technology into every aspect of their organization to meet the demands of their competitive environment.

The company has even created a FedEx Services business unit which provides application and infrastructure support to all of the business units and processes within the company. Business partners work continuously with IT managers to help in developing and launching new products along with creating new business strategies. This constant collaboration between IT and other business functions allows FedEx to create new business processes along with new strategies that are both technologically feasible and will create added value for the company.

Technological innovations have changed how organizations do business and because of this it is a necessity for a company to make information technology a key component to their strategic planning. Because information technologies are changing how companies operate, both business and IT units must collaborate together in order to create strong and effective strategies that will help them compete in the global marketplace. Companies can no longer take a re-active approach to information technology; it is the job of CIO's to act as scouts for their organizations. They must have the vision to see what new and upcoming technologies are worthwhile for their organization in order to effectively plan and manage new business strategies that will be the determining factor in whether or not they can survive in today's global, fast paced, ever changing business environment.

SUMMARY AND CONCLUSION

In summary, advances in information technology have changed the way we live and have changed how people, businesses and governments interact with each other. Innovation in information technologies has played a major role in the progression of globalization over the past few decades. This expansion has had a profound impact on organizations across the globe and the only way for companies to adapt to this new environment is to make a concerted commitment to globalization through their development of processes, infrastructure, and strategies. In order to best achieve this goal companies should make information technology an integral piece to a company's global business strategy. Information technology has forever changed how organizations conduct business, as shown by my examples of companies introducing information technologies into their organization to create global strategies.

As companies both large and small press forward into the future, the need for acting on a global scale becomes even more essential. Information technology is penetrating every aspect of business and without a sound IT infrastructure; companies will soon realize that they can not keep up with the rest of their competitors making use of information technology in their firms. What organizations must remember however, is that as information technologies become cheaper to acquire, more standardized and more replicable, their ability to create value and gain competitive advantage has become lessened as more and more people have access to the same types of technologies. As these trends in information technologies continue, the market for IT will soon become a commodity market, as IT systems, services and suppliers can easily be inter-changed without loss of functionality and productivity.¹⁸ Companies can no longer implement information technologies and expect them to create value for their organization. The company must first address its strategic needs and challenges that come with an increasingly competitive and global environment, then apply the functional technology to assist in bringing that strategy to being. This is already being seen, presently with companies such as Wal-Mart, UPS,

¹⁸ G Grant, 'What Really Matter About IT', *Journal of Global Information Management*, Vol. 12, Iss. 3, Jul-Sep 2004, p.2.

FedEx and Dell who have recognized a global strategic challenge that needed to be solved and by applying the necessary information technology to address this challenge, these companies created a competitive advantage for themselves that no one in their industry has yet to match. Information technology alone may not lead to a competitive advantage but it does allow for innovation, integration and collaboration that is necessary in order to effectively implement and manage a global business strategy. The increased alignment of information technologies and an organization's strategic needs will be imperative in order to create a competitive advantage that is both unique and difficult to replicate.

New technologies will continue to change existing practices and create new ways for your company to improve business practices. A new technology that is just entering the market but is widely gaining popularity is service-oriented architecture (SOA). Microsoft defines SOA as, "a means for integrating across diverse systems. Each IT resource, whether an application, system, or trading partner, can be accessed as a service."¹⁹ What makes SOA such a valuable architecture for an organization is that any resource on the network is made available as an independent service that can be accessed without knowledge of the underlying platform of that resource. SOA also helps businesses respond more quickly, with less cost, to changing market conditions, which is imperative in a multinational corporation. SOA links resources more easily and promotes their reuse by leveraging pre-existing technologies to perform in new ways, rather than throwing away and replacing new systems. When trying to implement a business strategy, having a system in place that responds to business needs quicker, develops faster, and is easier to maintain and manage, is a huge advantage for a company that can do that on a global scale.

The 'Semantic Web' is another new technology that is still in its development stage, but will soon change how organizations do business on the web. The semantic web can be thought of as a global web of data. Today the web is full of data; you can view your bank statements, check appointments on calendars and schedule flights. The

¹⁹ 'Learn about Service Oriented Architecture (SOA)', Microsoft, Dec 1, 2006, <http://www.microsoft.com/biztalk/solutions/soa/overview.mspx>, viewed 3 April 2007.

only problem is that each of these data types is controlled by different applications and each application does not communicate with the others. The semantic web solves this problem by introducing a common format for integration and combination of data that comes from different sources. The semantic web also contains a language that records how data relates to real-world objects. This allows a person or machine to begin in one database and then move through and search other databases related to the initial data. Having a globally integrated and uniform web that can manage data from diverse application is a great capability for a company to create a global strategy. Companies who take advantage of this technology will be able to create services that have never been seen before. For example, a company could offer a web-based calendar along with a photograph uploader and people would be able to view their photos on their calendar the day the picture was taken, so they can see what they were doing that day. While this may seem a primitive example, it shows the promising capabilities for a company who can be first to take advantage of the semantic web. Integration and standardization are pivotal features that must be implemented when creating a global strategy, with the semantic web; companies will soon be able to create cross-functional web services for their employees, along with inventing new web-based services for their customers on a global scale.

Globalization has affected every person on earth in one way or another and will continue to influence their daily lives. We have gone from many independent nations working separately, to a world full of communication and interaction due to the effects of globalization. The world has come a long way in the past few decades and it is due in large part to information technology. There is no way to measure the affect information technology has had on the global landscape, but its influences are seen throughout the world on a daily basis. People can now communicate with people half way across the globe with the littlest of ease and more and more people are interacting with more people in more ways than they ever could have before information technology came into play. From the rise of the PC, to the creation of the internet, to the development of mobile, digital and virtual technologies, information

technology has played a monumental role in the earth truly becoming a globally-connected world. Globalization may have already been occurring before information technology came to be, but there is no doubt that without information technology, globalization would never have progressed as rapidly as it did, and globalization would not be at its current state without information technology. Globalization has become incorporated into every arena across the globe from economic, political, social, to business. While globalization has had an impact on all of these different arenas, globalization has played a crucial role in how companies do business today in a global world. Globalization is no longer something companies must deal with, but rather engage and take full advantage of all that it has to offer. Companies that do not recognize globalization as a major factor affecting their business, are truly going to be left behind, as globalization will only continue to immerse itself and become more engrained into how business are going to have to conduct their operations.

The global playing field is being leveled as more and more countries, people, and resources are available and willing to join the global market place. Countries such as Brazil, China, India and Russia are well on their way to becoming major competitors in the global landscape as their economies and skills are growing due to globalization. As communication continues to intensify, quicken, and become simpler, even more participants will join the global landscape and will pose a new challenges for corporations. Presently, the speed at which businesses operate is faster than ever before and as globalization intensifies and continues to grow, businesses must be able to respond immediately and adapt quickly to the ever changing global business environment that awaits them. If an organization wishes to continue to run a successful business, it must continually create new business processes that take advantage of the new trends and events that are sure to take place. Businesses must continually develop new products and services that are unique and innovative if they wish to maintain a competitive advantage over their competitors. There is no way to tell what the future holds for businesses as globalization continues to progress, but what is for sure is that globalization is not going away and businesses will need to

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utilize new and emerging information technologies in order to implement global strategies that will be able to harness all that globalization brings.

Information technology has been the leading factor in the progression of globalization to this point, and will continue to influence globalization's progression throughout this century, leading to a globally connected world. With globalization becoming such an integral part of the global landscape, businesses need to adapt their processes and operations in order to compete in the highly competitive global environment.

Information technology is the driver behind organizations' need and desire to implement global strategies. Information technology has moved the business environment from a predominantly U.S.-based world to a truly global world and both U.S. and the rest of the globe are benefiting from it. We have moved from the Information Age to the Global age and the main force behind this change is information technology. The importance of globalization will continue to grow as companies move into the upcoming decades. With innovative information technologies to support them, organizations will have the capability to monitor, re-evaluate, modify and employ global business strategies that will meet this global challenge.

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