

INTERNATIONAL JOURNAL OF THE ACADEMIC BUSINESS WORLD

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ISSN 1942-6089 (print)

ISSN 1942-6097 (online)

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International Journal of the Academic Business World

Published by

JW Press

P.O. Box 49

Martin, Tennessee 38237

Printed in the United States of America

ISSN 1942-6089 (print)

ISSN 1942-6097 (online)

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IDENTIFYING CONSUMER BEHAVIOUR TOWARD CONSUMER TO CONSUMER E-COMMERCE: CHANNEL ADOPTION BARRIERS AND BENEFITS¹

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ABSTRACT

With the growth of the online marketplace, a new channel has emerged that presents consumers with a new method of shopping. This novel approach allows consumers, through a facilitator who provides a market of exchange, to do business with other consumers. This channel is called consumer to consumer and is best identified through eBay, Yahoo Auctions, and partially Amazon. Our study looked at three groups, which included those who do not buy online, buy online but not through this channel, and buy from consumers online. By means of focus groups, this research found that those who do not buy online avoid the market because they still prefer many of the service outputs provided to them through the brick and mortar stores. Those who do not use the consumer to consumer service, but buy online, prefer a hassle free experience that the new channel does not provide to them. Those who do use the new channel do so because they are price sensitive and are able to compensate for any perceived risks by spending more time researching the purchase. In the end, it is evident that those who do and do not buy through this new form of business are two distinct groups, and a lot will need to be addressed to further integrate them.

1 Research supported by the SSHRC Research Development Fund (Lakehead University).

Introduction

There have been many studies concerning consumer behaviour. Previous research focuses namely on why people buy from one store versus another; the effects of price; service; and other factors on where, why, and what a person shops for. With the introduction of the Internet, a new shopping experience has emerged. Consumers can go online and find products with a greater availability, variety, and, in many cases, for a lower price than traditional brick and mortar locations. Additionally, many consumers find it appealing to shop from the comfort of their own home. There have been studies that have investigated why people shop on the Internet. Now, however, a new method

has developed with consumers shopping, not only at businesses, but with other consumers. The new market is consumer-to-consumer (C2C) business. In this paper, our aim is to look at why consumers have and have not adopted the online C2C channel for consumption of goods and services. Hence, it is important to understand who the consumer is and what the deciding factors are behind the decision to use or not to use the online C2C channel.

The remainder of the paper is as follow. First we address three major issues related to the online buying process; namely the consumer, company, and C2C factors. Afterwards, the methodology and the re-

sults are presented, and finally, the results are discussed and a general conclusion is provided.

Online and Consumers-To-Consumer Shopping Experience

When searching researching online purchases, it has been found that males and those with a higher cost of living, income, and level of education tend to buy online (Black, 2005). Younger consumers, higher gift spenders, and those who enjoy the Internet shopping experience also buy online; however, individuals who feel the experience is too risky do not like using this technology (Swinyard and Smith, 2003). It will be interesting to see how the profile of the non-Internet shopper differs from the C2C and Non-C2C buyers. If risk is seen as a barrier to buying online then what exactly are those risks? Consumers' tend to fear unwanted information sharing, accumulation of junk mail, abusive transactions, and insufficient security (Miyazaki and Fernandez, 2001). Many retailers have recognized the fears associated with a perceived increase in risk and lack of security, and have reacted by, not only, increasing the security of the site, but also in communicating the improvements of those features to potential buyers (Desai, Richards, and Desai, 2003). It is therefore crucial to explore how and if these risks are present in the online C2C market.

Those who participate in the online shopping environment tend to not be concerned with the feeling, touching, and seeing of products (Torzadeh and Dillon, 2001). They also seek a challenge when using the channel, but do not want it to be too complicated, as they want quick and easy access. Additionally, they desire the whole experience to be reliable and that the seller is competent in providing accurate information, speedy shipment and quality service (Lim and Dubinsky, 2004). Finally, it is found that third party systems can help improve a website's image of competency, and thus make the consumer more trusting and confident in his or her decision to shop there (Ba, Whinston, and Zhang, 2000). The third party system would allow consumers to use other services for payment and may have additional fraud protections, so it is logical that users would feel more comfortable with this service.

Conversely, there has not been a lot of research on the C2C channel thus far, but there has been an interesting look at the classification of risk through the mar-

ket. Risks through this channel have been separated into fraud and undesirable transaction behaviours (Macinnnes, 2005). Fraud is defined by credit card fraud, deception, and non-shipment. There is a fear that someone will steal the consumer's credit card number and misuse it. Deception is defined as the seller purposely lying about what the product is and its quality. Non-shipment is the seller not shipping the product to the consumer. Undesirable behaviour traits are defined as incompetent services such as slow shipping, mistakes in the packaging, and sending the wrong product. It will be interesting to explore what roles these two risks play in why people do and do not use the C2C channel.

Distribution and Company Factors

First, it has been identified that assistant devices can help consumers make decisions for online purchases through providing a list of different products and prices that are available online. This can help the consumer make his or her decision (Haubl and Trifts, 2000). Businesses can use the outcomes of the assistant devices to make positioning decisions. For instance, if they know that the devices detect certain products with certain prices then they can try to position the company to fall into the recommendation category of the systems. This means that when a consumer does a search he or she will find the company at the top of the list. It was also found that assistant devices should be customizable for each consumer based on his or her behaviour, and should be independent from the retailer (Menzer, Street, and Monge, 2002). The assistant devices can lead the consumer to the best price on the Internet for a given product, but it is only beneficial if the prices are better through the online channel than the brick and mortar channel. Further, it has been found that for electronic goods, prices are on average 16% less expensive than in the brick and mortar channel (Baye, Morgan, and Scholten, 2003). Another study compliments this research, as it has found that, for different products, prices can be anywhere from 9% to 16% less expensive, and that online prices fluctuate more and have a higher dispersion than in retail stores (Bryjolfsson and Smith, 2000). It was also found that online consumers tend to be rather price sensitive, and are more trusting of sites with a name that they are familiar with and has branded products (Smith and Bryjolfsson, 2001). Finally, products that are more expensive, are in the maturity stage of their lifecycle, and are high involve-

ment have higher price dispersion (Lindsey-Mulkin and Grewal, 2006). In addition to price, there are other factors that businesses can use to help provide assistance to the consumers. One is through return policies, as it is found that lenient return policies help consumers make their product decisions quicker, increases value, and lowers potential regret for the product (Wood, 2001). Lastly, if a company makes a mistake, it will need to try to fix the relationship, and the best way is to not only exchange the product, but to also offer compensation for the error (Forbes, Kelley, and Hoggman, 2005).

Objectives and Research Questions

To address all the abovementioned issues, the paper will (i) identify the consumers who buy online and why they buy online, and then (ii) investigate if the online C2C and non-C2C buyers have any different requirements and preferences for the experiences, and finally (iii) propose a general model for the C2C purchase. To tackle those objectives, there are two research questions that will be examined in the study. The broad first question is:

What are the reasons why consumers buy online, but not from a C2C website?

The barriers behind why people do and do not buy online have been well researched and are relatively clear. This question deals with the barrier between why people buy online, but do not use the C2C Channel for their Internet purchases.

The second research question is an extension of the first:

What are the main reasons why people buy from the C2C channel?

From this question, the purpose is to discover and understand the main motivations of why these consumers buy from a C2C website, the benefits that they see, and their C2C consumption behaviours. This answer will further the analysis of the first question, because it will provide the behaviours of both groups and thus we can now compare them to see the contrasting motives.

Methodology

Procedure

While the study investigates active online shoppers, it cannot be limited to those who are authorities in Internet commerce. The research must capture a broad audience of participants. The sample should include many users who shop at different levels including: price, purchase amounts, and products. With depth interviews, the study would have to focus on those who shop in high frequency on the Internet. Additionally, one can argue that having a dynamic environment, with participants building the themes off of each other, will allow for a more complete study. Therefore, focus groups were chosen over depth interviews, because they will allow for a wider, more dynamic group of participants, thus leading to more complete results. To help increase the validity of the sample, there were strict guidelines that dictated who was eligible to participate. The guidelines ensured that those who are being studied are relevant to the research question.

Different qualifications were expected for each focus group. For the Non-Online Buyer, the participants needed to be actively online for more than 10 hours per week, but must have never shopped online for any product or services. The Internet use requirement ensures that the participant is one who has the opportunity and knowledge to buy online, but makes the specific decision to not shop through the channel. For the online Non-C2C and C2C Buyers, the participants needed to make five different annual online purchases from at least two of the following categories: "tickets/reservations," "DVDs, CDs, books," "electronics," "clothing," "furniture," and "other." These qualifications helped ensure that the participant is a regular and diverse online buyer. It also assumed that the buyer is educated enough about online purchases to be able to convert to C2C buying. The C2C Buyers then needed to make a minimum five online purchases a year, with a minimum three purchases through the C2C channel, and also buy from at least two of the following categories: "tickets/reservations," "DVDs, CDs, books," "electronics," "clothing," "furniture," and "other."

Sample

There were 11 focus groups with a total of 39 respondents (cf. Table 1 for more details). The groups were all conducted in the cities of Thunder Bay and Ottawa, Ontario (Canada). The Non-Online Buyers had one group in Thunder Bay and two in Ottawa with a total of 10 respondents. The Non-C2C Buyers had three groups in Thunder Bay and two in Ottawa with 18 respondents. The C2C Buyers had one focus group in Thunder Bay and two in Ottawa with 11 respondents. The participants were found through a judgement snowball technique. While it may not be the most unbiased way to find members, the screening questions were strictly followed to ensure that respondents fit the desired profile.

There were three segments studied with Non-Online, Non-C2C and C2C Buyers. The Non-Online Buyers had the oldest participants, with an average age of 37. This can be a limitation, as the resulted behaviours could have been influenced by age and findings may not have resulted from variables associated solely with the online environment. This particular group had a 50% gender split. The Non-C2C Buyers have an average age of 29, so while there can be an age difference between the Non-Online and Non-C2C Buyers, it is not drastic; however, gender may have played as a limitation as over 70% of the group was male. The C2C Buyers had an average age of 27, which aligns it-

self with the Non-C2C Buyers, and also was just over 70% male.

Analysis

Sample results were obtained by analysis of verbatim transcripts of the audio-taped interviews. Even though it is not necessary to transcribe the interviews, this does allow for more in-depth analysis of subtle themes. Each member received a financial incentive to participate. While incentives may cause a bias with the participants, it is argued that it will have little to no effect on the quality of response. Each interview ran between one to two hours, and was documented on a digital recorder. All focus groups were recorded and transcribed to capture, with minimal bias, the perceptions, benefits and motivations underlying decision-making process with regard to non-online, online and C2C purchases. Data collected in the focus groups were analyzed using content analysis. Data was organized around particular themes, on a judgmental basis, that were coded and categorized in order to facilitate their interpretation (cf. Table 2). Content analysis and coding of the data was performed according to the relevant literature (Kassarjian, 1977). Two separate judges coded the data. The inter-reliability between the coders was 92%, which is above the satisfactory level of 85% agreement (Kassarjian, 1977).

TABLE 1
CONSUMERS PROFILE

		Non-Online Buyers	Non-C2C Buyers	C2C Buyers
Gender	Male	5	13	8
	Female	5	5	3
Age	18-30	4	13	8
	31-50	4	2	3
	51+	2	3	0
Occupations	Retail	3	2	2
	Student	1	9	4
	Government	2	0	0
	Office Work	1	3	4
	Self-Employed	0	2	1
	Other	3	2	0

TABLE 2		
THEMES CLASSIFICATION		
Non-Online Buyers		
Themes	Number of Sub-Themes	Definition
Shoppers' Profile	8	Explains who the buyer is, the buyer's behaviours, and how the buyer acts
Standard Shopping Experience	9	How the buyer feels about shopping through the brick and mortar channel
Purchase Requirements	7	What is required from the buyer to buy the particular product from the specific store
Non-C2C Buyers		
Themes	Number of Sub-Themes	Definition
Shoppers' Profile	5	Explains who the buyer is, the buyer's behaviours, and how the buyer acts
Standard Shopping Experience	7	How the buyer feels about shopping through the brick and mortar channel
Online Shopping Experience	13	How the buyer feels about shopping through the online channel
C2C Barriers	4	What prevents the buyer from using the C2C channel
C2C Buyers		
Themes	Number of Sub-Themes	Definition
Shoppers' Profile	5	Explains who the buyer is, the buyer's behaviours, and how the buyer acts
Standard Shopping Experience	5	How the buyer feels about shopping through the the brick and mortar channel
Online Shopping Experience	7	How the buyer feels about shopping through the online channel
Purchase Requirements	9	What is required from the buyer to buy the particular product from the specific store

Results

We conducted a content analysis of all focus groups. A list of 11 themes structured into 124 sub-themes was determined and involved different sets of motivations, attitudes, and perceptions. All 11 themes have been grouped into different categories capturing major aspects of non-online buyers, online buyers, and C2C buyers. Themes and sub-themes have been chosen using a simple algorithm, (i) sub-themes are exclusive to the theme they belong to, meaning that a sub-theme can not be part of two different themes, and (ii) all themes are a by-product of the research objec-

tives and clearly mirror the spirit of the interviews. To analyze the results, there was a careful concentration ongoing through the whole shopping process. The first theme that is analyzed is the Shoppers' Profile, because this will identify the buyers and thus show what behaviours will dictate how the consumer reacts in the other themes. Next, there will be a review of the Standard Shopping Experience, which looks at the in-store buying process. It will be followed by the Online Shopping Experience that looks at the Internet purchasing process. Finally, we come to the end of the purchase decision process, so there is a look at

what the Purchase Requirements are, followed with the C2C Barriers.

Shoppers' Profile

The psychographics and behaviours of a buyer can dictate the way he or she makes purchasing decisions. This can be seen in the Shoppers' Profile. There are two different categories for the theme with "risks" that the buyer sees in the online shopping environment and "desirable behaviours" that the buyer wants from the seller. The first risk is *perceived risks*, which is the fear of the website getting hacked, receiving junk mail, and potential identity theft. *Product delivery* was mentioned as a fear that the consumer would not receive products after being ordered. *Credit card fraud* involves the idea that there could be potential *abuse from company* as well as a hacker accessing the corporate records. There are several behaviours that this group finds desirable. The *trusts information* sub-theme deals with the faith in the information they receive in the brick and mortar channel. These consumers also desire *privacy* and are protective against losing it. At the same time these consumers do prefer to have their product immediately in their hands and want to avoid the experience of *shipping*. In contrast, they are willing to use the *phone and catalogue* channel and deal with shipping for some of their products.

For the Non-C2C Buyers, in their Shoppers' Profile, they are concerned with "risks" like *credit card fraud*, *hacking sites* and *identity theft*, and "Undesirable behaviours" with traits that they dislike from the seller. These three risks are problems that are also seen by the Non-Online Buyers; however, these consumers understand the problems with these risks and believe that by going to larger, more popular sites that the sellers are more trustworthy and have the financial strength to implement stronger security procedures. So while this group is concerned about risks, they are also very risk averse. The group wants to deal with competent businesses and find *slow shipping* a symbol of incompetence, as they prefer to deal with companies that are known to deliver the product quickly. The group also finds *returns a hassle*, so they will only buy a product online if they are ultimately sure it is what they want.

The C2C Buyers can be seen as *risk takers*, as they are willing to deal with sites that could be less safe to deal with for only a slightly better return. Interesting enough, when they buy from even the less trustworthy sites they *expect product shipment* and *feel safe* with the transaction. One could see, however, that this group tries to compensate for their risk taking by being *more observant* as they tend to pay more attention to their shopping experience. This group also likes to check out different sites and channels, and participate in *price matching*.

Standard Shopping Experience

How the buyer feels and reacts to the brick and mortar shopping channel can be explained by the Standard Shopping Experience. For the Non-Online Buyers, the theme can be broken into three categories looking at "why the buyer purchases new things," "likes and dislikes" of the in-store shopping experience, and "location choice" for consumption. The Non-Online Buyers like to purchase products, because they like to get *new things*, and like to see and purchase *different products*. Some of them do *hate crowds* and *hate lines*, but most like to *browse* through the different stores, even without the intention of buying. This group likes to choose their locations by having places that offer *one stop shopping* and provide *convenience*. They also enjoy the *product experience* for most of their purchases as they like to feel, see, and touch the merchandise. This group likes to use *local shopping* as they feel local businesses have a vested interest in providing better information and service, and that they want to support the regional economy.

The Non-C2C Buyers also *like new things* and *different products*, and it seems like these two ideals are more important to this group than the Non-Online Buyers. This group also intensely *hates lines*, *hates crowds*, and *hates hassles* as they feel that the Standard Shopping Experience can be troublesome with these obstacles. They feel that they can avoid these displeasures by using the online channel. Interesting enough, this group may dislike buying through the brick and mortar channel, but still likes to *browse* through a store. They like to look for and receive *deals*. Surprisingly, the C2C Buyers seem to have a similar experience through the brick and mortar channel, as they also like to get *new things*. Thus, there is nothing re-

ally different there from the other two groups. They also *hate lines* and *hate hassles*, and even like to *browse* through the brick and mortar channel. The big difference for this group is that it is very *deal sensitive*, which is a big increase from the Non-C2C Buyers and is also the second price oriented sub-theme found so far for this group (the first being *price matching* for the Shoppers' Profile).

Online Shopping Experience

For the Non-C2C Buyers, the sub-themes can be separated into "where they want to buy" their products and services, "why they buy where they do," and "why they buy online." Not only does this group like to browse through the brick and mortar channel, but they also like to *browse websites*, even without the intention of buying. When trying to find products, they tend to go to their most popular websites and use their *favorites* first. With that said, sometimes they do use *searches* with a search engine or an assistant device. In the end, they will still only buy from the sites they trust the most, and really prefer websites with a *brick and mortar location* as they feel the tangibility of a real store offers more security. When deciding what to buy and where to purchase from, the consumer will look at different *online feedback* and *reviews* for the product and site. The consumer will also *compare information* for different products through different sites. They will look at *shipping speed/cost*, realizing that the price of the product may not be the final cost and understanding that there are different shipping speeds for different products. The group, however, will pay a little more for expedited shipping in the case that they want quicker product delivery. Finally, the consumers do like places with a lenient *return policy*. This is interesting because the group also saw returns as a hassle within their Shoppers' Profile. The group likes the online shopping experience and has several reasons why they use the channel. They like that the Internet channel offers superior *convenience* than the brick and mortar channel, and they also find that in many cases they can get better *prices* online. Additionally, the channel offers a much wider *selection* than the brick and mortar channel, and finds that the method is *quick and easy*.

For the Online Shopping Experience, the C2C Buyers can be easily compared to the Non-C2C Buyers as they have the same three categories for the separation of sub-themes. The buyers for this group are a

bit different than Non-C2C Buyers in how they find the product they are looking for. This group likes to *use searches* with search engines and assistant devices to find the product they are looking for and who carries said item. They will search for the product and buy it from whatever site meets their requirements. While they do like to shop from stores with a *brick and mortar location*, they do so out of familiarity and not security. They mention that they have no real loyalty to where they shop and will buy from the site that gives them the best reason to make the purchase. The group is concerned about *shipping speed*, but will usually just pay more for the expedited shipping if they want it quicker. They spend a lot of time using the *online feedback* and *comparing information* as compensating factors for the risks that they take. The time that they spend on these features appears to be much greater than the Non-C2C buyers would. Finally they like to buy online because of *convenience*, but most of all *price*. Price again is a big factor for this group as this is the third price related sub-theme mentioned by them. They mentioned that price is the main reason why they buy online and is the main reason why they buy the product from where they do.

Purchase Requirements and C2C Barriers

Person Oriented Features are service outputs that a company can provide through direct contact between its employees onto its customers. *Service* is one sub-theme, as consumers' desire friendly and helpful staff. The respondents also want the employees to be *knowledgeable*, because they like to be provided with information from those that they feel are trustworthy. However, if they are making a quick, low involvement purchase, they do not like *being bothered*. There are service outputs that the Non-Online Buyers desire that are not necessarily provided through direct staff contact. The Non-Online Buyers desire *quality* with their purchases, and feel that by being able to see, feel and touch the product that they can better judge its quality. They also desire that the product has a fair *warranty* and *return policy*, and that brick and mortar location gives them a place to go after if they have to use the warranty or return the product. Finally, *price* does matter to this group, but they are looking for more of a fair price than being price sensitive.

The consumer will buy from the site if it has good *reviews* and a good *return policy*. Additionally, for some

products, they prefer it if they have some form of *trial* for the item. As mentioned before, this group takes more risks, but they try to compensate for those factors by paying more attention. The group is very observant and looks for certain things to help differentiate from a trustworthy and not trustworthy site. They believe that the site has a certain *level of design* with not having spelling mistakes, well formatted and so forth; the site will be more trustworthy. They do look for certain *customer service* features and a *1-800 number* to try to find ways to build a bond with the company to reduce the risk. The buyers also have some preferred services as they desire paying with *PayPal* when using the C2C channel. They also want the *expedited shipping* when shopping from a site. Finally, if they do not feel comfortable with the transaction they will go somewhere else and *pay more for comfort*.

Conversely, there are four barriers that the Non-C2C Buyer faces that prevent them from using the C2C channel. The first barrier is *auction* as they want to get the product immediately and find that the bidding process is too clumsy to deal with. The second is that they feel that the sellers are not well identified and inexperienced, so they fear *incompetent service* thinking that there will be slow shipping or mistakes with the delivery. They also see the environment as being *too much trouble*, as the whole process of finding a product, signing up for PayPal, reviewing the sellers, looking at the feedback and doing the auction goes against the quick and easy principle they are looking for. Finally they do see the channel is one that could be prone to *fraud* and do not want to have their credit card number stolen or never getting the product that they ordered.

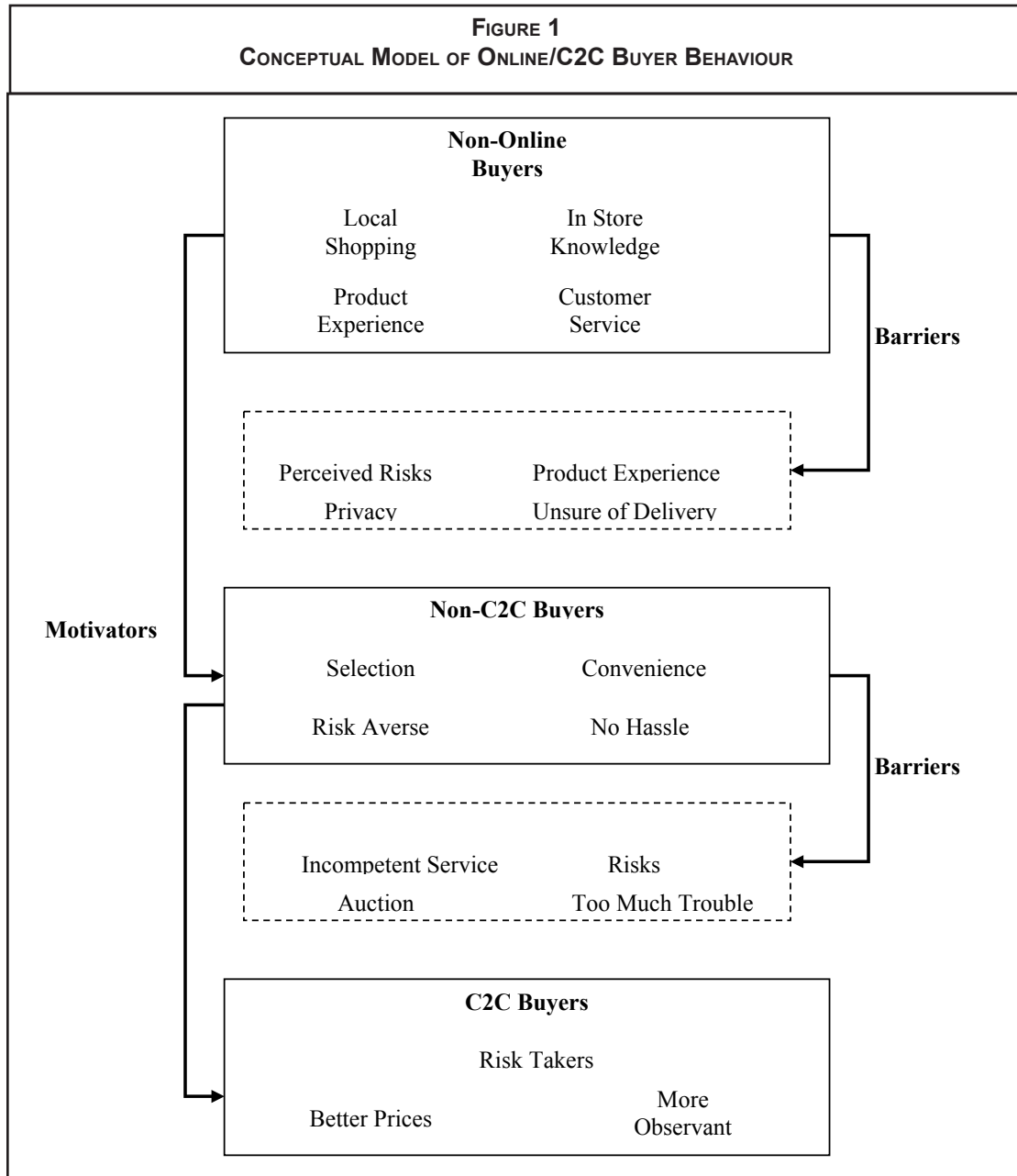
These five themes have developed a clear picture of who the three buying groups are and why they are segmented in this particular way. These three groups are not static, but rather are dynamic. The Non-Online Buyers can become Non-C2C Buyers, and the Non-C2C Buyers can become C2C Buyers. The following conceptual model looks at this behaviour and how a buyer can be motivated to move from one group to another, and conversely, what role the barriers play in preventing the flow from one level to the next (cf. Figure 1).

Figure 1 goes here (Figure 1 attached in the appendix)

There are three distinct groups of buyers with motivators to move to the next level and risks to stay in the current or move back a level. The Non-Online Buyer is encouraged to become a Non-C2C Buyer through gaining more trust with the online environment, looking for an easier route that will make the shopping experience more convenient and hassle free, and having confidence in the purchase that they make online so that they trust the quality of the product and its delivery. If these three motivators are strong enough the buyer will be pushed through the barriers and become a Non-C2C Buyer. At the same time the Non-Online Buyer is faced with losing in store service and benefits it sees from that, moving into a riskier situation, and losing the whole experience of seeing, feeling and touching the product, thus encouraging them to remain in their current group. For the buyer to move from Non-C2C to C2C they need to develop better trusts in the seller as far as believing the consumer to not be a risk of fraud and competent, be willing to spend a lot more time to do a more in depth investigation of the purchase, and be more price sensitive. If these motivators are strong enough, the buyer will move through the barriers and become a C2C Buyer. The Non-C2C Buyer may also fear greater risks with moving to the C2C channel and may feel that they do not have time for the whole process, and can be encouraged to not move forward to the next group.

Discussion and Managerial Implications

Previous studies have looked solely at the online shopping experience as a whole. Conversely, this research took the current online shopping segment and saw that there were two distinct groups. The paper investigated a whole new channel for shopping and business, and identified some of the challenges companies and marketers can face. These findings take it one step further than Black (2005) and Swinyard and Smith (2003), as it examines not just why people do and do not buy online, but why they do or do not buy from the C2C channel. Additionally, previous findings in Swinyard and Smith (2003) and Miyazaki and Fernandez (2001) discussed risks as a limitation to buying online, but no real research has dealt with the hassle aspect between different sites. From the findings, it is clear that, for the Non-Online Buyers, there are factors that could motivate them to buy online. They do want a convenient, easy shopping experience and the online environment would provide those fea-



tures. With that said, in the end this group has too many hard to change behaviours and enjoy too many of the in-store service outputs to be convinced to do part of their shopping online. The Non-C2C Buyers enjoy the online experience, because it gives them the quick and easy, hassle free environment that they do not receive through the brick and mortar channel. This group buys online mainly due to selection and ease, as its members feels that they do not have a lot of time to spend shopping. On the other hand,

the C2C Buyers are extremely price sensitive and are willing to spend a lot of time and effort researching the best price. The group does not appear to be very loyal to particular stores and tend to be more product and price loyal than loyal to a location. This is the big difference between the Non-C2C and C2C Buyers. The Non-C2C Buyers are more risk averse and are only willing to take a little more risk if the return is greater. They will not buy from through the C2C channel because it is too risky and is too much of a

hassle, and thus there is little to no desire to cross over to this channel. The C2C Buyers do not mind using the channel, because they spend a lot of time researching the whole buying process, thus being able to compensate for the risk and gain a better price.

This dilemma is an interesting one for business and marketing, because if the consumer is the buyer and seller then one would think that business has little to gain from the industry. In contrast this is a new emerging opportunity for businesses to take advantage of. eBay is the main competitor in this field and if one were to compete with the company then these factors need to be known. Additionally, the C2C market is opening up its doors to many small businesses and even larger companies who are trying to get rid of excess inventory, so it is important to them to understand the behaviours to gain the optimum return. While the Non-C2C Buyers do not want to participate in auctions, the C2C Buyers have embraced the system, so a two tier system with and without auctions would probably best solve that issue. There needs to be a clearer separation between consumers and the small businesses selling on this channel to help provide integrity to the businesses, so that they can show themselves to be competent and trustworthy. The provider of the marketplace also has to try to promote strategies among its businesses to try to encourage a better identity for the whole market. In the end, to help increase the strength of the market there will need to be definite considerations into reducing the hassle and building the trust.

Conclusion

The C2C channel offers a whole new way of doing things, and like online shopping, some consumers have embraced it and some have not. It appears that those who do not buy online are individuals who do not have a lot of free time and want to purchase products easily, quickly, and without any hassles. The C2C Buyers are price sensitive, thorough, and are willing to spend a lot of extra time and effort to find the best deal from sites that they have identified as safe. The Non-C2C Buyers are not willing to buy through the C2C channel, because of its risky environment and it is a hassle. They are careful where they shop and tend to only buy from larger, well known, online businesses. These are challenges for a business to deal with if it wants to take part of this potentially profitable, but demanding form of commerce.

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A SURVEY ON THE APPLICATION OF COMPUTER NETWORK TECHNOLOGIES AND SERVICES OVER HETEROGENEOUS ENVIRONMENT IN HIGHER EDUCATIONAL INSTITUTES

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ABSTRACT

This study focuses on heterogeneous services and communication technologies for retrieving and sending information in Malaysian Higher Educational Institutes. It intends to investigate pattern and significant level of various services implementation, convergence of communication technologies, bandwidth capacity for Internet (WAN)/LAN and Quality of Service (QoS). It is designed to determine which communication technologies, services, bandwidth capacity and QoS will achieve the highest level acceptance in Malaysian Higher Educational Institutes. Heterogeneous environment can also generate mobility approaches. A survey method is used to collect data from respondents (System Network Administrator) in Malaysian Higher Educational Institutes. Statistical Analysis using t-test shows that implementation of high speed bandwidth for Internet (WAN) achieved significant level. From the result, it shows that there is significant differences implementation of high speed bandwidth for Internet (WAN) in Malaysian Higher Educational Institutes. However, implementation of high speed bandwidth for LAN did not show any significant level and it has a similarity of high speed bandwidth implementation of 100 Mbps. The result from t-test shows that QoS also did not achieve the maximum implementation level, which means there is no significant value exists. Frequency test are used to analyze the various services implementation via convergence of communication technologies in heterogeneous environment for retrieving information. The results did not show any significant difference on implementation of various services over convergence of communication technologies and it also shows decreasing of graph in exponential pattern. The most apparent finding of this study is that various services implementation in Higher Educational Institutes can affect convergence of communication technologies usage in accessing information over heterogeneous network environment. From the survey results, it confirms that Malaysia Higher Educational Institutes have not achieved a maximum level of various services implementation via convergence of communication technologies in heterogeneous network environment and QoS implementation. . Therefore, low convergence of communication technologies can also produce a low mobility and ubiquitous computing environment in Malaysian Higher Educational Institutes. The recommendation based on the finding for future work is to develop heterogeneous model environment for evaluating convergence of communication technologies and services performance in Higher Educational Institutes.

Introduction

The purpose of this study was to investigate current network infrastructure, implementa-

tion of various services and utilization of variety communication technologies for retrieving and sending information to last mile users over heterogeneous environment in Malaysia Higher

Educational Institutes. This study discusses details and focuses on (i) types of communication technologies and services have been used for accessing information; (ii) impact of heterogeneous services and utilization of communication technologies over high speed bandwidth for computer network in Malaysia Higher Educational Institutes; and (iii) Quality of Service (QoS). In this study, services refer to service-oriented architecture and communication. The communication can involve either simple data transmission or it could involve two or more services. While, technologies are related to communication technologies media that have been used by last mile users. The media includes digital broadcasting, integrated services digital networks, digital cellular networks, Local Area Network (LAN) and Wide Area Network (WAN) such as Internet, bulletin boards, modems, transmission media such as fibre optics, cellular phones and fax machines and digital transmission technologies for mobile space communication (the new low earth orbit satellite voice and data services).

In addition, heterogeneous environment is related to implementation of various services such as WWW, Email, VoIP, IP Telephony, IVR, WAP, VoD, Video Conference and Unify Messaging that can be accessed via variety of communication devices such as PC, PDA, fix and mobile phones over wired and wireless network. This wired and wireless network architecture is focused on LAN and Internet connectivity. The study deployed survey methodology to evaluate and measure the implementation of various services and convergence of communication technologies for retrieving and sending information. It intends to investigate pattern of graph and significant level of various services implementation, QoS and convergence of communication technologies. Also, it is to determine which communication technologies, services and QoS will achieve the highest level implementation in Malaysian Higher Educational Institutes.

Literature Review and Problem Statement

Literature Review

In the past twenty years, the use of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavour within business and governance. Within education, ICT has begun to have a presence but the impact has not been as extensive as in other fields (Ron Oliver, 2002). Internet technology has become an important educational technology and tool for developing higher education in accessing information (Jianqiang Li, Zhaohao Sun, 2004); (Ron Oliver, 2002). Future users will use more than one devices that is capable of gaining access to the Internet. Moreover, in the future, the integration of data and communication services, almost every 'Internet Ready' device will be a communicable device. With the availability of this infrastructure, users are now demanding and expecting more services (Binh Thai, Rachel Wan, Aruna Seneviratne, Thierry Rakotoarivelo, 2003). The convergence of communication technologies and applications is driving demand for new and innovative communications services that supports communication, technology and media (Sibongiseni Tunzelana, 2002).

For example, City University of New York, LAN infrastructure on all the campuses has been upgraded from 100 Mbps to a fully redundant and scalable 1 Gbps backbone. The SNet model development is used to provide a total end-to end e-Service to students. This model is to leverage existing infrastructure, add enhanced services and support the total infrastructure and services (Anand Padmanabhan, 2003). Many new services have emerged to realize ubiquitous computing environments, owing to the increasing supply of mobile devices and more widespread Internet and wireless network facilities. Students, professors, school staffs, and campus visitors can easily access the various available campus services by using image-based sensors and mobile devices such as CDMA cellular phones or WiFi smart phones (Melazzi N.B, 2005); (Bigioi P, Corcoran P.M, 2002); (Tack-Don Han, Cheolho Cheong, Jae-Won Ann et al., 2004).

Percentage of PC technology usage for accessing information has achieved 96% but utilization of using other communication technology devices still not fully utilized in retrieving and sending information (Assistant Sectary Cecilia V. Reyes. 2003), (Binh Thai, Rachel Wan, Aruna Seneviratne, Thierry Rakotoarivelo.2003). With the availability of Internet infrastructure, users are now demanding and expecting more services. Users will use more than one devices that are capable of gaining access to the Internet (Paul Reynolds, 2003). Users can get the information content they want, in any media, over any facilities, anytime, anywhere (J.C. Crimi. 2002). Convergence is pushing towards an environment that requires new investment in infrastructure and able to support the delivery of rich services (various services), applications and content. For example, using computers to phone, browsing websites with cellphones or reading emails on TV screens to illustrate idea of convergence (Xianxin Jiang; Fangchun Yang; Hua Zou. 2003), (Podhradsky, P. 2004).

Problem Statement

In the 21 century, a network infrastructure is based on multi-service implementation over convergence of network medium such as ISP, PSTN and GSM (Qigang. Z, Xuming F., Qunzhan L., Zhengyou H., 2005). Availability of multi-service has produced multi-traffic in network infrastructure. Therefore, multi-traffic in the network infrastructure has become more complex to observe and analyze (Kyung-Hyu L, Kyu-Ok L, Kwon-Chul P, Jong-Ok L, Yoon-Hal B, 2003); (Xianxin Jiang, Fangchun Yang, Hua Zou, 2003). Today, retrieving and sending information can be done using a variety of communication technologies such as PC, PDA, fix and mobile phones that are more prone to heterogenous environment, but unfortunately the optimal capability of communication technologies are not fully realized. PC technology is more often use in retrieving and sending information compared to other communication technologies (Assistant Sectary Cecilia V. Reyes, 2003). The main factors of network congestion in Higher Education are related to network design and bandwidth capacity (David R. Gerhan & Stephen M. Mutula, 2005).

Nevertheless, few studies have been conducted to evaluate the application of computer network technologies and services over heterogeneous environment in Higher Education Institutes. Therefore, retrieving and sending information over heterogeneous environment using convergence of communication technologies in Malaysian Higher Educational Institutes should be analyzed and evaluated. This study posits several research questions such as (i) what are the current status of network infrastructure?; (ii) how does the implementation of various services using variety of communication technologies percentage?; (iii) what are the level of network utilization and bandwidth capacity for LAN/Internet connectivity and (iv) how is the level of QoS implementation for retrieving and sending information in Higher Education Institutes?

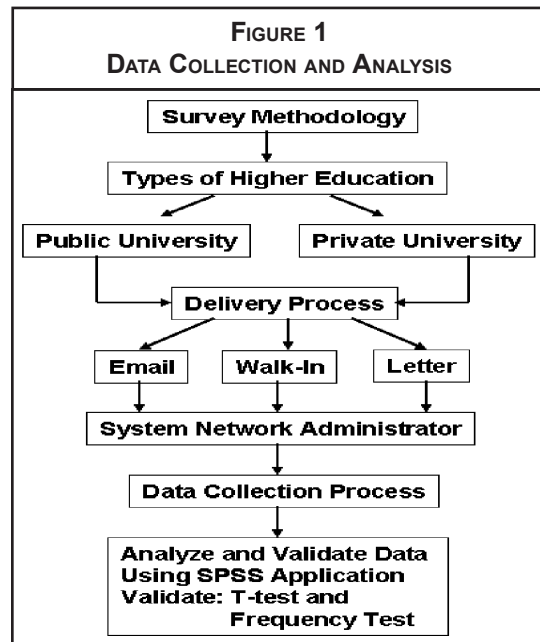
Methodology

The study deployed survey methodology to evaluate and measure the implementation of various services of communication technologies for retrieving and sending information. Malaysian Higher Educational Institutes were selected because, to investigate the pattern of network infrastructure that has build based on multi-service implementation over convergence of network medium such as ISP, PSTN and GSM in the 21 century.

This survey was conducted in January 2006 in several Malaysian Higher Educational Institutes. Public and private universities including college universities were selected to participate in this study (refer to Table 1). Research procedures in Higher Educational Institutes consist of (i) identify research questions; (ii) construct research instrument; (iii) identify sample frame; (iv) collect data from the respondents; (v) evaluate and measure the data and; (vi) validate and analyze the data. The questionnaire comprises four categories: (i) general information; (ii) network infrastructure; (iii) communication technologies and services; and (iv) Quality of Service (QoS). Figure 1, shows the data collection process, validate and analysis in this study.

**TABLE 1
MALAYSIA
HIGHER EDUCATIONAL INSTITUTES**

Types of Institutions	Total	Sample (Response Rate)
Public	17	10 (60%)
Private	19	16 (60%)



**Analysis of
Heterogeneous
Environment Implementation
Performance**

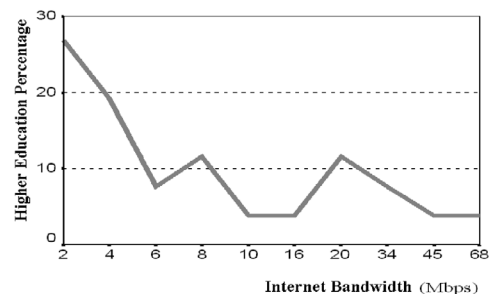
Impact and performance analysis of heterogeneous environment implementation will be divided and discussed in three areas: (i) analyze availability of bandwidth for network infrastructure; (ii) analyze implementation of various services and communication technologies over heterogeneous environment; and (iii) analyze implementation of QoS for heterogeneous environment.

Availability of bandwidth for network infrastructure

Frequency test was used to analyze and measure availability of bandwidth speed for network in-

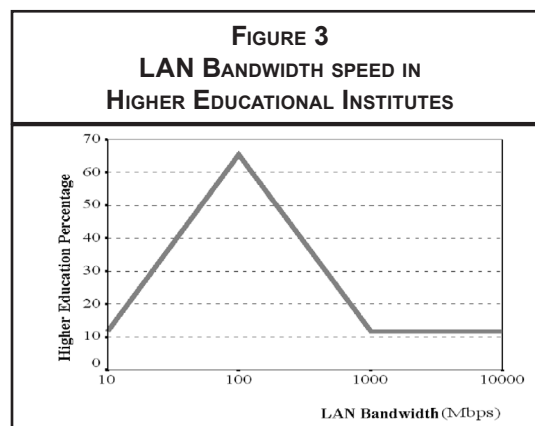
frastructure in Higher Educational Institutes. Figure 2 shows that implementation of 2 Mbps (low speed bandwidth) has achieved higher percentage than 20 Mbps and above (high speed bandwidth) in Higher Educational Institutes. While, it also shows that LAN speed bandwidth more focusing to 100 Mbps implementation compared to 1 Gbps (see Figure 3 and Table 2). Frequency test has show decreasing of graph in exponential pattern for Internet bandwidth implementation from low speed bandwidth to high speed bandwidth.

**FIGURE 2
INTERNET BANDWIDTH SPEED AVAILABILITY IN
HIGHER EDUCATIONAL INSTITUTES**



**TABLE 2
BANDWIDTH FOR
LOCAL AREA NETWORKS (LAN)**

Band-width	Public Universities	Private Universities	Total
10	11.5	0	11.5
100	11.5	53.8	65.4
1,000	7.7	3.8	11.5
10,000	7.7	3.8	11.5
Total	38.5	61.5	100.0



cational Institutes. However, implementation of high speed bandwidth for LAN among public and private Higher Educational Institutes did not show any significant difference and it has a similarity and focusing of high speed bandwidth implementation 100 Mbps (see Table 3).

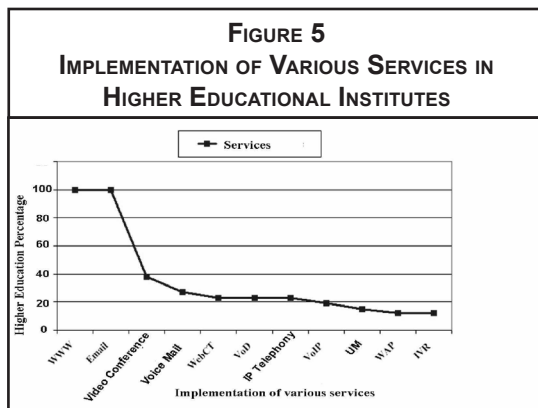
TABLE 3
T-TEST FOR TYPES OF BANDWIDTH BETWEEN PUBLIC AND PRIVATE INSTITUTES

Type of Bandwidth	Type of Institution	Sample Size	Significance Value	t-value
Internet (WAN)	Public	10	0.03	2.308
	Private	16		
LAN	Public	10	0.268	1.135
	Private	16		

Implementation of Various Services and Technologies

Frequency test was also used to analyze the implementation of various services and technologies in Higher Educational Institutes. Figure 4, shows the result of various services implementation such as Web and Email services achieve higher percentage (100%) as compared to other services such as Video Conference, Voice Mail, WebCT, VoD, IP Telephony, VoIP, Unify Messaging, WAP and IVR (20% and below). Therefore, retrieving and sending information in Malaysian Higher Educational Institutes

Table 4 and Figure 5 show the impact of various services operational on convergence of commu-



nication technologies utilization for retrieving and sending information. The result also shows decreasing use of communication technologies such as PC, PDA, Mobile Phone and Fix Phone in accessing information which is less than 10%.

TABLE 4
CONVERGENCE OF COMMUNICATION TECHNOLOGIES PERCENT

Convergence of Communication Technologies	Institutes	Percent
PC	9	34.6
PC, PDA	7	26.9
PC, PDA, Mobile Phone	3	11.5
PC, PDA, Mobile Phone, Fix Phone	1	3.8
PC, Mobile Phone, Fix Phone	1	3.8
PC, Fix Phone	1	3.8
PC, Mobile Phone	2	7.7
PC, PDA, Fix Phone	1	3.8
Total of Utilization	25	96.2
Not Sure	1	3.8
Total of Percentage	26	100.0

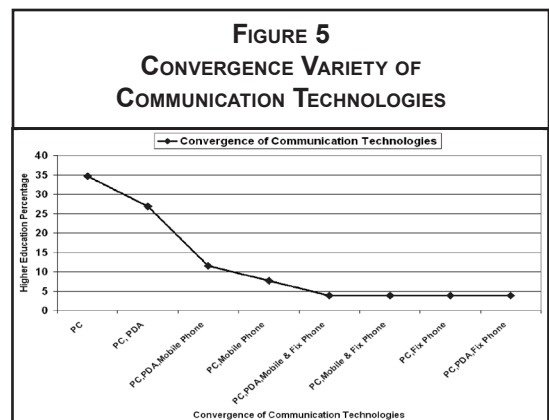
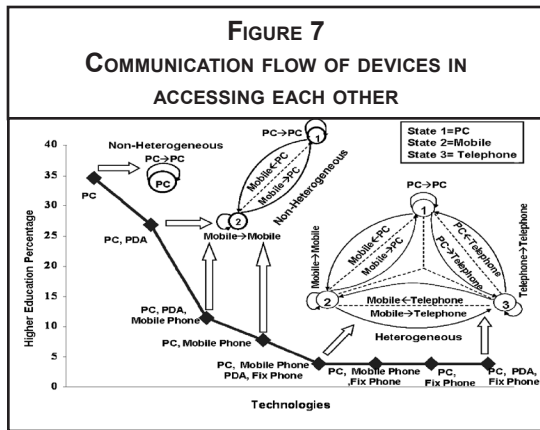
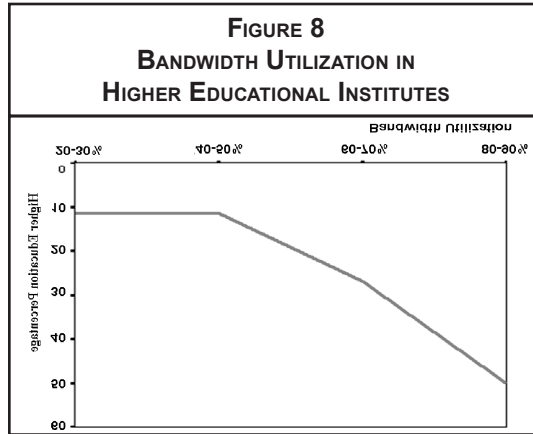
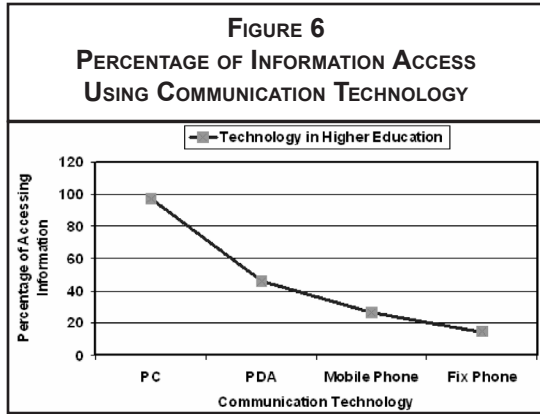


Figure 6 shows the percentage of each communication technology in accessing information in Malaysian Higher Educational Institutes. The most popular communication device used for accessing information is PC technology (100%). While, Mobile and Fix Phones (20% and below) are the lowest communication technologies used for accessing information in Malaysian Higher Educational Institutes.



Educational Institutes can impact the heterogeneous network environment performance.

TABLE 5
TYPES OF SERVICES CONGESTION

Types of Services	Frequency	Percent
WWW	12	46.2
Video Conference	3	11.5
WWW, Video Conference	1	3.8
WWW, Email	5	19.2
Email, Video Conference	1	3.8
WWW, WebCT	1	3.8
No Congestion	3	11.5
Total	26	100.0

Figure 7 shows communication flow of devices that communicate with each other for accessing information in Malaysian Higher Educational Institutes. It indicates that Malaysian Higher Educational Institutes did not achieve optimal performance in heterogeneous environment.

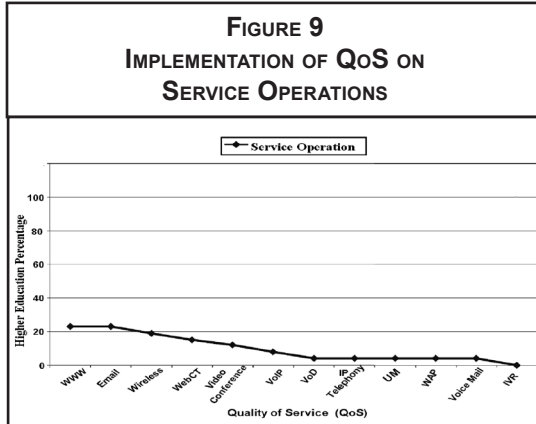
Low speed bandwidth implementation for Internet connectivity (refer to Figure 2) can contribute higher bandwidth utilization. Figure 8 shows that the majority of the Higher Educational Institutes have obtained higher bandwidth utilization (80% to 90%). A few of Higher Educational Institutes (10%) has not fully utilized the bandwidth utilization (20%-30%).

Due to high bandwidth utilization, it can degrade the network performance on operational services such as Web and Email traffic congestion (see Table 5). Web and Email services contribute to 66.4% of the network traffic congestion. Today, higher bandwidth utilization in Higher

From the data analysis, it shows accessing information in Higher Educational Institutes is under utilized based on the implementation of various services and convergence of communication technologies. If Malaysian Higher Educational Institutes want to develop heterogeneous environment, it needs to ensure that capacity, utilization and service of network is well managed. This problem can be solved if System Network Administrator is able to evaluate and measure the network performance in early stage (preparation, planning and designing) before implementing of various services over heterogeneous environment. Therefore, it needs a mechanism or model to evaluate and measure network performance in early stage.

QoS Implementation

Impact of low service operations in Higher Educational Institutes also affects the implementation of QoS (see Figure 9). The result also shows decreasing exponent pattern for QoS implementation.



Based on the respondents' comments (refer to Table 6), the result shows that few expert workers is the main factor why QoS is not implemented in Higher Educational Institutes to improve the operational services performance.

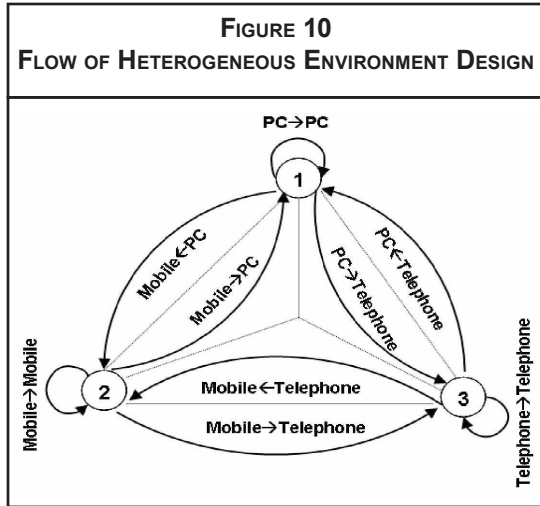
Responses	Frequency	Percent
Few expert workers	8	30.8
Failure to determine QoS	1	3.8
Difficult to define types of QoS	5	19.2
Few expert workers, Difficult to define QoS	3	11.5
Few expert workers, Failure to determine QoS	4	15.4
Few expertise workers, Difficult to define types of QoS	2	7.7

Conclusion and Future Work

From the survey results, it shows that Malaysian Higher Educational Institutes have not achieved maximum level of various services implementation via convergence of communication technologies for retrieving and sending information. Furthermore, Internet bandwidth connectivity implementation is more focusing on low speed bandwidth (2 Mbps) compared to high speed bandwidth implementation. Low speed bandwidth can affect the bandwidth utilization in network infrastructure. In addition, the survey also indicates a minimum QoS implementation in Higher Educational Institutes. Web and Email services have contributed to higher network congestion due to high utility. To ensure that other services e.g. video conference, video on demand, VoIP and IP telephony can operate without any interruption, the Higher Educational Institutes should have high-speed bandwidth and good QoS implementation. The most significant finding in this study is to show that accessing information over heterogeneous environment in Malaysian Higher Educational Institutes is still under utilized.

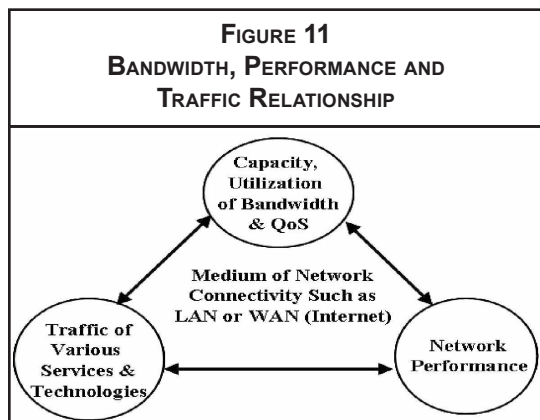
Based on the findings of this study, I have conceived a new comprehensive communication flow framework of devices and taxonomy that allows us to categorize of heterogeneous environment (see Figure 10). This framework suggests a low mobility and ubiquitous computing environment in Malaysia Higher Educational Institutes. In addition, convergence of communication technologies aims to enhance various services implementation for accessing information in Higher Educational Institutes. Figure 11 shows how the relationship between network performance, multi-traffic, bandwidth capacity, utilization and QoS can affect network connectivity such as LAN or Internet (WAN) over heterogeneous environment.

If Malaysian Higher Educational Institutes are planning to develop heterogeneous network environment, they need to ensure that bandwidth capacity, bandwidth utilization and QoS of network are well managed for multi-service traffic. Heterogeneous environment can also generate a mobility approaches for accessing informa-



tion (see Figure 10). To ensure the successful implementation of heterogeneous network environment, the system administrators need to understand current traffic characteristics of the various services. By measuring bandwidth utilization and bandwidth capacity performance before deployment of new heterogeneous network environment, can aid in the correct redesign and configuration of traffic prioritisation in network infrastructure, see illustrated in Figure 11.

Future work is to develop a conceptual framework for heterogeneous model as a platform to combine various services implementation and convergence of communication technologies in Higher Educational Institutes. This model can assist system network administrator to analyze computer network performance more effectively and efficiently in designing network topology over various services implementation using heterogeneous model. This futuristic model can



help system network administrator to evaluate capability of network performance on preparation, planning and designing stage. It can also improve and obtain high on efficiency network and technical aspects in contributing the robust network architecture.

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THE ROLES OF THE MORTGAGE BROKER IN THE SUB-PRIME REAL ESTATE LENDING IMPLOSION

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ABSTRACT

The rapid growth of real estate mortgage brokers contributed, in part, to the sub prime mortgage foreclosure explosion currently attacking America's economy.

These smaller, uncontrolled or unregulated firms, played a substantial role to accentuate the growth of 100% plus, no down payment financing via exercising pressures on real estate appraisers and lending institutions alike.

While stressing that they were not the only driving force behind the foreclosure explosion, it will be shown how mortgage brokers contributed a good part to the troubles ailing the real estate market in the United States.

The paper will take a look at this business segment, including startup costs and existent state and federal licenses, restrictors, regulations and policies. Changes in these areas, both underway and needed, will also be discussed. Effects on property appraisers will be reviewed.

In the Late Twentieth Century

This paper is not trying to pin all blame for the sub prime lending fiasco on the mortgage broker. Many groups, from lending institutions to grading groups, such as Moody's, as well as existent banking's attempt to blend investment banking into their existent portfolios, are responsible. The role of the mortgage broker did play a role, as will be discussed below.

What exactly is a "mortgage broker"? It is "An individual or company which brings borrowers and lenders together for the purpose of loan origination, but which does not originate or service the mortgages. The broker might also negotiate with the lender to try and find the best possible financing deal possible for the borrower."¹ In other words, a mortgage broker is a third party matching lenders and borrowers, with no financial investment for either side; or risk for themselves. Another definition, augmenting the "no

risk or investment" aspect, is "An intermediary who brings mortgage borrowers and mortgage lenders together, but does not use its own funds to originate mortgages. A mortgage broker gathers paperwork from a borrower, and passes that paperwork along to a mortgage lender for underwriting and approval. The mortgage funds are then lent in the name of the mortgage lender. A mortgage broker collects an origination fee and/or a yield spread premium from the lender as compensation for its services."²

Establishment of becoming a real estate mortgage broker is quite simple; many states have no rules whatsoever. Existent federal enactments have little real teeth to them.³ In most states, one can establish a real estate mortgage brokerage firm in the basement, or a spare bedroom. An open, accessible office location is usually

1 http://www.investorwords.com/3130/mortgage_broker.html

2 <http://www.answers.com/topic/mortgage-broker?cat=biz-fin>

3 [http://www.namb.org/Images/namb/GovernmentAffairs/Word_From_Washington/WFW%202006-11%20\(Regulation%20of%20Brokers\).pdf](http://www.namb.org/Images/namb/GovernmentAffairs/Word_From_Washington/WFW%202006-11%20(Regulation%20of%20Brokers).pdf)

not required. As an industry leader in watching the area states, “The uniqueness of the mortgage licensing laws of each state is expressed in the diversity of the laws, rules, regulations that each state adopts. The states differ on whether a Mortgage Broker even needs a mortgage license, whether the Mortgage Broker can loan on both 1st and 2nd mortgages, or whether a physical office in the state is required. As business over the internet increases, the mortgage licensing laws are becoming more lenient on this physical office requirement. States also differ on how much continuing education they require of the Mortgage Brokers. The various mortgage licensing laws also pertain to the employees of the Mortgage Brokers, and whether they, too, need a mortgage license.”⁴

In other words, the few laws existent vary from state to state, with (generally) no license required, no stable site of operations, and importantly, *no risk assumption on the part of the mortgage broker*, as related to the loan and borrower they are arranging with a lending institution.

Real Estate Growth Rates and the Mistaken Belief

Given the general growth rate in terms of real estate values over the last fifteen years, vis-à-vis other forms of investment, had help lead to the growth of these “third party” real estate mortgage brokerage firms. If the growth rate of value of homes gains 10 plus percent per year over a long period of time, lending institutions risk lowers dramatically, since the time honoured aspect of real estate lending included a “built-in” equity position for the lender, given the general 20% down (financing 80% of the appraised value) aspect of most lending institutions.

Risk on the part of the lender was almost non-existent, since given the above growth rate coupled with the 20% down rule, payment default led to a quick resale for at least the loan balance either on the part of the lender or borrower. This (along with declining interest rates) is one reason that

4 http://www.mortgagenewsdaily.com/mortgage_license/

foreclosures were so low in the time period 1990-2005; no one was “upside down” in terms of loan balance versus resale value.⁵

This risk removal was compounded by interest rate declinations, noted above, of 40% in this time period ⁶, as well as historically low overall interest rates-lower than in the last 45 years,⁷ and was one of the areas that allowed for the rapid growth in the last ten years of these third party real estate mortgage brokers.

The larger lending institutions, awash in the belief of constantly increasing returns on investments, elected to increase, dramatically, the portfolio percentage of consumer real estate to their investment packages. This belief of secure, always convertible mortgage loans with guaranteed equity could then be converted into packaged into securities. ⁸ By selling these “guaranteed return” mortgages to security firms, the primary lenders removed themselves from the day to day servicing of the loan, with their own return guaranteed. It was a great world, it seemed.

All this meant the lending institutions needed a way to expand the amount of residential real estate loans they would make, and they needed a new “selling arm” to assist in generation of prospects for the new wave of residential real estate loans they wanted to make. Hence, enter the mortgage broker.

This interest rate reductions, along with the increasing real estate values, helped assist many banks and mortgage financiers to change the long standing “20% down” rule to as much as 125% of appraised value and no down payment financing, with a third year balloon, to non-credit worthy customers. Many in the industry, in retrospect, believed this shift was caused, in large part, by the unshaken belief on the part of lenders that the residential real estate market was

5 <http://www.chron.com/dispatch/story.mpl/business/5603337.html>

6 <http://www.rense.com/general67/BB.HTM>

7 http://www.tomorrowproject.net/pub/1__GLIMPSES/Globalisation/-1318.html

8 <http://www.kiplinger.com/magazine/archives/2007/07/subprime.html>

a constantly increasing value market. This belief led to opening the residential market to these sub prime markets, since even with 125% financing and no money down, it was believed that there would be a positive equity position in less than three years, given the above noted constantly increasing property values.⁹

The New Real Estate Target Market

So, what is a “sub prime borrower”? A sub prime borrower is someone whose credit history is less than desirable. A subprime borrower is assumed to be a higher credit risk than someone with average or above average credit and because of this, is usually penalized in some way. Charging sub prime borrowers a higher rate of interest than that which is charged those with better credit is the most common type of penalty.¹⁰ This type of borrower historically could not qualify for a conventional residential real estate loan, due to not having the necessary down payment, not being able to develop a high enough Beacon (credit rating) score, had been historically delinquent on previous loans or had been recently bankrupt, among other items.

This was a large market, as large as 40% of the US populace-and would be a tremendous boon to lenders and builders alike if they could somehow now qualify for a real estate loan. The above noted “guaranteed property value increase” could be the answer, since any foreclosures that occurred with these less-than-desirable customers would be quickly cleared via sale of the property, whose value had now ensconced beyond the remaining loan value, due to the property’s increased value. Again, this meant that the lending institutions needed extra help in linking themselves with potential new buyers. The market for the mortgage broker would now explode.

⁹ http://www.americanmortgagemt.com/content/125_financing_633.htm

¹⁰ <http://www.creditorweb.com/definition/sub-prime-borrower.html>

The Rapid Expansion of Mortgage Brokers

The National Foundation for Credit Counseling has certified about 1,440 housing counselors in 2007, 25 percent more than there were in 2006.¹¹ How many counselors are at work, in total, in the U.S. isn’t known. It can be guaranteed that there exists a large undercurrent of mortgage brokers not aligned with any sort of national monitoring service.

All the previously mentioned real estate construction growth, low interest rates, the misguided belief in constantly increasing real estate values and relatively free flowing funds to banks and lending institutions made the mortgage broker field highly attractive for entry. The almost non existent (in most states) entry/startup costs, along with (virtually) no licensing or regulations made entrance into the field highly attractive, even greater than the explosion of entrants in the real estate sales field. Yes, there are current Federal enactments, but they have little bite to them.¹²

Probably, the most attractive aspect of entry into the mortgage broker field was the almost total lack of responsibility for both the loan itself as well as responsibility to the purchaser of the home, on the part of the mortgage broker. Once the loan was closed, the mortgage broker would collect his/her 2 to 7 per cent payout, and have no worries in future if the loan was paid or not. This would allow the influx of new mortgage brokers to include some with less than stellar moral backgrounds; the veritable “sheep in wolves clothing” entrant, concerned with collection of the payout only; and not whether the real estate purchase was the correct option for the purchaser. Given the nature of the payout, the less than morally upright mortgage broker would now be plying their trade with the only objective closure of the loan, in order to collect the payout and move on.

¹¹ http://news.efinancialcareers.com/NEWS_ITEM/newsItemId-13128

¹² [http://www.namb.org/Images/namb/GovernmentAffairs/Word_From_Washington/WFW%202006-11%20\(Regulation%20of%20Brokers\).pdf](http://www.namb.org/Images/namb/GovernmentAffairs/Word_From_Washington/WFW%202006-11%20(Regulation%20of%20Brokers).pdf)

Mortgage Broker Illicit Tactics for Loan Closure

Given the appearance of “shady” personnel now employed as mortgage brokers, borderline illicit tactics began to appear, such as:

One of the first to feel the pressure was the real estate appraiser, who appraised the property in question as usual. The mortgage broker would need a higher appraisal in order for the loan to meet lending requirements, and would solicit the appraiser to increase the appraised value. Varied tactics were employed by the mortgage broker, including telling the appraiser up front what value was needed to close the loan, as well as telling the appraiser that they would take their appraisal business elsewhere, if the appraiser could not make the appraisal value match the lending institution bottom number. As Larry Metcalf, a Middle Tennessee certified appraiser stated, “We began to get calls from mortgage brokers we had never heard of, soliciting us to increase appraisal values in order for them to close a real estate loan. We could tell that the applicant was not credit worthy to the degree of securing a real estate purchase, but were advised to simply make our appraisal match their numbers and look the other way.” Mr. Metcalf continued, “several of the “firms” were simply an individual working out of their basement, serving as a third party brokering the sale between lending institutions and the borrower, and could care less whether the sale was valid, or in the best interest of both lender and borrower.”¹³ He concluded by stating, “some of these “fly by night” brokers offered a “special bonus” if the appraisal value was taken up to match the lenders requested amount.” This has been noted in other states, as the Washington Post reported,¹⁴

“A new survey of the national appraisal industry found that 90 percent of appraisers reported that mortgage brokers, real estate agents, lenders and even consumers have put pressure on

them to raise property valuations to enable deals to go through. That percentage is up sharply from a parallel survey conducted in 2003, when 55 percent of appraisers reported attempts to influence their findings and 45 percent reported “never.” Now the latter category is down to just 10 percent”. If the appraiser refused to increase the appraisal value, future business could be jeopardized. “Appraisers who resist pressure to inflate values said they may be blacklisted.”¹⁵

Another tactic used by this type of mortgage broker involved coercion with the potential borrower to pad their income statement by adding fictional incomes, reducing the number of deductions or similar actions to attempt to make the borrower’s balance sheet look better. This so called “stated income loan” did not require income verification.¹⁶ While one would think that (in the age of the Internet) these tactics would not be very useful, in many cases they were. The availability of funding on the part of the lending institution made this a bit easier, too.

This type of mortgage broker would solicit the lender themselves, offering a “kickback” to the loan closer for assistance in “looking the other way” regarding loan application abnormalities. In conversation with a lender representative for Regions (who must remain confidential), this mortgage broker approach was a very typical avenue used by the broker to attempt to influence the loan decision.¹⁷ This lending executive also stated that this approach was considered in the industry to work effectively, particularly in “third-tier” lenders, such as Countrywide.

Results and Outcomes from Mortgage Brokers on the Sub-Prime Fiasco

This paper is not intended to make the mortgage broker the prime candidate for the sub-prime foreclosure explosion, nor is it to say that the entire market of mortgage brokers is corrupt. There are many, many examples of mortgage brokerage firms that are totally above board and legitimate.

13 Discussion with Larry Metcalf, February, 2008.

14 <http://www.washingtonpost.com/wp-dyn/content/article/2007/02/02/AR2007020200712.html>

15 <http://www.bloomberg.com/apps/news?pid=20601109&sid=aKTGgOD1teG4&refer=home>

16 <http://www.mbarl.org/letter.php>

17 Unnamed Regions Official, January 2008.

Several groups, including the mortgage lending industry itself, the institutions that packaged the sub-prime loans into securities for resale to the public, the insurance industry and the credit rating companies themselves were all responsible, to some degree, in contributing to the real estate meltdown that many believe has not reached its apex as of May, 2008. The unfounded belief (noted above) of a constantly increasing real estate value market also contributed.

However, it is certainly true that the explosion of entrants into this (virtually) unregulated field contributed in a measurable way to the overall meltdown. The noted coercion practices to both appraisers and lenders alike exhibited not only immoral actions on the part of the mortgage broker, but contributed to loans being made that should never have been made, to borrowers not credit worthy, on parcels of property that had over inflated values.

Summary and Recommendations

The mortgage broker business needs to be brought under control via the introduction of laws and requirements for entrance into the industry. Regulation by a federal agency, such as the FDIC regulated the banking industry, must be developed.

Congressional examination of the industry should occur, with the establishment of an across the United States developed, in order to reign in the industry and remove the selected groups currently in the field that do not meet the set of federal restrictions placed on the overall industry. Individual states, such as Texas,¹⁸ are currently attempting this, but it needs to be nationwide, under the aegis of the Federal government.

While this enactment suggestion is somewhat akin to closing the barn door after the horses are out, it would certainly in future bring the industry into compliance and reduce the chances of another real estate implosion to occur. Enactments of this nature would go a long way to protecting

¹⁸ [http://info.sos.state.tx.us/pls/pub/readtac\\$ext.ViewTAC?tac_view=4&ti=7&pt=4&ch=80](http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=4&ti=7&pt=4&ch=80)

the lender, borrower, investor in after market securities and stock market investors-as well as the retirement investor who has lost so much due to the faulty securities they invested in-making their "401K a 201K."

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article/2007/02/02/AR2007020200712.html](http://www.washingtonpost.com/wp-dyn/content/article/2007/02/02/AR2007020200712.html)

THE ADDITIVE DUPONT MODEL: AN ALTERNATIVE APPROACH TO ANALYZING COMPANY PERFORMANCE

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ABSTRACT

An alternative version of the classic accounting/financial analytical tool known as “The DuPont Model” is presented in this paper. The traditional DuPont model is a multiplicative model that “explains” the valuation of a company’s common stock as being the result of a linkage of financial ratios multiplied together. Although mathematically precise, a dissection of the model in terms measuring each component’s relative impact is problematical. As an alternative, an additive DuPont model that computes the change in a company’s common stock price from one year to the next is presented. The additive model demonstrates that the change in common stock price can be computed as a function of five change factors involving: 1) sales margin, 2) asset turnover, 3) financial leverage, 4) \$ shareholder’s equity per share, and 5) price earnings ratio. The primary advance of this additive DuPont model over the multiplicative model is that the additive model provides an analyst with the means to calculate the relative importance of each of factors in the model in such a way that they can be mathematically added to precisely verify the change in a company’s common stock price from one year to the next.

The Multiplicative DuPont Model

One of the most familiar financial analysis tools known to both accounting/finance students and professionals alike is “The DuPont Model”. The traditional model, which was initially created by the E.I. du Pont de Nemours Co. in about 1919, is an algebraic structuring of certain financial relationships that multiplicatively “explain” the

common stock valuation of a company. More specifically, the traditional DuPont model is commonly expressed as the following nexus of relationships:

Notice that ROA, ROE, and EPS are actually “sub-total” calculations, which result from the multiplication of two other subcomponents of the DuPont model. Therefore, when the sub-

Sales Margin	x	Asset Turnover	=	Return on Assets (ROA)
Return on Assets	x	Leverage Factor	=	Return on Equity (ROE)
Return on Equity	x	Shareholder’s Equity (SE) per share	=	Earnings per Share (EPS)
Earnings per Share	x	Price Earnings (P/E) Ratio	=	Stock Price

total calculations are pulled out, one can see that the trading price of a company's common stock, in its essence, can be viewed as simply the product of just five numbers: "Sales Margin" x "Asset Turnover" x "Leverage Factor" x "SE per share" x "P/E Ratio".

The mathematical precision of the multiplicative DuPont model is unquestioned. Unfortunately, the multiplicative model is of limited value to financial analysts. One weakness of the traditional DuPont model has been highlighted in the preceding paragraph – that its predominantly known components (e.g., ROE, EPS, and stock price) are not mathematically independent as they are "sub-totals". Furthermore, even the five essential multiplicative relationships are not independent due to the redundancy of several of the same constructs appearing in the model as both a numerator and a denominator. Perhaps the biggest problem with the multiplicative DuPont model stems from the fact that the comprising ratios are, by definition, "apples and oranges"; and there is no way to easily measure each ratio's relative contribution in explaining the common stock price. Fortunately, there is a way to mitigate the aforementioned weaknesses of the traditional multiplicative DuPont model by transforming the model into an additive model.

The Additive DuPont Model

The additive DuPont model is an algebraic re-configuration of the traditional multiplicative DuPont model. To illustrate the logic and mechanics of this reconfiguration, a hypothetical company's balance sheet is presented in Table 1 and the income statement in Table 2 for the base year and the following 2nd year of operations. The financial ratios that comprise the traditional multiplicative DuPont model can be computed from the company's financial statements presented. These ratios and their multiplicative extensions that ultimately culminate in the calculation of the valuation of the company's common stock are shown in Table 3. In addition, the differences in each of the multiplicative DuPont model ratios (base year compared to 2nd year) are shown in Table 3.

TABLE 1
HYPOTHETICAL ILLUSTRATIVE COMPANY
BALANCE SHEET
AS OF DECEMBER 31

Assets	2 nd Year	Base Year
Current Assets:		
Cash	\$ 6,863	\$ 5,000
Other Current Assets	5,750	5,000
Total Current Assets	\$ 12,613	\$ 10,000
Non-current Assets:		
Property Plant and Equipment	\$ 17,250	\$ 15,000
Less: Accumulated Depreciation	5,975	5,000
Total Non-current Assets	\$ 11,275	\$ 10,000
Total Assets	\$ 23,888	\$ 20,000
Liabilities and Stockholders' Equity		
Current Liabilities	\$ 5,750	\$ 5,000
Long-term Liabilities	9,000	5,000
Stockholders' Equity *	9,138	10,000
Total Liabilities and Stockholders' Equity	\$ 23,888	\$ 20,000

TABLE 2
HYPOTHETICAL ILLUSTRATIVE INCOME STATEMENT
FOR THE YEARS ENDED DECEMBER 31

	2 nd Year	Base Year
Revenue	\$ 50,000	\$ 40,000
Expenses:		
Operating	\$ 36,895	\$32,083
Depreciation	975	750
Interest	900	500
Total	\$ 38,770	\$ 33,333
Income before Taxes	\$ 11,230	\$ 6,667
Less:		
Income Tax Expense	4,492	<u>2,667</u>
Net Income	\$ 6,738	\$ 4,000

These multiplicative relationships for both the base year and the 2nd year of operations of Hypothetical Illustrative Company are summarized in Table 4A and Table 4B.

Notice from Table 4A that the company's rational stock valuation computes to be \$36.00 per share; from Table 4B we see that by the end of the 2nd year, the company's stock is worth \$75.33

TABLE 3 MULTIPLICATIVE DUPONT MODEL RATIOS									
Year	Sales Margin	Asset Turnover	Return on Assets (ROA)	Financial Leverage Factor	Return On Equity (ROE)	Stockholders Equity Per Share (SE)	Earnings Per Share (EPS)	Price/Earnings Ratio (P/E)	Stock Price
Base	0.1000	2.0000	0.2000	2.0000	0.4000	\$5.000	\$2.00	18.0	\$36.00
2 nd	0.1348	2.0931	0.2821	2.6141	0.7374	\$5.108	\$3.77	20.0	\$75.33
2 nd minus Base	0.0348	0.0931	0.0821	0.6141	0.3374	\$.108	\$1.77	2.0	\$39.33

TABLE 4A MULTIPLICATIVE RELATIONSHIPS - BASE YEAR													
			Sales Margin		Asset Turnover		Financial Leverage Factor		Stockholders Equity Per Share		Price/Earnings Ratio		Stock Price
Base Year Ratios & Data			0.1000		2.0000		2.0000		\$5.000		18.0		\$36.00
Return on Assets	0.2000	=	0.1000	x	2.0000								
Return on Equity	0.4000	=	0.2000			x	2.0000						
Earnings Per Share	\$ 2.00	=	0.4000					x	\$5.000				
Stock Price	\$36.00	=							\$2.00	x	18.0		

TABLE 4B MULTIPLICATIVE RELATIONSHIPS - 2 ND YEAR													
			Sales Margin		Asset Turnover		Financial Leverage Factor		Stockholders Equity Per Share		Price/Earnings Ratio		Stock Price
2 nd Year Ratios & Data			0.1348		2.0931		2.6141		\$5.108		20.0		\$75.33
Return on Assets	0.2821	=	0.1348	x	2.0931								
Return on Equity	0.7374	=	0.2821			x	2.6141						
Earnings Per Share	\$ 3.766	=	0.7374					x	\$5.108				
Stock Price	\$75.33	=							\$3.766	x	20.0		
The proof of this algebraic manipulation is as follows: $F - E = [C \times (D - B)] + [(C - A) \times B] = CD - CB + CB - AB = CD - AB$													

per share. This is a \$39.33 increase in stock value from base year to the end of the 2nd year.

With the additive DuPont model, one can disaggregate the \$39.33 increase in stock value into five (5) separate effects that are **additive** to account for the \$39.33 increase in value. The key to understanding this is to consider the following simple algebraic manipulation.

$$\begin{aligned} \text{If} \quad & A \times B = E \text{ and } C \times D = F \\ \text{Then} \quad & F - E = [C \times (D - B)] + [(C - A) \times B] \end{aligned}$$

This algebraic equivalency of $F - E$ is the configuration used to develop each of the 5 separate additive effects presented in the ensuing sections of this paper.

The proof of this algebraic manipulation is as follows:

$$\begin{aligned} F - E &= [C \times (D - B)] + [(C - A) \times B] \\ &= CD - CB + CB - AB \\ &= CD - AB \end{aligned}$$

Developing a Change in P/E Ratio Effect

Again, the important configuration is $F - E = [C \times (D - B)] + [(C - A) \times B]$. Looking at the last linkage of the multiplicative chain of the traditional DuPont model, let's use this configuration to "explain" the difference between the Hypothetical Illustrative Company's \$75.33 stock value at the end of year 2 versus the \$36.00 per share value at the end of the base year. Using the financial data from Table 3, let:

- F = stock value at end of yr. 2 (\$75.33)
- E = stock value at the end of the base year (\$36.00)
- A = base year EPS (\$2.00)
- B = base year P/E ratio (18)
- C = 2nd year EPS (\$3.7668)
- D = 2nd year P/E ratio (20)

Multiplicatively,

Year	EPS	x	P/E Ratio	=	Stock Price
Base	\$2.0000	x	18	=	\$36.00
2 nd	\$3.7668	x	20	=	\$75.33
(Δ)	\$1.7668		2		\$39.33

Additionally, the change in stock price is equal to:

[C	x	(D - B)]	+	[(C - A)	x	B]	
[\$3.767	x	(20 - 18)]	+	[(\$3.767 - \$2.00)	x	18]	
[\$3.767	x	2]	+	[\$1.767	x	18]	
\$7.53			+	\$31.80			= \$39.33

Therefore, the change in stock value, from one year to the next ($F - E$), initially breaks down into two additive parts: 1) 2nd year EPS (C) x **the change** in P/E ratio ($D - B$); and 2) the change in EPS ($C - A$) x base year P/E ratio (B). However, EPS is a composite of still other parts of the multiplicative DuPont Model, and it is necessary to decompose the effect of this change further. But since the P/E ratio cannot be decomposed any further, the first additive part (in which the calculated change in P/E ratio is a component) will be referred to as the **change in P/E ratio effect**. The change in P/E ratio effect computed in this example is \$7.53. The proper interpretation of this is that of the \$39.33 increase in the company's stock value from one year to the next, \$7.53 of it is attributed to the change in the P/E ratio going from 18 in the base year to 20 by the end of the 2nd year, as summarized in the box at the top of the next page. Therefore, the change in P/E ratio effect is \$7.53.

Developing a Change in Shareholder's Equity per Share Effect

Using the same algebraic logic and manipulation as demonstrated in the previous section, the change in the company's EPS can be disaggregated into two parts. From the financial data of Table 3, now let:

- F = 2nd year EPS (\$3.7668)
- E = base year EPS (\$2.00)
- A = base year ROE (0.4000)
- B = base year SE per share (\$5.00)
- C = 2nd year ROE (0.7374)
- D = 2nd year SE per share (\$5.1082)

Multiplicatively,

Year	ROE	x	Stockholders Equity (SE) Per Share	=	EPS
Base	0.4000	x	\$5.0000	=	\$2.0000
2 nd	0.7374	x	\$5.1082	=	\$3.7668
(Δ)	0.3374		\$0.1082		\$1.7668

Δ in P/E Ratio Effect	+	Δ in Earnings Per Share Effect	=	Δ in Stock Price
2 nd year EPS x (Δ in P/E Ratio)	+	(Δ in EPS) x Base Year P/E		
3.7668 x (20 - 18)	+	(3.7668 - 2.0000) x 18		
3.7668 x 2	+	1.7668 x 18		
\$7.53	+	\$31.80	=	\$39.33

Additively the change in EPS per share is equal to:

[C x (D - B)]	+	[(C - A) x B]		
[0.7374 x (\$5.1082 - \$5.000)]	+	[(0.7374 - 0.4000) x \$5.00]		
[0.7374 x \$0.1028]	+	[0.3374 x \$5.00]		
\$0.0798	+	\$1.670	=	\$1.7668

Therefore, the change in EPS, from one year to the next (F - E), breaks down into two additive parts: 1) 2nd year ROE (C) x **the change** in SE per share (D - B); and 2) the change ROE (C - A) x base year SE per share (B). Since ROE is a composite of still other parts of the multiplicative DuPont Model, it is necessary to decompose the effect of this change further. Since SE per share cannot be decomposed any further, we will call the first additive part indicated above (in which the calculated change in SE per share is a component) the **change in SE per share effect**. The preliminary change in SE per share effect computed in this example is \$0.0798. To convert this amount to an effect that is mathematically additive (in terms of all effects being “commonly denominated” so as to add to the total change in stock value), the \$0.0798 must be multiplied by the base year P/E ratio of 18. Doing so yields a change in SE per share effect of \$1.44 or (\$0.0798 x 18 = \$1.44). The proper interpretation of this is that of the \$39.33 increase in the company’s stock value from one year to the next, \$1.44 of it can be attributed to the change in SE per share

going from \$5.00 in base year to \$5.1082 in year 2, as summarized at the bottom of this page.

Therefore, the change in SE per share effect is equal to \$0.00798 x 18.00 (the Base year P/E ratio) for a total change in SE per share effect of \$1.44.

Developing a Change in Financial Leverage Factor Effect

Using the algebraic logic and manipulation as demonstrated in the previous section, the change in the company’s ROE can be disaggregated into two parts. From the financial data of Table 3, now let:

- F = 2nd year ROE (0.7374)
- E = base year ROE 0(0.4000)
- A = base year ROA (0.2000)
- B = base year Financial Leverage factor (2.000)
- C = 2nd year ROA (0.2821)
- D = 2nd year Financial Leverage factor (2.6141)

Multiplicatively,

	ROA	x	Leverage Factor	=	ROE
Base Year	0.2000	x	2.0000	=	0.4000
2 nd Year	0.2821	x	2.6141	=	0.7374
(Δ)	0.0821		0.6141		0.3374

Δ in SE per share Effect	+	Δ in Return on Equity Effect	=	Δ in EPS
2 nd year ROE x (Δ in SE)	+	(Δ in ROE) x Base Year SSE		
0.7374 x (\$5.1082 - \$5.00)	+	(0.7374 - 0.4000) x \$5.00		
0.7374 x \$0.1082	+	0.3374 x \$5.00		
\$0.0798	+	\$1.6870	=	\$1.7668

Additively, the change in ROE is equal to:

$[C \times (D - B)] + [(C - A) \times B] = \Delta \text{ ROE}$			
$[0.2821 \times$	$\frac{2.6141 - 2.0000}{2.0000}] +$	$[(0.2821 - 0.2000) \times$	$2.0000]$
$[0.2821 \times 0.6141] +$	$[0.0821 \times 2.0000]$		
0.1732	+	0.1642	= 0.3374

Therefore, the change in ROE, from one year to the next (F - E), breaks down further into two additive parts: 1) 2nd year ROA (C) x **the change** in the financial leverage factor (D - B); and 2) the change ROA (C - A) x the base year leverage factor (B). Since ROA is a composite of yet other parts of the multiplicative DuPont Model, the effect of its change must be decomposed further. However, the leverage factor cannot be decomposed any further, the first additive part indicated above (in which the calculated change in leverage factor is a component) will be called the **change in financial leverage factor effect**. The preliminary change in leverage factor effect computed in this example is .1732. To convert this amount to an effect that is mathematically additive (in terms of all effects being “commonly denominated” so as to add to the total change in stock value), the 0.1732 must be multiplied by the base year \$SE per share of \$5.00 and then by the base year P/E ratio of 18. Doing so yields a change in leverage factor effect per \$15.59 (0.1732 x \$5.00 x 18 = \$15.59). The proper interpretation of this is that of the \$39.33 increase in the company’s stock value from one year to the next, \$15.59 of it can be attributed to the change in the company’s financial leverage factor going from 2.0000 in base year to 2.6141 in year 2. (See box at the bottom of this page.)

Therefore, the change in Financial Leverage Factor effect is equal to 0.1732 x 18.00 (the Base P/E ratio) x \$5.00 (the Base year SE per share) for a total change in Leverage Factor effect of \$15.59.

Δ Financial Leverage Factor Effect		+	Δ in Return on Assets Effect		=	Δ ROE
2 nd year ROA	x	(Δ in Leverage Factor)	+	(Δ in ROA)	x	Base Year Leverage
0.2821	x	(2.6141 - 2.0000)	+	(0.2821 - 0.2000)	x	2.0000
0.2821	x	0.6141	+	0.0821	x	2.0000
		0.1732	+	0.1642		= 0.3374

Developing a Change in Asset Turnover Effect and a Change in Sales Margin Effect

Using the same algebraic logic and manipulation as demonstrated in the previous section, the change in the company’s ROA can be disaggregated into two parts. Using the financial data from Table 3, now let:

- F = 2nd year ROA (0.2821)
- E = base year ROA (0.2000)
- A = base year Sales Margin (0.1000)
- B = base year Asset Turnover (2.0000)
- C = 2nd year Sales Margin (0.1348)
- D = 2nd year Asset Turnover (2.0931)

Multiplicatively,

	Sales Margin	x	Asset Turnover	=	ROA
Base Year	0.1000	x	2.0000	=	0.2000
2 nd Year	0.1348	x	2.0931	=	0.2821
(Δ)	0.0348		0.0931		0.0821

Additively, the change in ROA is equal to:

$[C \times (D - B)] + [(C - A) \times B]$			
$[0.1348 \times$	$\frac{2.0931 - 2.0000}{2.0000}] +$	$[(0.1348 - 0.1000) \times$	$2.0000]$
$[0.1348 \times 0.0931] +$	$[0.0348 \times 2.0000]$		
0.0125	+	0.0696	= 0.0821

So the change in ROA, from one year to the next (F - E), breaks down into two additive parts: 1) 2nd year sales margin (C) x **the change** in asset turnover (D - B); and 2) the change in sales margin (C - A) x the base year asset turnover (B). In the DuPont model both sales margin and asset turnover cannot be disaggregated any further, therefore, both a **change in asset turnover effect** and a **change in sales margin effect** can

Δ Asset Turnover Effect		+	Δ in Sales Margin Effect		=	Δ in ROA
2 nd year Sales Margin	x (Δ in Asset Turnover)	+	(Δ in Sales Margin)	x Base Asset Turnover		
0.1348	x (2.0931 – 2.0000)	+	(0.1348 – 0.1000)	x 2.0000		
0.1348	x 0.0931	+	0.0348	x 2.0000		
	0.0125	+		0.0696	=	0.0821

be developed. The preliminary change in asset turnover effect computed in this example is .0125. To convert this amount to an effect that is mathematically additive (in terms of all effects being “commonly denominated” so as to add to the total change in stock value), the .0125 must be multiplied by the base year leverage factor of 2.00, then by the base year \$SE per share of \$5.00, and then by the base year P/E ratio of 18. Doing so yields a change in asset turnover effect of \$2.26 (.0125 x 2.00 x \$5.00 x 18 = \$2.26). The proper interpretation of this is that of the \$39.33 increase in the company’s stock value from one year to the next, \$2.26 of it can be attributed to the change in the company’s asset turnover going from 2.0000 in base year to 2.0931 in year 2. Likewise, the preliminary change in sales margin effect computed in this example is .0696. To convert this amount to an effect that is mathematically additive (in terms of all effects being “commonly denominated” so as to add to the total change in stock value), the .0696 must be multiplied by the base year leverage factor of 2.00, then by the base year \$OE per share of \$5.00, and then by the base year P/E ratio of 18. Doing so yields a change in sales margin effect of \$12.51 (.0696 x 2.00 x \$5.00 x 18 = \$12.51). The proper interpretation of this is that of the \$39.33 increase in the company’s stock value from one year to the next, \$12.51 of it can be attributed to the change in the company’s sales margin going

from .1000 in base year to .1348 in year 2. (See box at the top of this page.)

Therefore, the change in Asset Turnover effect is equal to 0.0125 x 18.00 (the Base P/E ratio) x \$5.00 (the Base year \$SE per share) x 2.00 (the Base year Leverage Factor) for a total change in Asset Turnover effect of \$2.26. Likewise, the change in Sales Margin effect is equal to 0.0696 x 18.00 (the Base P/E ratio) x 5.00 (the Base year \$SE per share) x 2.00 (the Base year Leverage Factor) for a total change in Sales Margin effect of \$12.51.

Bringing all the Change Effects Together

Observe in Table 5 that the five change effects computed above all add up to fully account for the \$39.33 increase in Hypothetical Illustrative Company’s common stock value from base year to the end of year 2.

In the case of the hypothetical Illustration Company, the primary driving force behind the \$39.33 increase in stock price was that management was able to increase the financial leverage factor of the firm from 2.00 to 2.61. This increased financial leverage effect accounted for \$15.59, or almost 40%, of the firm’s year-to-year value enhancement. Second, in relative importance was the relatively modest 3.48 % percentage point

	Sales Margin	Asset Turn-over		Financial Leverage Factor		SE per Share		P/E Ratio	Stock Price
Δ in Sales Margin effect	0.03476	2.0000		2.0000		\$5.000		18.0	\$12.51
Δ in Asset Turnover effect	0.1348	0.0931		2.0000		\$5.000		18.0	\$ 2.26
Δ in Leverage Factor effect			0.2821	0.6141		\$5.000		18.0	\$15.59
Δ in \$SE per share effect					0.7374	\$1.082		18.0	\$ 1.44
Δ in P/E ratio effect							\$3.77	2.0	\$ 7.53
Total Δ in Stock Price									\$39.33

(from 10.0% to 13.48%) improvement in sales margin. Actually, this improvement caused the stock to rise \$12.51 in value (approximately 31% of the positive stock value change). Management was, also, able to manage the firm to a slightly higher total asset turnover and a slightly greater SE per share, which together boosted the firm's stock valuation another \$3.70 (\$2.26 + \$1.44), or 9% (rounded) of the total stock price change. Finally, the supply/demand forces of the stock market in concert with investor opinion helped out by raising the company's P/E ratio from 18 to 20. This change proved to be rather significant in that it added another \$7.53 of value enhancement (approximately 20% of the total change in value).

Real World Example

The preceding hypothetical example has illustrated the ability of the additive DuPont model approach to simply, yet also comprehensively, fully explain the change in a company's common stock value that results from the inter-play within a rather complex system of inter-related financial effects happening simultaneously. Now the additive DuPont model will be used to demonstrate this simplifying and explanatory ability with a

	2006	2005
Revenue	\$68,222	\$56,741
Cost of Goods Sold	33,125	27,872
Gross Margin	\$35,097	\$28,869
Selling, General, and Administrative Expenses	21,848	18,400
Operating Income	\$13,249	\$10,469
Other Revenues and Expenses:		
Interest Expenses	\$ 1,119	\$ 834
Other Non-operating Income, net	283	346
Net Other Revenues and Expenses	\$ 836	\$ 488
Earnings before Income Taxes	\$ 12,413	\$ 9,981
Income Tax Expense	3,729	3,058
Net Income	\$ 8,684	\$ 6,923

real world company. Proctor & Gamble (P&G) and its stock value changes in their fiscal years from 2005 to 2006. Tables 6 and 7 present Proctor & Gamble's condensed financial statements for those years.

In 2006, Proctor & Gamble faced the situation of melding a major acquisition (Gillette) into their operations, and thus financial results, while mitigating the potential dilutive effect on their common stock valuation. The \$53.43 billion Gillette deal was completed as of the beginning of the second quarter (10/01/05) of P&G's 2006 fiscal year. Thus, 2006 financials are consolidated with Gillette's balance sheet and nine-months of Gillette's operating results. A comparison of 2005 financial performance with that of 2006 using

	June 30 2006	June 30 2005
Assets		
Current Assets:		
Cash and Cash Equivalents	\$ 6,693	\$ 6,389
Investment Securities	1,133	1,744
Accounts Receivable	5,725	4,185
Inventories	6,291	5,006
Deferred Income Taxes	1,611	1,081
Prepaid Expenses and Other Receivables	2,876	1,924
Total Current Assets	\$ 24,329	\$ 20,329
Property Plant and Equipment	18,770	14,332
Net Goodwill and Other Intangible Assets	89,027	24,163
Other Noncurrent Assets	3,569	2,703
Total Assets	\$ 135,695	\$ 61,527
Liabilities and Stockholders' Equity		
Current Liabilities	\$ 19,985	\$ 25,039
Long-Term Debt	35,976	12,887
Deferred Income Taxes	12,354	1,896
Other Noncurrent Liabilities	4,472	3,230
Total Liabilities	\$ 72,787	\$ 43,052
Shareholders' Equity *	62,908	18,475
Total Liabilities and Stockholders' Equity	\$ 135,695	\$ 61,527

the traditional multiplicative DuPont model is presented in Table 8.

In comparing the ratios of the major acquisition year (2006) with those of the immediately pre-acquisition year (2005), it can be seen that while sales margin held virtually constant with a very slight 0.53-percentage-point improvement (0.1273 – 0.1220), total asset turnover, return on assets, return on equity, and earnings per share all declined. Yet P&G, 2005 to 2006 FYE, managed to experience an increase in common stock valuation per share. Some analysts would find this improved price performance, in the face of so many deteriorating traditional performance measuring ratios, to be somewhat “curious” if not outright counterintuitive. The additive DuPont model perhaps helps clarify these results as shown in Table 9.

Since the calculations for Table 9 are the same pattern of calculations as was illustrated by the comprehensive example of Hypothetical Illus-

tration Co. presented earlier in this paper, the detailed calculations will not be rehashed for Proctor & Gamble.

To summarize and interpret the results from Table 9, the 2006 Proctor & Gamble acquisition of Gillette was a financial success even in the short-run; and this success was due in no small measure to P&G’s astute and skillful management of this complex business situation. In short, P&G knew that the Gillette acquisition would play major havoc to the traditional financial measures of asset efficiency (i.e., asset turnover) and capital structure effectiveness (i.e., deployment of financial leverage) that together, via conventional wisdom, should put significant downward price pressure on the value of their common stock. To counter-balance and mitigate these negative effects, P&G was able to absorb major acquisition expenses, yet still record increased net sales margins in their first full year of consolidation with Gillette operations. Simultaneous to the events

TABLE 8
PROCTOR & GAMBLE’S ADDITIVE DUPONT MODEL RATIOS
2005 AND 2006

	Sales Margin	Asset Turnover	ROA	Financial Leverage Factor	ROE	SE Per Share	EPS	P/E Ratio	Stock Price
2005	0.1220	0.9222	0.1125	3.3303	0.3747	\$ 7.471	\$2.80	18.8	\$52.55
2006	0.1273	0.5028	0.0640	2.1570	0.1380	\$19.789	\$2.73	21.1	\$57.68
2006 minus 2005	0.0053	-0.4195	-0.048	-1.1732	-0.236	\$12.318	\$(0.07)	2.3	\$ 5.13

TABLE 9
PROCTOR & GAMBLE’S ADDITIVE DUPONT MODEL RATIOS
2006 CHANGES FROM 2005

Effect	Sales Margin	Asset Turnover	ROA	Financial Leverage Factor	ROE	SE Per Share	EPS	P/E Ratio	Stock Price
Δ in sales margin	0.00528	0.9222		3.3303		\$7.471		18.8	\$ 2.27
Δ in asset turn	0.1273	-0.4195		3.3303		\$7.471		18.8	\$(24.94)
Δ in leverage			0.0640	-1.1732		\$7.471		18.8	\$(10.53)
Δ in OE per share					0.1380	\$12.318		18.8	\$ 31.93
Δ in P/E							\$ 2.73	2.3	\$ 6.40
total Δ in stock price									\$ 5.13

of the above, their truly masterful maneuver was to buy-back a sufficient number of common stock shares (in spite of the shares that they issued to acquire Gillette) such that the net change in earnings per share declined only very slightly, from \$2.80 (2005) to \$2.73(2006). With the market apparently convinced that future growth rates would actually be enhanced, the market bid up the company's P/E ratio, and when all of these effects were said and done in the aggregate, the value of P&G's common stock actually increased. Thus, the utility of the additive DuPont model is demonstrated by the model's ability to identify and show the relative impacts of the major factors that explain the \$5.13 per common stock share price increase from 2005 to 2006 FYE.

Summary and Conclusion

To summarize the additive DuPont model perspective, the four essential financial measurements or relationships (that are at least somewhat under the control of management or at least directly affected by management decision-making) that ultimately drive the common stock valuation of the firm are; 1) sales margin, 2) total asset turnover, 3) the financial leverage of the firm, and 4) shareholder's equity per share. The fifth factor, the price-earnings ratio, is exogenous to the firm and is not directly under the manipulative control of management. A myriad of other financial relationships may be most certainly important, but only in the sense that they affect or are a "subset" of the five essential relationships. A difficult challenge often facing the manager or analyst of a company is that the effects of changes in various financial relationships can be intri-

cately inter-related and even at cross-purposes in their logical effect upon the value of the company's common stock.

The particularly informative feature of the additive DuPont approach is that it can not only help unravel the counter-balancing effects of the financial factors affecting a company; but it can also provide insight into the relative importance of the five major factors affecting the common stock value of a company. The additive DuPont Model is a flexible tool that can be used by either the internal manager or external analyst of the company, either on a pro forma basis or as after-the-fact analytical review. In either case, this paper suggests that the additive DuPont model is a useful tool for the manager/analyst to better understand the stock price performance of their company.

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INTERNATIONAL M&As IN THE FINANCIAL AND MANUFACTURING SECTORS

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ABSTRACT

International mergers and acquisitions in the financial sector have lagged significantly behind the manufacturing industry. This paper examines market response and the patterns of international investments by U.S. firms in both financial and manufacturing industries for plausible explanations. The conventional FDI framework indicates that, from an operational perspective, the lack of ownership and internalization advantages is a primary reason for the relative lagging of FDIs in the financial sector. The less favorable cross-border diversification announcement wealth effect for financial firms is consistent with such assertion and the less than glamorous market valuation may discourage their globalization attempts. The determinants of their M&A announcement wealth effects are found quite dissimilar between industries. Profit opportunities, information costs and regulations, and firm characteristics may also explain in part why financial industry is lagging in globalization.

Introduction

International investments by U.S. firms in the financial sectors have surged significantly in the 1990s compared to previous decades.¹ However, in terms of both number and value, not only are cross-border mergers and acquisitions (M&A) still a fraction of domestic M&A transactions in financial sectors but are also far less frequent than those of other industries.² This is somewhat

1 The number of deals and total value of international M&As are about 10 and about \$200 million in 1988, but they surged to over 120 and \$24 billion in 2000. They are up by more than 12-fold in number and 200-fold in value. Source: various issues of *Mergers and Acquisitions*.

2 In terms of number of M&A deals involving US acquirers, the ratio of foreign M&A to domestic M&A is 5.48% overall and 1.51% in the financial sectors in 1988. In 1989, the ratios are 9.18% and 1.92%, respectively. Although, they increased dramatically throughout the 1990s, they are still significantly lower than the overall average. For ex-

peculiar because there seem to exist plenty of motives for financial institutions to expand abroad. Other than the common causes of synergy and cost savings across all industries, Saunders (2000) identifies favorable factors for globalization specific to U.S. banks: the use of the dollar as an international medium of exchange, capital flows to offshore branches and subsidiaries of U.S. banks caused by political risk concerns, the U.S. domestic banking activity restrictions, and improvements in technology and communications.

ample, in 2000, the foreign to domestic M&A ratios are 25.87% overall versus 15.98% in the financial sectors. Source: various issues of *Mergers and Acquisitions*. In terms of value, Berger, DeYoung, Genay, and Udell (2000) document that, even though both the domestic and cross-border transactions have increased rapidly, the gap between domestic and foreign M&A in financial sectors has actually widened over the period 1990-1998. Domestic M&A values have been consistently over 25 times higher than those of international M&As in financial industries (their data source is Securities Data Company).

Despite the recent surge of foreign investments in financial sectors, the fact that international investments by financial institutions remain lagged significantly behind those by manufacturing firms warrants an investigation on the recent globalization of US financial service firms.

International mergers and acquisitions remain the dominant mode of foreign entry in financial sectors.³ The factors in favor of cross-border expansions recognized by Saunders (2000) should contribute to their wealth creation, once the US financial firms announce their foreign acquisitions. The existing literature on international M&As by U.S. firms generally reports positive but somewhat modest wealth gains surrounding such announcements in the 1970s and 1980s, albeit mostly insignificant. It is less clear, however, whether significant wealth gains could be found for U.S. financial firms acquiring foreign targets during the 1990s, given the drastic changes of the global economy in the last decade. Equally unclear is what lead to the financial sector's lagging behind other industries in foreign direct investments.

Focarelli and Pozzolo (2001) attribute lesser cross-border M&A activities in financial industries to information asymmetries in banking relationships and to regulatory restrictions. It is more challenging for outsiders to assess bank assets due to asymmetric information. Consequently, investors may have a greater degree of difficulty in measuring the worthiness of these cross-border transactions by financial firms. Moreover, compared to acquirers in manufacturing industries, the relative lack of ownership advantages, possible shortage of firm-specific information based assets, and thus the lesser need for internalization may result in less favorable market reactions toward acquisitions by financial firms.

3 In 1997, for instance, the percentage of cross-border M&As over total FDI flows in banking and finance sectors is approximately 73 percent, \$33.7 billion over \$46.2 billion, worldwide. Source: *World Investment Report*, 1999, United Nations Conference on Trade and Development (UNCTAD).

To verify, this paper measures market reactions and examines their determinants of wealth effects for international M&As by U.S. firms in both financial and manufacturing industries – the primary mode of market entry – for additional evidence for the differential behavior of financial and manufacturing firms with regard to their international investments. The results show interesting differences in international M&As by U.S. firms in financial and manufacturing industries. Market reactions to international M&A announcements by U.S. acquiring firms are positive but statistically insignificant in the financial sector, compared with positive and significant gains for acquirers in the manufacturing industry. Evidence implies that the gains of globalization are apparently smaller in the financial industry than in the manufacturing sector. The financial firm wealth effect is associated with firm characteristics to a greater degree than with target country profit opportunities or information costs and regulations.

Literature Review

Some studies use aggregate cross-border M&A data on national level to examine such primary mode of foreign entry. For instance, Focarelli and Pozzolo (2001) present evidence relating rarer cross-border M&A activities in financial industries to information asymmetries in banking relationships and to regulatory restrictions. In a study using 1985-2001 aggregate cross-border M&A data, Buch and DeLong (2004) also confirm information costs impeding cross-border bank mergers and regulations affecting such activities. In analyzing annual M&A data (1985 to 2000), Berger, Buch, DeLong, and DeYoung (2004) show support for the new trade theory and the theory of comparative advantage literature. They identify certain country-based comparative advantages and a number of country characteristics influencing FDI/M&A activities in banking sector.

In the literature regarding market reactions toward cross-border M&A announcements in the financial sector, it appears that acquirers tend to experience insignificant wealth gain (e.g., Ami-

hud, DeLong, and Saunders, 2002).⁴ In addition to report positive value creation for U.S. targets but insignificant for U.S. bidders, Kiymaz (2004) identifies macroeconomic factors as wealth effect determinants in economic conditions, host country economic development, exchange rate volatility, foreign country effectiveness, relative size, and control of target. The above finding of acquirers' insignificant gain is consistent with the empirical evidence showing little support on cross-border consolidation leading to managerial efficiency improvements in banking sector (e.g., Amel, Barnes, Panetta, and Salleo, 2004). However, there are exceptions. For instance, Cybo-Ottone and Murgia (2000) report, for both targets and bidders in 14 European markets from 1988 to 1997, statistically significant value increase which is believed stemming from the different structure and regulation of EU banking markets.

The existing empirical studies of domestic bank mergers and acquisitions tend to report significant wealth losses for the acquirers, although the magnitude of wealth loss decreased in the 1990s.⁵ In addition, none of the few studies focusing on international M&A activities by US financial firms report significant positive returns for the acquirers. Waheed and Mathur (1995) find significant -0.17 percent return at day 0 for U.S. banks acquiring foreign targets for the period of 1963-1989. The two-day CAR $(-1,0)$ is sensitive to the organizational form and the destination of expansion. Biswas, Fraser, and Mahajan

⁴ Amihud, DeLong, and Saunders (2002) also find no change in the acquirers' risk.

⁵ Houston, James, and Ryngaert (2001) investigate acquisitions between banks and discover a significant -3.47 percent CAR over a six-day event window $(-4,1)$ for the acquirers (and a significant $+20.80$ percent for targets) in the full sample. Their results are more favorable for the acquirers in the 1990s as the magnitude of the wealth loss falls or becomes insignificant. DeLong (2001), however, finds CAR $(-10,1)$ to be -1.68 percent for the acquirers (and $+16.61$ percent for the targets) on a sample of acquisitions involving at least one party as a bank over the period 1988-1995.

(1997) find CAR $(-1,0)$ to be $+0.27$ percent for US bidders in financial industries over the period 1977-1987, but the effect is statistically insignificant. Amihud, DeLong, and Saunders (2002) obtain an insignificant CAR $(-10,1)$ of -0.53 percent for US bidders in cross-border bank mergers over the period 1985-1998. They discover no change in the risk of US bidders after cross-border bank mergers. Nevertheless, the model developed by Repullo (2000) shows that a takeover is more likely to occur if the foreign bank is small and its investments are risky, which may indicate a possible increase of risk after cross-border bank mergers and acquisitions.⁶

Compared to manufacturing firms, financial firms seem to be short of ownership advantages and thus have a lower need for internalization. This indicates that globalization may not create as much value for financial service sectors as for manufacturing industries. Furthermore, owing to a higher degree of information asymmetry in banking industries as documented in the literature, investors appear to have more difficulties assessing the worthiness of international M&A transactions by U.S. financial firms. Some studies also imply that risk may increase for bidders after cross-border bank acquisitions (e.g., Repullo, 2000). Given these uncertainties, it is less clear whether international M&A announcements create as much wealth gains for U.S. bidders in the financial sectors as those found for the acquirers in the manufacturing industries.

Model

To examine the market responses (CAR) and the patterns of international investments by U.S. firms in both financial and manufacturing industries for plausible explanations as to

⁶ Evidence on foreign bank experiences is somewhat more positive. Cybo-Ottone and Murgia (2000) study a sample of M&As in banking between 14 European countries over the period of 1988-1997 and report a significant two-day CAR $(-1,0)$ of $+0.62$ percent for the bidders.

why the financial sector has lagged significantly behind in cross-border investments, the following regression model is tested with the presence of selected explanatory variables/factors.

$$CAR = intercept + factor_1 + factor_2 + \dots + factor_n$$

To account for the vastly different characteristics of these two sectors, two sets of explanatory variables are used in the tests. One set, as dictated in the OLI framework, is intended for the manufacturing industries, and the other in acquirers' characteristics, profit opportunities, and information costs and regulations, as described in the literature, is specifically for the financial sector. The definitions of all these variables are detailed in Table 1 and 2.

Empirical Results

The present study focuses on international mergers and acquisitions, the dominant mode of entry for foreign direct investments, and examines the determinants of acquiring firm wealth effects.⁷

⁷ The shareholder wealth effect is measured by the cumulative abnormal return (CAR) derived from implementing the standard event study procedure. The full sample is formed by first including all U.S. firms conducting international mergers and acquisitions, as listed in *Mergers and Acquisitions*, in the initial sample over the period from 1992 to 2000. I then exclude any partial acquisitions, cleanups, or increasing stakes of previous partial acquisitions. The event date, $t = 0$, is the date when the news of international acquisitions first appears in the *Wall Street Journal*. Given the publication lag of one day, this means that $t = -1$ is the day when the firm actually makes an announcement. The acquisition cases that are not reported in the *Wall Street Journal* are eliminated from the sample. To ensure a "clean" sample, free from any confounding effects, acquirers with any major concurrent corporate event occurring within the 15-day period prior to the acquisition announcement also are excluded. The *Wall Street Journal Index* is again consulted for this purpose. Finally, the remaining acquisitions will be retained only if stock prices

The announcement wealth effect is found to be consistent with the notion that the conventional FDI framework is less applicable on financial firms as they possess less ownership and internalization advantages. Not surprisingly, the market valuation of their globalization announcements is far less than glamorous. In addition, the wealth effect determinants between industries are also found relatively dissimilar.

In the present study, the daily abnormal returns and cumulative abnormal returns surrounding the international M&A announcements by both U.S. manufacturing and financial firms are measured. Not surprisingly, the two-day cumulative abnormal return, CAR $(-1,0)$, is insignificant but positive +0.47 percent for financial service firms. In contrast, the two-day CAR $(-1,0)$ is +1.42 percent for manufacturing firms, and significant at the 1% level. Given the differences in magnitude and significance, it appears that investors are wary about the uncertainties associated with mergers and acquisitions in the financial sector. It also may be related to the degree of the ownership endowments and internalization advantages possessed by the firms in these two sectors. At any rate, it is interesting that, unlike results of many domestic M&A studies, U.S. financial firms do not lose values as a result of international M&As.

Regardless of the magnitude of the value gain, however, it would be of interest and great importance to examine what might explain the wealth effect for the acquirers. Following recent studies and taking into account the differences between the manufacturing and financial industries, the present tests use the different sets of explanatory variables. Table 1 indicates that the degree of foreign presence and management ownership, but not internalization, have the most explaining power for the wealth effect (CAR $(0,1)$) of the manufacturing firms' acquisitions. The degree of foreign presence, showing significantly positive in foreign sales ratio but negative in foreign assets ratio, appears to indicate that the market

for the acquirers are available on CRSP tapes. The final sample consists of a total of 369 U.S. acquisitions overseas completed over the period of 1992–2000.

Regression on CAR (-1,0)			
Model	1	2	Variable Definition
Intercept	-0.61 (-0.24)	0.24 (0.10)	
Management Ownership	34.51*** (4.05)	33.25*** (3.86)	The percentage of equity of the firm owned by top five executives
Management stock options	-1.56 (-0.90)	-1.69 (-0.98)	The average ratio of the value of executive stock options granted to top five executives (valued by the Black-Scholes model) to the value of their total compensation
Target is in related industry	-0.39 (-0.56)	-0.38 (-0.53)	A dummy variable, equal to 1 if the target is in a different industry from that of acquirer based on the two digit SIC codes, and 0 otherwise
Shareholder protections	0.60 (0.80)		A dummy variable, equal to 1 if the target is in a common law country, and 0 otherwise
Developing countries		0.24 (0.23)	A dummy variable, equal to 1 if the target is in a developing country based on the designations used by the United Nations Conference on Trade and Development, and 0 otherwise
Foreign sales	0.06** (2.15)	0.07** (2.19)	Foreign sales over total sales of the firm
Foreign assets	-10.44*** (-2.68)	-10.05** (-2.57)	Foreign assets over total assets of the firm
R&D	-0.0036 (-1.53)	-0.0032 (-1.38)	R&D expenditure over total assets of the firm
R&D times Foreign sales	0.0001 (1.62)	0.0001 (1.51)	An interaction variable between R&D and foreign sales
Book to market	1.99 (0.70)	0.84 (0.58)	Book value of equity divided by the market value of equity in t-1 for firm
Firm size	0.24 (0.78)	0.14 (0.43)	Total sales of the firm in natural logarithm
<i>R</i> ² (%)	31.42	30.73	
<i>R</i> ² -adj.(%)	19.59	18.78	

TABLE 2
DATA DEFINITIONS OF SHAREHOLDER WEALTH DETERMINANTS FOR
U.S. ACQUIRING FIRMS IN FINANCIAL INDUSTRIES

Variable	Definition
Characteristics of the acquirers	
Firm Size	Natural log of total assets
Cash Flow	Natural log of cash flow
ROE	Return on Equity
ROA	Return on Asset
Ownership Concentration	The percentage of equities owned by the top five shareholders. <i>Source:</i> CompuStat ExecuComp Dataset
Book to Market	Book value over market value of equity
Profit Opportunities	
Financial Center	Dummy variable set equal to 1 if there is the presence of a financial center in the target country, 0 otherwise.
FDI Inflows	Foreign direct investment inflows as a fraction of GDP: the annual average 1990-1999. <i>Source:</i> World Bank; Dollar and Kraay (2003)
Per Capita GDP Growth	Annual real per capita GDP growth: the annual average from 1990 to 1999. <i>Source:</i> World Bank; Dollar and Kraay (2003)
Inflation	Logarithm of (1+Inflation/100): annual average from 1990 to 1999; inflation rate measured as annual percent change in CPI for the target country. <i>Source:</i> World Bank; Dollar and Kraay (2003)
Credit Market	Stock of credit by commercial and deposit-taking banks to the private sector divided by GDP for the target country. <i>Source:</i> World Bank; Levine and Zervos (1998) (Available as annual average from 1976 to 1993)
Information Costs and Regulations	
Same Law	Dummy variable set equal to 1 if the same legal system prevails in the target and acquirer country, 0 otherwise.
Distance	Natural log of miles between the center of the target country and the center of the home country.
Toughness	Following Buch and DeLong (2004), index of toughness of banking supervisors that has been computed as the sum of 1-0-dummies capturing the following aspects: (i) Are supervisors legally liable for their actions?, (ii) Can the supervisory agency supercede bank shareholder rights and declare bank insolvent?, (iii) Can the supervisory agency order directors/management to constitute provisions to cover actual/potential losses?, (iv) Can the supervisory agency suspend dividends?, (v) Can supervisory agency suspend bonuses?, (vi) Can supervisory agency suspend management fees? <i>Source:</i> Barth et al. (2001)
Transparency	Following Buch and DeLong (2004), index of disclosure requirements in the banking industry that has been computed as the sum of 1-0-dummies capturing the following aspects: (i) Are consolidated accounts covering bank and any non-bank financial subsidiaries required?, (ii) Do regulations require credit ratings for commercial banks?, (iii) Must banks disclose risk management procedures to public?, (iv) Are off-balance sheet items disclosed to public? <i>Source:</i> Barth et al. (2001)
Government Ownership	Share of government ownership in the banking system. <i>Source:</i> Barth et al. (2001).

TABLE 3
DETERMINANTS OF SHAREHOLDER WEALTH FOR U.S. ACQUIRING FIRMS IN FINANCIAL INDUSTRIES

This table performs cross-sectional regressions of shareholder wealth measured by CAR (-1,21). Financial industries comprise firms with SIC 6000 – 6999. The sample size is 25. All firm-specific variables other than dummies are annual averages over the five-year period prior to international acquisitions. See Table 6 for all data definitions. The *t* statistics are in parentheses. *** Denotes significance at the 1%-level. ** Denotes significance at the 5%-level. * Denotes significance at the 10%-level.

Model	1	2	3	4	5	6	7	8	9
Intercept	0.31 (0.75)	0.25 (1.18)	0.68 (0.74)	0.08 (0.42)	-0.14 (-0.90)	0.70 (1.12)	0.20 (0.86)	-0.01 (-0.05)	1.20 (1.21)
Firm Size	-0.10 (-1.06)			-0.08* (-2.03)	0.001 (0.02)	-0.05 (-0.70)	-0.08* (-2.24)	0.01 (0.32)	-0.08 (-1.90)
Cash Flow	0.06 (0.56)			0.14** (3.00)	-0.03 (-0.57)	0.15 (1.89)	0.14** (3.15)	-0.05 (-0.75)	0.18** (3.26)
Return on Equity	2.35** (3.16)			0.001 (0.30)	2.44*** (4.28)		0.001 (0.39)	2.42*** (3.98)	0.001 (0.21)
Return on Asset	-5.14 (-1.74)					0.47 (0.39)			
Ownership Concentration	-0.39* (-2.05)				-0.27 (-1.69)			-0.33 (-1.85)	
Book to Market	0.35* (2.21)			-0.0006 (-0.00)	0.28* (2.23)	-0.24 (-0.69)	0.05 (0.18)	0.13 (0.67)	-0.26 (-0.74)
Financial Center		-0.01 (-0.09)		-0.21** (-2.38)	-0.16** (-2.63)	0.41 (0.72)			
FDI Inflows		-1.96 (-0.15)				-36.91 (-0.96)			
Per Capita GDP Growth		-7.87 (-0.79)				-18.86 (-1.67)			
Inflation		-0.14 (-1.14)		-0.20 (-1.76)	-0.23** (-3.08)	-0.56* (-2.05)			
Credit Market		-0.11 (-0.09)				-0.43 (-1.35)			
Same Law			-0.24 (-0.59)						-0.83 (-1.49)
Distance			-0.13 (-0.78)						-0.18 (-1.01)
Toughness			0.03 (0.30)				-0.07* (-2.41)	-0.07** (-3.57)	0.03 (0.32)
Transparency			0.19 (0.73)						0.30 (0.99)
Government Ownership			-0.32 (-0.42)						-1.69 (-1.65)
R ² (%)	74.62	16.21	17.41	58.63	88.30	77.12	61.47	88.79	76.65
R ² -adj.(%)	55.59	-9.97	-8.40	33.82	76.61	35.94	40.06	77.58	34.63

responds more favorably toward acquiring firms with sizable foreign sales but not those having foreign direct investments already in place. Investors seem to believe that the closer proximity between sales and production can improve profitability but not redundant foreign direct investments. In addition, management ownership is very significant and positive, suggesting corporate governance also plays an important role.

For financial firms, in light of recent international banking studies, factors in acquiring firm characteristics, profit opportunities, and information costs and regulations are examined to comprehend whether these factors account for the lukewarm market response toward their international M&A announcements. These determinants are similar to those used in Focarelli and Pozzolo (2005), in which bank characteristics and potential profit opportunities are found important in the decisions of banks' expansion abroad, as well as those in Buch and DeLong (2004) in which they find information costs and regulations affect cross-border bank mergers. Table 2 presents the detailed variable definitions and data sources for these determinants.

Due to the statistical insignificance of immediate market response, $CAR(0,1)$, for financial firms, tests on the longer-term one-month wealth effect, $CAR(-1,21)$, are also conducted.⁸ Since the explaining variables are mostly not significant on the immediate wealth effect, $CAR(0,1)$, it may imply the necessity of additional time for investors to process and react to M&A decisions in the financial industries, albeit not surprisingly, perhaps due to the higher information barrier. Table 3 shows that firm characteristics are the most relevant determinants of financial firms' wealth effect over the one-month post-announcement period.⁹ Among them, return on equity has the most significant and positive impact on the acquiring firms after controlling for ownership concentration. The adverse impact of ownership concentration suggests large shareholders wary about the outcomes of international expansions.

⁸ On average, there are 21 trading days each month.

⁹ Only the test results on the depending variable, $CAR(-1,21)$, are reported in Table 7.

Firms with superior return on equity (ROE) enjoy sizable firm value increase upon announcements. Beyond equity related factors, cash flow is the most critical attribute toward positive wealth effect. Financial firms are also better perceived in announcing their foreign M&As when they are relatively undervalued (higher book to market ratio) and not too big in size.

On the other hand, only two variables in profit opportunity and one in information cost and regulation are significant determinants of financial firms' wealth effect. The presence of a financial center in the target country leads to negative wealth gain. Apparently, investors concern about the acquirers' competitive advantages in the most competitive markets. Inflation in the target countries also reduce the acquirers' values possibly due to the concerns over potential host country currency depreciation and wealth decline. In the information cost and regulation category, host country regulation toughness results in wealth loss as well.

Overall, firm characteristics are more relevant, while target country profit opportunities, information costs and regulations have only limited influence on the announcement wealth effect for financial firms. Among them, some financial firm characteristics such as ROE and cash flow serve as positive forces driving acquiring firm value gains. However, factors in profit opportunities and information costs and regulations, along with the other firm characteristics, lead to negative announcement wealth effect. These counter effects may explain why the international M&A announcements only result in modest and insignificant gains in the financial industries.

Concluding Remarks

It is intriguing why financial sectors are not as active as manufacturing industries in expanding their foreign operations, given the number of benefits associated with the globalization of financial service firms. The distinct differences between the two groups reported in this paper may suggest some plausible explanations for this phenomenon.

Most of the existing studies on international M&A activities in the financial service industries find negative or insignificant announcement wealth effects for U.S. acquiring firms. In comparison, the present study obtains a positive two-day cumulative abnormal return for the bidders, and its magnitude is relatively bigger. However, the present results suggest a notion that the benefits of globalization perhaps are smaller in the financial industry than in the manufacturing sector.

The analysis of M&A announcement wealth effect reveals the importance of the degree of foreign involvement and management ownership for manufacturing industries. Corporate governance and closer proximity between production and market appear to be more imperative for manufacturing firms. For financial firm value gains in foreign M&As, firm characteristics are more relevant, with some limited influence from potential profit opportunities in destination countries and information costs and regulations. The resulting lukewarm market response explains in part why financial firms are not enthusiastic about globalization.

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RISK MANAGEMENT, LAW AND ETHICS: MERCK

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ABSTRACT

Merck created the painkiller Vioxx in 1994. Vioxx and other COX-2 inhibitors help reduce aching and swelling without common side effects of ulcers and gastro-intestinal bleeding. Clinical trials showed that Vioxx was effective in the treatment of arthritis patients, and the drug was approved for marketing in May 1999. It was subsequently revealed that consumption of Vioxx increased the risk of heart attacks. In September 2004, Merck unexpectedly withdrew Vioxx from the market and subsequently faced around 27,000 lawsuits from people who claimed either themselves or their family members were hurt or died from consuming Vioxx. These lawsuits covered 47,000 sets of plaintiffs. Rather than settle, Merck chose to go to trial. In the sixteen cases that went to trial and were decided by jury, Merck won eleven cases and lost five. After spending over \$1.2 billion in legal expenses, Merck agreed to settle for \$4.85 billion. This paper examines the several risk management, legal and ethical issues that arose in the context of the introduction of Vioxx and its subsequent withdrawal. This paper contributes to the growing body of knowledge on risk management, business law and ethics particular to the pharmaceutical industry.

Introduction

Merck created the painkiller Vioxx in 1994. Vioxx and other COX-2 inhibitors help reduce aching and swelling without usual side effects of ulcers and gastrointestinal bleeding. Clinical trials showed that Vioxx was effective in the treatment of arthritis patients and the drug was approved for marketing in May 1999. It was subsequently revealed that consumption of Vioxx increased the risk of heart attacks. In September 2004 Merck unexpectedly withdrew Vioxx from the market and subsequently faced around 27,000 lawsuits from people who claimed either themselves or their family members were hurt or died from consuming Vioxx. These lawsuits covered 47,000 sets of plaintiffs. Rather than settle, Merck chose to go to trial. In the sixteen cases that went to trial and were decided by jury, Merck won eleven cases and lost five. After spending over \$1.2 billion in legal expenses Merck agreed to settle for \$4.85 billion. This paper examines the several risk management, legal, ethical, and financial issues that arose in the context of the introduction of Vioxx, its subsequent withdrawal.

Brief History

In November 1998 Merck sought US Food and Drug Administration (FDA) approval for Vioxx. In January 1999 Merck launched clinical study VIGOR to show Vioxx was safer than naproxen to the human digestive tract. The study was overseen by a Data Safety Monitoring Board (DSMB) chaired by Michael Wienblatt. In May 1999 the FDA approved Vioxx. In October 1999, at the first meeting of the DSMB, it was reported that Vioxx was safer than naproxen because Vioxx patients suffered less gastrointestinal bleeding and ulcers. In December 1999, at a DSMB meeting it was reported the Vioxx patients were found to have twice the risk of heart problems and death compared to patients taking naproxen. The DSMB reported that the results were inconclusive because it was suspected that naproxen, like mild aspirin, may provide protection against heart disease and this might be the reason why Vioxx, lacking the defensive characteristic shared by naproxen and mild aspirin, may falsely appear to have a higher incidence of death and heart problems. Early in 2000, Merck submitted to the *New England Journal of Medicine*

(*NJEM*), its findings with respect to Vioxx relative to naproxen, however the results submitted covered only 17 of the 20 heart attacks experienced by Merck's Vioxx patients in the study. The results also did not include data on other kind of heart problems experienced by Vioxx patients. These results were published in the *New England Journal of Medicine* in November 2000. In October 2000 Merck submitted data on all 20 Vioxx patients to the FDA and the FDA subsequently made public these data in February 2001. In August 2001 an Indian cardiologist Debabrata Mukherjee and two American cardiologists Steven Nissen and Eric Topol published an article in the *Journal of the American Medical Association* (*JAMA*) challenging the DSMB hypothesis that naproxen protected the heart just like aspirin does and thereby suggested that perhaps Vioxx was more dangerous than previously assumed. Between January 2002 and August 2004 several additional studies showed that Vioxx patients had a higher incidence of cardiovascular difficulties. In September 2004, Merck abruptly decided to withdraw Vioxx from the market. But by this time over 20 million Americans have taken Vioxx. Among Vioxx patients about 88,000 suffered heart attacks from which 38,000 patients died. In July 2005 the *NJEM* editor alleged Merck had deliberately misled him about the results of their research which advocated Vioxx's safety and efficacy.

Litigation Strategy

Merck faced thousands of lawsuits from patients and families of patients that had consumed Vioxx for the months it had been on the market. Faced with a Hamlet like dilemma ("to be or not to be")— in Merck's instance to settle or not to settle, initially Merck ruled out an expensive mass settlement of claims and vowed to fight all claims filed by plaintiffs. This obviously aggressive legal strategy was intended to discourage marginal lawsuits. The firm hoped that if it won a favorable judgments in early court trials, its legal victories might help persuade waiting plaintiffs to settle for a smaller amounts because the study that caused Merck to pull Vioxx off the market had only showed that Vioxx patients who had used Vioxx for more than 18 months had a higher risk of stroke and heart attack . Many plain-

tiffs related to patients that had used Vioxx for less than 18 months and many related to patients that had other cardiac risk factors such as age, obesity, and previous cardiac problems. These plaintiffs could find it difficult to prove that Vioxx was responsible for the deaths of patients. It appears Merck also counted on the statute of limitations expiring for many of the cases to be tried in state courts. In January 2006, the FDA announced a new "preemption" policy. According to this policy, FDA stated "drug manufacturers that followed the FDA's drug approval and labeling requirements should be immune from state lawsuits alleging that the company failed to warn consumers of the dangers of their drugs" A lawyer for Alston & Bird who specialty lies in protecting firms against group product responsibility claims opined . "While the policy does not have the force of law, it could add weight to Merck's efforts to get cases thrown out before trial or on appeal" [Masters, 2006].

Financial Aspects

Vioxx accounted for \$2.5 billion of Merck's sales in 2003 and about 15% of its profits in 2003. But by January 2006, Merck had provided a reserve of \$675 million for legal expenses related to Vioxx. It had not provided a reserve to pay damage claims. "We do not have a reasonable basis for establishing a liability reserve," said Ted Mayers, one of Merck's external counselors. "It's not as simple as you try one case and you know what is going to happen in a whole category." Mayers said the company did not believe there was indisputable evidence of a scientific nature to establish that that Vioxx caused heart attacks, even after Vioxx had been used for a long duration of time. Merck reiterated that it had acted in the interest of patient safety [Masters, 2006.] The major goal of a corporation is supposed to be maximization of shareholder wealth. On the day Merck withdrew Vioxx from the market, the market value of Merck shares declined by 27%, essentially losing \$27 billion in shareholder wealth. Shareholders subsequently filed lawsuits against the directors of the company accusing the firm not properly evaluating and disclosing the risks of Vioxx.

On August 19, 2005 in Texas, Merck was found negligent and was ordered to pay \$253 million

including \$229 million in punitive damages to the plaintiff. On November 3, 2005, in New Jersey, a court cleared Merck in the death of a patient who had been on Vioxx for two months. On February 17, 2006 in Louisiana, Merck was found not guilty in the case where a patient died after taking Vioxx for one month. On April 11, 2006 in New Jersey, a court awarded \$13.9 million to the plaintiff in a case where a patient died after taking Vioxx for four years. However the same court absolved Merck of the death of a patient who died after taking Vioxx for almost two years. On April 21, 2006, in Texas the court awarded \$32 million to the plaintiffs in a case where a patient who died after taking Vioxx for one month. On June 26, 2006, the NJEM published a report that stated that patients faced a heightened risk of heart problems within twelve months of taking Vioxx and these risks increased not merely after 18 months of use as Merck maintained [Brennan, 2007]. On July 13, 2006, a jury cleared Merck in the death of a patient who had taken Vioxx for two and one half years. In a total of sixteen cases that were tried Merck won eleven and lost five. Since Merck had admitted the increased risk to patients who had taken Vioxx for more than 18 months, it perceived a higher probability of losing cases where the patient had taken Vioxx for more than 18 months. Even though Merck should have had a higher probability of winning cases where the patient had taken Vioxx for less than 18 months, Merck lost some cases where the patient had been on Vioxx for less than 18 months. Merck also lost some cases where the patient had been taking Vioxx for more than 18 months. These losses taken together clearly changed the risk balance against Merck.

Risk Management

“Settlement negotiations are not a sign of weakness, they are an important part of risk management. As such, risk managers must be able to identify the components of a solid settlement, know how to secure one and see that every claim is negotiable, not just cases where liability is clear.” [Fogel, 2003] Early settlement may encourage more plaintiffs to come forward.

“At... [an] early stage you have to take the position you are not settling. Oth-

erwise you bring everybody out of the woodwork,” opines Fordham University law professor Benjamin Zipursky [Masters 2006.]

Part of Merck’s legal strategy was to also try and avoid the problem faced by the pharmaceutical firm Wyeth after it took its diet drug ‘Fen Phen’ off the market in 1997. Wyeth did not properly estimate the true cost of settling the ‘Fen Phen’ litigation and its equity value sharply declined as the cost of settlement rose. In January 2006, Wall Street analysts and mass tort experts estimated the cost of the Vioxx settlement at between \$10 billion to \$12 billion.

By November 2007 Merck had set aside \$1.9 billion for legal expenses related to Vioxx but had already incurred \$1.2 billion of that amount even though only 16 cases had been decided. There were several hundred more cases to be decided so Merck decided to wisely cut its losses and offered plaintiffs a combined settlement of \$4.85 billion. This represented one of the largest settlements in the industry’s history.

Ethical issues

Questions about ethics and moral hazard have plagued the Vioxx case from clinical trials to settlement. Merck’s clinical trials of Vioxx were monitored by a Data Safety Monitoring Board (DSMB) chaired by Michael Wienblatt. In February 2000, a financial disclosure statement from Weinblatt showed that he and his spouse owned \$72,975 in Merck shares. Weinblatt also signed on as consultant to Merck with compensation at the rate of \$5000 per day for twelve days over two years. While there is no clear evidence that Weinblatt was less than wholly independent and objective in his evaluation of Vioxx, it is clear that as a shareholder of Merck he stood to benefit from Merck’s gaining FDA approval of a blockbuster drug. The inclusion of only 17 out of the 20 patients in the study initially published in the New England Journal of Medicine also raised questions about business ethics and lack of concern for patient safety.

According to the terms of the settlement proposed by Merck, Merck could opt out of the set-

tlement if fewer than 85% of eligible claimants enrolled in the plan. It was in Merck's business interests to get as many claimants as possible to enroll in the plan. The proposed settlement contained a rule that if a lawyer had one of his clients participate in the settlement then the lawyer had to recommend the settlement to 100% of his/her other Vioxx clients. If a client was not interested in settling then the lawyer had to withdraw from representing that client provided the withdrawal did not violate rules of ethics. Hechler (2005) reported an explosion of legal services advertised on the internet shortly after Merck announced the Vioxx recall as many lawyers rushed to sign up clients who were ready to sue Merck. Many lawyers had already invested a considerable amount of their own money preparing to defend their clients and were anxious to recoup their investment. The 100% recommendation was troubling in that it provided lawyers with a powerful incentive to push for the settlement even if it was not in some individual clients' best interests to settle. Some clients could presumably gain more by going to trial as in the first Vioxx case that Merck lost, the jury awarded the plaintiff represented by attorney Mark Lanier, a sum of \$253 million dollars. The troubling aspect of the 100% recommendation rule is that any Vioxx plaintiffs who chose not to accept the settlement and whose lawyers subsequently withdrew, might find it difficult to find another lawyer to represent them after the litigation had continued for over three years. As a result these plaintiffs might end up being left on their own without the means to fight Merck. Such plaintiffs essentially faced a Hobson's Choice with respect to the Merck's settlement. Stanford Law Professor Deborah Rhode warned this would be in violation of the Supreme Court ruling that in settling cases lawyers must ensure that the "interests of individual plaintiffs aren't sacrificed for the good of the whole, which not coincidentally serves the interests of attorney." [Koppel, 2007] U.S. District Judge Eldon Fallon of New Orleans was appointed to oversee the settlement to ensure that a lawyer's withdrawal did not violate ethical guidelines.

Conclusion

Shareholder wealth maximization is generally accepted as the goal of a corporation. Sound risk

management practices help realize the goal of shareholder wealth maximization while ensuring patient safety. A firm maximizes shareholder wealth by accepting only reasonable risk and positive NPV projects while rejecting extremely high risk and negative NPV projects. The greatest difficulty with NPV analysis is cash flow estimation and estimating the risk of projected cash flows. Those risks are magnified in the pharmaceutical industry because of the risk of high negative cash flows arising out of product liability litigation. Vioxx had a potential to generate large positive cash flows for Merck but those cash flows were not fully realized when the product was necessarily and abruptly taken off the market. In all likelihood Merck may not have fully recouped the initial investment and especially the high costs of the research and development that went into the development of Vioxx. The introduction of Vioxx once perceived to be a positive NPV project for Merck ended up being a huge cash drain and a negative NPV project for the firm that did not create value for its shareholders or the greater community.

As of March 3, 2007, Merck reported that it expected the settlement deal to go forward as 44,000 of the 47,000 plaintiffs who had registered for the settlement had submitted all their paperwork making them eligible to receive payments. Despite the large settlement Merck's financial losses from Vioxx are far from completed. Merck faces three categories of lawsuits arising from Vioxx - Vioxx product liability lawsuits, Employee Retirement Income Security (ERISA) lawsuits and Vioxx shareholder lawsuits. This paper chiefly addressed only risk management and other issues arising from product liability litigation. The settlement deal also only covers some plaintiffs. Many former Vioxx patients are excluded from this settlement and their cases continue. The firm still faces lawsuits from patients in several foreign countries including Canada, Brazil, Australia, Israel and countries in Europe. Recently Merck lawyers successfully obtained a dismissal of 100 cases filed by UK residents by applying the doctrine of *forum non conveniens*. "Specifically, the court did not want to burden jury members and a community having no relationship to the litigation and did not want to inflict an additional administrative burden on

the court system. Although the court applied its analysis only to the foreign plaintiffs, the same rationale applies to nonresident domestic plaintiffs.” [Lifton and Bufano, 2007]. Merck will undoubtedly continue to seek additional and new legal strategies to reduce its liability but its litigation costs will not be small. As of March 7, 2008 Merck has set aside \$6.773 billion for litigation. It is likely that Vioxx litigation will persist for many years to come. The case underscores the importance of properly assessing risks to consumers before new product introductions and their impact on the cash flows of the firm.

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MANAGING AND LEADING TECHNOLOGY AND INNOVATION: AN INTRODUCTORY APPROACH

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ABSTRACT

In Managing in a Time of Great Change, Drucker talks about irreversible changes that too many leaders have failed to address (1995). Drucker said that universities, hospitals and other large organizations are most in need of change and remain stuck in the past. Consider your view of reality in respect to your environments, and ask, "How mired in the past am I and my organization?"

When the answer points backwards, leadership requires one to become a cosmopolitan deep thinker, manager, and learner comfortable operating across many boundaries as facilitators who look beyond the obvious disciplines, functions, and cultural norms traditionally followed (Drucker, 1985 and Gardner, 2003). These futuristic leaders get extraordinary things done with power beyond the normal expertise taught in business schools or found in the literature. They must enhance employee capabilities and clarify values and norms to get the most from existing and new knowledge (Paterson, et al, 2008). They must lead functions where they have little expertise.

The purpose of this article is to help its reader learn how to obtain the knowledge necessary to be an "Advantage-Maker (Feinberg, 2008: p. xvi)" capable of leading innovatively in technology areas where they are not experts.

Introduction

In learning organizations, the leaders are the best and most diligent of learners (Blanchard, Meyer and Ruhe, 2007; and McDermott and Sexton, 2005). These leaders must continuously reassess the quality of all levels of leadership and relationships. Effective leaders balance how much time they expend on results and on relationships. Effective technology leaders are not arrogant or humble, they are realistic and work to increase their knowledge of emotional issues as well as contents, contexts, and processes (Giuliani, 2002). Effective leaders utilize resources and knowledge from many areas, people and disciplines to foster the creativity required for success (Wheatley, 2001). All leaders must, at many points in their careers, innovatively manage technological functions and make difficult trade-offs (Baschab and Piot, 2003; and Mintzberg, et al, 2005). Those

in charge of information systems and technology functions must lead, not just manage (Broadbent and Kitzis, 2005).

Need for Innovative Leadership

Two recent best selling business books, *The World is Flat* (Friedman, 2005) and *Freaknomics* (Levitt and Dubner, 2005), are great reads that clarify our "new" competitive worlds. These books, along with others, tell us we must become repositories of much knowledge to remain competitive (Blanchard, et al, 2007 and Hunter, 2008). Friedman's premise that the world is flat and we are now competing against everyone in the world tells us not to build walls, but dig our way out by acting small if we are big and acting big if we are small. He pushes innovation as a goal while reminding us that imagination can

never be outsourced; we must learn how to keep building it.

Likewise, *Freaknomics'* authors present entertaining conclusions that could be useful when interpreted properly. *Freaknomics'* five themes parallel our favorite concepts in many ways: 1) We must realize that what we value and how we value it is not necessarily related to what and how others value different or even the same things. 2) Common sense is uncommon. 3) There are many simple explanations that are wrong. 4) Look at what the advice giver has to gain (this is a principle that often debunks experts). 5) Measure it and it will improve—be sure what “it” is.

Both books invoke continuous learning of how to be more innovative as we compete on a worldwide basis. The books make readers realize that all leaders and good managers need to grow as intellects, repositories of information, and guides of behavior, basing their development on derived wisdom (Mariotti, 2008, and Tichy and Bennis, 2007). Curiosity, the desire to know more, seems to be a self-regenerating force, because, the more we know, the more we want to know, and need to know. Effective innovative leaders find ways to receive and process more information better. Superior leaders learn more faster from more perspectives; and adapt and adjust for newly gained information quicker than less effective leaders (Lane, 2008).

Leveraging the enormous amounts of dormant talent and creativity within organizations is a function of leadership learning and knowledge building directed toward innovation. Yet, before innovation, all managers and leaders must know that “Americans are more discerning and less herdable than their cultured despisers suppose, so what matters most is simple. Good products (Will, 2007: p. 9A)”. What determines a good product is a moving target and can only be met by those that stay ahead of the curve and innovate for quality, function, design and costs. Organizations cannot stay wrong for long, and will not stay right long, as perhaps Ford and GM are belatedly discovering.

A leader is the bridge to the future where new knowledge meets current needs. The world is

changing too rapidly to keep up with this deluge of new knowledge (Mauzy and Harriman, 2003; and Wheatley, 2001). Yet, leaders must be able to deal with the rapid change for they move people into the unknown requiring leaps of faith from their followers. But where do they start? Perhaps the *Success Built to Last* admonition to make new mistakes by continuing to try new things is a starting point. *Success'* advice to push and shove the three circles of meaning, thought and action requires a blend of understanding and performance. Leading for innovation requires continuing to move these three circles toward alignment in life and work (Porras, Emery, and Thompson, 2007).

For success, leaders must realize two organizational imperatives: 1) understanding how to become and remain innovative, and 2) understanding why someone would do business with their organization (Service, 2005c). First, becoming and remaining innovative is primarily a function of an innovative leader emphasizing the need to innovate. Second, someone does business with an organization because it can provide something of value, has no substitutes, cannot be imitated, and is rare (Barney, 1991, 1995). Therefore, the question becomes: How can one accomplish these objectives throughout a long and varied career as they stay the course? Start by paying particular attention to these driving forces:

1. Accelerating rate of technological development.
2. Fast worldwide commerce, media, and travel.
3. New values and ambitions of employees—Ideas and support of all employees.
4. Understanding the consequences of cultures: they are hard to change (Arnott, 2000).
5. Understanding the geopolitical nature of current times.
6. The changing nature of demographics.

7. The quality and speed imperative for services and products. improvements (Barney, 1991, 1995; Imai, 1986; and Porter, all).
8. Democratization of the world's countries-Returning to religiosity and cultural roots (Service and Ledlow, 2007). Warren Bennis (1989) stated that a truly innovative leader must be curious and daring; and that study, travel, people, work, play, reflection, and mistakes are all sources of knowledge and understanding. Truly successful innovative leaders see relationships as linear, sequential and serial, discrete, singular and independent, parallel and simultaneous, connected, murky, multiple and interdependent. Effective leaders seek to go outside of normal "boxes, frames, and models" and direct their thinking toward developing true innovation within organizational members, starting with themselves (Bennis and Thomas, 2002).
9. Shifting powers, trends, demographics, technologies, and new developments of all types (Cortada and Hargraves, 1999; Jacobs and Whybark, 2000).

Innovation is *not* primarily about teams, globalization, hardware, software, etc. It is about shared commitment among organizational members to satisfy needs of constituents through 1) continuous improvement, 2) more functionality, and 3) systematic change. To these ends, knowledge available outside an organization matters more than inside information. Customers' perceived and expressed values must be the guide (Jackson and McKergow, 2002).

In leading organizations, the underlying questions and theories matter most, because they direct the power and course of leadership influence. Hardware and software can not feel, love, hate and react like irrational emotion-driven humans. In the end, innovation is effected by people and their desire to improve or benefit from new approaches.

There are many opportunities as well as problems, solutions and innovative uses associated with technology. Effective leaders have to be attuned to knowledge applications in many areas, and not fear technology or innovation but be able to apply it. Many leaders are surprised to find that most innovations are not technology-based (Porter, 1990).

Highly effective organizational leaders have shifted emphasis from *management* of stability and control to *leadership* directed toward speed, empowerment, flexibility, and continuous improvement, all directed at organizational innovation (Service, 2005c). Innovation is using change opportunities and learning to identify potential change. Failure to innovate results in organizational decline and the only truly sustainable competitive advantage comes through constant

Becoming more innovative personally and developing a more innovative organization is difficult. A plethora of books and articles has attempted to explain how to do this over the past three decades. A starting point is understanding that *innovation* is getting ideas to market, where they create value for consumers (Goldenberg et al, 2003). Occasionally, innovation includes invention.

An effective leader of innovation needs to follow a rapid innovation strategy both individually and organizationally. Organizational innovation is critical to the profitability, adaptability, and survival of organizations. This proposes a new perspective of organizational theory (OT) based on speed, flexibility, and commitment that is emerging to replace the old OT perspective based on stability and control. This strategic type should be called Innovation Through Rapid Incrementalism. It is becoming the only viable sustainable competitive advantage strategic type (Imai, 1986 and Service and Arnott, 2006).

In academia, progress is too often impeded because relatively radical creative ideas are often hard to justify. One seeking the approval of the academy often must temper assertions. Sadly, rewards can come more easily to those that play the publishing game than to those that excel in extraordinary ways. As a case and point Goodman's words fall close too home for those of us in academia:

Our public-school system and our health-care systems may seem as different as night and day. Yet both systems share something in common: Mediocrity is the rule and excellence, where it exists is distributed randomly.

In both cases their reason is the same. There is no systematic reward for excellence and no penalty for mediocrity. As a result, excellence tends to be the result of the energy and enthusiasm of a few individuals, who usually receive no financial rewards for their efforts (2007: p. A13).

In academia, there is a strong need to be alert to what behavior is rewarded. Moreover, outside academia, behaviors needed to innovatively utilize technology are often impeded by the desire for status quo. We must seek to give birth to more ideas, whether in academia or practice, whether radical or conservative, or block-buster or mundane. Getting a lot of *good* ideas requires getting a lot of ideas.

The cumulative effect of successive incremental improvements is larger than technological breakthroughs. Competitive advantage is sustainable because of “constant improvements and upgrading (Porter, 1990).” Organizations can become competitive only by being market-driven and by organizing the entire business around innovation (Drucker, 1991). “The strategy itself is the innovation (Drucker, 1985: p. 243).” Business in general seems to understand these foundational requirements for the innovation mindset. At present, it seems academia does not understand the requirements for innovation in applications of teaching or research.

Managers often lose sight of the need to lead everyone to act as owners sharing commitments (Becker, et al, 2001). Effective technology leaders celebrate attempting instead of fearing failure, they play to win, and they are diligent and focused in pursuit of new techniques. They are able to look to others for help and take advantage of fate. Innovation does not reside only in technology; however, more and more of the block-

buster breakthroughs *are* based on technology. While both the technology-related and non technology-related innovations are useful, focusing primarily on technology leadership in this article.

Understanding, Obtaining and Using Technology

A formula for successfully understanding, obtaining, and using technology is: **TECHNOLOGICAL SUCCESS** = a function of (location + industry + organization + individual), considering needs and perspectives.

A more detailed look at the formula is: **EFFECTIVE TECHNOLOGY UTILIZATION LEADERSHIP** = *function of* ((national and global [governmental influences-pressures + markets + industries + cultures]) + (industry [phase of maturity + level of technology + acceptance + ASK {abilities, skills, knowledge} requirements] + (organizational [structure + management-acceptance-focus-arrangements + production process type + culture + socialization + internal labor market structures + human resources practices + strategic choice variables + level of technology + phase of maturity of organization, people, products and services, markets, cultures, society, strategy]) + (individual [end user social comparison-acceptance-focus + training + participation + ASK + technological sophistication + perceptions + attitudes + cultures]), considering fit and balance among internal and external people and things (Service, Whitman and Harper, 2000).

This relatively complex relationship is enabled by necessity, commitment, and communications; and moderated by an understanding of the players (Service and Boockholdt, 1998). The obstacle is the density and richness of the information (Gerloff, 1985). The more knowledgeable the leader who is attempting to make this formula work, the more likely success will be achieved. The exercise of developing and using an individualized formula is foundational to success in leading for technological innovation. Simplification only works when the result is a complete and accurate response. For every complex problem,

there exists many simple, easy to explain responses that are incorrect.

Examining more closely the formula above, the pressures of location are intense and must be understood from every level if an organization is to be global. The cultural aspects alone can boggle one's mind when one must do business in Christian, Islamic, Buddhist, atheistic, socialistic and other cultures. As politically incorrect as it may seem, religion is the "Mother of All Context (Service, 2007)."

The industry and its stage of development is another guiding force for technology. To understand an industry means knowing where the industry is going, not where it has been.

The next category of variables is the rich elements that comprise the organization. The key is alignment, both internal and external, and insuring that the formal and the informal structures and communications patterns are similar. Incongruence with the formal (SOP) and the informal ("way we've always done it!") in an organization indicates a problem.

Lastly, from a leader's role, without innovative leaders an organization stands little chance of being able to maximize the effectiveness of the latest available technologies.

The word "technology" often connotes Information Systems (IS), Information Technology (IT), computers and telecom. Though IS/IT are the most common forms of technology now being exploited for competitive gain, they are *not* the preponderance of technologies. Many areas of robotics, genetics, plant and other automations, medicine, and transportation are technologies outside of IS/IT though most use some form of computerization. The guidelines and principles presented in this article focus on IS/IT because so many leaders have difficulties in these areas. The IS/IT knowledge presented herein represents the tip of the iceberg as to the depth of knowledge needed in many technology areas.

Staying Abreast of Technologies

The specifics of staying abreast of IS/IT and other technologies can be unclear. A major area of concern is whether to include or exclude a certain technology. Few organizations are exempt from IS/IT, and leaders must have enough knowledge to manage these functions regardless of whether they are performed in-house or outsourced. Contrary to popular ideas, managing outsourced activities can be more difficult than those maintained in-house.

Most MBAs, and even undergraduate business majors, have managerial finance and accounting courses, but fewer have a managerial IS/IT course; fewer yet have technological innovation courses. This is a much-needed area of expertise, as MBA candidates continuously express (Mintzberg, 2004; and Service and Cockerham, 2007).

This section presents only a brief description of the basic functional knowledge needed to manage in the technology area. Any technological decision should begin by defining the "what" of the needs before you considering the "how." Technology is all about leverage used to solve real problems and address real opportunities, and must start by addressing the desired outcome. IS/IT and other technologies should be used to:

1. Speed up, improve quality, lower cost or expand scope for effectiveness or efficiency.
2. Improve reliability and accuracy, make more complete, and/or provide linkages/interfaces.
3. Improve decision-making by reducing uncertainty: facilitate experimentation/what-iffing.
4. Differentiate by improving or expanding service and/or expanding customer base.
5. Address and keep up with current and future customer concerns.

6. Reduce manpower or other resource usage through increased productivity.
7. Meet a quality or functionality need you cannot meet otherwise.
8. Meet reporting or governmental requirements using by-products of normal business.
9. Leverage human capital such as IQ, education, experts and other human strength.
10. Make people, processes, contexts, sales, marketing, support functions, products, and services more competitive through increasing their value, scope, functionality, or uniqueness (Andrews and Johnson, 2002; and Baschab and Piot, 2003).

The question is: How can we lead our IS/IT functions, or other technology-based functions to better meet the potential? It starts with better use of existing tools, and then proceeds to innovation of processes, methods, and self, before it goes to invention and new applications. Most can use IS/IT at a high level. To get any innovative edge from this technology is very difficult, to say the least. Technology should have the following considerations (Service, Heames and Smith, 2005):

1. The business goal—what is to be accomplished with the IS or technology.
2. The work practices or processes enabled/forced by the IS or technology.
3. What it looks like and does—data, text, pictures, sounds, motions, tasks.
4. Physical and knowledge components—the hardware and software.
5. The level of technology needed to support the correct IS or tech component.
6. People interfaces and interactions.

7. Human or machine competitive impacts (Service and Maddux, 1999).

There is a circular relationship between technology and business needs as they drive each other. There is huge value residing in information, organizations and management that could be directed at innovativeness. IS problems revolve around merging of the old and the new technologies. One example is using IT to address sustainable competitive advantage at any of the five points of Porter's (all dates) five forces model. Or we might see globally that IT/IS and other technologies are forces for social, political, and economic change. There are people disconnected because they adapted technology for technology's sake, or intending it to replace or leverage human activities. There is little that is too farfetched to predict about technology.

Given these broad conclusions, how can a leader's knowledge of IS/IT or other technology help? First, you must avoid automating the old instead of rethinking the new way of doing business given the potentiality of IS/IT (technology) as it currently exists. Second, to avoid common pitfall exercise an extremely disciplined approach to making forecasts and judgments; do not consider the extremes or preferences too heavily, or let emotions rule. Do this by looking for possibilities that are outside preconceived notions that are mired in your worldviews. Third, build testing and disciplines into your Decision Support Systems (DSS) that can uncover errors in thinking before they become errors in decision and execution. Finally, focus on the complex set of hi-low-no-technology tools, methods, procedures, models, and methodologies that can be tailored to meet clearly defined needs. Leaders must learn the capabilities of and their expectations for technology before using the technology. We cannot go into a great detail, but we can help the reader think through the application of some fairly well known tools. The following discusses organizational IQ elements which allow an organization to use its information through the application of IS/IT (Service and Maddux, 1999).

IS/IT/Technology Knowledge Foundation

Effective leaders are prepared to manage the IS and IT function just as they manage other functions, such as accounting and marketing. A solid IS/IT and technology management knowledge base must include the ability to examine successful origination, development, implementation, and diffusion of information systems enabled by emerging technologies. Most non-IS/IT technologies require interfaces with existing IS to be of use. Strategic management of IS/IT for competitive advantage requires exploring the interaction of all technologies with strategic variables related to the support of organizational purposes.

Of late, many authors have written a myriad of useful books and articles that could be used in developing a better IS/IT knowledge base. For a representative sample see: Albrecht (2003); Barner (2000); Becker, Huselid, and Ulrich (2001); Burns and Stalker, 1961-a classic; Cohen and Prusak (2001); Flanagan and Safdie (1999); Gaynor (2002); Goldsmith, et al. (2003); Jick and Peiperl (2003); McDermott and Sexton, 2005; Service and Arnott, 2006; and Wind, et al (2005). There are a few books on general technology management or innovation management, but they are mostly texts; and, frankly, we could not recommend them. These cited authors look at topics such as teaming, developing innovative mindsets, evaluation and comparisons, leadership, and change. Their usefulness relates primarily to the attention needed for the human interface element involved in learning, managing, and the IS/IT functions. To effectively manage IS/IT the focus must be on the most difficult interactive human element not on the technical aspect of IS and IT (Service 2005a).

Leaders of technology functions must grasp: 1) what drives managers to adopt new technologies, and 2) how technologies can meet the need for increased responsiveness to customers, more speed, improved geographic reach, more functionality, more efficient use of labor, leverage of intellect, and faster-learning individuals and organizations.

IS/IT trends are for the development and use of expert systems (ES) that replace the human experts and artificial intelligence (AI). We mention ES and AI applications, for they are replacing the need for humans no matter how difficult or complex the replaced functions may appear. If you are not aware of these areas you should research them.

Technological/IS/IT Management Imperatives

Alan Greenspan said, "Information technology has begun to alter, fundamentally, the manner in which we do business and create economic value (Melloan, 1999: p. A27)." In this information age, the organizations that survive will be those that succeed in using IS/IT to provide sustainable competitive advantage: why someone would choose your organization.

Greenspan further stated that these technologies did not "just happen, they were incubated," and that how they occurred could provide important lessons for organizations. We are presenting leadership, managerial, strategic, and design guidelines that must be understood to enable the use of powerful new technologies in providing better IS/IT. Understanding the leadership implications of IS/IT requires new approaches for those who hope to exploit these new technologies. We will first discuss how IS and IT can be better utilized in organizations, and then how IS needs to be designed to help highly effective leaders of the future understand how to manage IS/IT toward those ends.

Our question quickly becomes, "Can we better lead the staff that designs and programs our IS so the products and services we use will more closely meet the needs of the average person?" The answer is yes; but first we must understand the whys and the required contributions of leaders of these functions.

New Approaches to Implementations in IS and Other Technologies

An organization's IS and technology are more determinate of the products and services of our organizations than many want to believe. They

drive how we accomplish our work. In addition to needing IS, and other technologies, that are more people-friendly and allow more innovativeness, the need to improve competencies is being driven by a combination of interacting factors. They include instantaneously available global information, accelerating technological innovation, worldwide deregulation and privatization, and the opening of markets and competition (Linkow, 1999). Continuing on these themes, Cortada and Hargraves (1999) describe how IBM and other firms are moving into the “networked age.” These authors list the 21 themes that are now defining the game of commerce and that therefore should help us mold our IS to accommodate commerce in the future. These themes illustrate the need for IS to capture, retain, and manage information from multiple sources while handling change and new avenues of interconnectivity. Organizations now have the opportunity to gather operational and external data and manipulate it in ways that can transform the data into the basis for solid decisions. IS have the capability to take the raw material of living and doing business, and synthesizing it into useful knowledge for your organization’s decision-making.

Decisions are choices under varying degrees of uncertainty, and knowledge is useful in decreasing uncertainty. To attain a sustainable competitive advantage, IS must retain the right *knowledge* until the right *time* and then communicate it to the right *people*. Indeed, it seems that few leaders understand these relationships well enough to develop truly useful IS.

We are not gathering all the right data for true DSS, in part because it is impossible to map out all information that might be required in our rapidly changing world. Yet we must do this effectively, because executive decisions are by nature ever-changing and non-repetitive. Business intelligence applications are now possible using data-warehousing and online analytical processing. These are good technical solutions, but they are not solid foundations upon which to base DSS. In order to implement IS for sustainable competitive advantage, the IS need to capture the right information and provide design flexibility. We must resist the urge to get *prematurely physi-*

cal and select the systems before we decide truly what is needed to improve the competitive position of our organizations.

Perspective Needed for Real Knowledge

Andrew Carnegie said, “The only irreplaceable capital an organization possesses is the knowledge and ability of its people. The productivity of that capital depends on how effectively people share their competence with those who can use it (Cortada and Hargraves, 1999:p. 82).” Without the commitment to generating and sharing knowledge, no IS or other related technology will insure a competitive edge. Organizations can use a “garden variety” of decision, information, material, process, and telecommunications technologies to beat their competitors. Management of new technologies will transform how an organization does its business. That transformation can and will be difficult for an organization; an effective knowledge base among leadership then becomes the initial key to a successful IS/IT or other technology implementation.

Managers fail because they do not execute management fundamentals—selecting, directing, evaluating, and rewarding (Service and Lockamy, 2007). Regardless of the technology guidelines and direction we develop in a particular project, people and processes must be managed effectively. As Collins (2001) said, getting the right people is the first step in improvement. We are identifying the criteria for effective IS/IT application, but we will precede that by stressing how to manage “human capital” to gain the full potential of IS or other technological applications.

One difficulty in structuring new IS applications for decision-making results from individual preferences and modes of operation. Everyone has developed frames of reference, contexts, histories, and educational experiences that can lead to bad (or at least skewed) decisions. These limit our ability to use IT in innovative ways, as we have mentioned so often. A good IS can help decision makers use for status quo alternatives the same evaluative criteria that are applied to new alternatives, by presenting the current state as just another alternative.

Executives and managers are often overwhelmed by emerging technologies. The amount of available information is but one of the problems. The increased speed of technological change in the area of information is outpacing the ability of most organizations to research, evaluate, test, install, and use it for competitive advantage. We have to learn to focus our time and attention and to use the time and attention of our followers, if we are to have a chance at staying abreast of the latest developments that might affect us and our organizations.

Technology Strategy for Competitive Advantage

The key is to insure the technology implemented provides functionality, quality, speed, cost advantages, or information needed to offer something rare that is of value to a customer (Barney, 1991).

Identifying the issues that really matter in using technology for competitive advantage requires systematic innovation of our methods of learning. We see most leaders being more comfortable investing in physical capital than in human-knowledge capital. CEOs must be convinced that sound investments lie with people and a solid technology infrastructure, not just plant and equipment, and specifically IT hardware. Many think that by buying the latest, greatest, fastest, smallest, and most expensive piece of IT equipment they are in the networked age. Little do they know that *buying* is easy; *using* for success is very difficult!

The [technology] doesn't manage, the people do (p.16). . . . You need to solve the management problems and get the relationships between functions sorted out before you can fire up the [technology] (Jacobs and Whybark, 2000, p. 12).

Listed below are guidelines to be followed to insure that strategic development is directed toward using technological tools for gaining and maintaining a competitive advantage:

1. Understanding the necessity of gaining **shared commitment** to organizational purposes.

2. Building **human resources systems and policies** that support innovative people.
3. Instituting the cornerstone of improvement—**measurement**.
4. Understanding that **relationships and discipline** are keys to successful management.
5. Perceiving new rules of commerce: **flexible broadening** of alternatives.
6. Knowing and understanding of **frames and biases** expands alternatives.
7. Committing to **usefulness that is defined by customers**, not technology.
8. Insuring **function-centered automation** overrides technology-centered functionality.
9. Showing that **flexibility** is the key to survival.
10. Having **rewards and recognition direct the organization toward trying**
11. **continuous improvements**, adding of new features and systematic innovation.
12. Knowing that **capturing information outside** of an organization matters the most.

Technology will not contribute to a sustainable competitive advantage without recognizing in its design the human resources, relationships, and change. The objective of technology design is to provide leverage that supports these essentials. In other words, the technology should not be the end in itself; the end should be how the technology allows an organization to more effectively and efficiently meet the needs of its constituents.

Technology must be flexible enough to be adaptable to changes in the organization's management and its external environment. Technological change, specifically using IT in IS, has led to

success for some organizations. However, using high technology for IS does not guarantee success. Many important innovations relating to IS for competitive advantage are mundane. All information innovations have the potential of providing competitive advantages, and should be viewed as critically as major technological information systems changes. How do we take advantage of the “hi-low-no-tech” IS promised potential? Effective leaders start by formulating a technology strategy for advantage.

Developing A Technology Strategy

A strategy that allows organizations to achieve technology’s potential is developed by:

1. Identifying all information, processes, and interfaces in an organization’s value chain.
2. Identifying potential technologies in other industries and under scientific development.
3. Determining the likely path of change in key technologies.
4. Determining which potential technologies are most significant for competitive advantage.
5. Looking at the key information and processes and select for updating or replacement.
6. Assessing a firm’s capabilities in key technologies and the cost of making improvements.
7. Selecting a technology strategy that reinforces the firm’s overall competitive strategy.
8. Reinforcing individual business unit technology strategies to support corporate strategy.
9. Insuring that technology supports organizational strategies and fits capabilities.

10. Doing it, measuring it, adjusting it, and going back to step one!

Managers should follow these steps to formulate a technology strategy and to implement a consistent reward system. Poor leaders say they want one thing, but reward for another. Rewards must reflect commitment to innovativeness (Service and Boockholdt, 1998).

Getting the right people to identify the right problems is more important than determining the correct answers. Therefore, rewards must be geared toward identification and not necessarily toward solution. Supporting IS designed for strategic advantage must have the ability to capture, store, and retrieve volumes of information from customers and potential customers.

Likewise, any technology, from the large-scale ERPs to walkie-talkie systems, requires a strategic plan with **SMART** objectives (**S**pecific, **M**easurable, **A**ttainable, **R**elevant and **T**ime bounded) and proper rewards. Never forget human interface elements during implementation.

Implementing an IS or Other Technology Strategy

Gates (1999) said that how you gather, manage, and use information is the chief determinant of whether you win or lose. The information flow is the lifeblood of any business. The right information must reach the right people at the right time. He goes on to say that most organizations have the technology they need, but they don’t necessarily know how to use what they have. The only way to make money today is to solve customers’ problems.

Figure 1 outlines a development process that has been successful in creating systems or selecting other technologies for competitive advantage. It is a repetitive circular process: its steps are repeated when new information or technologies become available. It has been successful because it facilitates innovation and accommodates changes in the organization’s environment.

Managers can use this process to develop effective IS for competitive advantage or as criteria for

selecting other technologies: add value constituents.

IS Success Components

The above discussion includes suggestions for identifying and developing IS for competitive advantage. These suggestions, however, lead to the following questions: “How do managers identify ways of deploying IS in their organizations to achieve competitive advantage?” and “How do managers know that their IS/IT adequately serve this purpose?”

An organization must work to determine the success factors of its chief technology applications; and we provide an example of success components that apply to IS in particular—but they also apply to any other technology application usage. The IS success factors are shown in Figure 2 and are detailed in Service and Maddux (1999) and Service, Heames and Smith (2005) which describes organizational IQ.

These factors are useful guidelines for applying technology. Look at these principles closely, for they can give you guidelines for all management and leadership issues. Remember, if the questions themselves are wrong, the answers are simply irrelevant. Success comes when major problems are solved (effectiveness), price performance is improved (efficiency), and the users are satisfied (competitive advantage).

3. Define business strategy and process vision. Where you are; where you want to be: then strategy.
4. Understand the structure and flow of current process: helps locate the areas that need the most help.
5. Measure the performance of the current process: then you can know if you have improved things.
6. Design the new process. Start with what you want to accomplish and be very careful to design in the needed flexibility and ease of production.
7. Prototype the new process. Test before committing. Figure out a way to avoid bet your organization implementations—use evolutionary approaches.
8. Implement the process and associated systems.
9. Measure, report, adjust, refine, and continue to monitor.
10. Build commitment toward this type of solution by obtaining feedback from users and making adjustments. Listen to those that are most effected by the technology.

FIGURE 1
DEVELOPMENT PROCESS FOR
CREATING SUCCESSFUL TECHNOLOGIES

1. Select processes for re/design with promising payback, risk-reward ratios or CBA projections. The intangibles may be more important than the tangibles.
2. Identify enablers for new process design: people, equipment, processes-many things are enablers.

FIGURE 2
SUCCESS COMPONENTS FOR IS AND
OTHER TECHNOLOGIES

Aiming—Robustness Through Fundamentals

1. Complete Database
2. Continuous upgrading
3. Fast Innovation/New Products.
4. Linkage to all necessary product, services, customers, suppliers, etc.

Capturing—Market and Customer Focus

5. Service Added
6. New Pricing Structures and/or Low-Cost Provision
7. Speed/Timing or Being First
8. Keeping Info from Customers and Non-customers
9. Anticipating Future Needs and Maintaining Maximum Flexibility

Balancing—Provide More Functional Levels To Strategy

10. Making IS and/or IT [All Types of Technology] Support an Organizational Objective
11. Point to a Distinctive Competency
12. Know Your Business and Apply IS/IT [All Technology] to Business Needs
13. Redesign or Incremental Improvement

Measuring—Behavioral/Structural-Infrastructure/Focus

14. Benchmarking
15. Assess Risks
16. Assess Infrastructure
17. Assess Managerial Impact
18. Assess Organizational Structures Impact
19. Assess Managerial Focus

Designing and Integrating—Development Process

20. Quality and Design

21. Lock-in and Lock-out—for Customers and Value Chain
22. Integrate Products
23. Simple Solutions
24. Define Existing Processes
25. Maintenance of Special Features
26. Testing Ideas Before Committing (modified from Service and Maddox, 1999).

Why and How Leaders Keep Up with IS/IT Emerging Technologies

Most leaders are overwhelmed by all types and speed of emerging technologies and many by the day to day IS/IT their organizations use. These overwhelmed leaders are having difficulty researching, evaluating, choosing, developing, testing, installing, and monitoring technology use for daily business needs, let alone for competitive advantage. The effective leader will figure out a way to help aspiring managers better handle these technology capabilities and align them with other organizational functions that are much more comfortable to manage.

In order to realize these potentials, upper management can no longer think of computers, networks, and other technologies as “black boxes” and cell phones that can be managed only by techies for techies. All technologies, especially IS, must meet organizational needs. Additionally, any organizational technological component must play its part in realization of organizational purposes. Tech projects must align with global missions and objectives. Specific ways to measure the results and related rewards must be put into place. Realistic and relevant cost-effective approaches to information needs must be properly addressed.

Effective leaders should study technical aspects, but this should not divert them from the major purpose. Keep asking yourself three critical questions as you review technology trends:

1. How will this help in leading any technology function?
2. How will this help in strategic alignment of technology and the overall organization?
3. How can technology be used to sustain strategic competitive advantage?

To be a leader through technology, you must have an overriding goal to understand enough to lead technology functions as you would lead another, more familiar, function. You do not have to be able to *do* it all, but you do have to *understand* it all at a conceptual level. We have supplied a small amount of what you might need to be able to develop that conceptual thinking in technological areas, especially IS/IT.

Conclusions

A special problem exists as most research and descriptions of potential theories are completed by those of us in academia; and that problem is more common than one might think in most industries. For no matter the industry or field of study, we need those that give differing and even way out views. And, remember, that nothing is more potent in stifling innovation than a pure devil's advocate: a time and place for everything. When brainstorming the goals are to start by sharpening the focus, having few ground rules, stretching, getting physical and setting a pace with little structure. Never surrender and always embrace the mental game of thinking with in and outside the box (Kelley and Littman, 2006, and Williams and Ceci, 2007: p. B16).

We encourage the readers to remember that technology success is **not just** functionality, information, productivity, innovation, TQM, teams, globalization, computers, IS/IT, speed, connectivity, compatibility, the customer, the products, the services, hardware, or software . . . it is the leadership within the institution. Moreover, its purpose must be to realize a shared commitment on the part of the institution's members to satisfy the needs of others with: 1) continuous improvements, 2) meeting changing needs, and 3) systematic innovation that all allow the organi-

zation to develop a distinctive competency; understanding why someone would chose your over the competition.

We need technologies, computers, networks, and systems that do things, not challenge the users to figure out a way to do things. Technology complexities and frustrations are largely due to the attempt to cram far too many functions into a single box that sits on the desktop. To develop better technologies, leaders need to hire people with human-centered skills, who will find out what customers want and desire—avoid technology-centered and marketing-minded people as systems developers. This is the framework for technological leadership success. Everything else is window dressing. This is no different for managing anything: the rewards still drive the behavior. Ultimately, it will be up to the leader to find out how his/her organization can stay up on technology and take advantage of technological innovations.

We have just scratched the surface on innovation, technology, IS, and IT. And, leaders of the future have to have much technology knowledge. In today's complex global-technological world, where time, size, speed, quality, and functionality are rapidly changing, we continuously have to learn to lead new and different areas. There is a certain level of understanding required to manage or lead any function; an effective leader's knowledge is not stagnant.

Ultimately it comes down to a choice on how you spend the most valuable of your assets: that is your attention (Davenport and Beck, 2001). For "There is a choice you have to make in everything you do. So keep in mind that in the end, the choice you make, makes you (Wooden and Jamison, 2005: p. 13)."

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Learning and Administration in
Higher Education
(ICLAHE.org)**

All too often learning takes a back seat to discipline related research. The International Conference on Learning and Administration in Higher Education seeks to focus exclusively on all aspects of learning and administration in higher education. We wish to bring together, a wide variety of individuals from all countries and all disciplines, for the purpose of exchanging experiences, ideas, and research findings in the processes involved in learning and administration in the academic environment of higher education.

We encourage the submission of manuscripts, presentation outlines, and abstracts in either of the following areas:

Learning

We encourage the submission of manuscripts pertaining to pedagogical topics. We believe that much of the learning process is not discipline specific and that we can all benefit from looking at research and practices outside our own discipline. The ideal submission would take a general focus on learning rather than a discipline-specific perspective. For example, instead of focusing on "Motivating Students in Group Projects in Marketing Management", you might broaden the perspective to "Motivating Students in Group Projects in Upper Division Courses" or simply "Motivating Students in Group Projects" The objective here is to share your work with the larger audience.

Academic Administration

We encourage the submission of manuscripts pertaining to the administration of academic units in colleges and universities. We believe that many of the challenges facing academic departments are not discipline specific and that learning how different departments address these challenges will be beneficial. The ideal paper would provide information that many administrators would find useful, regardless of their own disciplines

Conferences

Prior to this year, Learning and Administration was a primary track of the annual Academic Business World International Conference. Because of increased interest, we have promoted Learning and Administration from a Track to Conference in its own right. For the full call for papers and more information go to <http://ICLAHE.org> and <http://ABWIC.org>

