Summary

Introduction/Background

The end of the twentieth century has witnessed a tremendous growth in computer use, PC penetration, installed servers, network connections, and the emergence of ecommerce as viable business format. Populations using the Web continue to explode, with critical mass now being reached in many regions. Total world-wide Web users amount to over 171 million (CommerceNet, 1999), with over 27 million in Asia alone. Chinese accessing the Web currently number over four million in Taiwan alone, with another four million coming online in Mainland China. This trend clearly signals a business opportunity, hereafter referred to as ecommerce, than cannot be ignored.

Firms created purely for the ecommerce boom, such as Amazon.com, have lead the way in demonstrating the market for online purchasing, but what started as a niche market is quickly developing into a mass market. A recent ABCNEWS.com poll showed that over 13 percent of Americans used the Web for Christmas purchases, with over 40 percent planning to use the Web for future purchases (Langer, 1999). A central question in this new marketing opportunity is the optimized competitive form for ecommerce.

While it is generally recognized that price will become a much more central competitive issue on the Web (Kotler, 1999), it is not at all clear what marketing strategies will assist a firm to succeed. A decline in marketing usefulness is seen by some (Schultz, 1998), as the Marketing Concept becomes completely implemented with each individual consumer at the center of the firm's network—directly communication with the firm. Peterson et al. (1997) have argued that there will actually be little impact from ecommerce beyond the transmission of communication between firm and customer. With accelerated change engulfing ecommerce (often referred to as dog years) understanding the impact of Web sales on the firm is of high importance.

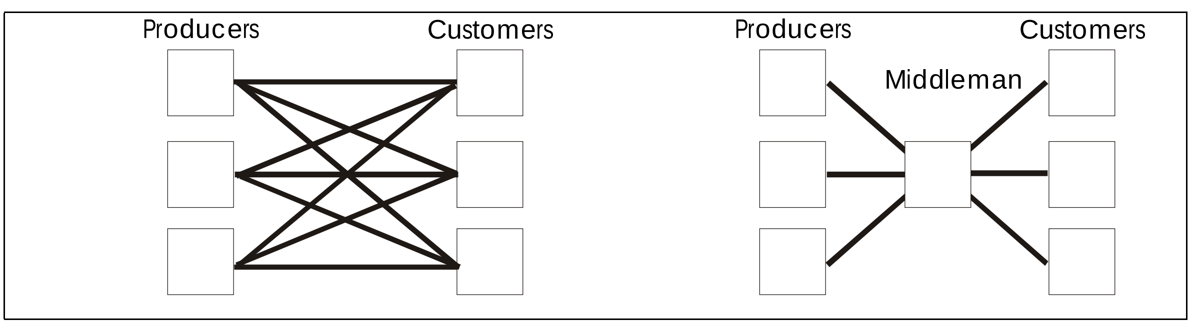
This research aims to understand the different channel structures possible in ecommerce settings, and how such structures coexist with traditional channels. Benjamin and Wigand have pointed out the benefits a firm may gain from changed to the channel structure through the enabling technologies of ecommerce.

Characteristics of Channels

Traditional channel structure, i.e. manufacturer→wholesaler→retailer has been overtaken in recent decades by new forms. Corporate channels are characterized by vertical integration and single ownership. Administered channels obtain vertical integration through the use of power on the behalf of one of the parties. Contractual channels obtain integration through the application of agreements, which are mutually beneficial, often in order to obtain access to larger markets, or economies of scale.

Distribution strategy has centered on the decision of how many middlemen are cost-effective for a firm. Balderston (1958) early on suggested the importance of calculating an equilibrium number of middlemen to serve a channel. The balance is required as direct contact with customers has traditionally been expensive. The cost reduction through the use of a middleman can clearly be seen in Figure 1. The number of middlemen is dependent on the cost advantage they have over the producer directly contacting customers. Traditionally, the efficiency of the middleman in the channel has been higher than the producer contacting customers independently.

Figure 1. Reduction in contacts due to middleman



In addition to cost considerations, the implementation of intermediaries in the channel structure has been influenced by social considerations, such as conflict, power and satisfaction (Gaski, 1984; Frazier, 1983; Anderson and Narus, 1984; Fader, 1986; Li, 1997).

Elimination of the middleman is favored if the costs are lower, however, the middleman role may be important in ways not measured in financial terms alone. Middlemen can have these advantages:

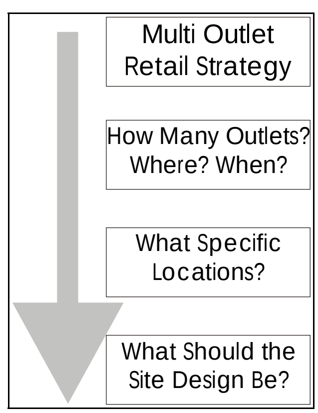
1) **Retailing expertise and local market knowledge**

2) **Can offer one-stop shopping convenience for the customer.**

These, and other, factors lead to many different channel decisions within the marketplace, even among similar firms with similar products (McGuire & Staelin, 1986).

Location selection is another major factor in channel decisions, including market selection, number of stores, location of stores, and store design. The steps involved are shown in Figure 2.

Figure 2. Steps in channel location decisions (addopted from Lilien et al, 1992)



This short review of channel decisions clearly shows that maximization is the goal. But just how to define what maximization is in the new ecommerce environment may prove very difficult.

Channel Modification in E-Commerce

TV Home Shopping

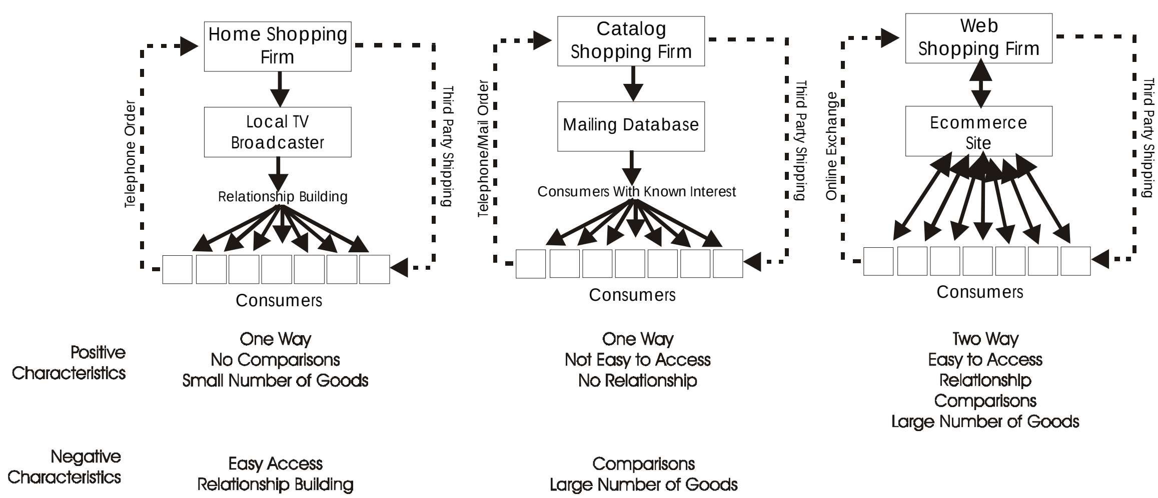
Changes brought on by the development of the Web as a marketing medium have been recognized only since the mid 1990s. Researchers have been attempting to find previous marketing trends that show similarities to the new ecommerce trend. Since TV marketing involves high technology gadgets and broadcast to individuals, it is a candidate. Direct marketers using TV avoid many channel nodes, but do so at a cost to the consumer—choice. TV-based home shopping, QVC style, depends on showing single products at a time, and not comparing products within the same category. Sales are often linked to the relationship the salespeople (hosts) have with the audience (Stephens et al, 1996). The audience for TV home shopping is limited by the restrictions on how many products can be displayed and especially by the fact that at any one time, all viewers must watch the same product presentation, although the broadcast can reach into all homes equipped with cable TV, thus allowing new viewers to easily enter. Thus, the absolute inflexible nature of the one-to-many structure makes it unsuitable as a model for what form sales on the Web might take. However, the success of TV shopping firms in selling physical goods, points to the feasibility of selling through an electronic medium (total sales top several billion US dollars).

Catalog Home Shopping

Catalog shopping is also a candidate for understanding the new ecommerce structure. Catalog sales in the US are made up of over 10,000 mail-order companies, with over US$50 billion in merchandise sales every year. Catalog shopping allows the consumer to view what he/she is interested in, so that comparisons can be made. In addition, a wide selection of goods can be offered. This home shopping method is still a one way technique, with the consumer having not interaction with the firm, or other consumers, beyond the phone call to make a purchase. Another problem with catalog shopping is that the receiver must first be sent a catalog, and then he/she must have the catalog on hand in order for shopping to occur. This means that the consumer must first be known to the firm, and the consumer must previously have an interest in the products offered. While some companies, like Lands' End, have attempted to create a relationship with their customers, by including short stories or opinion pieces in their catalogs, most shopping catalogs look as interesting as a train schedule.

These two popular, and financial successful home shopping channels, both have advantages that when combined, look very much like the current capability of Web home shopping (see Figure 3). Web-based shopping allows easy access, at anytime one logs onto the Internet, like TV shopping, while also having a pre-existing product involvement, since the Web user must him/herself navigate to the companies Web site (just as a catalog shopper must first receive a catalog). Large numbers of products are available and comparisons within and between categories are possible.

Figure 3. Comparison of home shopping channels



This combination of similarities has been sited as the basis for a significant competitive advantage when entering ecommerce. Alba et al. (1997). Firms which already have direct channels to customers, and reduced overhead, will be able to compete better in the electronic marketplace, as will firms that have already learned how to sell through virtual formats, such as TV.

Web Home Shopping

Growth of Web shopping can be viewed as an extension of demographic trends not only in the US, but throughout the industrialized world. Time constraints are probably the most central of trends (Schor, 1989) to impact modern working families, brought on by increased number of family member working, and the demands of child care in more nuclear families (in the US, often single parent families). In addition, while not often studied, there is a significant number of people who simply do not enjoy shopping (Cope, 1996). It is above all else, the convenience Web shopping offers that is appealing to consumers (Burke, 1998). The ability to enter *Web space* and experience *flow*, as Hoffman and Novak (199) label it, is the unique aspect of Web home shopping that has not existed previously. While Web shopping technology is often cited as not being advanced enough, Brody (1991) points out that people tend to underestimate the possibilities of advances in existing technology. Furash (1999) points out that the negative observations about Web shopping and its accompanying security questions is what reveals the true promise of this new exchange medium, i.e., even while things are still so bad, so many people are drawn to it!

Ecommerce Vs Bricks & Mortar

For an existing firm to build and maintain an ecommerce site requires an investment of money and time, as well as a long-term, fulltime commitment, since the constant updating of such a site is required to keep visitors interested. Not only are there entry costs, but the combination of existing channel structures with ecommerce capabilities may not lead to synergies and may even display high costs. Koehn et al. (1996) gives an example of a US based Web store that would accept electronic shopping orders, then transmit them to the relevant local store, such as a Wal-Mart or Cub Foods supermarket. The total retailer's expense for serving the Web customer was an additional US$13 over normal store customers. This has also been the experience of Pea Pod, the pioneer in combining a supermarket with Web orders, which has only experienced loses for their Web-based business.

Firms that begin life as virtual players, or at least have a channel structure approaching a virtual firm, the economics may be very different. Operational efficiencies can be gained by having centralized warehouses instead of local stores. Traditional channel decisions are not only changed, in many cases they are totally eliminated, which can result in savings in operating costs. Internet retailers can triple profits or cut prices by as much as 12 percent compared to non-virtual retailers (Cope, 1996). In addition, Internet retailers build minimum channels that do not require fixed purchases in bulk, or purchases that satisfy relationships, since they do not exits. This allows Internet retailers to dynamically adjust the marketing mix, even down to the level of individual customers (Phillips et al., 1997).

Channel Changes

Currently, many firms are hesitant to enter ecommerce under the impression that a bricks & mortar operation cannot compete effectively in the virtual marketplace. While some observers feel the new Web-based market is just another separate and distinct marketing channel (Rowsom, 1998), others feel it is nothing short of a paradigm change in marketing (Furash, 1999; Hamel, 1998). These extreme views do not assist business in making ecommerce decisions.

The movement towards ecommerce is undeniable, and irreversible. Firms that do not adapt will certainly suffer because while few predictions of the future can be agreed upon, one fact is certain—the marketplace of shoppers will not be increased by ecommerce (Shi and Salesky, 1994; Hagel and Eisenmann, 1994; Peterson et al., 1997). As the segment of Web shoppers increases, firms without effective Web sites will be overlooked (Graham, 1998). The central question is just what channel changes can be made by existing firms in order to compete effectively with pure ecommerce firms?

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Research Design

Model

We propose changes made in a firm to compete in the ecommerce marketplace take place along two distinct paths. A matrix is used to represent the requirements for change a firm must undertake when moving away from the traditional pure physical marketing and towards a more virtual marketing, represented by ecommerce. This research attempts to quantify the trends and describe their perimeters. The capability to describe how a firms channels undergo change during movement towards ecommerce can act as a guideline for Taiwan firms now on the edge of undertaking such change. More importantly, this model can be used to explore the central questions of how, or even if, to mix traditional channels with the radically reduced ecommerce channels, beyond uninformed guessing that presently dominates ecommerce decision making (Burke, 1997).

Model development can be used to test the following propositions

Proposition 1: Historical data shows an accelerating trend towards the *pure virtual* quadrant of the model.

Proposition 2: Firms can add virtual content to their products and services at much lower costs than changes in channel structure (the model's width is larger than its height)

Proposition 3: Firms with reduced channel structures (direct marketers) and physical goods are well positioned to enter ecommerce (hybrid physical).

Proposition 4: Firms with reduced channel structures (direct marketers) and virtual goods (pure virtual) will outperform firms lacking virtual goods and/or reduced channel structures.

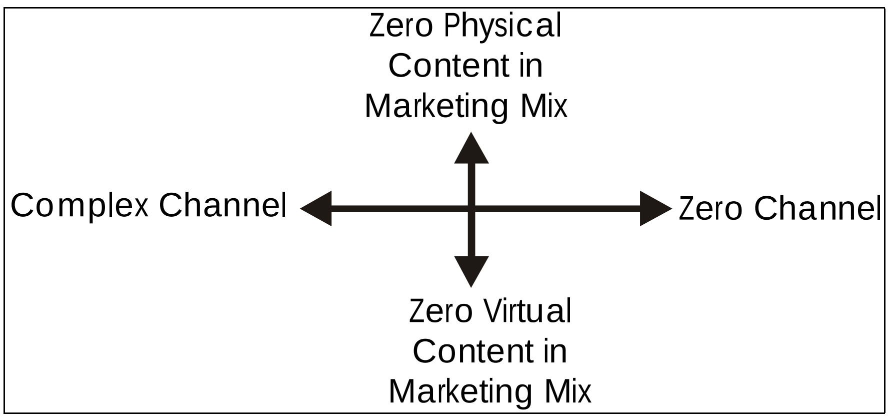
Proposition 5:Existing firms can compete effectively with pure ecommerce firms by moving to a hybrid virtual marketing strategy.

Proposition 6: Firms staying within the pure physical quadrant will display inferior performance when compared to firms in any of the other three quadrants.

Ecommerce Channel Model

The model axes proposed for this research can be seen in Figure 4, and is designed to be used at the firm level as well as at the product level. Channel pressure is the pressure to reduce channel complexity and overhead. Virtual content is the amount of the marketing mix that is virtual. At the very top of the virtual content axis are products such as software. At the extreme right hand of the model, products are never physically seen, existing in purely digital format and distributed to the consumer directly from the firm through electronic means.

Figure 4. Proposed model axes



Channel reduction is used in the model to represent the differential in profits due to channel expenses for the same product. For example, Barnes & Noble bookstore (a bricks a mortar retailer) may sell the same book as Amazon.com at a ten percent higher price. If both stores have approximately the same virtual content, then the difference in price, at least to some extent, is the result of channel costs of Barnes & Noble.

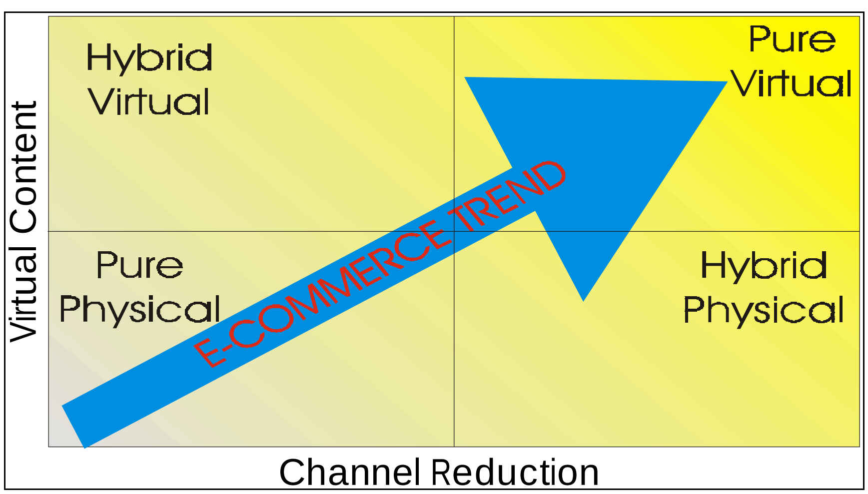
Virtual content is the amount of Web-based technology used in the marketing mix. While a product may itself be very suited to virtual treatment, such as software, that does not mean a firm executes a Web site well. In fact, one of the leading complaints of Web shoppers is the lack of easy to use Web sites and limited offerings once in a virtual store (Jarvenpaa and Todd, 1997). A completely physical product, such as an automobile, can obtain some level of virtual content along this

scale by, for example, having simulated driving experiences placed on a Web site (a common practice already). Ability to quickly compare the car's features to other cars, as well as offering information on financing, would increase this product's virtual content. Since it is unlikely such a Web site would be developed for just one product, this scale can be viewed as the firm's overall effort at brining virtual content to their offerings.

Model Quadrants

Our proposed model can be divided into four quadrants, each of which can be used to describe the competitive situation of a firm in relation to competitors. The pure physical quadrant is the traditional marketing zone. There may be increased virtual content and decreased channels, as in TV home shopping, however, crossing over the center lines signifies entry into ecommerce, specifically through use of the Internet.

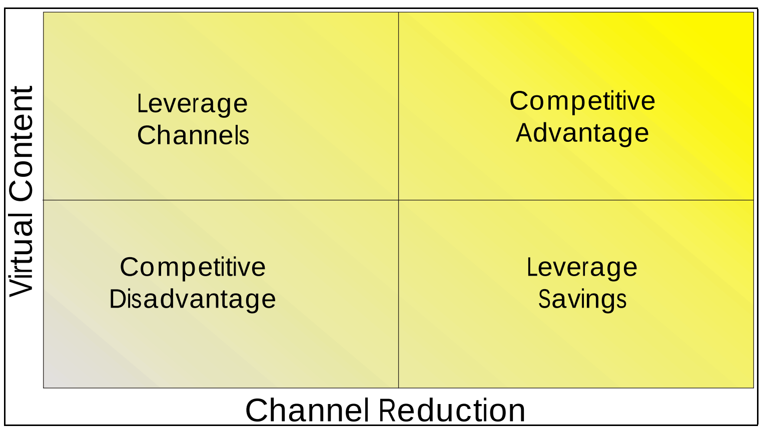
Figure 5. Proposed model quadrants



Our propositions state that a firm, relative to competitors, may gain advantage depending on its location in the matrix (see Figure 6). For example, since a book cannot obtain pure virtual status, it still must be physically delivered, there is no reason why Barnes & Noble cannot match the virtual content of Amazon.com for the same book (thus becoming a hybrid virtual firm). Barnes & Noble could

then take advantage of their channels to obtain an edge in supply, service, price, etc. Given that Barnes & Noble can purchase larger amounts of a given book, since it can be distributed out to the brick and mortar establishments, it is conceivable a price advantage could be gained. From this perspective, the brick and mortar side of the company could increase the firms competitive capabilities, thus neutralizing the advantage of the purely ecommerce firm. On the other hand, Amazon.com tends to have an advantage in its virtual content creation, as it can concentrate resources, without the distraction of physical stores (a hybrid physical firm). This would tend to give purely ecommerce firms a chance to neutralize advantages brick and mortar firms could develop when in the hybrid virtual quadrant.

Figure 6. Relative competitive status



Channel Changes

Once the model is sufficiently described and historical data used to refine it, exploratory methods will be applied to examine the differences between these two ecommerce strategies, i.e., hybrid virtual and hybrid physical. Since the model describes these two strategies as possibly balancing each other, it seems logical to assume that firms would continually push towards the pure virtual quadrant, in order to gain competitive advantage (see Figure 7, and Figure 8).

Figure 7. Hybrid physical strategy tends towards pure virtual

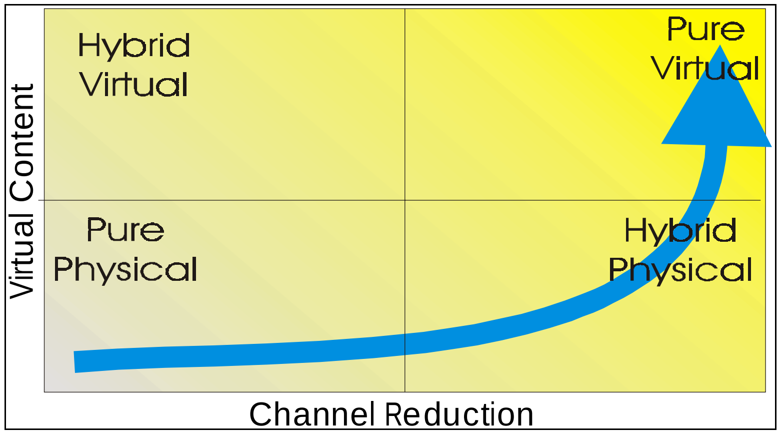
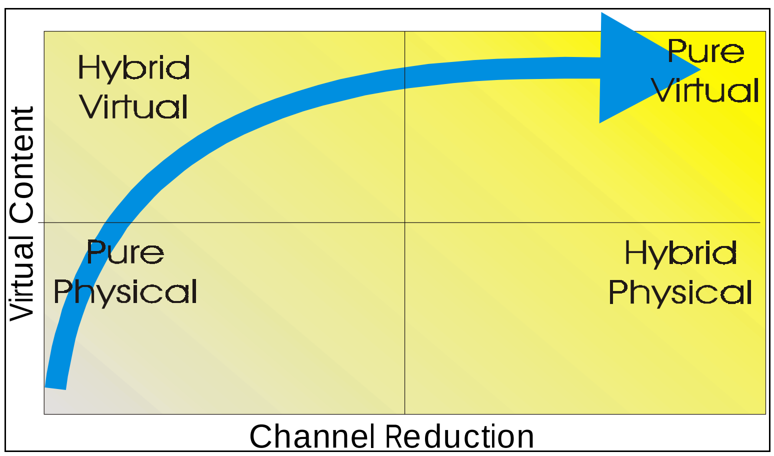
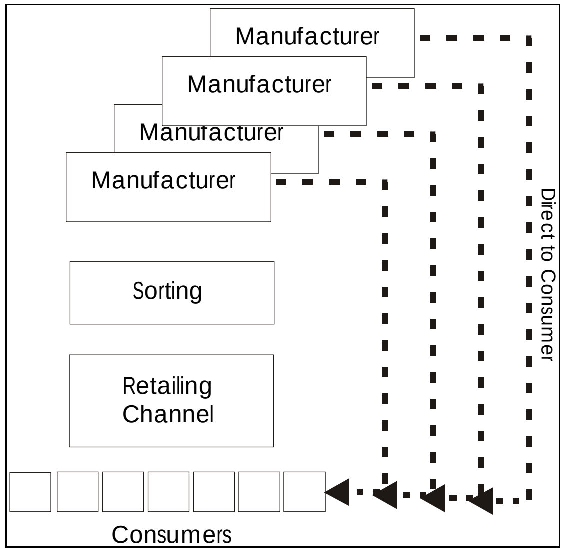


Figure 8. Hybrid virtual strategy tends towards pure virtual



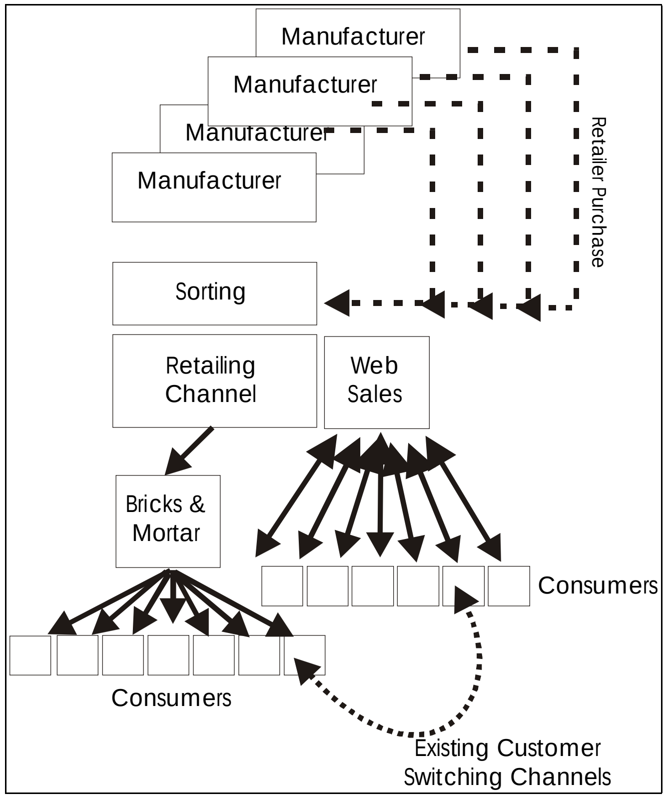
The efficiencies of a pure virtual firm are clear, but will consumers accept such firms (See Figure 9)? Loss of the sorting out activity and creation of sorts (Alderson, 1965) now performed by retailers may not prove so appealing to consumers.

Figure 9. Manufacturers distributing directly to consumers



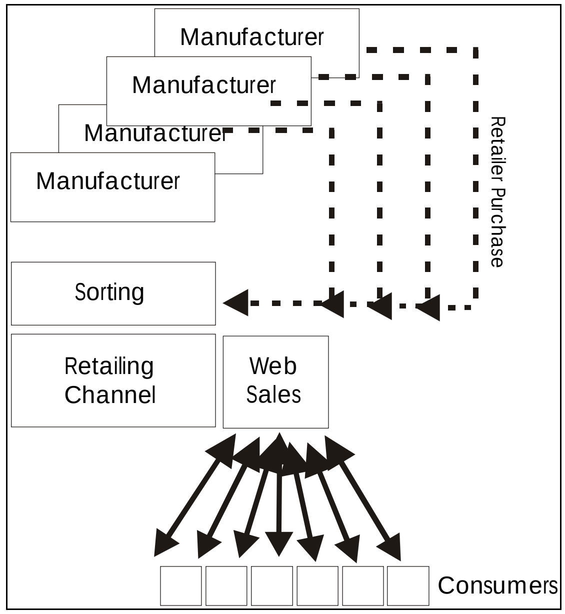
By modeling, we will be able to approach this question in steps that reveal the qualitative and quantitative benefits to consumers. Hybrid virtual strategies appear to be the best choice for existing firms to compete, but they run the risk of stealing away their own customers, as two distinct channels appear (see Figure 10). In addition, channel partners may react to another channel being opened up (Quelch and Takeuchi, 1981). Numerous firms in the US, such as P&G (Cleary, 1999), are now experimenting with this approach.

Figure 10. Hybrid virtual channel structure (may attract retailer's own customers)



Model development will also assist in understanding the functions served, such as the sorting out, of hybrid physical firms (see Figure 11). To date, there simply is no understanding, from a marketing perspective, of how these firms compete, or even what a competitive advantage is within the ecommerce context.

Figure 11. Hybrid physical channel structure (how important is the sorting function?)



Research Phases

This project will be undertaken in three main phases, each producing important results for the understanding of ecommerce.

Descriptive Phase

Development of the model parameters, including specification of measurements. Data will be collected from publicly available sources, including annual reports, tracking data, SEC filings, and other databases. Firms will be chosen that represent channel structures in each of the model's quadrants. Combining these two steps, data will then be fit to the model and discriminant analysis techniques applied. Adjustments will then be made to model measures and new data sets selected if needed. When the validity of the data and the model are satisfactory, the result will be the input for phase 2.

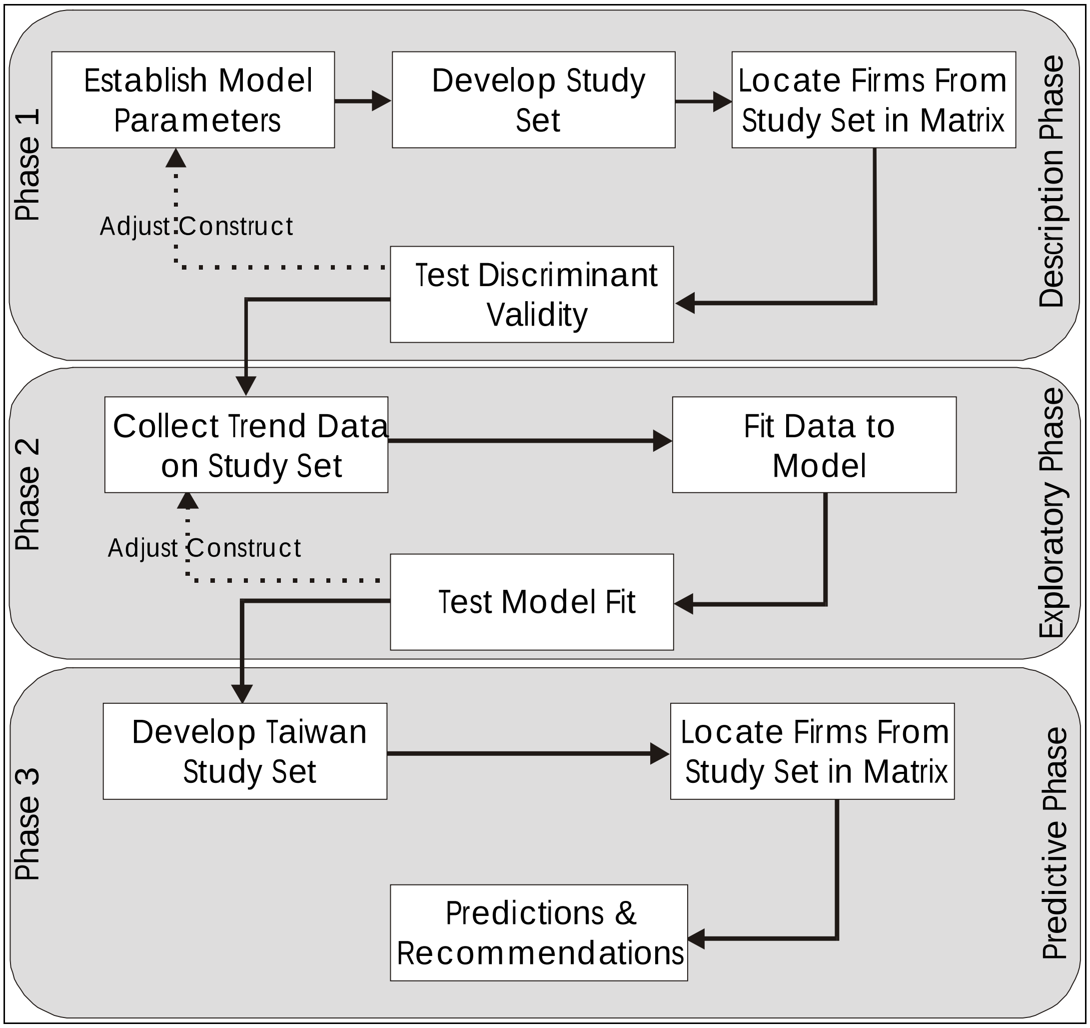
Exploratory Phase

The developed parameters and study set will then be used to explore changes over temporal measures. Again, model adjustment can be undertaken to better fit the model with the data. Specifically, the movement towards the pure virtual quadrant will be tested for, applying data from US public firms.

Predictive Phase

Results from Phase two can then be used as guidelines of what firms do over time in relation to ecommerce and changes in channels. Such a model will allow us to take data from an existing firm in Taiwan, and predict the most beneficial changes in virtual content and channel structure, in order to gain competitive advantage.

Figure 12. Phases of study



Expected Results

Predictions will help to inform Taiwan firms how to approach ecommerce when already established in the bricks and mortar marketplace, as well as allowing understanding of the advantages of beginning a firm from the ecommerce sphere, with no physical presence. The extreme case of direct selling to consumers with no physical presence may have a role to play in Taiwan's developing technology sector. At the other extreme, Traditional firms may benefit from understanding what the future holds if they stay in the pure physical quadrant. Most importantly, will be

the capability to model how to balance both physical and virtual assets in order to stay competitive in the market place of the twenty-first century.

Applications: / Results:	Capability to measure trends in marketing related to ecommerce	Understanding firm's competitive position in ecommerce setting	Guidelines for strategic decisions concerning physical/virtual mix	Basis for further e-commerce research
Measurement of trends (Phase 1)	✓			✓
Construction of Model (Phase 2)	✓			
Descriptive power of e-commerce channel model (Phase 3)	✓	✓	✓	✓
Predictive power of e-commerce channel model (Phase 3)	✓	✓	✓	✓