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Investment in Electronic Commerce
– Financial Perspectives and Profit Conditions

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Abstract: Electronic Commerce ("eCommerce") is a concept for trade based upon products and services that are being marketed, contracted, and paid for over the Internet. Consequently, electronic commerce demands for the investment in computer systems, marketing, logistics and payments.

This paper will focus on the profitability of investments in eCommerce with a special focus on outlays for information technology systems and sales management. If the services are made more standardized, if they do not change that often, or if they are well known to the customers so that there is little need for supplementary information, then the less costly will the information technology system become. The investment in marketing depends on how well known the brand name is to the customer. eCommerce firms "Born on the Net" have to spend substantially more resources on marketing than firms that "Move to the Net".

These investments may be seen as parts of a process, which aims to generate larger revenues to the firm, better services to the customers, a more efficient logistic system, and lower payment costs. These costs and benefits are analysed and used in order to develop principles for investment evaluations. Finally, the analysis is applied to five case studies from the sectors of capital goods, financial services, food, ornamental horticulture, and books and stationeries, where the given background from practice and conditions for success are developed in terms of a customer-base, margins, and sales growth.

Keywords: Electronic commerce, investment sequencing, cornerstones of profitability, customer base, customer retention, case studies

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1. Background and Purpose

Electronic Commerce is an activity that makes use of a computer network (the Internet) in order a) to exchange information about products and services including price offers, and b) to buy and sell products, services, and information online. It stands for a radical structural change concerning computer systems, marketing principles and logistics. Objectives have been "to develop low-cost customer-prospecting methods, establish close relationships with customers, and develop customer loyalty" (Kalakota & Whinston 1996, p. 9). The main profitability of eCommerce is supposed to come from transactions business-to-business (B2B). In the case of business-to-consumer (B2C) only a limited number of cases seem to have become a success. For an overview sector by sector see e.g. OECD (1999, pp. 34-41).

Until today substantial resources have been invested in eCommerce. They have been directed towards two main tasks:

1. To develop an *information technology system* (a Web system) to be connected to the Internet. Such a system should let the potential customer obtain accurate information on product availability, product quality, service conditions, and payment facilities in order to execute a purchase.
2. To establish and to maintain a *customer-base* (a register over earlier customers, present customers, and potential customers in combination with detailed sales records). Such a customer-base may be obtained by advertising in medias such as the Web, newspapers, television, telemarketing, etc. It may be maintained in terms of running a "Customer Club", in which a customer obtains benefits from repeated purchases.

An investment in eCommerce may be compared to an investment in research and development, in patents, and in new technologies. Such an investment has the following characteristics:

- The expected stream of net profits has a substantial degree of uncertainty. Certain customers may not be well-trained in using the Internet and they may consider on-line payment systems as being risky.
- It is essential to find an optimal date of investment. A delay in investment gives an opportunity to obtain a more developed information technology system as well as more information about market conditions. "Nothing can compensate for the disaster of a massive launch when a site isn't working" (Varianini & Vaturi 2000, p.90). On the other hand, a delay may result in a loss of cash flows to competitors.

The uncertainty about market conditions will result in a need for special financial programs including guarantees, risk-sharing systems, and the supply of venture capital.

The purpose of this paper is to develop *conditions for profitable investments in eCommerce*. These investments are treated as activities that initially spend fixed outlays on information technology and marketing in order to obtain a time series of net benefits to the firm and to its customers. The paper starts (in Section 2) with the investment in eCommerce seen as a process. The paper will then analyse the costs (Section 3) and the benefits (Section 4) of investment and operation of eCommerce. Section 5 is devoted to principles for investment evaluation. Those analytical principles are then used as a background for five case studies, each of them representing one specific economic sector (Sections 6-10). The experiences from these case studies will form a basis for an analysis of the conditions for profitability (Section 11). Finally, conclusions are drawn (Section 12).

2. Principles of Investment Evaluation

Until today there have been a number of studies concerning the advantages of eCommerce based upon special theories like transaction costs, marketing, diffusion, and networking (see e.g. Wigand, 1997, Österle et al. 2000, pp.107-9, 130-2). However, there have been very few studies on the conditions under which an investment in eCommerce is profitable (see e.g. Farbey, Land, & Targett 1992, Giaglis et. al 1999, Sarker & Syed 2000). There is evidently a need to develop principles for investment in eCommerce with a special emphasis on profitability analysis and financial considerations.

There are many reasons for a firm to *invest in online distribution*, i.e. to inform, to sell, and to charge its customers over the net[2]. In this way the firm will *serve an existing customer-base* by providing them with an alternative that is more comfortable and less time consuming. One reason is to reduce operating cost for sales, for distribution, for holding inventory, and for ordering and payment. Let us call these effects for *"cost savings from online operations"*. Another reason is to extend the customer-base in order to sell more in order to increase revenues. In this way online distribution becomes a means to grow by attracting new customer groups, e.g. young people starting their careers. We will identify these effects as *"net revenues from sales expansion"*.

The efficient sequencing of investment outlay in combination with cost savings and net revenues will be called *three cornerstones* of eCommerce profitability (see Figure 1 below).

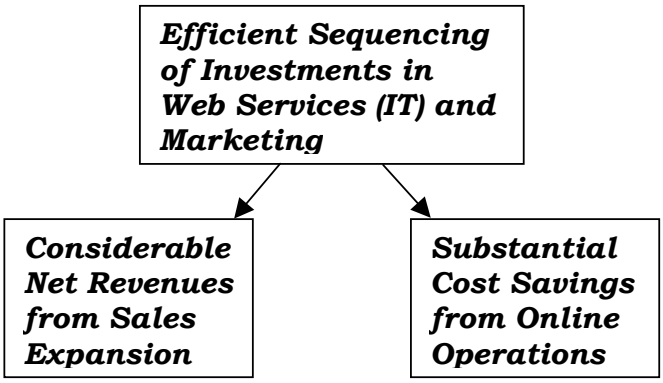

Figure 1. Three Cornerstones for Profitable Investments in eCommerce

The investment sequencing is important as investments in eCommerce may be seen as a process in at least two stages (see Figure 2 below):

1. Investment in Information Technology (computer facilities and related software) in order to set up a web site from which to serve existing customers online instead of offline. The cost of such a system will increase as a function of
    a. the number of potential customers,
    b. the amount of information what concerns the products and the associated services and maintenance,
    c. the need for customer interaction (online or on phone) what concerns product specification and design,

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[2] Elliot & Briers (2001) have performed an interesting overview of the "drivers" companies have for demanding financial services online. Companies find that these services will reduce transaction costs because being "better captured electronically than on paper". They also find that "as in every other industry being revolutionised by e-commerce, customer retention, up-sell and cross-sell represent the real business battleground for the future". Finally they stress that "mature products and services that can be standardised and commoditised will be first affected by e-business".

d. the need for regular changes in products and service.
e. The desired configuration of the system for web-service has often been rather unspecified at the time of investment. In some of these cases it was found that the investment was made too early. New information on technical equipment and customer preferences has resulted in that substantial and costly modifications had to be made at a later date. On the other hand, there are other cases where the investments were postponed too long in order to obtain better and better information, so that competitors had taken over the market place. Consequently, the *right timing* is a substantial issue for this kind of investments.

2. Investment in Marketing Activities (branding, advertising campaigns, etc.) in order to expand the customer-base. Sometimes this second stage includes an investment in a new logistic system (Stage 2b), in order to adjust the firm to a growing demand. The investment in marketing covers two consecutive themes, namely activities (mainly advertisements) to *reach* a sufficient amount of customers over the Internet, and to establish a system to *sell* products and services to these customers. Consequently, the amount to invest depends on:
   a. *The initial amount of customers available.*
   b. *The desired information about products and services.*
   c. The volume of products or services to be delivered

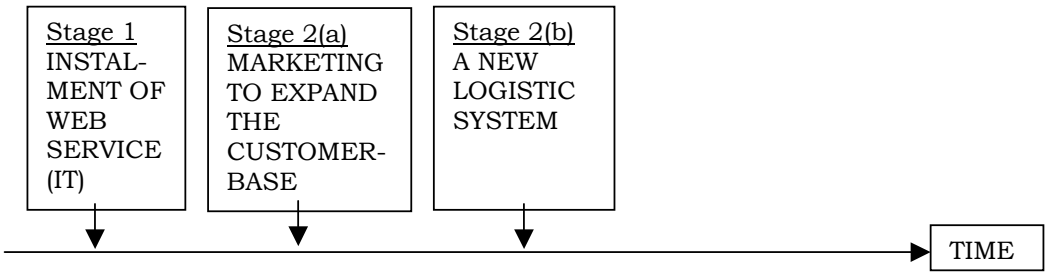

Figure 2. Stages of Investments in eCommerce

Consequently, the *initial outlays* concern two separate types of activities – instalments of a system for *web-services* and actions for *marketing* with an emphasis on advertising and customer service. These initial outlays will then have to be covered by a series of *operating surpluses either from the growth in net revenues or from cost savings*.

The *scale* and *time phasing* of these cornerstones has a crucial role for the profitability of investment in eCommerce. Each cornerstone may contribute to the profitability in the following ways:

- Low Investment Outlays. The availability of an existing computer system for customer management implies that investments in web services may be kept low. An example may be taken from the financial sector, where organizations such as banks and insurance firms already operate computer systems for assets and liabilities with customers ("ledger systems"). In such cases online services will only be met through an investment in a "front system", from where customers themselves will be able to perform operations such as transfers between accounts or to give sales or purchase orders with regard to stocks and bonds.

- Low investment outlays may also cover firms that already operate rather large customer-bases. Examples are mail order firms or grocery chains. They have no need for expensive sales promotion activities, but they may perform those activities directly by e-mail or by similar information channels. However, there are cases where low outlays for investments in information technology and marketing may be ruled out by high investment costs for

delivery systems (the "logistics"). The cost of capital for investment purposes will depend on the existing financial records for the company. A company born on the net is assumed to generate larger capital costs than one with a long-term record from classical retailing.

- Substantial Cost Savings. This case covers most of the business-to-business (B2B) transactions and especially firms with stable delivery systems, i.e. consider a manufacturing firm that produces ball bearings, drills, etc., in order to supply other industries. These types of interaction between two business firms are usually organized over regular processes on the basis of longer term delivery contracts. By tradition, replacements were made by phone. But eCommerce e-mail or the Internet will take over these operations, and this in turn will lead to substantial cost savings.

- Considerable Net Revenues. This category covers firms, which have set up web sites offering customer services which up to then were not available online. Consequently, these kinds of new services may be associated with a considerable willingness to pay. Consumer products and services that generate substantial customer benefits may belong to this category. Focus may be set on services, which will generate large volumes and reduce travelling and queuing for the customers[3]. Good examples are found in online ticketing, online hotel booking, etc. Here, the customer gets a much better knowledge of available services which they may order at low costs.

3. Costs of Investment and Cost Savings from Operation

Above eCommerce has been seen as an activity that makes use of a computer network (the Internet) to achieve, transform, market, sell, deliver and pay for products and services. Such activities will imply fixed as well as variable costs for marketing and sales, for logistic management, and for payment and finance ("cash management"). Let us treat them in this order.

1. Development Costs: For a company the investment in an infrastructure for eCommerce management will comprise of Web server functions for information retrieval, data and transaction management, and secure messaging. They are usually set up in terms of presentation, logic, and database. The more stable and standardized the products, the services, and the processes are the lower this category of investment costs will become. This implies that these development costs will depend on*:*
   - the number of customers to be served *(size)*
   - the need for frequent changes *(flexibility)*
   - the demand for customer interactions *(prepurchase interactions)*
   - the demand for product maintenance *(postpurchase interactions)*

   There is a set of cases available in which these investment costs have become extremely high. Cunningham (2000, p.30) has presented an example where these development costs reached something in the order of $100 million.

2. Sales Cost: Many firms "born online" initially spend substantial fixed resources on branding and customer acquisition[4]. For example, banner ads may cost up to $100 per thousand impressions (Whinston et al 1997, pp. 42, 248, Korper & Ellis 2000, p.53). A

[3] See for example Calkins et al. (2000, pp. 140-147) for an analysis of the need for scale in eCommerce.

[4] For example, in 1998 Gap spent approximately $3 m on gap.com advertisements on the Web (CEBC, Feb. 2000:B, p.5). On the other hand, Gap used its retail stores to market its online activities. "The Web site is promoted at every cash register and, recently, with the slogan "surf.shop.ship". Gap also offered 10% off and free shipping for the first online purchase just in order to form a data base of e-mail addresses. That promotion doubled its online customer-base (Business Week, October 18, 1999).

crucial issue is if these fixed outlays are viable from an economic point of view[5]. In comparison, firms that "move to the Net" use fixed outlays for advertising to a lesser extent, and just in order to expand an existing customer-base (see Carpenter 2000[6] & Dayal et al. 2000). The expectation is that the variable costs for online sales should be considerably smaller than those for sales offline. Such a reduction in variable costs should concern sales provisions, costs for contracting, and so-called menu costs for a regular updating of products and price lists (see Levy et al. 1997).

3. Costs of Operation: Online services are assumed to improve the customer information concerning products available, their quality, price, and delivery conditions. Firms "Born on the Net" have mostly to set up and operate a completely new logistic system associated with substantial operating costs. On the other hand, many firms that move to the Net have the cost advantage of making use of delivery systems established for offline services. A good example is given in terms of the computer firm Dell, which has succeeded "to decrease the direct costs of configuration, ordering, tracking and support for its transactional business by about 15%" (CEBC, Nov 2000, p. 13).

   There is a set of products and services for which the logistic costs are minor and especially suitable for online services. For example, consider sending money transfers online instead of sending checks offline or sending confirmed bookings online instead of printed tickets offline. (The latter case will be relevant for air tickets, railway tickets, hotel bookings, money orders, theatre tickets, insurance policies, etc[7]).

4. Costs of Payment and Finance: The payment activity will induce costs for a safe transfer of money and for credit risks. The cost for a safe transfer of payment is based upon the need for a buyer to send an electronic payment (electronic cash or digital cash) together with remittance information. The seller then has to authenticate the payment and the remittance information and accept them as valid. On-line payments will make it possible to obtain a reduction in float, in non-payments, in processing errors, in paper processing, and in postage (see e.g. Ouren et al. 1998, p.99). The credit risks include the extra costs for a delay or a loss of payment as well as a higher risk premium for the financial costs, i.e. a higher discount rate than usual.

Summing up, investments in eCommerce may concern initial investment outlays for a web service, for a customer-base, and for advertising. Well-organized, these investment outlays may be compensated for in terms of additional sales revenues combined with a reduction in sales costs, in costs of operation, and in costs for payment and finance[8]. On the other hand *it seems easy to find examples where a rush to the Internet without rigorous planning has resulted in costs getting out of control.*

[5] Morgan Stanley (see Meeker 1997, p. 3-7) estimates that one site of Internet is sufficient to reach a market of 10 million customers. If that has to be done over classical distribution systems it would require 500-600 branches. Then they find it reasonable to assume that an investment cost of $1 million per Internet site corresponds to an investment cost of $1.5-2.0 million for a branch site. Consequently, retailing over branches will become 900 times more expensive than the corresponding one over Internet.

[6] Carpenter (2000, pp. 17, 78, 155) gives examples from iVillage, CDNOW, and Yahoo of the financial consequences of branding.

[7] For examples of savings in the banking area, see Clemons & Hitt (2000) and Schutze (1997).

[8] For example, Meeker (1997, pp. 3-15) makes an interesting comparison between the expansion of mail orders in the 80´s and the one of eCommerce today.

4. Benefits

4.1 Customer Benefits and Online Demand

Let us first consider a firm that already has established, and has access to, a *customer-base* in terms of customers served through ordinary market channels ("off-line"). Those customers may be either business firms or private households. A critical issue for a profitable investment in eCommerce is how large a part of that customer-base is willing to switch from off-line to on-line purchases. That fraction may vary between different products and services and between different markets. For example, consider the 13 million people being members of the US Army and Air Force Exchanges (AAFES). They represent an extremely large customer-base out of which a substantial part seems willing to be served "on-line" over the Internet (see Shibo & Gordon 2000, pp. 22-23).

Firms or private persons, who form the customer-base of a company, may find different reasons for demanding products or services over the Internet (see e.g. Booth 1999, Konkurrensverket 2001):

a. *Reduction in time and cost to obtain product information or to make price comparisons*[9].
b. *Reduction in price caused by a reduction in margins.*
c. *Reduction in time and cost to obtain a product delivery*[10].
d. *Reduction in time to forward views and complaints on quality of products and services*[11].

Consequently, there are in many sectors substantial customer benefits from switching to the Internet.

4.2 Increased Revenues

Some firms establish online services with the focus on attracting new customers, and consequently, to generate new revenues. In fact, the rate of growth in sales generated by online services is a crucial factor in obtaining profitability in investments aimed at establishing eCommerce activities. However, there are cases where substantial revenues online will be associated with equally large reductions in revenues offline. Such an overflow of sales from existing and profit-generating market channels offline to the Internet is called a "cannibalisation". Consequently, one has to look for the net revenues in terms of the difference between the revenues from what is sold online and the reduction in profits offline. That difference will constitute the Net Revenues for the actual firm.

[Net Revenues] = [Sales Revenues Online] – [Reduced Profits Offline]

However, there are many cases where the establishment of online channels will generate positive effects on their offline operations. Certain offline retailers may even sell more if their customers are exposed to online sales as well. For example, the set up of a site called gap.com resulted in an example of rapid growth online without a correspondent contraction offline. It has been estimated that gap.com sales grew from $20 million 1998 to $80-100 million in 1999 without any observable cannibalization. "50% of consumers who bought from the same company online and in stores spent more than when they shopped only at stores" (CEBC Febr. 2000:B, p. 3).

An even larger growth of net revenues has been demonstrated by Dell, where sales expanded from $3.5 billion in 1994 to $25 billion in 1999. Even if the use of offline retail channels contributed to growth, "Dell was not making any money out of these sales" (CEBC, Nov. 2000, pp. 3-4)[12].

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[9] The Baby Center is an interesting example on the use of a web site for information. In 1999 it was seen in USA to be " the largest information source for expectant and new parents". It was said to have 15 million page views, 560,000 unique users, and 180,000 registered users (CEBC, Feb. 2000:A).

[10] There have been efforts to identify typical categories of online grocery shoppers (see e.g. CEBC, March 2001, p. 2). For example, they are "shopping avoiders" (those who dislike shopping), "necessity users" (who have limited ability to go to stores), and "time starved" (those who need more free time).

[11] For example, customers with gap.com may return products that do no fit to any Gap store (offline).

[12] "Many of Dell´s employees feared that moving to the Internet would automate away their jobs. However, this was not the case. To the contrary, they would mostly benefit from having most of the routine time consuming jobs being carried out online" (CEBS, Nov. 2000, p. 13).

In the next five sections we will analyze *the three cornerstones* for profitability of investments in eCommerce seen from firms representing five different business sectors – capital goods, financial services, the food industry, ornamental horticulture, and books and stationeries. These sectors are chosen in order to represent those with low incremental costs for investments in information technology (financial services), low costs for investment in a customer-base (grocery chains in the food industry), substantial savings in operating costs (business to business such as for the distribution of stationeries), considerable net margins (capital goods), as well as customer benefits and retention from online distribution (books, financial services, flowers, and food).

5. Capital Goods – AB BlueMarx

BlueMarx is a company serving private customers with capital goods. It has a low cost profile combined with an aggressive expansion. Its objective is to focus on such eCommerce, that aggregates customers and also stays close to them. It offers its customers a low-cost "co-shopping" without being members of any cooperative. Its focus is on well-informed and knowledgeable customers, who know the qualities that may be demanded with regard to expensive capital goods. An emphasis is given to products including cars, boating equipment, telecom equipment, computers, photo equipment, sport equipment, and household goods, in terms of eCommerce,

BlueMarx belongs to a group of "New Organizations Born on the Net". In fact, it started in April 30, 1999 as WeBuy and changed its name to BlueMarx on February 1, 2000. At that time it showed sales revenues around 75.000 SEK per week. Nine months later it delivered a set of high quality technical products including automobiles, computers, cameras to about 500-550 customers per week generating a sales volume of SEK 3-3.5 million per week[13]. This implied an average purchasing volume per week and per customer on SEK 3.25 million/525 = SEK 6180. Assume that this average volume per customer has been stable. If so, there should have been approximately 75.000/6.180 ≅ 12 customers the first week.

Capital goods are goods with a long life. Most customers may not regularly repeat such a purchase. Consequently, a crucial issue for this company is to achieve and to retain active customers.

Cornerstone 1 - Investment Sequencing:
The investment costs in marketing became very large in comparison with those for web services. The main part of them was scheduled to come very early before the net revenues could be estimated. Based upon information provided in annual reports they may be estimated as follows:

1. *fixed costs* from an investment in information technology (web-service) SEK 3.0 million
2. *fixed costs* from an investment in marketing campaigns: SEK 20.0 million

The challenge for BlueMarx is to recover these outlays quickly.

Cornerstone 2 - Net Revenues
Based upon the BlueMarx annual report, we may also estimate the total annual variable costs (including sales, supply, inventory, distribution and payment – the "logistics") to SEK 14.9 million. That implies approximately SEK 696 per customer. The order margin (*m*) lies between 6%-35% per order. If we assume an average order margin on 20% on an average order on SEK 6180, the net revenues will become SEK 0.2*6180 - SEK 696 = SEK 540 per customer.

Cornerstone 3 - Cost Savings
As BlueMarx was "born on the Net" it started without any offline operation. Consequently, it could not account for any cost savings.

[13] Such a growth is not extraordinary for an eCommerce firm. Amazon.com´s annual sales grew from $511´000 in 1995 to $1.6 billion in 1999. During the same period Yahoo´s sales grow from $1.6 million to $588 million (CPA 2001, p.14).

Conclusion: BlueMarx is a company that was born on the net. A set of investors took the opportunity to invest step by step in its computer systems and sales programs. As BlueMarx did not initially own any customer-base, it became a challenge to design an advertising program that could generate a growth in sales rapid enough to pay back the investment outlays. In total, BlueMarx has made a series of substantial investments in marketing in order to switch enough customers from offline to online and retaining them online. However, *there is a need for a quick and substantial growth in the sales rate in order to generate such a high stream of net revenues that is necessary to outweigh the extremely high costs of marketing.*

6. Financial Services – Goodguy AB

Financial services seem well suited for application of eCommerce services as there is little need for any physical deliveries. One may expect a large demand for online services like investments in bonds and stocks. The customers may save substantial amounts of time and money to perform these investments over the Internet instead of over-the-counter. Consequently, over the last five years one has observed a very strong transfer of customers from offline to online services. For example, the Nordea Bank reports that at the end of year 2000 more than 2.1 million Nordea customers were using Internet banking services. In Sweden alone, the number of Internet customers with Nordea grew from 345,000 in December 1999 to 732,000 in December 2000. At the same time, the number of log-ins almost doubled. Furthermore, the Internet has became a suitable instrument for insurance management, and Nordea demonstrates an increase of 50% in the number of claims reported over the Internet (see Nordea 2000, pp. 24-25). Similar tendencies were found for other Swedish banks like FöreningsSparbanken and SEB.

Goodguy AB was set up to become an intermediary organization working with services such as non-life insurance, electricity and telephone. Its comparative advantage has been to serve its customers with an information system containing low cost offers and to assist them in constructing attractive service packages. It has operated a member register of 65000 customers, that was used as a basis for a cross-selling of financial services. Consequently, one would expect that Goodguy demonstrated a growth rate for online services similar to those of the banks. Unfortunately, Goodguy had difficulties in attracting and retaining customers, and its business activities were closed down in the middle of the year 2001.

Cornerstone 1 - Investment Sequencing
Goodguy invested in an advanced system for web services in 1999. This system was formed in such a way that a potential customer could present his or her characteristics in terms of age, location, work, housing, car etc., online. Then the system presented a set of offers concerning competitive financial services to the customer. The cost of such a system may be estimated to about SEK 2 million. Furthermore, Goodguy owned no customer register, nor could it obtain such a register from the supplying firms. Consequently, the firm had initially to spend substantial investment funds on the marketing of its trademark. Based upon the annual report from Goodguy, those investment outlays may be estimated to approximately SEK 3 million.

Cornerstone 2 - Net Revenues
Goodguy operated on a commission basis for other companies. The customers paid the supplier directly. When the supplier received payment. Goodguy got 10% in commission for insurance products and a flat fee for telephone and electricity services. Assume that Goodguy could sell 10000 contracts per year with a value of SEK 1000 each. Then the total annual income from commissions would have become SEK 1000 * 10% * 10000 = SEK 1 million. To obtain net revenues, subtract its operational costs limited mainly to salaries for its 6 employees and to operating its computer network.

Cornerstone 3 - Cost Savings
Goodguy like BlueMarx was "born on the Net" and started without any offline operation. Therefore no account for cost savings could be made.

Conclusion: Goodguy has been a company that - like BlueMarx - was born on the Net. Consequently, opposite to the banks which operate in the financial sector, it had no customer-base to begin with. Therefore, it had to spend substantial resources both on investments in computer systems and in customer acquisitions. As it operated on a commission basis for other companies, its way to profitability was based upon low costs and a high service quality. A crucial issue was to retain its customers online and to cross-sell several services to each of them. This was critical as Goodguy did work as a commissionaire for producers such as banks and insurance firms. For such a company, there is always a latent risk that many customers may feel attracted to use its services once but then consequently to acquire these services directly from the producers. *If GoodGuy would have been associated with a bank it could have had access to its computer systems and customer-base. In that case the net revenues may have been enough to cover the relatively low investment costs of a new front system.*

7. Food Industry – ICA Ahold

ICA Ahold is a chain of 4600 grocery stores mainly located in Norway and Sweden. Today, ICA Ahold operates a limited eCommerce activity in the Stockholm area called "*ICA direkt*". A customer may order about 4000 different products online, which may be delivered either from a special e-store located in a place called Rosersberg or from certain ICA stores connected to *ICA direkt*. *ICA direkt* serves customers in cities like Märsta, Sollentuna, Stockholm, and Uppsala. The system design implies that ICA will follow a "Pick-to-Location" strategy similar to those implemented by Peapod, Wal-Mart, and Webvan (see Kinsey 2000, Deutsch & Bunker 2001, CEBC March, 2001).

When a customer is accepted by *ICA direkt*, it will be provided with an ICA Customer Card (which may be used as a bank card as well). That customer may perform online orders 24 hours a day. The orders will be delivered during a number of pre-specified time windows dependent on where the customer is located. A fee of SEK 100-150 will be charged for each delivery. Payment may be made in cash, by a credit or by a debit card or by an ICA Customer Card ("ICA Kundkort").

Cornerstone 1 - Investment Sequencing
ICA Ahold has invested about SEK 1.5 million in equipment for web services. In addition ICA Ahold has spent a certain amount on direct marketing to families with a double income and located in the area of distribution.

Cornerstone 2 - Net Revenues
An average purchase comes up to SEK 1300. If the 3500 customers will place an order in average two times per month, the income generated will become approximately SEK 120 mill.

Cornerstone 3 - Cost Savings
ICA direct is not set up with the main objective to save costs.

Today, Ica Ahold serves about 3500 online customers. The number of people employed is limited to about five sales persons and five persons operating the logistics of the e-store in Rosersberg. However, it plans to grow in size and location and has worked out an extensive plan for serving high-density populated areas like Stockholm and Göteborg.

Conclusion: ICA Ahold´s strategy for selling food online is directed towards a limited customer-base. Double income families willing to pay an extra charge for home deliveries will obtain this service online. Consequently, the challenge for ICA Ahold is to stimulate large volume customers to go online to such an extent that ICA will obtain economies of scale in distribution. In fact, ICA expects that the extensive information given to their customers will not only stimulate them to go online but also to result in a net expansion of sales.

The marketing investments may be kept rather small as advertisements may be presented on the existing website. *The crucial issue is if the net revenues from the sales expansion will become large enough to motivate the investment outlays for a new logistic system.* However, that uncertainty could not be diminished until the initial investments in information technology are performed. Consequently, ICA Ahold seems to have followed a prudent strategy starting online in a densely populated area and then continuing step by step as the uncertainty in demand is resolved.

8. Ornamental Horticulture - Interflora AB

Interflora AB is a corporation serving 750 flower retailers in Sweden. It has been set up in order to take care of inter-company businesses like supply of flowers (a joint venture with ICA), national and international deliveries of flowers to customers ("Blommogram"), etc. Recently, Interflora introduced sales over the Internet as an alternative to Blommogram by using the same chain of flower stores for the actual delivery. Consequently, Interflora belongs to a group of the Internet companies, which may be classified as "existing organizations that move to the net".

Cornerstone 1 - Investment Sequencing
Interflora started its new web-service in 1998. Based upon information given by Interflora, we can estimate the fixed incremental costs for its online sales of flowers as:

- Investments in web-services	SEK 2,200,000
- Investments in marketing	SEK 2,500,000
- Maintenance of web-service	SEK 1,300,000

Cornerstone 2 - Net Revenues
Let us consider the net revenues quarter by quarter from the start in 1998. Given the sales records of 65,000 orders in 1998, 90,000 orders in 1999, and 130,000 orders in 2000, let us assume that sales was at a level of 14200 during the first quarter of 1998 and that it has followed a stable growth of 9% per quarter since then. Assume that Interflora showed an average net revenue about SEK 44 per customer. That indicates annual gross revenues about SEK 2.9 million in 1998, SEK 4.0 million in 1999, and SEK 5.7 million in 2000. From those amounts deduct annual costs of operation and payments as SEK 0.5 million and SEK 1.0 million respectively.

Cornerstone 3 - Cost Savings
The calculation is based upon the assumption that this web-service will not result in any cannabilization on the offline services like the Blommogram or the ordinary retail sales.

Today, all deliveries are invoiced by mail. Most payments are made by the Internet or by giro to an estimated cost of SEK 3 million over three years (i.e. approximately SEK 1 million per year). Credit cards are not used at all. International payments are administered from Zürich by the use of "Florins" as a concept of an internal currency (1 Florin = 1 CHF). Interflora is financing a large part of its activity with the use of the float.

Conclusion: Interflora already operated a flower delivery system offline when it decided to complement it with online services. The investments were made in steps starting with a smaller system and a moderate sales program. Then in a second phase, a larger system was introduced aimed at reaching new market segments with a younger profile. As soon as that system operated Interflora launched an extensive sales program over classical media like newspapers and journals. A critical issue for Interflora was to find out the saturation level for online sales. Assume that the online sales will continue to grow at the same rate as during the initial year. That implies that we may expect a total net present value (NPV) for three years about SEK 300.000-400.000 (given a discount rate of 20%).

A long term strategy may be one where Interflora´s marketing efforts are focused initially on younger age groups. Then, when the uncertainty of sales to those groups is released, investment efforts may be spent on other market segments. As Interflora has moved to the Net, it has had the advantage of making use of well organized systems for supply and delivery of flowers, and of an existing

customer-base. Consequently, *the outlays for marketing may be kept low, and the net revenues from sales expansion may become considerable.*

9. Books and Stationeries – Wettergrens Kontorscenter AB

Wettergrens Kontorscenter AB – "Wettergrens" - is a wholesale and retail company selling books and stationery material in Western Sweden. It operates one central storage (in Mölndal), four wholesale centers ("StorCash" in Högsbo, Mölndal, Ringön, and Skövde), and six stores for books and stationeries (five in Göteborg and one in Kungsbacka). Since 1995 Wettergrens sells books to private customers over the Internet, and since 1998 firms may also request stationery goods over the Internet. As soon as an order is sent over the net it is directed to the central inventory in Mölndal. Through the Internet a business customer has the advantage of immediately finding out if a certain product is available in storage or not.

Cornerstone 1 - Investment Sequencing
Wettergrens developed its B2C system as early as 1995. In 1998 Wettergrens launched its B2B Microsoft system for 6000 stationery products. Some years ago this system was managed by a consulting firm, but today it has been transferred over to PostNet. The system serves 6000 active business customers with a sales volume of 20 million SEK in 1999. The development cost for this system is estimated to SEK 600,000.

Cornerstone 2 - Net Revenues
Wettergrens operates both a B2B and a B2C. Wettergrens is, in both cases, an existing organization that has moved to the net. Only a minor part of the income comes from sales expansion.

Cornerstone 3 - Cost Savings
The marketing of the B2B system has been concentrated to direct marketing through visits to customers. As the customers make use of the B2B system, the salesmen of Wettergrens may concentrate their sales effort on campaigns 6-7 times per year,
With the B2C system the sales volume has grown to a level of 1 million SEK in 1999. Nowadays, the number of purchases is around 4000, which indicates an average purchase value of 250 SEK. Wettergrens will charge a delivery fee of SEK 100 for an order below SEK 1.000. Consequently, the size of an order over the Internet is double the average one of traditional telesales. On the other hand, only 95% of the private customers pay their invoices.

Conclusion: Wettergrens has invested both in a system for B2B and in one for B2C. These systems work separately, and follow different advertising strategies. However, the corresponding logistic systems are operated in parallel with existing offline systems. The progress with these systems is based upon two assumptions. First, as there are economies of scale in the delivery system, and as the orders are expected to become larger, there is an expectation in terms of profitability. Secondly, online information on product specifications will deepen the quality of service. The challenge to Wettergrens is *to obtain substantial cost savings from online operations in the business segment*. For private customers there will be a chance to obtain net revenues from an expansion in the sales of books. However, records from international book stores tell us that these revenues may not be large enough to cover the investment costs.

10. Conditions for Success

Two of the investigated firms were actually born on the net – Bluemarx and Goodguy. Those two firms owned no customer-bases to begin with, but had to spend substantial resources on marketing investments. The three other ones, ICA, Interflora and Wettergrens have operated for a long time on well-established customer-bases. Consequently, their marketing investments have been minor.

The *growth in sales volume* is another critical issue for the profitability of eCommerce investments. This growth may come from a cross-selling to existing customers as well as from segments of new

customers. In both cases we have to estimate the growth of the sales volume over a relevant series of time periods, for example, quarter by quarter over the estimated life time. The quicker the growth in sales the larger the return on investment. A reasonable assumption is that the growth rate may decline over time when more "conservative" market segments are approached.

In this analysis we did focus on two kinds of sales strategies, namely to achieve and to retain Internet customers:

a. *For Companies that Have Moved to the Net:* This case concerns a firm with an existing customer-base offline, which wants to cross-sell eCommerce activities on the Net. Examples are Wettergrens´ B2B-activities and Interflora´s transfer from offline mail orders (Blommogram) to Internet.
b. *For Companies that Were Born on the Net:* Here the strategy is to sell eCommerce activities to new customers and to retain them as customers. This has been the main case for BlueMarx and Goodguy and to some extent for Wettergrens´ B2C-activities.

The growth in sales volumes over a relevant series of time periods is a crucial issue for eCommerce profitability. The quicker the growth in sales volumes, the larger is the return on eCommerce investments. However, it is a fact that *the growth of online sales are associated with substantial uncertainties, which may not to be reduced until the investment in information technology is made and the system is in operation* (see Table 1 below). As a consequence, many firms have decided to perform investment decisions in a sequence such as the following (see e.g. Cunningham 2000, p. 88):

- Investment in a site with a lot of information.
- Observe the customer reactions and sales rates.
- Revise the site concerning products and services in order to increase revenues.

Up to now, several options have been proposed that concern the evolution of time series for sales volumes (s_t):

- Sales will have a steady growth (g) such that $s_t = s_0 (1+g)^t$.
- There will be an investment effect on the sales such that the larger the marketing investments (I_t) the faster the growth in sales (g).
- Sales may grow during the first time periods as an effect of the marketing investments up to a point of a critical mass. Then the growth may decline towards the horizon period as an effect of market saturation. This type of S-curve follows the theories of diffusion (see e.g. Rogers 1995. pp. 313-330, Rau 1997, Quaddus 2000).
- The sales volumes may depend on an existing customer-base following the theories of joint production and cross-selling (see e.g. Bergendahl 1995, pp. 17-28).

Future sales volumes are uncertain, but may be represented in terms of a *binomial lattice*. Then the multi-period investment model may be elaborated in terms of real options (see e.g. Luenberger 1998, pp. 337-346).

Table 1. Costs and Consequences for the Five Cases of eCommerce.

Company	BlueMarx	Goodguy	ICA	Interflora	Wettergrens
Products and Services	Capital goods (cars, cameras, computers, etc)	Services (insurance, energy, telecom)	Groceries	Flowers	Books, stationeries
Investment in IT	Stepwise	One only	Stepwise	Stepwise	One for B2B and one for B2C
Investment in Marketing	Repetitive branding	Repetitive branding	Minor	Minor	Minor
Payments	Invoicing (80%) reimburse-ment at delivery (20%)	Commissions from the producer	Over its own ICA Bank	By giro or by Internet	By invoicing.
Finance	Venture Capital	Venture Capital	Internal	By internal float	Internal
Investment Outlays - *Cornerstone 1*	***Substantial Marketing Outlays***	**Moderate if associated with banks or insurance firms**	**IT moderate Logistics substantial**	**Moderate**	**Moderate**
Net Revenues - *Cornerstone 2*	**Crucial to Retain Customers**	**Low Growth + Small Margins**	**Small Margins**	**Substantial if attracting new business segments**	**Moderate**
Cost Savings - *Cornerstone 3*	**--------**	**----------**	**Minor**	**Certain Savings when Replacing Blommogram**	**Substantial savings B2B; lower savings B2C**
Consequences	Rapid growth needed to recover funds invested in marketing.	Crucial to be able to retain customers and to cross-sell to them.	Low margins. A rapid growth needed.	Saturation in different market segments	Large orders wanted. Online information improves service quality.

11. Conclusions and Future Developments

This paper has analyzed the profitability of investments in eCommerce. Two kinds of investment outlays have been considered – those for information systems (web-services) and those for marketing. It has been found that the marketing outlays are often of the same dignity and sometimes above those of the information systems. Both kinds of investments must be seen as extremely risky and it must therefore be important to develop principles for a financial evaluation of them.

The initial investment outlays will have to be matched to the *operating surplus*. It is sometimes the case that the investment decisions may be taken in a sequence. This provides the investments with a substantial flexibility. For example, a second step of investment in web-services and marketing may not be taken until the uncertainty has been released as to the effect the initial investment in marketing gave on online sales.

The practical relevance of these investment decisions has been studied for five firms representing five different business sectors. Two kinds of firms were identified – those being "Born on the Net" and those that have "Moved to the Net". Firms that move to the Net spend substantially lower investment outlays on branding and sales marketing as they already are provided with a customer-base.

An existing customer-base will become a strong indication of loyalty. A rapid growth of new customers online will become a great advantage. However, such new customers often show less loyalty to the firm than the traditional customers do. This is a reason why the business-to-business segment of eCommerce has been more successful in sales management than the business-to-consumer one.

A multi-period investment model has been developed in order to evaluate the profitability of investments in eCommerce. The fixed outlays will concern instalments in a system for web-services as well as actions for marketing with an emphasis on advertising. The time series of sales volumes stand for the main inter-period relations and their uncertain evolutions will have a critical influence on the profitability of investments in eCommerce.

The multi-period investment model has been applied to two of the five firms. One of them (BlueMarx) may be classified as "Born on the Net" while the other one (Interflora) as being "Moved to the Net". Comparing them forms a basis for a set of conclusions:

- An existing customer-base (as for Interflora) will reduce the need for marketing investments and will also increase the willingness for customers to purchase services online. A well-known brand will stand as a guarantee for product quality, payment safety and lower costs of finance.
- Capital intensive products (as for BlueMarx) will generate large margins for online services. At the same time they will limit the market segments to wealthy customers and the longer product life may reduce the volume of repeat purchases.
- The higher the rate of sales growth the larger the profitability. On the other hand the faster a market saturation, the riskier the investment.

In conclusion, a successful eCommerce strategy seems to be:

- Invest in an interactive computer system.
- Focus the initial sales efforts on an existing customer-base.
- Use the computer system for online marketing to existing and potential customers.

This type of strategy has been successful for firms like Dell, Gap, Interflora, Nike, Nordea, Wettergrens, and many others.

Given these findings concerning the profitability of eCommerce projects, it seems constructive in the future to further develop the multi-period investment model in order to handle risk. One attractive way of doing so is to formulate the uncertain sales growth in terms of a binomial lattice and reformulate the model as one of real options.

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