

# **From the Stone Age to the Information Age, How to Utilize eCom in Stone Industry**

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## **ABSTRACT**

This study is part of the technology and development program called STONE, which is launched by Finnish Natural Stone Association and National Technology Agency, Tekes. The main purpose of this study is to examine how to increase use of natural stone in households and how to utilise electronic market places to achieve this goal. Another purpose is to explore is there any other way to utilise information technology and to explore the other possibilities of electronic business in a field of stone industry?

The study was started in middle 2001 and was finished late 2001. A research method a survey and data was gathered by structured interview and it consist of six stone industry companies and four yard and park constructing companies. Just now electronic business is used only a little. Most of the business transactions are made by telephone and fa, but the trend is that in B2B trade several companies will utilise internet when it is economically profitable. None of interviewed companies utilise a network in product order and payment transactions. B2C business varies but normally it is very minor so there has been only a little interesting to get the electronic market place for stone industry.

At the moment, it seems that electronic market is one possibility to gain competitive advantage but before that a lot of structural chances must be done and some course of action must be changed. Information Technology is not an answer but it could enable a new way off doing business in stone industry.

## **INTRODUCTION**

The technology and development program called STONE was launched by Finnish Natural Stone Association and National Technology Agency, Tekes. The goal of the programme is to double stone industry turnover by the end of 2005 and it have five main themes: 1) efficient and environmentally acceptable quarrying, 2) efficient and technologically advanced production and distribution, 3) new product and building

methods, 4) International co-operation in stone working industry and 5) public awareness of the industry and ensuring a viable labour market. The last theme involves projects that strengthen both in-house and outside expertise resources and particular intention is paid to the utilisation of information technology.

## **STONE INDUSTRY IN GENERAL (1-2 PAGES)**

Stone industry is a very special business field. It is a thousand of years old. Stone was used as a tool or weapon and it has had a great influence on the architecture as a construction and monument material.

The stone industry in Finland contains of about 200 stone companies. Most of those are SME companies and the most common company is family business where one or two people make gravestones to local customers. Totally, stone industry provides employment for 1700 employees and a total turnover is little less than 1 billion FIM.

Italy, China and Spain are the most important stone industry countries. Especially Italy has a long history in high stone technology and China is very important stone blocks producer. Some companies in Finland have the very high technology of stone quarrying and some bigger Finnish stone companies have a high level of stone refinery but costs and production capacity are not so competitive than companies have in Italy.

Stone refining starts in a quarry. First huge stone blocks are quarried from a rock. After those big stone blocks (about 7 x 5 x 20 m) are disengaged from rock, it will be subdivided in smaller pieces (3 x 6 x 6 m) and finally semi-finished blocks will be finished to the cubes which size are about 2-3 meter per side. These blocks are raw material for stone refining industry. The most of quarrying stages are made by drilling, blasting and wedging. Loss of stone is varying from 50-95 % and average supply is very slight, only 12.7 %. Totally quarrying is the secondly important business field after fireplaces and its sale was about 249 million FIM in 1999 (42million €) [Riihimäki, Lehtinen, 2000].

Stone refining industry is refining stone blocks to the end user's products (from here stone products). Most used working techniques are cutting, sawing, splitting, turn stone on the lathe and smoothing. Usually work is done by a diamond blade and special tools.

Most important stone products are fireplaces, construction stones, gravestones and monuments, environment stones and other products such as installing etc.

Most important stone products in 1999 [Riihimäki, Lehtinen, 2000].

	Sales, Million €	Export, Million €
Fireplaces	74,7	26,4
Construction stones	32,8	4,9
Gravestones and monuments	15,5	0,5
Environment stones	15,2	1,2
Other (installing etc.)	10,1	0,2
<b>Totally (without quarrying)</b>	<b>148,3 Million €</b>	<b>33,2 Million €</b>

Fireplaces are mostly intended for the private customer and it is delivered with installation so that new fireplace is easier to get in use. Other fireplace products are hearts of fireplaces, cover plates and other fireplace products.

Construction stones are mostly used by construction companies. Typical construction stone products are cover plates as wall elements, flagstones and slabs. Because natural stone is regarded as a hard as durable material it is often used to the facades and entrance halls in important buildings which life cycle is designed to be long. Nowadays it is also common to use natural stone in companies headquarters and other representative buildings because natural stone gives the atmosphere of stable and wealthy company, so called solid as rock. If someone requires a high standard for kitchen material, new natural stone products as kitchen tops are one solution.

Gravestones are the very old way to use natural stone. Ancient king's graves in Finland, for example, were made of stone heaps. Nowadays gravestones are used as a memorial monument to a dead person. In spite of long history of using gravestones, a sale of gravestones has decreased in Finland in a last few year. Mostly it is because cremation has become more popular and memorial monument's has changed to tiny plates. Every year about 50000 people dies in Finland and almost 20000 will be buried in a traditional grave. In most cases, those graves will also have a traditional gravestone. About 15 % of the total sales of gravestones and monuments are not gravestones but other monuments.

Environment stones are used mostly by a field in public administration. Typical environment stone products are stone pavements, steps, cobblestones, stone pillars and colonnades. Because a concrete and asphalt are cheaper than natural stone, they have substituted it in normal covering material. However places where high duration is required, a natural stone has remained in its traditional place.

Designing, installation, and other natural stone involved services has become more important and in many products, fully serviced installation is important part of sales.

Natural stone is material which requires special knowledge and skills and that why these services are suitable for stone industry.

## **ELECTRONIC COMMERCE**

Electronic business could be defined in many ways. Electronic business can be defined as a business, which is based on the electronic handling and transportation of data and it includes the sales of products and services, electronic payment transactions, auctions, marketing, after sales and delivering digital contents. Kalakota and Whinston (1997) say that electronic commerce can be defined from three different perspectives. 1) From a communications perspective, the electronic commerce is the delivery of information, products or services, payments over telecommunication lines computer or other electronic means. 2) From a business perspective, the electronic commerce is the application of technology toward the automation of business transactions and workflow. 3) From a service perspective, the electronic commerce is a tool that addresses the desire of firms, consumers and management to cut service costs while improving the quality of goods and increasing the speed of service delivery. 4) From an online perspective, the electronic commerce provides the capability of buying and selling products and information on the Internet and other online services. Difference between electronic commerce (eCom) and electronic business (eBusiness) can be defined so, that eCom is part of eBusiness, not only just selling and buying but also servicing customers and collaborating of business partners and conducting electronic transactions within an organisation [Turban et al. 2000]. In this study, those terms are combined and from here we use eCom as its broader meaning which is near enough to a term of electronic business.

There are several areas in eCom. Typically, categorisation depends on which one is seller and which one is a buyer. In Business to Business electronic commerce (*B2B*) both sellers and buyers are business corporations. In business to consumer electronic commerce (*B2C*) sellers are business corporations and buyers are individual customers. Also situation where both sellers and buyers are a individual person is quite common. This kind of electronic commerce is called Consumer to Consumer (*C2C*) electronic commerce. Typically, this kind on eCom is based of some kind of electronic auction place. *B2C* is divided into smaller categories where One to One Marketing (*O2OM*) is quite new. Its idea is based on individual marketing and service production [Peppers et al. 1999]. This kind of personalised marketing is also criticised because individual customers behave so unique. Because *O2OM* marketing could not work it is said to be as One-to- (N)one Marketing [Kuchinskas, 2000]. Another eCom categories are Business to Public Administration (*B2PA*) and Public Administration to Citizen (*PA2C*) [Doukidsin et al. 1998]. As it is seen the other side of commerce is a public sector. A non-business eCom (*EC*) is situation where a non-for-profit organisation use *EC* to

reduce their expenses or use it inside of some enterprise for internal organisational activities. Some of these abbreviations and categories are not in common use. In spite of daily talk and news where B2C is seen as the biggest part of eCom the B2C is only small part of total eCom. The fact is that B2B is the main area of eCom and it has said to expand rapidly in the next few years. This study is primarily focused on B2C and in some cases also on B2B eCom.

## **ECom as a part of Business**

The starting point to eCom can differentiate a lot. eCom can be made up from an existing business unit as a new parallel or/and complementary business unit. It can also be a separate business unit, which is created from its own starting points. How it is integrated into the other business units, depends on firms situation. Also how the firm manages its business risks, how big resources the firm has, what is expected growth in eCom and what is a business field where the firm operates has a great influence.

In business world marketing must be separated from sales. Without sales, marketing has been throw resources away but without good marketing it is difficult to sell. When building a business what meets customer's needs, a marketing mix (product, place, price and promotion) is a powerful tool. In many case marketing mix element "place" is replaced with term distribution or marketing channels. So marketing mix is not always "four p". In One to One Marketing (and some cases also in CRM), those four p can be replaced with five i. First i is identification because a customer must identify as well as possible. Second i is individualisation because with out it O2OMarketing (or CRM) is not possible. It can also be called as a differentiating activity. Characteristics of every customer must be recognised, differentiated and analysed. Third i is interaction with a customer, so that every needs of the customer can be found out. This also includes untold and tacit needs. Fourth i is integration, where all employees in firm must support this five i customised marketing strategy. Fifth i is integrity, where firm must act so that it can protect customer's confidence because without a confidential relationship sustaining of a customer will be very difficult. [Moon, 1999] [Peppers et al. 1999].

Although these methods or tools are well known, does not men that this is enough for eCom. This does not take some important point's into consideration. For example, a complexity of products or services requires more information or support to the customer. Also business field tradition is very important in some cases. So these tools and methods can be seen as a simplifying of a real world.

## **Value chains**

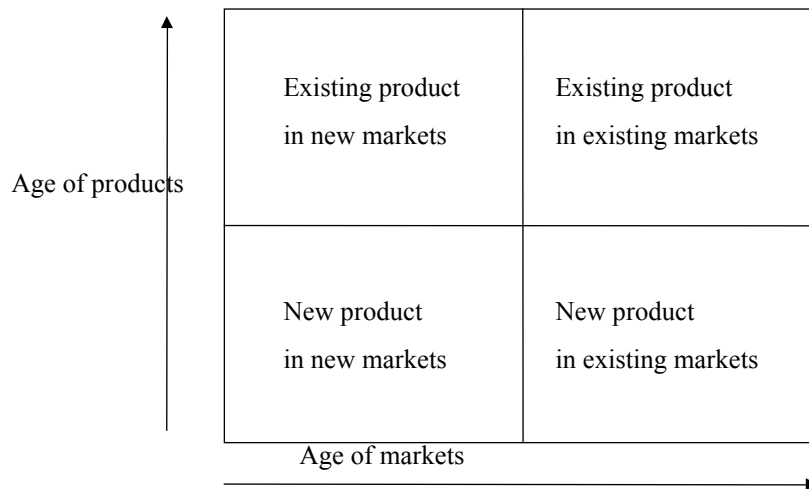
One main reason for eCom is said to be a shortening of value chain or lowering vertical marketing structure. This means that some part of value chain will disappear or replace with other. Value chain [Porter 1980] is usually seen as a one-way process, but it has (at least) two directions. One flow for products and services and marketing and other

direction for ordering and payment flow. Every firm sees value chain as its own point of view and many case so that that firm is in the middle of the whole value chain. Some part of chain can be the core of chain and some other plays a supporting role. Those parts which are not producing any added value to chain are useless and usually those will be cut away. In a turbulent business world continuous analysis of the whole value chain is very important. In a long term, this means that value chains will be compete as well as firms themselves. In efficient value chain there is only a minor need for product's storage. This kind of value chain can react much faster that traditional companies.

When we think about value chain in the light of eCom, it seems to be more like B2B commerce. However, the final customer can be individual and to this end it can also be seen as a B2C where a seller is a whole value chain. From this point of view, every firm in the chain has to analyse what is important just at that point of chain and act so that it creates the highest possible added value for the final customer. Firms can not gain added value only for itself.

## **Products in eCom**

A product is not only a combination of features. It is a bundle of different values that meets customer expectations [Bovée et al. 1995]. In a market pulling manufacturing every feature in a product has initiated because of the customer and a manufacturer only makes this features come true [Slywotzky, 2000]. Individualised product making can be made by mass tailoring or by making unique products. In mass customising the core of the products will remain in the same but a customer can define its own features so that better meet customer's needs. In unique production also the core of the product will change so that every item is totally different. In mass production both production line and product will remain the same.



How product's are introduced in to markets depend of age of a product and also an age of markets. The issue in eCom is about new markets with new products or a new distribution channel for existing products. In some cases eCom can also be a foundation for some other business so that eCom itself is not profitable but it creates profitable situation for core business. What customer sees in eCom market place is not necessarily a core business but it is bundled to it. Any how eCom must gain some competitive advantage to the customer otherwise it will not be success.

Some products fit better to eCom than other. If a product is totally virtual and if its features can be described in an adequate way and a product can be digitally delivered it well fits into eCom [Choi 1997]. If products need physical a market place or logistic chain, a traditional marketing system can fit better. Logistic is important part of eCom and can cause more expenses. Logistic can be divided in three areas: strategic, tactical and operational. A logistic strategy means the location of factories and storehouses. A logistic tactic means allocation of resources for those equipment (cars, trains etc.) and routes which is used in the transportation and operational logistic means use of hose routes and equipment.

### **Some characteristics of B2C**

Consumers are individuals and also their needs are individual ones. But instead of that all consumers have some characteristics in buying behaviour and they can be used in several ways to categorise customers. Behaviour to a certain extent depends on desire to buy and ability to buy. Some other motives are social and psychological factors.

Impulsive buyer buys by a momentary impulse although there is no exactly need for that product or that need is not identified. A controlled buyer considers necessity to purchase and purchases will be made in a certain priority. An analytical buyer compares products, prices, values, qualities and makes decision after the combination of these factors. The

motive can be environmental, a social, or other reason what is important to that consumer. Analytical buyer needs a lot of information to support her/his decision. Also purchase can be made in many ways.

- Purchase is planned and decision is made beforehand. This requires that need is identified and suitable products have been found and the features of those products have been compared.
- Purchase is planned but product have not yet been selected
- The need pop up into the mind when suitable products are seen
- Totally non-planned purchase

Every consumer can belong to all of these categories or made purchase in different ways depending on situation. Impulsive purchase is made typically when purchase or a price is quite small comparison with buyer's wealth. Purchase is simply made because it seems to be right and suitable for that moment. Bigger and important purchases or purchases which have long time influence require more planning and it is made in more controlled or analysed situation. So the purchase itself is only an execution of decision, and all other acts which belong to the purchase tasks have to made in forehand. The smaller is a purchase the less numbers of tasks are necessarily done forehand.

In a market pulling markets where a suitable product does not exist, a buyer must design that product that he/she wants. To specify adequate features requires enough skills and knowledge. This also means that in this situation non-planned purchases can not be made. In other words, a product, which leads to the important purchase situations, requires that product exists and all needed information is available. The complex products needs more information before a customer can make his/her purchase decision [Malone,et al. 1987] However, there is no need to store those products, those can also be made by JIT after order is made.

Electronic business models can be based on cybermarketing, an electronic shopping mall, bazaar, auction or a flea market. What ever they are they have to support selected business strategy.

## **RESEARCH AND A RESEARCH METHOD**

The study started at the beginning of 2001 and was finished late 2001. The research method has been a survey and data was gathered by structured interviews [Järvinen 1999] [Steward et al.1988]. The most of interviews was made by late of September.

Totally there has been ten interviewed companies. Six of them was companies from stone industry and a rest were courtyard constructing. Interviewed companies were selected together with Finnish Natural Stone Association. Interviews were made in companies except tree courtyard constructing companies, which was interviewed by telephone. Accurate interviewing was not required because natural stone was not in general use in those companies.

The main business areas for interviewed stone industry companies were quarrying and a primary sector (3), refining and stone processing (4), environmental constructing (2) and all-inclusive services (2). Refining and stone processing mean all the processes what are needed for refining stone blocks to the end product. Although only two companies say that quarrying and primary sector is one of the main business areas. Almost all have quarries and a company's own primary sector.

Interviewed companies are all quite big companies in stone industry. Turnover varies from 1.7 million € to 12.6 million € (10 million FIM to 75 million FIM) and there was about from ten employees to more than one hundred employees. Some companies were part of some bigger stone company or told turnover and number of employees were not accurate. Therefore the number of employees and turnover were not comparable. Total turnover was more than 35.7 million € (212 million FIM) and if conglomerates are included total turnover is more than 85 % of total annual turnover of stone industry. So interviewed companies represents a big portion of stone industry. If the number of stone companies in the sample is considered, our sample is not representative. Because many companies are very small family business, what do not have resources to develop eCom, we can assume that our representation is good.

Before interviews were made, there were four hypotheses.

H1.Private customers are important marketing sector for the stone industry now or in near future

H2. Stone industry manufactures products and offers services that are suitable for customers in private sector and especially homes

H3. B2C eCom is suitable for stone industry and for (existing) stone products and stone industry have high enough IT maturity to utilise it

H4.It is profitable to create an electronic market place for B2C marketing for the whole stone industry.

All hypotheses were formulated in Finnish Natural Stone Association and these were not based on literature findings.

## Research results

### *IT maturity*

IT maturity means used information technological equipment and the use of them. In every company, all clerks have their own computer and almost all computers were connected to the Internet. Companies did not have their own www-servers but they use ISP servers. With out any exception, all companies consider that their software, computers and IT knowledge was high. In those cases when IT upkeeping was outsourced, company's own knowledge has not been high enough but outsourcing has replaces lack of knowledge. Email and www was in general use and almost all have their own web pages for products marketing. IT maturity was good and IT capabilities are not a problem for eCom.

### *Products and services*

All kind of building slabs and cover plates were one of the most important products. Second important products were gravestones and services as designing. Fireplaces are the important product only for one company and as well as stone blocks and environmental stones.

<b>Most important products</b>	<b>The number of Companies</b>
Building slabs and cover plates	5
Interior stones and slabs, kitchen tops	3
Gravestones	2
Services, designing	2
Environmental stones	1
Fireplaces	1
Stone blocks	1

Almost every company considers its own manufacturing methods and techniques high when compared a usual level in stone industry. This can be caused for the size of those companies, all were quite big comparison with general size. In some cases quality was not good enough especial with subcontracts.

Production is started always after an order was received. Products are not made in to the store except some semi-finished products. Practice is because there are no standard products in stone industry. The architecture of the building says what kind and size of stone slabs are used. Other hand every stone is unique and highly standardise products can not be made. What the more standardised products are required the higher will also be loss of stone. Quite well used “standards” are stone types and its colour. Some companies have made own “stone brand” for the colour of granit like “Balmoral Red”, “Baltic Brown”, “Kajaani Grey”, “Kuru Grey” “ etc. Because stone is “living material”

it gives good opportunity to make unique products with the high price. So it is balance with standards and unique products.

Because there are not products in store, it is very difficult for courtyard constructor or other small buyers to buy stone products. No one of interviewed companies, was not willing to change the production because of some small customer who buys “some slabs”. Gravestones differ from other products because a buying situation is so unique and the gravestone can not be made before “client” has died. Also social pressure and traditions take a great impact for this purchase.

#### *Customers and marketing*

Most important customers were public sector, constructors and other companies in stone industry. Detailed analysis of customers can not be done because interviewed companies did not give exactly information about their customers. But it was clear, that private customers were not important customers for anyone. None did mention courtyard builders as a customer. Even though many consider them as a great custom area in particular for the environmental stone products.

<b>Main marketing methods in domestic trade</b>	<b>The number of companies (6)</b>
Direct contacts	4
Established relationships	3
Www	3
Exhibitions	2
Dealers	1
Permanent exhibits	1

Orders and other trade transactions are made with normal business tradition and practice and they do not have significance cost effect. Because the main customers were other companies, normally marketing is based on a long time relationship and direct contacts. Publications were not seen as a good marketing channel. Information distribution was seen as the main methods for private customers. Gravestones were marketed usually with the help of funeral directions and kitchen tops were marketed with kitchen designers and cupboard builders. Those dealers get some commission and this was seen as a good practise.

#### *Attitude to eCom*

All interviewed companies have their own web pages. Normally, web pages include a normal company presentation and information about products. Email was in general use for order etc. handling. None of interviewed companies sees eCom as an appropriate way to sell stone products for private customers. Reasons for this were that stone products are too complicate and unique to that kind of business and average customer do not have enough knowledge to buy and therefor a ordering process should continue with telephone or other more informative way. Also customers right to return products was

seen as a strong risk. Because there is no standard product, it is quite easy for a customer to claim that ordered product was not that what he/she was meant. In some case eCom also is in conflict with dealer's interest and dealer's was seen as a better way to sell products to the private customers.

Information distribution was seen as a good way to use eCom. In B2B trade eCom will give many advantages but in B2C products ordering is too risky. A stone product is not like a book or CD what is totally similar, stone products differ too much. In the long view eCom might be a new way to get a new customer but not now. A business field itself must change and develop so that it can deliver more suitable products for a private customer.

A normal answer to question “why does a private customer want to buy stone products from Internet” was that they do not. Other common answer was that customers do not have any need for stone products and without demand you can not sell. The need should exist and it should satisfy easily and at a reasonable price.

When asked if there is a common eCom B2C place for stone industry will your company join that, the typical answer was yes but the identity of companies must guarantee, and make companies compete against each other should not be too easy for a customer.

## **CONCLUSIONS**

Stone industry is a very special business field, and a hasty look gives a picture of the field where electronic markets couldn't be used. A detailed look shows that there are several places where electronic markets are one possibility to gain competitive advantage. Especially in B2B electronic commerce gives new opportunities but a problem is that customers IT maturity is not high enough.

One the main reason for this study was to find out possibilities to B2C electronic commerce. Findings show that B2C is not suitable for stone industry. Reasons for this conclusion are that stone products are too complicated and customers do not have enough knowledge about stone as a building material. For those products, what are meant to private customers, for example gravestones and kitchen tops have some problems. Purchasing a gravestone is special situation and tightly tied to the tradition where expenses and easy buying are not in priority. Those advantages what eCom may have are not suitable for products of this kind . Kitchen tops purchasing are mostly made with kitchen equipment and cup board dealers. So eCom will be a competitor to dealers and this is not seen as a desired situation.

Before interviews were made, there were four hypotheses.

H1. Private customers are an important marketing sector for the stone industry now or in the near future.

This hypothesis turns out to be false. Only those companies whose main products are kitchen tops and gravestones keep a private customer as a good client and the rest of companies were not interested in private customers.

H2. Stone industry manufactures products and offers services that are suitable for customers in private sector and especially homes

There were a few products what were meant to the private customer and those products were not very suitable for eCom. Some companies were willing to make some new products for private customers but those were plans what were not told precisely enough in interviews. So also this hypothesis seems to turn out to be false but in future situation may be different.

H3. B2C eCom is suitable for stone industry and for (existing) stone products and stone industry have high enough IT maturity to utilise it

Stone has a long history of our every day life and it could be assumed that stone products are well known. Nevertheless actually only some architects and specialists know current stone products well enough. Because no standard products are made at the moment, customers have to design and define all wanted features for ordered products. A problem is that private customer's knowledge is not high enough to do those definitions for online ordered stone products.

A stone industry must change its attitude about private customers and create products which are intended to them. One good example is some companies who make fireplaces. Their products are not only some pieces of stone as part of fireplaces but in includes total delivering, installation and instructions of a use about a delivered fireplace. Only what customers need to know or define is a model of a fireplace and an installation day. All other parts of the process are included in in the delivering process.

H4. It is profitable to create an electronic market place for B2C marketing for the whole stone industry.

This hypothesis was connected with other hypothesis and that why because all other hypotheses were turned out to be false, also this hypothesis is turned out to be false.

Just now B2C eCom is not suitable for stone products. Improving knowledge and distribute information about stone and its possibilities, Internet and its applications are one promising channel. Finish Natural Stone Association has created a project to build a

new portal called Stone for this purpose. This is a good starting point and in the long sight when knowledge is higher there might be possibilities for eCom solutions.

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*From Idea to Knowledge*