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Implementing Mass Customization Strategy to Enhance Customer Value - Findings from eBusiness Research of Finnish Metal and Electronics Companies

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IMPLEMENTING MASS CUSTOMISATION STRATEGY TO ENHANCE CUSTOMER VALUE - FINDINGS FROM E-BUSINESS RESEARCH OF FINNISH METAL AND ELECTRONICS COMPANIES

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Abstract

Today's business environment is characterized with extremely tight competition. Companies are forced to constantly reduce costs and outperform when pursuing efficiency. At the same time, companies are struggling to reach effectiveness to retain customer loyalty. Combining these two aspects is difficult at best and requires reasonable trade-off between variety, functionality, and price of the products and services. In this research we are concentrating to understand how companies are utilizing e-Business and mass customisation strategies when pursuing efficiency and effectiveness using multiple case study in Finnish metal and electronics industries. Results implies that companies are pursuing efficiency first inside their own company and then moving to enhance the fluency of the whole supply chain community. This development creates background for effectiveness seeking and enables companies to implement more customer-oriented strategies, like mass customisation.

Keywords: e-Business, efficiency, effectiveness, mass customisation

1 INTRODUCTION

Today's business environment is characterized with extremely tight competition between companies, countries and even entire continents. Companies are forced to constantly reduce costs and outperform. Efficiency and cost-based competition has been highlighted and production is increasingly been transferred to countries with low labour cost.

At the same time, customers are becoming increasingly demanding placing pressure for customer service. Competing only with price is risky if switching costs are low. To retain customer loyalty companies should serve every customer as an individual offering customised products and services at a reasonable price (Pine 1993). Companies are expected to pursue both efficiency and effectiveness at the same time. Combining these two aspects is difficult at best and requires reasonable trade-off between cost control and production of customer value. Mass customisation, as 'ability to use of flexible processes and organizational structures to produce varied and often individually customised products and services at the price of standardized, mass-produced alternatives' (Hart 1996), is seen as a solution in this inconsistent situation.

Previous research was conducted to understand and outline the development paths of the Finnish metal and electronics industries. The first findings reported in this paper make an attempt to answer to our research questions:

- how the opportunities of mass customisation strategy are identified and used, and
- how different strategies are related to the use of e-Business systems?

e-Business is understood in this research quite broadly, e.g. the use of information and communication technology (ICT) as a basis for communications, operations and management of an organization and as a driving force for having business changes.

Qualitative approach was selected to be able to understand the multidimensional decisions made in area of mass customisation and e-Business. Multiple case study method (Cunningham 1997) was required to be able to extend our knowledge among individual cases and create an outline of development paths of metal and electronics industries.

Empirical data of the study was collected from 40 Finnish metal and Electrotechnical enterprises in cooperation with Federation of Finnish Metal, Engineering and Electrotechnical Industries (MET)[1]. Study consisted 40 in-depth company visits, interviews with 50-60 directors or managers responsible for e-business decisions and review of related documents. Company visits were done during December 2000 and March 2001.

		Size of the Companies			Interviewed person						
Industry	Total	Small	Medium	Large	CEO & Vice	CIO & IT staff	Marketing	Quality & Development	Production	Other Managers	Other
Metal	29	6	7	16	15	6	2	7	6	8	2
Electronic	11	2	2	7	4	4	1	4	0	0	0

Table 1. Division of interviewed companies and persons

Results imply that companies are emphasizing first internal e-Business activities and then moving to enhance the fluency of the whole supply chain community. This development also creates background for effectiveness seeking and enables companies to implement more customer-oriented strategies, like mass customisation.

[1] The name of the organization has been changed to Technology Industries of Finland in the beginning of June 2003.

In section two we outline the above mentioned e-Business development in Finnish metal and electronic industries. In section three we describe different kind of mass customisation strategies used in interviewed companies using Gilmore and Pine's (1997) classifications of mass customisation alternatives. In section four we present our conclusions from our research in its current phase.

2 FROM EFFICIENCY TO EFFECTIVENESS

Four categories of e-Business initiatives emerged from interviews. Three of them may seem to be very common for any industry. Fourth category is, instead, something that is emerging only recently both in practice and in literature, as e-Business has had some time to mature.

ERP-initiatives. Integration of enterprise's processes and systems has been management challenge for a few decades already. Emergence of Enterprise Resource Planning (ERP) systems has tried to answer to the integration challenge (Sheer and Habermann 2000). Few of the companies in Finnish metal and electronics industries were implementing ERP system for the first time, others had already some experiences about ERP systems. Major issues identified among interviewed companies were migration paths to new versions of or new packages of ERP systems (see e.g. Kremers and van Dissel 2000) and reducing various ERP systems already in place. For example, we discovered a company struggling with re-engineering 18 different ERP-systems located in different sites.

Creating channels for fluent information sharing inside company can have substantial effects in reducing costs, even if it rarely lead to any competitive advantage or increased customer satisfaction. On the other hand, poorly functioning back-end systems can lead to dissatisfied customers, suppliers, auditors, or regulators (Davenport 2000).

SCM-initiatives. According to Kumar (2001), conventional strategic thinking has focused on individual firms as the competitive unit in any industry. However, today's networked business environment places emphasis on fluency of the whole supply chain. Management of supply network is with many ways one of the key challenges currently in the development of e-Business systems in Finnish metal and electronics industries.

This trend towards supply chain communities means integration of supply chains across organizational/industrial borders. It is not just managing transactions, but moving toward joint and shared management of supply chain processes, like planning, control and execution of processes. From customers' point of view the best supply chain activates, works customised and reach its' services beyond organizational borders depending of customers needs (Heikkilä 2002).

CRM-initiatives. Effectiveness of company means increased production of customer value and thus increased customer satisfaction. This requires fulfilling customer's needs, e.g. offering products and services according to customer's preferences (Peppers et al.1999). To acquire knowledge about customer's preferences usually requires implementation of Customers Relationship Management (CRM) system (Goodhue et al. 2002).

Managing customer relationships is important, because profitable business is moving to maintenance, repair and total service concepts (Johansson and Olhager 2003). It is natural, that also service concepts must become customised. Enterprises must know the needs of their customers and also manage the business skills of the individual customers. It was not unusual among the most developed enterprises that they also served as business consultants for their customers.

Few of the interviewed companies were very advanced in their e-Business initiatives. They focused to deepen their relationships with superior management of supplier, customer, and

business partner based knowledge. The "living" relationship between the enterprise and the customer requires knowledge about the needs and the business of the customer.

KN-initiatives. We call this emphasising of knowledge as a development toward Knowledge Networks (KN). According to Warkentin, Sugumaran, and Bapna (2001) knowledge networks allow their participants to create, share, and use strategic knowledge to improve operational and strategic efficiency and effectiveness.

These strategic alliances, jointly developing their competencies through knowledge management and inter-organizational learning, are also called e-Knowledge Networks (Warkentin et al. 2001). This point of view place emphasis on use of Inter-organizational Systems (IOS) and Knowledge Management to create knowledge oriented long-term alliances.

These four categories describe the actions made for developing e-business to support customer focused company. These four categories also seem to be the order of development within the interviewed companies. In deeper analysis of these e-Business initiatives "Four evolutionary phases of e-business" was identified in Finnish metal and electronic industries (Ruohonen et al. 2002). Phase model is always somewhat problematic as development is highly company-dependent and in some cases different areas are developed simultaneously. Nonetheless, overall picture of order of development is as presented below:

- ERP-phase, e.g. putting the foundation on enterprise information systems in order,
- SCM-phase, e.g. boosting the information systems of supply chain management,
- CRM-phase, e.g. deepening and improving customer relations and knowledge,
- KN-phase[2], e.g. taking advantage of business intelligence systems handling either customer, supplier or business relationship based knowledge in knowledge networks.

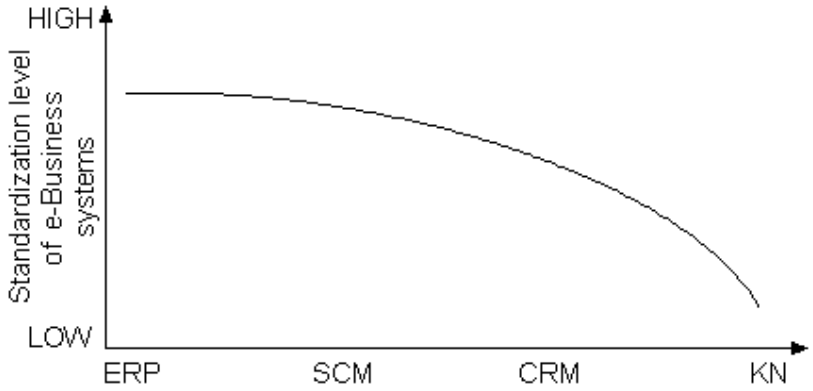

Figure 1: e-Business systems and their standardization level

What we found interesting in this development is, that first phases are already matured and e-Business systems are relatively standardized. As Porter (2001) has stated: 'Basic Internet applications will become table stakes – companies will not be able to survive without them, but they will not gain any advantage from them.' Instead, when taking steps forward (according to our four phase –model) the standardization level of e-Business systems seemed to diminish (see figure 1).

[2] Last phase was called Knowledge Management phase (KM-phase) in Ruohonen, Riihimaa and Mäkipää (2002), but we changed the title of the phase to this paper because in literature Knowledge Networks concept is more popular in describing the same content.

3 MASS CUSTOMISATION IN FINNISH METAL AND ELECTRONICS INDUSTRIES

Mass production is an ideal way to produce goods for homogenous markets. However, in the end of twentieth century situation started to change significantly as the market became more fragmented. Mass customisation, as an organizational strategy, is arising in direct response to the turbulence that has splintered the mass market (Hart 1995). Idea of mass customisation is to combine efficient mass production with effective customisation of products and services according to customers' or customer groups' individual needs.

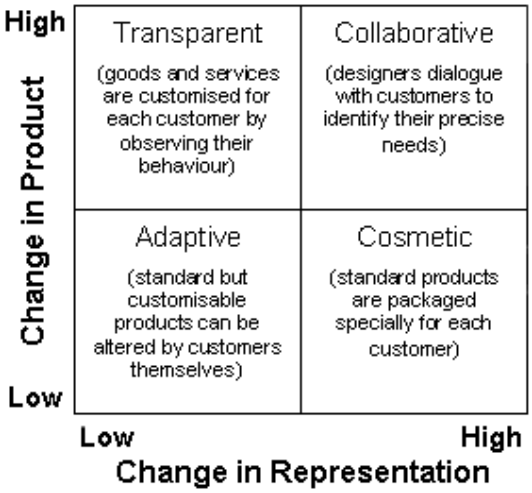

Figure 2: Mass customisation alternatives (modified from Gilmore and Pine, 1997)

Gilmore and Pine (1997) have made a classification of mass customisation strategies, which has captured the most fundamental dimensions of customisation alternatives: product and representation. This classification was evaluated to be useful framework for qualitative, empirical research by the research team. Gilmore and Pine's (1997) identify four customisation strategies described in figure 2: collaborative, adaptive, cosmetic, and transparent. Note, that we have modified the original framework by changing both product and representation categories to dimensions. We see that in empirical settings the scales should be rather flexible sliding from one extreme to other than just offering two options: change or no change.

In Finnish metal and electronic industries mass customisation is mostly practiced in a collaborative and adaptive (modular) way. However, an explicit mass customisation strategy is unique to the company developing and implementing it (Hart 1995).

COSMETIC MC. Case companies didn't raise cosmetic mass customisation in particular focus in ordinary meaning of the concept. However, we want to include a very important single viewpoint mentioned in some of the interviews - using software component to customise the product.

This development has been started with applying logical circuit solutions. However, in some interviews very ambitious projects were discussed. Projects where traditionally manufactured product had a computer installed inside. In these product areas ability to record usage information, make fault-analysis and control over quantity and quality of production can give significant competitive advantage for manufacturing companies in the future. This way information technology opens new doors for not only to make product's utilization possibilities more diversified, but also to create personalised service concepts to increase customer bonding.

ADAPTIVE MC. Adaptive customisation was emphasised by many of the case companies. In adaptive customisation selling company does not always know what customer wants, but by increasing the modularity of products or services customisation level increases. Company can therefore develop customers' needs fulfilling combinations of product qualities with efficient management of product data and by developing different kinds of product families.

Adaptive mass customisation is based on forward planning and representations of almost all possible combinations of product modules. For example, a designing system can be offered to help designing features of a machine in cooperation with customer (product configuration tools). Product or service itself or it's representation doesn't change that much because inside the product families different alternatives can be varied.

TRANSPARENT MC. Third way to put mass customisation in practice, not that much emphasised so far among the case companies, is based on idea that customers are not bothered with feature definitions and different inquiries. The idea of customisation is based on collecting and analysing customer knowledge through enterprise resource planning (ERP) systems and from different service channels. Collecting and storing customer preferences extensively can yield growth of expertise on customer needs, which can be utilised in next customer service situations. Transparent customisation requires the use of a large and diversified data warehouse, which contains detailed knowledge about customer and customer's product and service needs.

In manufacturing the development has lead to a position where importance of services as a part of business grows. Product and production oriented companies have to acquire knowledge of services production or at least search for partners who has service competencies in their industry. Hence, e-Business provides one way to offer some opportunities in traditional after-sales functions.

COLLABORATIVE MC. Another typical way to Finnish companies to customise products seems to be the collaborative mass customisation. This most challenging, difficult and also expensive way to mass-customise is based on using customer interaction in specifying product or service features. This collaborative model is needed when it is difficult for customer to express product preferences or when product is attached with complicated specifications, which in whole forms the end product. In this case even the seller can't know what customer eventually wants. Collaborative customisation is widely used in many companies, because their operations have started from very customer-oriented perspective, producing customers' defined products, leaving production series short. Customer is satisfied and supplier-company gets a good reference.

However, collaborative customisation can't be carried on forever, at least not for the same customers. This is because almost in all industries productisation occurs. This means that originally customised products can turn to be more standard and be bought as a mass product with a lower cost.

Different mass customisation approaches are needed in the strategic decisions. The company may want to change the emphasis from one "pure" mass customisation strategy to other. From e-Business viewpoint all the transitions may be relevant, for example cosmetic mass customisation strategy can be first used as tool to collect customer knowledge and later on company may choose another strategy to exploit the acquired knowledge.

Companies have to be able to manage these transitions between different mass customisation approaches. Different customisation strategies require different e-Business systems. For example, integrating supply chain can turn it to be more nimble, but might not increase customer value much. Instead, collecting and using customer knowledge can result in new appealing ways to serve customer and new personalised products with greater value for customer. Introducing more sophisticated mass customisation strategies increase potential for customer value, but also require more sophisticated e-Business systems (see figure 3).

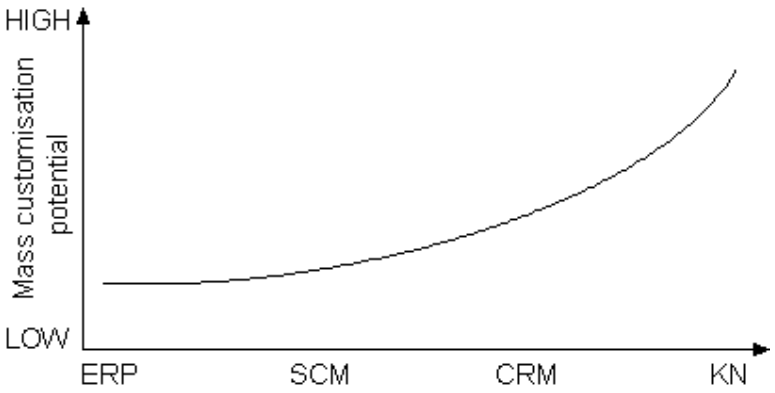

Figure 3: e-Business systems and their influence to potential of mass customisation

4 CONCLUSION

As more and more companies are streamlining their operations to achieve efficiency, significant competitive advantage can't be found from efficiency only, though it is pre-requirement for operations. To achieve competitive edge, companies have to pursuit effectiveness, e.g. added value for company's products and services (Porter 2001). First, company needs to acquire knowledge about customers' preferences and later on use this knowledge to create totally new product innovations, service concepts, and customer experiences. To be able to do this in cost efficient way, companies have to pursue mass customisation strategies.

As e-business systems become part of business-as-usual their role transforms first from a basis of routine transactions towards a challenging opportunity for knowledge-oriented and interactive forum of mass customisation. Organisations need to evaluate their e-business systems to find out more value-added services and customer experiences.

This covers the ERP- "the cornerstone" and fair part of SCM-phase. In CRM- and KN-phases companies are instead offered opportunity for interaction and learning from customers, suppliers and business partners and thereby collecting information and knowledge. It is important to use this acquired knowledge to configure tailored value chain that enables company to offer unique value. In this point standardisation level of e-Business systems is going to diminish and potential for implementation of new mass customisation strategies producing customer value increase (as illustrated in figure 4).

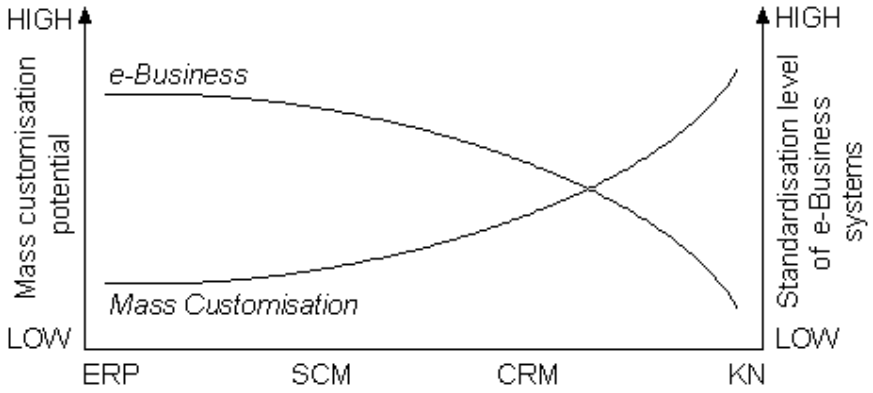

Figure 4: Mass customisation potential and standardization level of e-Business systems

The value of Mass customisation strategy depends for great extent on how much the firm wisely utilizes e-Business (Lee et al. 2000). Important is not the share amount of technology or adapted best practices but how successfully fit between these two business strategies is created. Interesting is also the intersection point, that is, when company perceives that their e-Business infrastructure has developed to stage where opportunity is open up to uniquely excel from competitors with repossession of knowledge. Sharing process and/or product-based knowledge in supply network might lead to new process and product innovations. However, we argue that it is essential to share also customer knowledge to achieve truly effective innovations, which also satisfy customers' needs.

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