

E-Commerce: From Converging 'B2B versus B2C' Segments to Solutions for Different Product Groups

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In this short expose, we will define e-commerce in general, as well as B2B and B2C e-commerce as the two most commonly quoted types of e-commerce activities. We point out to some of the relevant measurement difficulties related to the distinction, and question 'B2B versus B2C' as the most useful distinction of the various e-commerce initiatives and applications to be found. We then continue along the same lines discussing the relevance of differences in B2B and B2C e-commerce systems and technological infrastructures as they are often referred to. Our main conclusion is that due to the increasing convergence of B2B and B2C e-commerce, a more useful top-level categorisation criterion for e-commerce activities would be the nature of the products and services traded. The two suggested main product categories to be differentiated are (1) physical and (2) digital or at least digitizable goods.

The OECD (1999a) adopts the E-commerce definition of "business occurring over open, non-proprietary networks such as Internet". In this context the term 'business' means all activity that generates value both within a firm (internally) and with suppliers and customers (externally). Hence, a monetary transaction is not a required component in such a setting. IDC's concept of e-commerce is a bit narrower as it includes transactions that have been originated over the Internet in terms of information gathering. In the IDC framework, it is not important whether an order is finally placed over the Internet or via phone / fax. Forrester on the other hand requires the final order to be placed over the Internet.

With contrast to those three definitions just mentioned, we apply a rather narrow definition of E-commerce. We call *e-commerce only those transactions that take place over networks*. Economic transactions can be defined as a set of two separate sets of transaction types: a) transaction preparation meaning placing and retrieving information, all communicative activities related to a deal / transaction, and b) transaction completion including logistics and settlement, i.e. transfer of payment to the seller (Verhoest et al 1999). Hence, on the one hand we do not limit e-commerce to the use of the Internet, but on the other hand require a transaction to take place at least partially over a network. Electronic marketing, public relation activities, after sales service (without transaction) are excluded.

Based on the above definition of e-commerce, 'Business-to-Business (B2B)' and 'Business-to-Consumer (B2C) e-commerce' are probably the most widely quoted types of e-commerce, which are currently implemented. B2B e-commerce means that both buyers and sellers are corporate institutions, while B2C e-commerce refers to individual customers buying from corporate vendors. Other types of e-commerce along those lines include 'Consumer-to-Business e-commerce', 'Consumer-to-Consumer e-commerce', and eventually also 'Non-Business e-commerce', 'Intra-business e-commerce', and all kind of activities that involve public institutions when they involve transactions.

Comparing B2B and B2C Electronic Commerce, current scientific literature, market surveys and public press stress the relative importance of B2B e-commerce. According to the OECD (1999a) nearly all sources indicate that B2B dominates the e-commerce market. Commonly found ratios are the frequently quoted '80:20' rule, meaning about 80% of all e-commerce turnover stems from B2B activities. Villet-Philippe (1999, p. 3) even states that B2B e-commerce represents more than 85% of the total electronic market. Experts predict a raise in B2B e-commerce over the Web from US \$ 43 billion in 1998 to US \$ 1.3 trillion in 2003. Beyond absolute numbers, it is also important to look at percentages, i.e. to compare e-commerce figures with total turnover numbers in any given segment. Concerning B2B, predictions speak about an increase from 0.2 percent in 1997 to 9.4 % in 2003 (Anders 1998; Turban et al 2000). Along similar lines, Villet-Philippe (1999 p. 3) analyses that structural changes such as the re-engineering of business sectors are "the most far reaching" in B2B e-commerce. While numbers vary from source to source and from prediction to prediction, the general notion of growing importance of B2B Electronic Commerce both compared to total B2B turnover as well as to B2C Electronic Commerce is well covered in a variety of outlets.

Any such comparisons between B2B and B2C e-commerce are based on a set of numbers, most often rough 'guesstimates', that barely point to the calculation behind them. Sizing B2B e-commerce is fraught with measurement problems due to double counting and differences in methodologies and definitions across studies. Main issues in measuring B2B e-commerce are the need to agree on the definition of B2B e-commerce to be used as well as on the components of the transaction to be included in the measurement. Commonly used figures represent

- Ratio of B2B e-commerce to total B2B transactions,
- Share of B2B e-commerce transactions to total Internet transactions, and
- Relative weight of Internet in conducting B2B transactions.
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Furthermore, most quantitative B2B e-commerce statements have to be qualified by the assessment that most B2B transactions still occur over closed, proprietary networks (OECD 1999b).

Beyond these measurement difficulties, the issue raises whether the distinction in B2B and B2C is the most suitable one as top-level e-commerce categorisation. "On the Internet nobody knows whether you are a consumer or a business customer" (Timmers, 1999, p. 227). As Timmers (1999) says himself, this is certainly not always true, however, the authors would agree with his more general statement that the Internet more than any other medium enables vendors to fulfil the needs of both consumers and business customers in a similar way. Timmers (1999) names the examples of Dell - a company that operates basically identical processes for B2B and B2C sales - and almost all airline ticket auctions. Furthermore, he mentions Multimedica, a German health-site and Bloomberg, whose core online product varies for business customers and consumers, but who then both sell a variety of extra goods such as flowers, clothing or travels in the same way to both customers groups via their website.

Along those lines, it becomes clear that consumer and business markets becoming increasingly similar based on the possibilities offered by an infrastructure such as the Internet (see also Timmers, pp. 229-231). The technological possibilities are - among others - payment and upcoming micro-payment systems, data mining options as well as copyright protection software. It is those technologically driven possibilities that lead to the following: Treating B2B and B2C groups at any specific instance differently is at least as efficient as treating them the same. In economic terms, these information and communication technology (ICT)

advancements allow economies of scale to be outweighed by exploiting additional consumer rent.

Another driver for the vanishing distinction between B2B and B2C e-commerce is the growing overlap between business and private activities. Tele-work at home, small home small office companies and increasing routine shopping from the desk to be delivered to home are just some examples of this trend characterized by an increasing convergence of private and professional life.

Similarly, differences in system requirements are losing importance. Certainly, amounts of turnover and needs of appropriate book-keeping at both ends require or at least suggest differences in B2B versus B2C e-commerce systems: From a B2B customer's point of view the management of buyer information should take place at the buyer's site to integrate with corporate information systems. Hence, a buyer's information needs to be stored in the buyer's server to integrate with back-end systems such as Intranet, Workflow & ERP, while in B2C e-commerce buyer's information is and will be mostly stored in the seller's server. Similarly, B2B e-commerce requires complete bookkeeping procedures, while B2C applications normally can live with limited support for bookkeeping. Furthermore, B2B e-commerce still has a much higher need to secure large amount payments. Electronic check and electronic fund transfer will become popular, for which fees have traditionally been paid by buyers. In B2C e-commerce on the other hand credit card is popular, and relatively high fees are charged to sellers. Currently, in B2B e-commerce security, certification and non-repudiation is more critical and thus leading to increasing registered delivery, which keeps the important transaction record at the third party. With increasing customer expectations and transaction efficiency similar trends are to be expected in B2C commerce.

While we agree on these differences, we would suggest that the demand for meta-mall architectures reducing customers' efforts of visiting many sites will become increasingly relevant for both, B2B and B2C customers. Equally standard shopping bags and digital wallets that can work independently of malls should and will be offered to both customer groups. Behind the scene and the user interface, advanced e-commerce systems will treat also B2C comparison-shopping as multiple criteria decision support. Similarly other functionalities such as displaying dynamic inventory availability to customers, dynamically confirming the precise delivery date at ordering time, or the integration of orders with inventory, production scheduling, and delivery scheduling systems will be applied for both professional and private customers.

B2B e-commerce is characterized by buyers' and sellers' software agents assisting communication to minimize humans' involvement, while in B2C e-commerce humans more interactively involved in buying decisions. Nevertheless, turning e-commerce into a more and more daily procedure and component of private life, we see no reason why not also many B2C agents will jump on the scene and regularly buy various commodities for private people. Definitely, such features could serve as differentiator for gaining market share in any market. At least for products with a high per unit sales price formal contracts with electronic documents that include specific terms and conditions will become necessary also in the B2B segment.

We conclude that due to the increasing convergence of B2B and B2C e-commerce, a more useful top-level categorisation criterion for e-commerce activities would be the nature of the products and services traded.

We would suggest to apply main product categories as main differentiator for e-commerce activities. Due to (a) the difficulties in measuring B2B versus B2C e-commerce, (b) the increasing convergence between the two, and (c) the vanishing differentiation concerning system requirements, we suggest that the distinction cannot hold for very long. Instead we propose to distinguish between e-commerce with physical goods and e-commerce with digital (digitizable) goods as the highest level of differentiation. Due to

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Physical goods require physical delivery in one form or another, while for digital goods the complete transaction cycle can be executed over the Web or any other electronic infrastructure.

We think that the suggested categorisation in e-commerce with physical goods and with digital goods is the most crucial one. Electronic commerce challenges the way of doing business. A major component of the changes under way are the changing distribution processes or channels.

There seems to be broad agreement that some of the most fundamental and far reaching changes have been taking place in fields such as banking, financial services (in general) and travel (see also Villet-Philippe (1999)). While these examples can be counted as belonging to the files of services instead of 'goods', we would prefer to distinguish on the highest level based on product characteristics. It then becomes clear that the most fundamental changes have been taking place in those sectors where the goods and services are digital or can and partially have been digitized.

As we define e-commerce as transaction based activities on a network, the differentiation between e-commerce with physical goods versus e-commerce with digital goods needs to be investigated in the light of transaction components. Certainly, potential efficiency gains for electronic actions during the completion phase are higher for digital goods than for physical ones. Considering the preparation phase, routine based preparations promise higher gains than negotiation based ones.

It becomes obvious that the highest economic potential lies in traditional routine transactions of digital goods. While this may seem to be a small segment, the Web era has led to a tremendous increase in sales volume of digital goods and services. This is partially due to the availability of the global (distribution) infrastructure, and partially caused by the parallel development of a number of new web-based intermediaries that, by definition, buy and sell only over the Web (Verhoest et al 1999, Loebbecke 1999).

Hence, we would like to encourage political bodies to provide the needed legal, institutional, financial and technological environment for both main e-commerce categories to flourish and foster economic development and growth. Regarding the trade of physical goods, concerned major attention needs to be paid to efficient transportation infrastructure settings and logistics requirements. The development of and e-commerce with digital products in many instances demands suitable broadband infrastructures and international alignment of various legal and political rules (Bichler, Loebbecke 2000; Loebbecke 2000).

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