

e-Commerce for Small Businesses

by Simon Grant

Abstract

A large and increasingly important motivation for small businesses is to collaborate with other companies either as business partners, outsourcing providers or in virtual businesses. However, they are often unaware of the potential of electronic commerce, and have unanalysed business systems. Five stages of electronic commerce maturity are distinguished: immaturity; on the Internet; strategy decided; ready to implement; and integrated. To use Internet technology successfully in commerce, the business processes involved must be understood and documented. For this, a new kind of systems analysis is needed, focusing on mutually acceptable information flows across the boundaries of the small business.

1. Introduction

Small businesses are different from large businesses in several ways. They are often young: organisations start small and many are taken over or cease trading before they grow large. Conversely, a company that starts small may often grow large with time. Small firms are often less structured and less formal, with fewer fixed procedures, perhaps because there has not been time to develop them. Fewer fixed procedures, as well as a younger organisation, in turn mean less opportunity to automate and introduce IT. Closely related to this, the smaller the company, the less likely it is to have its own IT department, with resident expertise.

All these factors mean that the environment for the introduction of electronic commerce (e-commerce or e-c) differs substantially from that of a large, established business. A large factor in this difference is the fact that small businesses may not have analysed their business processes or flows of business-related information.

Successful introduction of IT systems in a business has never been free of risk, and many years of history of IT projects has shown that systems development methodology is important. But the introduction of Internet technology into small businesses is not the same as previous generations of IT, and it needs a new approach to systems analysis.

This paper sets out firstly to explain in more detail, and give evidence of, what the specific characteristics of small businesses are, relevant to e-commerce. Building on that is a simple model of the stages through which small businesses pass in order to arrive at a useful e-commerce implementation. This may be compared to previous models of EDI maturity (Whiteley 1998) and other maturity models. At that point, the ground is prepared for a discussion of how to approach systems analysis for small businesses.

2. The current situation of small businesses in e-commerce

2.1 Types of business

Traditionally e-commerce has been divided into business-to-business, business-to-consumer, business-to-administration etc., but this does not do justice to the kinds of business which actually present themselves at introductory courses.

Connect, the Internet Centre for Merseyside Businesses, part of the University of Liverpool, (Charlton et al 1996) has been offering (along with other courses) introductory day-long courses on e-commerce to SMEs in the region since March 1998. (Charlton et al 1998) Many of the businesses attending those courses are new or innovative, and frequently they offer services to other businesses. Because of their nature as providers of specific business

services, several would fit into virtual organisations, (for a definition, see for example the EC publication Accelerating Electronic Commerce in Europe) where a complete business is composed of a number of collaborating independent units. In this sense they are not whole businesses.

Also attending these courses are some more traditional businesses who either fit into the business-to-business model with EDI, or the business-to-consumer model with on-line catalogues and credit card sales.

We can break down the less traditional, newly important approaches to business into three areas:

Small businesses in business partnerships or associations. The more established form of this exists in supply chains that we see, for example, in the food or automotive industries, but new entrants to the field could well be any of the various micro-businesses in the Internet industry.

Outsourcing service providers. There are an increasing range of business services or functions that are being outsourced. This ranges from the traditional professional areas of accountancy and law through to many new Internet services, such as Web site construction and maintenance.

New virtual organisations. Established virtual organisations include franchise operations, where what appears to the customer as a single business (e.g. chain of retail shops) in fact comprises several organisations owned separately. There is plenty of scope for new virtual organisations to be created deliberately, without central premises or traditional employer-employee relationships. It is possible to envisage Internet-based tools playing a role in communication and control similar to that which traditionally comes through a shared office environment and traditional structures of line management.

One can easily imagine that these types of business are likely to grow and multiply greatly, and it is said that small businesses do as well if not better from e-commerce than big ones. (e.g. Schwartz 1997) Therefore there is every reason to expect that the small business sector will remain very important in e-commerce. The challenge is to help that process and to be a part of it.

The issue which is central to the present paper is, what are the characteristics of these businesses specifically in relation to e-commerce?

2.2 Gaps in small business awareness of electronic commerce

Many small business entrepreneurs have not even had much time to browse the Web. If they are doing well, they are quite likely to have the attitude of "if it's not broken don't fix it", in which case they would not be interested in a technology which to them might appear at best unproven. The result of this is that only a few small businesses have yet developed any active involvement in e-commerce.

From 1996 to 1998, Connect offered free basic Web sites Merseyside, funded by the European Union through the ESF and ERDF. Amongst perhaps 25 000 (a rough estimate only) Merseyside small businesses fewer than two thousand took up Connect's free web site offer. Far fewer attended the one-day course in e-c. So one could estimate that only a few hundred at the most are actively interested in e-c. This suggests that the first big challenge for involving small businesses in e-commerce is awareness-raising.

In the case of Connect's introductory e-commerce courses it is the interested SMEs that attend, and following on from the course a series of evening workshops were run, to look at specific topics more closely, while referring to a real-life example case brought by one of the participants. Discussion between, and conversation with these business people has helped in the development of a direct awareness of their needs and characteristics.

Most of the business people at the e-c courses and workshops have progressed beyond the stage of complete ignorance. In some cases the entrepreneur has seen Web sites and has formulated potential business ideas in terms of these sites. Though they often have very interesting and innovative ideas, too frequently they have no idea about how to go about implementing the ideas, or the costs and benefits involved. The ideas may therefore be realistic or not, but in any case they want to know how to do it. This is a more advanced awareness-raising challenge.

Only in businesses which are focused on the Web one may expect a full awareness of e-c potential in a micro-business, and not in the many other kinds of micro-business. This is partly because it is natural for micro-businesses to be specialist, and not to cover the whole range of either their own business needs or those of other companies. It is a mistake to expect them to know everything.

2.3 Lack of current systems analysis in micro-businesses

New businesses tend to start in the head of the entrepreneur. Often the business knowledge, and the business processes, are not formulated or recorded in any manner that has an external representation. This contrasts with the normal situation that larger businesses have developed over time. For very large, hierarchical businesses the obvious, perhaps necessary approach is to codify business procedures in detail. One may compare this to an old-fashioned flow-chart approach to systems analysis. Medium-sized businesses have frequently been the targets of system analysis and development projects, and during the course of these the data stores, flows and processes are often clarified and codified, written down on paper, and following the analysis much of the business knowledge is captured in databases and spreadsheets and presented to the management through software tools allowing graphical or query interfaces. (For discussion and examples of this kind of systems development methodology, see Olle (1991).)

For small and micro-businesses however, this process of codification and formalisation has usually not been done, as they typically have no IT or systems department, and there has usually been no other convincing reason for doing it. If all the information flow necessary in a business is accomplished by means of two people sitting in the same room conversing whenever needed, it is hard to justify a sophisticated IT system which would require this kind of analysis.

3. Stages of maturity in e-commerce

The development of e-commerce systems necessarily involves consideration of other partners or players in the business process, and each of these others may be at different levels, or stages, of what we might call e-commerce readiness or maturity. It is therefore vitally important, at an early stage of the analysis, to be clear about just what stage all the parties are at. This is vital because it so radically affects what systems are feasible to introduce.

Some kind of model of e-commerce maturity for small businesses would therefore be very helpful. Here are some suggestions for levels of this maturity. These ideas are the product of discussion with, and reflection on, small businesses that have attended the e-commerce awareness courses mentioned above, and those that have participated in further workshops or been subjects of consultancy advice. Put between the levels of maturity, there are suggested interventions that would be appropriate to that level, aimed at leading on to the next level.

3.1 Proposed stages

The first maturity stage can be called immaturity.

This is marked by a lack of awareness of e-commerce, and probably a lack of awareness of the potential of the Internet in general.

The first intervention: Basic awareness raising.

The first necessary intervention in this case is to raise the awareness of the business owners towards the potential of the Internet and e-commerce. Thereafter the business needs to be encouraged, and may need to be helped, to get connected and experience the Internet.

The second stage of maturity: On the Internet.

This involves the use of electronic mail, and using the Web for gathering information, looking at competitors' sites, and purposes of that kind. Informally, the stage is referred to as being "on the Internet" as opposed to off it. This may well include a simple web site, whether constructed in-house or externally. At this stage, such a site would typically be an on-line brochure, without any interactivity. The people in the business can be expected at this stage to be familiar with Internet technology as users.

The second intervention: Specific business awareness raising.

The appropriate intervention at this stage is to raise the business awareness further, introducing all the possible models of e-commerce which could reasonably be applied to the business in question. This should lead to the identification of chosen models of e-commerce which the management or owners are interested in investigating. This needs to be allied with a consideration of the costs and benefits, so that the business decision-makers can identify feasible business plans. Professional advisors need to be very clear here in ensuring that their clients have a proper understanding of all the issues involved.

The third stage of maturity: E-commerce provisional strategy decided.

The next level of maturity, possibly short-lived, is to have definite business plans for e-commerce, but not yet be ready to implement them. The obstacles may be many and varied. The time may not be yet ripe for implementation; the technology may be lacking; the costs may be currently too high but expected to fall; there may be a lack of expertise within the business.

The third intervention: Overcoming the obstacles.

At this stage, the general kind of intervention depends partly on the obstacles identified. If there is a lack of expertise in the business, sources of that expertise need to be identified and approached. If, as is likely, the business processes are insufficiently well formulated, this is the appropriate stage for business systems analysis, as introduced above. The provisional e-commerce business plan may make it clear that certain processes and data flows need to be captured or formalised. There is no general answer to which ones need this, because it depends on the business plan.

The fourth stage of maturity: Ready to implement.

The stage which results from this should be that the business is ready for implementation of an e-commerce strategy, with the business plans and expectations clear, with no insurmountable obstacles impeding progress; and having identified any needed partners or professional support.

The fourth intervention: Implementation.

The next step is to implement the plans. In a fast-moving area like e-commerce, it is likely that not everything will be exactly as anticipated, and especially if the business has no track record of e-commerce, there will be a continuing need for supervision and occasional advice from Internet professionals. In some cases, plans will have been hastily implemented without due consideration, and it will be a professional task to put the pieces back together again. This is particularly likely if the earlier stages of awareness were incomplete, and if the business has rushed into e-commerce without being clear about the

details of how to do it properly. The occasional ghastly web site that can be seen is one of the more visible examples of this premature and ill-considered action.

The fifth stage of maturity: Integrated and effective e-commerce.

The fully e-commerce mature business will have information and communication technology, including their Internet use and web sites, properly integrated with their business processes and information flows. In the current climate, where one sees many sub-optimal uses of the Internet, a properly planned and thought-through approach to e-commerce is likely to be profitable, possibly highly.

For convenience, this model will be referred to as the 5+4 model, for five stages of maturity plus four interventions.

3.2 Comparison with other maturity models

This model differs from or extends the models of Poon & Strom (1997), Whiteley (1998) and Burgess & Cooper (1999), in that it focuses on the internal characteristics and readiness of the small business, while considering Internet commerce opportunities.

Poon & Strom (1997), perhaps because of the date of their surveys in 1996, emphasise e-mail as the chief use of the Internet for small businesses. This naturally highlights actual or possible relationships with business partners, and their development model goes through four process stages of: searching for business opportunities; exploring possibilities for collaboration; consolidating project details; and engaging in structured information exchange.

Their model could reasonably be mapped onto the four interventions in the maturity model given here, bearing in mind that the nature of perceived small business opportunities on the Internet has changed, possibly radically, in the last three years, with more emphasis on selling over the Web and proportionately less on EDI and similar structured business-to-business communications. The 5+4 model could therefore be seen as a filling out and updating of their model, including the identification of the states of maturity between the processes of change. It is important to be able to recognise the states of maturity in order to select the appropriate interventions.

Whiteley's (1998) model of EDI maturity could be adapted to Internet commerce, and is relatively general across any size of business. His first stage, discovery, is followed by an introductory stage in which the technology is given a first try. The integration stage is where the EDI processes are linked with other business IT processes, which as he points out often never happens in small businesses because there are no other computerised processes. The next operational stage is taken to be when the processes are extended to perhaps the majority of business partners, which is usually necessary before the business sees substantial economies with EDI. The strategic stage refers to the much suggested gains that can be made through changes in business practices. And finally the innovative stage is when new products or services are enabled.

Whiteley's introductory stage approximately corresponds with the second stage here, "on the Internet", though there are many more gains from being on the Internet than there are from an introductory trial of EDI. Whiteley's integration and operational stages are not strictly required in Internet commerce, as a stand-alone system can be successful. The 5+4 model thus brings out in more detail some of the stages required for small business e-commerce.

Burgess & Cooper's (1999) "Internet Commerce Adoption Model" does not attempt to deal with the internal processes or characteristics of the businesses at all. Instead, it divides up the potential uses of Web sites into three general categories: promotion, provision, and processing. While this is useful for giving an indication of the comparative functionality of web-based e-commerce sites, it does not address the important issue of how to help small

businesses develop successful e-commerce strategies, through recognising the maturity of the company looked at from inside. The 5+4 model does this.

4. New approaches to systems analysis and e-commerce support

4.1 Readyng a small business for e-commerce

Current definitions of e-commerce generally agree that it involves the use of the Internet, or other communication network, for business-related information flow and processes. In order for the relevant information to be communicated electronically, it must be codified, recorded and stored. Thus a necessary prerequisite for a small business to engage in e-c is for them to have codified whatever information they intend to use.

This e-commerce information must be codified in one way or another, and if were to prove impossible to capture the existing business process, the only alternative would be replace it by some standardised or better-known process. But if it is replaced there is the danger of introducing an alien business process which is not properly integrated with other native processes. Thus the first option of choice should be to analyse at least the current business processes that involve communication with other players in the business.

For example, for customer relationships to be undertaken on the Web, the knowledge which may have been entirely in the heads of the sales staff needs to be captured, put in a database, and interfaced with Web software. One may think of different examples involving accounts, stock records, or indeed a wide variety of processes which are not entirely internal to the business.

In contrast, the analysis of information flows which are entirely within the business is concern of traditional systems analysis, and need not necessarily feature in an e-commerce systems analysis. However, common sense would suggest that, if possible, the two should be considered together.

4.2 Systems analysis techniques

Established methods of systems analysis are probably not entirely appropriate for this task. Although structured techniques (e.g. Crinnion (1991)) do represent external sources and sinks of information, they are geared for situations where there is important structure within the business, and less emphasis is placed on inter-business communication flows across organisational boundaries. In contrast, a systems analysis technique suited to small business involvement with the Internet needs to recognise that much of what is going to be usefully analysed is not within the control of the business under analysis; and thus that the control and management of the business processes, along with the technology to aid those processes, can only be introduced with the consent of all the partners participating in that business process.

4.3 Suggested systems analysis methodology for small businesses
With these considerations in mind, we can start to sketch some of the methodology for small business Internet commerce systems development. Stages in a plausible method might include some of the following very general points.

Analysis of business information flows across the organisational boundary, and of the business processes that involve collaborating partners (cf (Huemer, 1999)). Assessment of feasible communications options for these flows. This involves finding out what kinds of communication (electronic or otherwise) are acceptable to business partners, or what they can be persuaded to take on. A straightforward case is whether or not supply chain trading partners do, or are willing, to use EDI. Where business partners already use the Internet, the options are broader and easier.

Redesign of business processes and information flows with consultation of and agreement between partners. The feasibility of this will depend largely on the other partners, and this is a feature of major importance which differs from earlier approaches to systems analysis.

Analysis and design of internal information systems within the context of the external information and business process environment (or context). In many cases, with micro-businesses, there may be no need for any internal IT information systems beyond those required for e-commerce. In other businesses internal IT may help the internal control of processes that are the responsibility of the single business.

Particularly in cases where the ICT is new to any of the partners, iterative prototyping would be helpful, partly as education, partly as a testing of the communication channels. It may be possible at this stage to help business partners to a higher level of e-commerce readiness and maturity, but this obviously cannot be relied on because it cannot be directly controlled.

Implementation should bear in mind the environment of the partners and the likely or possible changes in their e-commerce maturity. The point here is that with less control over the information environment, there needs to be more caution and circumspection than would need to be the case for internal IT projects.

4.4 Requirements of the Internet systems analyst and designer

All the considerations above lead to the highlighting of certain requirements for professionals to be effective as e-commerce advisors and e-commerce systems analysts for small businesses. The advisor's basic business analysis awareness could come from a background in systems analysis for larger enterprises, but this needs to be tempered with a clear understanding of the peculiarities of smaller businesses, which systems analysts have traditionally seen little of.

One of the skills needed by an advice team will be negotiation and persuasion. With so much of the information system out of the direct control of the client, it is not just a case of having the client's commitment: one also needs the active participation of the other business partners or similar players in the virtual organisation.

Another necessary skill will be either vision and creativity, or the ability to recognise and manage it well. With the global marketplace offered in principle by the Internet, businesses will be needing to find their particular market niche in ways that they might not have done before. With virtually unlimited scope for product differentiation and innovation, standard e-commerce solutions could appear less attractive, as they are no longer likely to give competitive advantage. Something has to be new, different or unique, and that is increasingly challenging in a global marketplace.

5. Conclusions

The small business sector offers particular challenges for e-commerce, as well as great potential. New e-commerce ventures involving small businesses are likely to transcend traditional organisational boundaries, and it is important to distinguish the e-commerce maturity levels of all the players. It is most useful to do this in a way that clarifies the interventions necessary to develop that maturity. Further work could be done bring more detail to this model of maturity, for example by identifying likely barriers to e-commerce readiness and implementation in small businesses, and the most promising ways to overcome these barriers. Part of what is needed is a new approach to systems analysis and development which will have an orientation distinct from earlier approaches, and will require a somewhat different set of skills on the part of professionals engaged in the area. It will be interesting to see the emergence, perhaps hand-in-hand, of more method in the development in e-commerce systems, more understanding of small businesses engaged in e-commerce, along with their partners in virtual enterprises, and a new breed of professional to take this work forward.

The diffusion and development of e-commerce in small businesses is more complex than just a simple matter of technology, or of skills within the business, or of awareness, and a range of professional and other support may be needed to ensure that there are more "hot cakes" than "dead ducks" (Whiteley 1999).

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The author would be happy to collaborate in developing appropriate methodology, tools and techniques.

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