

Innovative Process in E-Commerce Fashion Supply Chains

Margaret Bruce and Lucy Daly

Abstract Fashion is price sensitive and runs on tight margins. Consumers expect high quality fashion at competitive prices, and in a recession falling prices and demand are particularly acute. This presents challenges for the supply chain. The sector is driven by cost and the need to manage the supply chain more effectively to reduce excess stock and risk in product forecasting. Increasing competition from low labour cost countries puts pressure on manufacturers to push down prices and, at the same time, to offer exceptional levels of service. Manufacturers may not wish to compete on the basis of price, and thus must find some other means of differentiation to remain competitive. E-commerce allows companies to improve communications within the supply chain and enhance service offering, thus providing opportunities for competitive differentiation. However, companies may not have the skills to develop e-commerce operations immediately, nor be able to realise revenue stream from investment in this technology and so may be unable to assess fully the risk of investment. Through the presentation of primary research, this chapter addresses the adoption process and the use of e-commerce in the textiles and clothing supply chain.

Keywords E-commerce · supply chain management · adoption of technologies · textiles and apparel supply chains

1 Key Drivers Affecting Change

The textiles and apparel industry in the UK is facing tremendous competition and is currently undergoing substantial change, particularly in a recessionary environment. Underlying clothing sales for Christmas 2008 were an estimated 6–9% lower

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than that for 2007 (The Observer 28.12.08). Consumers are reluctant to spend on discretionary items, and when they do, they expect fashion, quality and low cost items. The reduction in sales and the expectation of customers to pay less for a comparable quality resulted in one-day flash sales in the run-up to Christmas 2008, with discounts of up to 20% (The Observer 04.01.09). However, these figures did little to quell the effects of the economic environment, with reported third quarter sales down at least 5.5% on previous years (The Observer 04.01.09).

The Western textiles and apparel manufacturing industry can no longer compete on price alone, and thus is facing tough competition from low labour cost countries (Jones 2002). On 1 January 2005, the Agreement on Textiles and Clothing (ATC) was terminated. Consequently, world trade of textile and apparel products is no longer governed by quotas, but is instead governed by the rules and disciplines within the multilateral trading system (WTO.org, 01.06.2009). The impact of this is an increase of imports from countries with low labour costs. At the same time, the speed of replenishment is important in some areas to satisfy customer demand, thus making “countries with proximity more competitive for those goods where replenishment is important and these economic factors will intensify” (Abernathy et al. 2004). Therefore, there are two drivers underpinning sourcing decisions: cost and location. This is true for the US and the UK, where the general trend of a steady decline of indigenous production of textiles and apparel is ongoing (Abernathy et al. 2004)

The apparel manufacturing industry in the UK is also highly fragmented (Da Silva et al. 2000). There are a small number of large companies, and it is these companies that tend to be the main UK suppliers to the major retailers in the country, such as Marks and Spencer PLC, and the other high street stores. However, the majority of companies are small (Stengg 2001).

Notably, small firms often have limited manpower, time, expertise within the organisation and financial resources (Burns 1996; Bridge et al. 1998). This has an impact on the firm’s ability to invest in new technologies such as e-commerce. Often the skills are not available in-house, increasing the cost implications and perceived risk. Typically, learning new skills is carried out ‘on-the-job’. This has implications for adopting innovation in the management of the supply chain, as in-house skills and expertise may not be readily available and may need to be outsourced.

Apparel manufacturing is labour intensive, and the UK and the US has a high wage rate compared to many less developed countries. Many brands and retailers in both countries have increased overseas sourcing, thus resulting in a reduction of domestic production (Textiles and Apparel Strategy Group 2000). This raises the issue of how indigenous companies, and in particular the small and medium enterprises (SMEs), obtain competitive differentiation, as they are unable to compete on price. The industry has a number of characteristics, namely short product lifecycles, high volatility of demand, low predictability and high incidences of impulse purchase (Christopher and Peck 1998). These factors result in difficulties in forecasting demand, and the need for a constantly changing product portfolio places further pressures on the textiles and apparel supply chain.

Table 1 Market size and forecast of online retail sales of clothing and footwear, 2003–2008 (Source: Mintel 2008b)

	Online retail sales of clothing and footwear		Change year-on-year	At 2003 prices ^a	
	£m	Index	%	£m	Index
2003	1,089	100	20.1	1,089	100
2004	1,519	140	39.5	1,563	144
2005	1,691	155	11.3	1,780	163
2006	2,037	187	20.4	2,174	200
2007	2,377	218	16.7	2,556	235
2008 (est)	3,002	276	26.3	3,259	299

^aCalculated using Mintel’s clothing deflator

The UK and US high street clothing retail sectors have also seen increasing levels of competition, not only from overseas with new entrants, such as Zara and Mango with their efficient supply chains, rapid stock turnover and increasing numbers of seasons – the ‘fast fashion’, but also from the growth of supermarket fashion from traditional food retailers, such as Asda Wal-Mart and Tesco. Such companies have developed highly successful clothing ranges: Asda Wal-Mart with George, Tesco with Florence and Fred and Sainsburys with Tu. This has further increased competition and also redefined how consumers shop for fashion, with time-starved customers able to purchase cheap fashionable clothing as part of their weekly food shop, rather than visiting the high street specifically for clothes. Again, this is changing the dynamics of the sector as a whole, as there is an increasing emphasis on quick replenishment and rapid turnover of stock. Zara is a specialist fashion chain and an important example of a fast fashion retailer, with rapid stock turnaround and vertical integration. Indeed, Zara is credited with being a leader in fast fashion (The Economist 2005; Strategic Direction 2005; Foroohar and Stabe 2005). However, contributing to Zara’s success is its focus on a limited range, basic shapes and small sizes, so that it deals with a rather narrow product range.

Simultaneously, online fashion retailing has continued to grow steadily, as indicated in Table 1. It is predicted that online retailing could account for between 10 and 15% of clothing sales in the coming years (Mintel 2008a). In real terms, the market trebled in size between 2003 and 2008 (Mintel 2008b). Table 2 indicates that this growth will continue in future years.

It is expected that the online fashion market will be worth £6.8 billion by 2013 (Mintel 2008b).

2 The Textiles and Apparel Supply Chain

Fashion and textiles is a volatile industry, and getting the right product in the right place at the right time can be difficult to achieve (Ferne 1999). Response times in the textiles and clothing supply chain can be lengthy, resulting in the distributor

Table 2 Market size and forecast of online retail sales of clothing and footwear, 2003–2013 (Source: Mintel 2008b)

	Current Prices			At 2008 prices		Year-on-year
	£m	%	Index	£m	Index	%
2003	1,089		36	1,002	33	
2004	1,519	39.5	51	1,439	48	43.5
2005	1,691	11.3	56	1,639	55	13.9
2006	2,037	20.5	68	2,000	67	22.0
2007	2,377	16.7	79	2,353	78	17.6
2008 (est)	3,002	26.3	100	3,002	100	27.6
2009 (proj)	3,695	23.1	123	3,732	124	24.3
2010 (proj)	4,507	22.0	150	4,642	155	24.4
2011 (proj)	5,309	17.8	177	5,524	184	19.0
2012 (proj)	6,154	15.9	205	6,480	216	17.3
2013 (proj)	6,844	11.2	228	7,207	240	11.2

ordering up to 8 months in advance of when the goods are required in store (Forza and Vinelli 1997). Longer supply chains require more ‘pushing’ of merchandise and result in less accurate forecasts. This can lead to excess inventory, increased discounting and consumer dissatisfaction (Mattila et al. 2002). It is estimated that 33% of merchandise is sold at mark-down prices, and that only one in three customers are able to find the right product in stock (Fisher et al. 2000, cited in Mattila et al. 2002).

Fast fashion has the objective of getting clothing into store within the shortest time possible. This has resulted in an increasing number of ‘seasons’, and shipping times from suppliers must be taken into consideration (Mintel 2008a). Distance is key—goods from China can have a shipping time of 22 days, compared to five days from Turkey (The Financial Times, August 30, 2005). Retailers are switching production for replenishment to countries that are close to the market and have good infrastructure to move goods. And so, Eastern Europe, Turkey and India are benefiting in response to competition from fast fashion specialists, such as Zara, who are able to push the latest trends quickly by sourcing closer to home (The Financial Times, August 30, 2005). Some high street retailers are sourcing and buying on a weekly basis to introduce new fashionable items and to replenish stock.

Changes to fashion sale patterns in the UK and the US as a result of increased competition and changes in consumer purchasing behaviour have meant that retailers are now buying in smaller quantities. Sourcing has become more systematic with a greater emphasis placed on supplier involvement (Jackson and Shaw 2001). Because of competitive forces and reducing fashion cycles, retailers have been forced to develop strategies, enabling them to control the supply chain more closely, thus allowing them to source quality products at competitive prices (Bruce and Moger 1999).

The UK and the US industries need to concentrate on quick response methods to counteract the threat of the increasing number of imports and levels of

overseas sourcing (Bhamra et al. 1998; Abernathy et al. 2004). This includes ensuring accurate response to overcome industry characteristics, such as short product lifecycles, high volatility, low predictability and high impulse purchase (Chandra and Kumar 2000). These include flexible delivery through domestic sourcing, reduced levels of stock and increased net margins. In addition, there is an increased opportunity for improved innovation, quality and style. There is a growth in 'local' manufacturers in lower cost European countries such as Romania and Slovakia. By sourcing from lower cost countries in Europe, rather than countries further afield such as Asia, companies are able to realise shorter lead times, while still benefiting from lower costs. This, then, raises the issue of how the UK and the US indigenous companies can enhance their offering in order to obtain a competitive differentiation.

Information and Communication Technology (ICT) plays an important role in such activities by facilitating efficient ordering and tracking of goods within the supply chain, particularly when the supply chain is operating on a global basis. Many retailers are now using ICT to gain improved control over product development and supply chain processes (Jackson and Shaw 2001).

2.1 E-Commerce in the Textiles Supply Chain

Research has shown that through e-commerce, businesses are able to use the Internet to reduce costs associated with purchasing, to manage supplier relationships, to streamline logistics and inventory, to plan production and to reach customers in a more effective manner (Margherio et al. 1999) and to develop strategic advantage and successful implementation of business re-engineering (Strempek and Alexander 2000).

Hines (2001) argues that the 'e-revolution' is transforming how interaction occurs in business-to-business markets. This change has occurred not only because of technological advances, but also because of factors such as globalisation, organisational restructuring, information and communication technologies, increased focus on differentiation over cost-cutting and rise in consumerism. However, in contrast, Van Hoek (2001) argues that, in reality, e-business is still largely focussed on sales and marketing, rather than becoming an integral business model for transactions and operations management. Building on from this, Murphy and Bruce (2001) suggest that many companies entering into e-commerce activity do so purely so as not to be left behind by competitors and with little regard to strategy and return on investment. They fail to consider their target customer, and whether their web offering is targeting this group, attracting a new customer and, perhaps most importantly, what value the site offers to either group. This raises the question of to what extent are companies in the textiles and clothing supply chain taking advantage of e-commerce technologies.

E-commerce, and its predecessor EDI, has had a considerable impact on the transference of product requirement information through the supply chain. The

textiles and apparel supply chain is becoming increasingly global, as retailers transfer sourcing to low labour cost overseas suppliers in a bid to meet consumers' value for money requirements and increase profit margins. E-commerce technologies have the potential to considerably ease problems of communicating worldwide across time zones and enable immediate transfer of information between companies.

Characteristics of the textiles and apparel industry include short product lifecycles, demand volatility, difficulties in forecasting and impulse purchasing (Christopher and Peck 1998), and so make the issue of information distortion in the sector a particular problem. E-commerce may have an impact on the accuracy and speed of information flow. It allows companies to share information within the supply chain and provides customers with the ability to input order data and check the status of this.

Given the large proportion of SMEs in the sector, it is important to also consider SME use of e-commerce. Chapman et al. (2000) suggest that internet applications provide an opportunity for small firms to improve competitiveness. SMEs tend to use the Internet as a communication medium, and websites often provide information about the company and its products and services in order to increase awareness rather than to conduct business (Elsammani and Scown 2000). E-commerce holds benefits for smaller suppliers as well, as it allows them to collaborate with other small manufacturers, or even to work together with a large manufacturer, who can help with aspects such as warehousing (Loughlin 1999).

2.2 *Adoption of E-Commerce Technologies*

Thus, research indicates some of the salient benefits of using e-commerce in the textiles and apparel sector. So, what is the process of adopting this technology by companies in the sector and what are the challenges? Pires and Aisbett (2003) suggest that investment decisions about e-commerce must be considered in conjunction with internal, competitor and market analysis, and that e-commerce adoption may also require the adoption of new business strategies. Power (2002) also notes that websites tend to be used to establish a presence and providing information on the company, products and general PR, rather than as a transactional tool.

From the e-commerce adoption literature, the adoption process is presented as a stage process and different stages are presented by different researchers. Pires and Aisbett (2003) suggest that these move from basic use of communication technology through to the realm of business transactions. Work by Ellis-Chadwick et al. (2002) focusses on stages of e-commerce amongst retailers and suggests that the following stages apply:

- *Communication platform*: providing generally available information (financial, store location, mission statement and terms of customer service).
- *Electronic shop*: the retailer offers their offline shop online.

<i>Critical success factor</i>	<i>Phase</i>
Commitment	Start-up
Content	Start-up
Price sensitivity	Start-up
Convenience	Start-up
Control	Growth/start-up
Interaction	Growth/start-up
Brand image	Growth/start-up
Community	Growth
Partnership	Maturity
Process improvement	Maturity
Integration	Maturity

Fig. 1 Critical success factors by phase of development (adapted from Jeffcoate et al. 2002)

- *Trading community*: the development of portals that are inward looking (linking together the various companies under a single holding group) or outward looking (linking together companies outside the holding group).

Also, Jeffcoate et al. (2002) identify key stages in the adoption process. They suggest that three phases in the development of an e-commerce business can be found, namely start-up, growth and high volume business/maturity. And that they tend to move from an informational website to a transactional (i.e. cost effective selling) during these phases. They also identify a number of critical success factors for e-commerce, and argue that these become applicable during the different phases (Fig. 1). This approach raises the question of whether these issues apply in this sequence to the textiles and apparel sector, or whether certain phases such as brand image and partnership will apply earlier. For example, SMEs are restricted by a lack of in-house skills and may have to outsource or develop partnerships in order to move into e-commerce.

Again, it is important also to consider SME adoption of e-commerce, given the large proportion of SMEs in the UK textiles and apparel sector. Walczuch et al. 2000) identify uses of e-commerce by SMEs and also the frequency by which they are used (Fig. 2). Again this suggests activities that a firm starts with and indicates a progression to other activities. It also indicates that uses of e-commerce are far broader than merely launching a promotional website.

SME adoption of the Internet can be restricted by a number of factors, especially a lack of understanding of the opportunities available to small business, a lack of understanding on how to implement these techniques, a lack of skills amongst the workforce to use them, price of technology and a lack of willingness to dedicate the time and resources to resolve this paucity of understanding and skills (Chapman et al. 2000). One aspect of the adoption process is that it allows knowledge and insight to be gained to maximise the return from this investment at a later stage in

	<i>Percentage of companies</i>
E-mail address	97
To provide rational information	90
To promote company and/or products	86
To order	31
Customer service	21
To search for suppliers	10
To pay	7
Built-in security	7
To offer job vacancies	3
Information for personnel (intranet)	0
<i>Extranet</i>	<i>0</i>

Fig. 2 Website applications (Source: Walczuch et al. 2000)

the process. However, recent research by Ashworth et al. (2006) shows that smaller retailers can make revenue at the outset from their investment in e-commerce, if planned and managed effectively. They are critical of the stage models that tend to pass mechanically from information to transactional sites and which indicate that revenue gains can only be made at the later stages of adoption. From Ashworth et al.'s research, they found that successful e-tailers operated a transactional site at the outset. 'Web-weaving' is an approach they have identified as typical of successful e-tailers. These have evolved through a successive activity of venturing, learning and developing the business and have found a 'strategic fit' with their offerings and the market and continually evolved their businesses to meet new opportunities, adding value, for example through new services like fitting guides online, personal shopper, etc. In this way, they have benefited from cost savings and spreading expenditure to 'fast track' profits, and have generated revenue from the outset.

3 Adoption and Use of E-Commerce in the Fashion Supply Chain

To gain insight into the adoption process and utilisation of e-commerce in fashion supply chain, research was conducted with the US and the UK textiles and apparel companies at all stages in the supply chain. The sample selection included both large international corporations and SMEs to provide a greater breadth across the sector. Research was conducted through face-to-face, open-ended and semi-structured interviews with key personnel involved in the e-commerce operations of the company, and a set of constructs of themes were developed and some comparisons made,

<i>Attribute</i>	<i>UK</i>	<i>US</i>
<i>Benefits</i>	<ul style="list-style-type: none"> • Cost reduction • Expansion of customer base 	<ul style="list-style-type: none"> • Ease of access • Cost reduction • Expansion of customer base
<i>Challenges</i>	<ul style="list-style-type: none"> • Lack of skills in-house requiring outsourcing • Changes to the customer base • Lack of information available • Lack of funds • Challenging existing work practices and attitudes 	<ul style="list-style-type: none"> • Lack of information available to show successes and failures • High levels of risk • Channel conflict • Challenging existing work practices and attitudes
<i>Development</i>	<ul style="list-style-type: none"> • Important to take a gradual well managed approach 	<ul style="list-style-type: none"> • Important to take a gradual well managed approach
<i>Supply chain</i>	<ul style="list-style-type: none"> • Not concerned with channel conflict generally • Facilitates overseas communication within the chain • Not strategic in approach to e-commerce 	<ul style="list-style-type: none"> • Channel conflict a major concern • Facilitates overseas communication within the chain • Strategic in approach to e-commerce
<i>Supply chain relationships</i>	<ul style="list-style-type: none"> • No partnering for e-commerce ventures • Companies felt e-commerce benefited relationship • Customers felt e-commerce did not affect the relationship • Important not to lose personal contact with customers 	<ul style="list-style-type: none"> • Partnerships to develop e-commerce ventures considered important • Important to consider impact of e-commerce on existing relationships – e-commerce may not benefit the relationship

Fig. 3 Comparison between the UK and the US companies

as shown in Fig. 3. The results from this research were then used to develop a process of e-commerce adoption for the sector.

The US research was conducted with eight companies, and companies involved in the US study showed varied experience of e-commerce. Some companies were technology providers with considerable knowledge of the possibilities of e-commerce, and others were large organisations at various stages of e-commerce integration. UK research was carried out with five small companies in the textile and clothing industry. Companies involved in the UK study were all at different stages of

e-commerce use, with one company very new to e-commerce and one company with considerable experience. Themes from the US and the UK studies are compared as shown in Fig. 3.

3.1 *Costs and Benefits*

US companies involved in the study noted that e-commerce provided organisational benefits, including ease of access to technology, cost reduction and expansion of the customer base. Companies were operating within a global supply chain with many sourcing product from low labour cost countries, and e-commerce was deemed to be simpler than its predecessor EDI to implement in companies operating in less developed countries, due to its lower cost. UK companies in the study also noted cost reduction as a benefit, as it facilitated cost savings in promotional activities. However, ease of access and use was not a benefit recognised by the majority of the UK companies, as due to the size they did not have the skills in-house to develop and manage e-commerce operations, and thus had to outsource the activity. Further benefits noted by the UK companies included the ability to expand the customer base, although this then had implications of meeting demand and delivery, particularly with overseas requests.

A major concern of the US companies was the lack information available for a company moving into e-commerce. A common view was that information of past successes, failures and experiences of other organisations would be a useful aid for a company developing an e-commerce operation. This was echoed to some extent by the UK companies, although the information they required was with regards to where to source skills when outsourcing, as many were not in the position to carry out the activity in-house.

We'd outsource it, we don't have the skills. We wouldn't employ someone at this stage because we're more comfortable with outsourcing because they're contracted to do a specific task so, meta-tagging, things like that, they will be updated to the search engine and all the rest of it would be done on either a monthly or weekly basis, by someone who's contracted to do it.

(Small UK soft furnishings manufacturer)

Both the UK and the US companies, particularly those operating within manufacturing and retailing sectors, noted that it was important to take a gradual approach to e-commerce and to develop operations as skills and confidence increased within the organisation. For example, many companies regarded that an organisation should not develop a fully transactional site before the company was in a position to be able to respond to the number of orders that may arise, and ensure that they had addressed issues such as delivery and fulfilment.

You used to hear a lot about first mover advantage. I think it is less pertinent, I believe it is less important to be absolutely first, it is more important to do it correctly. We're taking a little bit more time I would say to do it correctly.

(Large US based international clothing brand)

UK companies noted that global reach was a major consideration with the introduction of e-commerce, and as a result of their internet presence had seen a considerable increase in interest from potential overseas customers. This was not the case with the US companies in the study. However, the US companies were all large, established organisations currently operating on a global level, while the UK companies were all SMEs, which often only have a localised customer base.

3.2 Challenges

The issue of customer base was a critical one for the US companies involved in the study. Manufacturers strongly believed that an e-commerce operation did not mean that they would then be able to sell directly to the end consumer, as this would result in channel conflict occurring between themselves and their current customer base of retailers. This was less of an issue to the UK companies involved in the study, and one company made deliberate moves to sell to its original customer base of retailers and also to a new target market consisting of the end retailer. This was justified by the fact that the company would be able to achieve greater profit margins when selling directly to the end consumer. It is possible that the reduced concern regarding channel conflict amongst SMEs was due to less advanced marketing skills, and their location in the supply chain, as small manufacturers. The large US organisations all had strong brand equities to protect, and did not want these damaging by any online activity. The UK SMEs in the study did not show concern regarding their existing brand and saw e-commerce as a move to target more customers.

Both the US and the UK companies stated that e-commerce functions such as e-mail, intranets and extranets were particularly beneficial when communicating with customers and suppliers overseas. However, the US companies were much more advanced in their use of e-commerce systems than the UK companies. The US companies were using systems that allowed them to electronically transfer design work and order information through extranets with the supply chain.

“You’re going to see suppliers becoming part of your design team.”

(US not for profit research and education consortium)

In comparison, many UK companies were using methods such as e-mail to communicate. This was as a result of the fact that they were much less advanced in their e-commerce activities and had not developed to the stage where they were implementing complex systems. The UK companies were at earlier stages of the e-commerce adoption and process and also had fewer resources to invest in e-commerce technologies.

The US companies all noted that business-to-business e-commerce was an area where they expected to see the greatest benefits for the organisation, and were actively considering ways in which they would be able to capitalise on this.

There's our public website which is there to build brand presence and to drive business to our existing channels and that seems to be a pretty common trend over here... we focussed on business to business. We really have two major initiatives going. One is around customer relationships management which was the driving force for our extranet application. What we wanted to do is give our customers the same information that our internal customer service reps have...

(US based sportswear brand)

However, the UK companies were much less strategic in their approach and were developing websites to target customers, but had not evaluated ways in which they could utilise e-commerce operations for the greatest benefit for the organisation. Only one UK company had actively developed systems which would enhance its service offering within the supply chain by providing customers with access to account information, thus benefiting from reduced administrative work.

Majority of the UK companies involved in the study had not developed fully transactional websites. However, the view was taken amongst these companies that, even if they were to sell online, it was important to still keep some form of direct contact with customers, and not to become so completely e-commerce enabled that it is not possible for the customer to contact the organisation to speak with someone directly. US companies did not demonstrate this view.

We have e-mail, online ordering, dedicated account ordering, we have a facility where our customers can log onto a secure portal on our server and buy, account information, print copy, invoices, statements, that sort of thing. They are the facilities that we offer currently.

(Small UK based workwear manufacturer)

4 Discussion

There is a wealth of e-commerce literature discussing the benefits to companies of the use of various e-commerce technologies. However, a key outcome of this study is that in reality companies are not leveraging fully the technology, suggesting that much of e-commerce literature takes a blue-sky approach to e-commerce technology, rather than documenting how e-commerce is being used in an industry. The purpose of this study is to document how e-commerce as a technology is actually being taken up and utilised in the textiles and clothing supply chain. This study has identified that, despite the widely cited benefits of e-commerce, there is a considerable and notable degree of cautiousness in the uptake of e-commerce technologies, amongst companies of all sizes, as opposed to much of the e-commerce literature, which does not take into account actual e-commerce uptake from a practical point of view.

This study has indicated that the uses and benefits of e-commerce, such as order tracking and streamlining of logistics, that are widely cited in the literature are not an immediate reality for companies developing an e-commerce activity. A key issue for all the companies involved in the study was the need to ensure that any e-commerce development was carried out at a rate that the company could sustain. It is essential

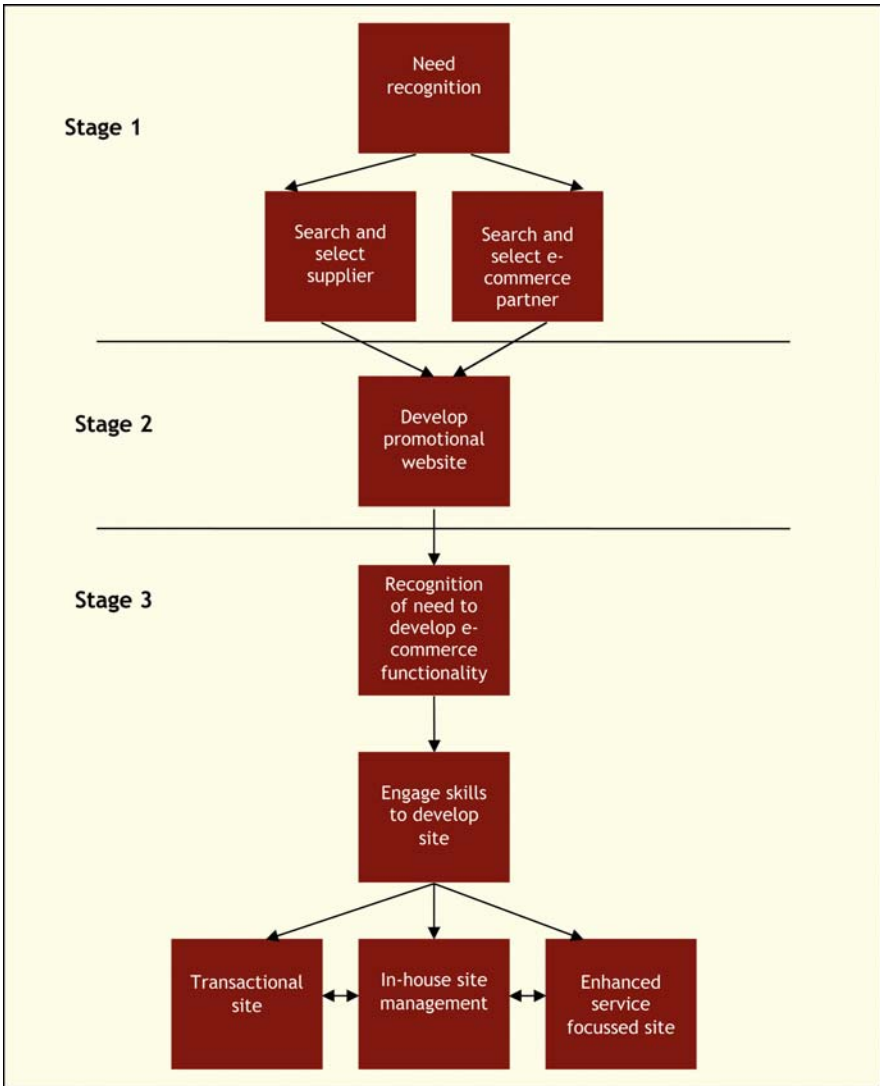


Fig. 4 Stage approach to e-commerce adoption in the textiles and apparel sector

that companies developing e-commerce functions do so at a rate that is appropriate to the skills within the organisation. This is echoed by Ashworth et al. (2006).

From the research reported here, it was apparent that a stage process could be identified for the adoption of e-commerce in the fashion supply chain. And that this did correspond to the stages presented by Jeffcote et al. (2002). Figure 4 presents the stage approach of e-commerce adoption that has been developed as an outcome of this study.

Figure 4 illustrates the process that companies follow when developing e-commerce functions. The speed at which companies move through the process will depend on the capabilities within the organisation, and so a company with skills in-house at the beginning of the process will move through stages at a faster rate than a company with no experience of e-commerce. All companies will begin the process by recognising a need to develop an e-commerce function of some sort. This is likely to occur as a result of competitor analysis or a desire to offer customers potential customers with improved ways of accessing company information. However, after need recognition, companies will take one of the two routes – either source a supplier, as in the case of many UK based SMEs, or identify an e-commerce partner, as in the cases of some of the large US corporations. Both routes provide e-commerce expertise for the company.

The company then enters stage two of the process model, which is development of a promotional website. It is highly likely that a company will develop an informational website when initially moving in to e-commerce.

Companies then move on to stage 3, which is the recognition of the need to develop e-commerce, facilities from a promotional site to an interactive site. Again, the length of time elapsed between stage 2 and stage 3 will depend on company skills and confidence levels. And this is reinforced by Ashworth et al.'s (2006) notion of 'web-weaving'. After need recognition, the company will source the skills to develop e-commerce functions. This level of the model refers to a company outsourcing the development of the stage of e-commerce if they do not have the in-house skills. However, companies with the in-house capability will by-pass this level and move directly to the final level of the model, which echoes the findings of Ashworth et al. This includes developing the in-house capability, which can occur either by training existing staff or recruiting new staff to manage e-commerce operations. This occurs as the need to manage the site in-house increases as a result of increased demand, either training or recruiting. Ashworth et al. (2006) note that accumulated learning occurs that feeds back into the development of the e-commerce activity and so may result in the rapid development of new functions and offerings and expansion into new niche markets.

The final level of stage 3 is to develop the advanced e-commerce capability, and again companies may find that they develop a transactional site allowing companies to purchase goods, or a site offering enhanced services such as tracking of goods and management of inventory. Companies may also decide to offer both facilities, either with or without a time-lapse. This is the stage where companies may use their e-commerce facilities to share information regarding scheduling and planning throughout the chain, and utilise e-commerce technologies to assist in achieving flexible manufacturing for fast fashion.

However, it should be recognised that it is not necessary that companies progress through all stages. In some cases it may be more consistent with company strategy to stop at stage 2 of the model, rather than to always plan to end at stage 3. Not all companies will have the resources in terms of capital and competencies to move to stage 3, and attempting to do so may damage company reputation. Others may plan from the outset to develop a transactional site, and as Ashworth et al have shown, this can enable 'fast track' revenue gain on the investment.

5 Conclusion

With globalisation of the supply chain, companies face complications of communicating across time zones. E-commerce technologies facilitate this, as it enables information to be transferred electronically. However, much of the e-commerce literature presents a blue-sky approach to e-commerce that is not immediately achievable for many companies developing e-commerce operations. This study has identified that, despite the widely cited benefits of e-commerce, there is a notable degree of cautiousness in the uptake of e-commerce technologies, amongst companies of all sizes. More detailed cases of e-commerce take up and utilisation would help to disseminate know-how and give exemplars of success and so could encourage further adoption and utilisation of e-commerce in the sector.

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