RESEARCH

A b s t r a c t
Theories of interorganizational coordination propose that the fit between information processing capabilities (structure, process and technology) and information processing needs (environmental, partnership and task uncertainty) is a strong determinant of IOS performance. Recently, electronic marketplaces have replaced many traditional interorganizational systems (IOS). While traditional IOS models predominately operationalize one-to-one relationships, electronic marketplaces are mainly characterized as one-to-many and many-to-many. Consequently, it is reasonable to question whether the performance of electronic marketplaces can be adequately explained by the fit between information processing needs and information processing capabilities. This paper develops a conceptual model in an effort to explain more adequately the performance of electronic marketplaces. The argument advanced is that performance is dependent on not only the fit between (a) the information processing needs and information processing capabilities, but also between (b) the value added and value demanded, (c) governance and investment, and (d) trust and security based mechanisms constructs. A case study of an electronic marketplace operating in the cotton industry is used to test the applicability of the model.

Keywords: electronic marketplaces, performance, case research

I N T R O D U C T I O N
IT has introduced much operational efficiency into the market system by providing more efficient and less costly coordination mechanisms and consequently lowering transaction costs (Gurbaxani and Whang 1991; Rosenthal et al. 1993). This affects the operations of organizations, and has led to the development of electronic hierarchies and markets. In its broadest sense, ‘an electronic market (hierarchy) is a market (hierarchy) that is implemented using electronic media, such as computers and communications systems’ (Rosenthal et al. 1993). Malone et al. (1987) predicted that information technology would increase the amount of activity coordinated by electronic markets, which could evolve from a non-electronic market or from an electronic hierarchy spanning firm boundaries. Such an evolution from an electronic hierarchy was predicted to involve three stages: (a) separate databases and processes, (b) linked databases and processes, and (c) shared databases and processes. The transformation into a market was additionally characterized as evolving from biased to unbiased in terms of how they operated (Malone et al. 1987). Such an evolution was evident during the 1990s when research such as Hess and Kemerer (1994) and Lee and Clark (1996) noted the increasing number of third-party market makers operating in electronic markets. For the purpose of this paper, such intermediaries are classified as electronic marketplaces.

Researchers have noted that the formation of electronic marketplaces has been declining and that failure rates are high. For instance, Dai and Kauffman (2002) reference a Deloitte research report from 2000 indicating that only about 400 of the 1,500 electronic marketplaces in operation at the time would be likely to succeed over the following four years. It has been argued that a major factor influencing the decline is the difficulty experienced with evaluating the performance of marketplaces (Klueber et al. 2001).

This paper explores the development of a new conceptual model for assessing the performance of an electronic marketplace. The following section examines the various definitions of electronic markets and electronic marketplaces and notes the lack of an agreed understanding of such terms emanating from the different type of electronic networks in operation today. Using the work of Dai and Kauffman (2002) and Soh and Markus (2002) a multi-construct definition of electronic marketplaces is derived for use in
this study. The next section develops a model of electronic marketplace performance drawing on research in interorganizational systems, electronic markets and strategic management. In developing the Malone et al. (1987) argument regarding the evolution of electronic markets from electronic hierarchies, the Bensaou and Venkatraman (1992) model of IOS performance is evolved to take into account the difference between IOS and electronic marketplaces documented by Reimer (1996), Bakos and Nault (1997), Bakos (1998), Timmers (1999), Senn (2000) and Dai and Kauffman (2002). A case study of an electronic marketplace operating in the cotton industry is then presented as a method of assessing the degree of empirical support for the derived model. The paper concludes that the primary data supports the constructs presented in the model, but that more research is required.

TOWARDS A DEFINITION OF ELECTRONIC MARKETPLACES

The evolution and interchangeable use of the terms ‘electronic market’ and ‘electronic marketplace’ is notable in the literature. McCoy and Sarhan (1998) propose that an electronic market ‘separates the negotiating function from the physical transfer of the product or commodity in which the market operates. It can manage buyers’ and sellers’ offers and bids, as well as moving products directly from sellers to buyers’. Bakos (1991) defines an electronic marketplace as ‘an interorganisational information system that allows the participating buyers and sellers to exchange information about products offerings’. He differentiates this systems view from Malone et al.’s (1987) concept of an electronic market noting that the market concept includes the governance issue. Bakos later proposes a wider range of functions in explaining that electronic marketplaces support the ‘all-in process of business transactions from initial contacts and negotiation to settlement’ (Bakos 1997). This wider role is made more explicit by the work of Bailey and Bakos (1997) who emphasize the role of intermediaries in electronic markets for aggregating, matching suppliers and customers, providing trust, and providing interorganizational market information. This concept of electronic intermediaries is empirically supported by the work of Kambil and Van Heck (1998) and Kaplan and Sawhney (2000). Nevertheless, a comprehensive definition is illusive. Soh and Markus (2002) build on previous research to operationalize the attributes under five constructs; value proposition, product-market focus, value activities, ownership and market structure. Similarly Dai and Kauffman (2002) classify e-market roles as being basic market functions, management needs and technology adapters. They further present the associated e-market functions using B2B examples to support their argument, as shown in Figure 1.

Table 1 extends the work of Soh and Markus (2002) to expand the concept of electronic marketplace value activities using the e-market roles identified by Dai and Kauffman (2002). The table illustrates that the value activities performed by electronic marketplaces focus on buyer/supplier needs for management support (business process support, supply chain and project management) and technology (standards, integration and outsourcing), in addition to the basic market functions of aggregation, matching and facilitation.

Consequently we can derive an operational definition of electronic marketplaces for use in this study as being:

an organizational intermediary that electronically provides value added communication, brokerage and integration services to buyers and sellers of direct and/or indirect products and/or services in specific horizontal or vertical markets by supporting basic market functions, meeting management needs for information and process support, and/or operating the required IS/IT infrastructure.

![Diagram](attachment://image.png)

**Figure 1.** Dai and Kauffman (2002) analysis framework
ELECTRONIC MARKETPLACE PERFORMANCE

A universally accepted definition of electronic marketplace performance does not appear in the literature. When researchers refer to the success of electronic marketplaces, factors such as revenue growth, profitability, improved efficiency and improved customer relationships are inherent in many definitions (Dai and Kauffman 2002; Wise and Morrison 2000). Dai and Kauffman (2002) argue that the success of an electronic marketplace, which they see as an intermediary, is determined by how well such entities satisfy buyers/sellers needs and the potential value that they offer. As electronic marketplaces are regarded for the purpose of this study as being organizational intermediaries, it is considered worthwhile to examine research on organizational performance.

While performance as a concept is often referred to, a comprehensive agreed upon definition of performance does not appear to exist in the literature. Nevertheless, higher performance implies some mix of improved efficiency, improved effectiveness, higher quality (Goodhue and Thompson 1995), revenue growth and improved customer relationships (Slywotzky and Morrison 1997). However, inconsistencies in performance measures exist (Norreklit 1999). An important issue in the debate surrounding organization performance relates to the appropriate use of accounting measures (Kaplan and Norton 1996; Norreklit 1999). Some of the problems that have been associated with accounting rates of return include the fact that: (a) they typically only reflect past information and are not forward looking; (b) they are not adjusted for risk; and (c) they are distorted by temporary disequilibrium effects, tax laws and accounting conventions (Bharadwaj 2000). Nevertheless, non-financial measurement systems have generally been characterized by loosely coupled local systems guided by local needs with no integration of the company’s strategic objectives or any balancing of local and company considerations (Mouritsen et al. 1995; Norreklit 1999). More recent efforts, however, have been directed at constructing a system of non-financial measures linked to strategy (Grady 1991; Kaplan and Norton 1992, 1996; McNair et al. 1990).

The balanced scorecard (Kaplan and Norton 1996) is a well-regarded performance model that integrates financial and non-financial measures. It is distinct from other strategic measurement systems in that it contains outcome measures and the performance drivers of outcomes, linked together in a cause and effect relationship making the performance measurement system a feed-forward control system (Norreklit 1999). The scorecard translates the vision and strategy of a business unit into objectives and measures in four different areas: financial, customer, internal business process, and learning and growth perspectives. The financial perspective identifies how the company wishes to be viewed by its shareholders. The customer perspective determines how the company wishes to be viewed by its customers. The internal business process perspective describes the business processes at which the company has to be particularly adept in order to satisfy its shareholders and customers. The organizational learning and growth

### Table 1. Electronic marketplace function

<table>
<thead>
<tr>
<th>Construct</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value proposition</td>
<td>Communication, brokerage and integration benefits (Malone et al. 1987)</td>
</tr>
<tr>
<td>Product-market focus</td>
<td>Products can be commodity/standardized, or differentiated; manufacturing or operating input; high or low cost (Bakos 1997, Kaplan and Sawhney 2000, Wise and Morrison 2000). Customers include both e-marketplace buyers and suppliers.</td>
</tr>
<tr>
<td>Market value activities</td>
<td>Value activities offered by e-marketplaces can be broadly classified as: search, selection, execution (post-sale transaction automation and logistics), and collaboration facilitation (Bakos 1998, Choudhury et al. 1998, Lee and Clark 1996). Basic market functions include; aggregation (public and private e-cataloguing), matching (public bidding and private negotiation), facilitation (financial services, delivery and logistics) (Dai and Kauffman 2002).</td>
</tr>
<tr>
<td>Management value activities</td>
<td>Procurement expertise and knowledge and business process support (workflow, supply chain and project management, (Dai and Kauffman 2002).</td>
</tr>
<tr>
<td>Technology/infrastructure value activities</td>
<td>System integration, standards provider and outsourcing services (Dai and Kauffman 2002).</td>
</tr>
<tr>
<td>Ownership</td>
<td>Owned by buyer, supplier or intermediary (Bakos 1997, Lennstrand et al. 2001).</td>
</tr>
<tr>
<td>Market structure</td>
<td>Decentralized or centralized (Lee and Clark 1996).</td>
</tr>
</tbody>
</table>

Source: Adapted from Soh and Markus (2002) and Dai and Kaufmann (2002)
perspective involves the changes and improvements that the company needs to realize if it is to realize its vision (Kaplan and Norton 1996).

To summarize, we have adopted a multifaceted approach to measuring electronic marketplace performance. This approach takes into consideration financial performance, customer satisfaction, internal business process improvement and organizational learning and growth. In the next section, we conduct a review of the literature and outline the factors that we believe generally influence electronic marketplace performance and we derive a model for assessing such performance.

INDICATORS OF PERFORMANCE IN ELECTRONIC MARKETPLACES

In considering the performance of electronic marketplaces, it is worthwhile considering that they have evolved from interorganizational systems (Applegate 1995; Reimer 1996). Consequently, it is useful to examine models of IOS performance. Bensaou and Venkatraman (1992) propose a model (Figure 2) for explaining the performance of a dyadic IOS. The model asserts that the fit (illustrated by the centre line in Figure 2) between information processing needs and information processing capabilities is a strong determinant of IOS performance. According to Bensaou and Venkatraman, information processing needs arise from environmental, partnership and task uncertainty. The uncertainties are counteracted by information processing capabilities such as structure, process and information technology (Bensaou and Venkatraman 1992).

Bensaou and Venkatraman (1995) operationalize the model by utilizing it to uncover dominant configurations of interorganizational relationships in the automotive industry across the US and Japan. The model was employed to assess data on 447 IOS relationships in these two countries. For this purpose, they consider three dimensions of performance of the IOS: (a) supplier rating index assessed by a team of engineers (e.g. development time, delivery performance, contribution to lowering costs); (b) perceived satisfaction with the relationship (i.e. quality, amount and accuracy of the information exchanged with the supplier); and (c) the level of buffers between the two firms (average levels of inventory kept by the assembler, by the supplier and shipment increments for the component delivered).

Bensaou and Venkatraman (1995) emphasize that the dimensions of information processing needs by themselves do not predict performance, they found high performing as well as low performing configurations operating under low information processing needs and on the other hand low performing as well as high performing configurations operating under high information processing needs. This strongly reinforces their view that the fit between information processing needs and capabilities is more important than either dimension alone. Their study illustrated that the better the fit between information processing needs and capabilities, the better the performance of the IOS under investigation.

In assessing the applicability of Bensaou and Venkatraman’s (1992) model to electronic marketplaces, it is necessary to consider how such marketplaces differ from traditional IOS. Table 2 uses and extends the work of Senn (2000) to contrast traditional dyadic IOS with electronic marketplaces. It examines interaction patterns, control, structures and electronic support in addition to the differences observed by Senn (2000); buyer/supplier relationships and networks. The underlying theory purported here is that by their very nature, electronic marketplaces are quite different to dyadic IOS.
Bensaou and Venkatraman’s model is limited in the context of electronic marketplaces as it focuses purely on an information processing perspective. In the following sections we use the differences identified in Table 2 to evolve Bensaou and Venkatraman’s (1992) model to consider a broader range of factors that affect performance. These factors are summarized under the constructs of (a) value added/value demanded (b) governance/investment (c) trust/security-based mechanisms.

Table 2. Differences between a dyadic IOS and an electronic marketplace

<table>
<thead>
<tr>
<th>Interorganizational system</th>
<th>Electronic marketplace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buyer relationships – Buyer/supplier relationship is determined in advance with the anticipation it will be an ongoing relationship based on multiple transactions (Senn 2000)</td>
<td>Buyer relationship – Two types of relationship may exist: 1. Buyer/seller linkage is established at time of transactions and may be for one transaction only (i.e. purchase transaction) 2. Buyer/seller purchase agreement is established whereby the seller agrees to deliver services or products to buyer for a defined period of time (i.e. a subscription transaction) (Senn 2000)</td>
</tr>
<tr>
<td>The rules of the relationship may be formatted in a formal non electronic setting</td>
<td>Rules of relationship formatted in an electronic setting (Reimer 1996)</td>
</tr>
<tr>
<td>Structure/Architecture – Dyadic, one-to-one, one-to-many in nature (Swatman and Swatman 1992)</td>
<td>Structure/Architecture – Multiparty (Bakos 1998)</td>
</tr>
<tr>
<td>Electronically supports the processing phase (Reimer 1996)</td>
<td>Electronically supports the initiation, negotiation and processing phases between all parties (Reimer 1996)</td>
</tr>
<tr>
<td>Buyer/seller agreements – Advance arrangements results in agreement on the nature and format of business documents that will be exchanged (Senn 2000)</td>
<td>Buyer/seller agreement – Sellers determine, in conjunction with the market maker which business transactions they will provide (Senn 2000)</td>
</tr>
<tr>
<td>Interaction Pattern is one-to-one, one-to-many in nature (Swatman and Swatman 1992)</td>
<td>Interaction patterns take various forms (Timmers 1999)</td>
</tr>
<tr>
<td>Control of the relationship – Relatively simplistic (Malone et al. 1987)</td>
<td>Control – much more complex (Bakos, and Nault 1997)</td>
</tr>
<tr>
<td>Trust – established in a non electronic fashion</td>
<td>Trust – normally established in electronic environment (Bakos and Nault 1997)</td>
</tr>
<tr>
<td>Uncertainty/level of risk is much greater than in an IOS</td>
<td>Uncertainty/level of risk is much greater than in an IOS</td>
</tr>
<tr>
<td>Networks – IOS’s may be built around private or publicly accessible networks (Senn 2000)</td>
<td>Networks – Electronic markets are typically built around publicly accessible networks (Dai and Kauffman 2002, Senn 2000)</td>
</tr>
</tbody>
</table>

Bensaou and Ventakraman’s model is limited in the context of electronic marketplaces as it focuses purely on an information processing perspective. In the following sections we use the differences identified in Table 2 to evolve Bensaou and Venkatraman’s (1992) model to consider a broader range of factors that affect performance. These factors are summarized under the constructs of (a) value added/value demanded (b) governance/investment (c) trust/security-based mechanisms.

Value added/value demanded

Numerous researchers have documented the value added by electronic marketplaces by examining the functions supported; aggregation, matching and integration. Many combinations of these functions are possible, and value added is dependent on the combination that best meets buyers and sellers needs (Dai and Kauffman 2002; Soh and Markus 2002). The marketplace’s ability to improve market reach (Bakos 1998; Kerrigan et al. 2001), the impact it has on pricing and operational costs (Bakos 1998), its ability to create industry best practices (Kerrigan et al. 2001), and the inherent value of the IT solution (Dai and Kauffman 2002) are all elements that impact the marketplace’s ability to create value.

The value demanded construct is defined as the value that a stakeholder requires from the marketplace. Choudhary et al. (1998) note that many electronic marketplaces should be designed to meet the needs of the parties using that marketplace. Indeed, Hess and Kemerer (1994) note that ‘suppliers only have incentives to participate in electronic markets where they can either differentiate their products or directly compete with a small number of other suppliers.’

Industry structure (Cavaye and Cragg 1995; Grover and Ramanlal 1999) and the business strategy of individual participants (Grover and Ramanlal 1999; Senn 2000) both impact the value demanded by individual stakeholders. In particular, the competitiveness of the marketplace, in the context of the whole market, is crucial. Thus, the value demanded by stakeholders will be impacted by: (a) alternatives to the marketplace; (b) participants’ ability to switch to a
competing venture; and (c) the marketplace’s share of the overall market (Choudhary et al. 1998; Kambil and Van Heck 1998). We operationalize fit as being the compatibility of the value added by the marketplace with the value demanded by stakeholders (see Figure 3).

**Governance/investment**

Governance is critical in an organization as it gives parties ‘the power to execute control’ (Grossman and Hart 1986). Two elements that affect governance are: 1. the ownership structure (Bakos and Nault 1997); and 2. the risk of investing (Kolb 2000). Bakos and Nault (1997) employ the theory of incomplete contracts to examine the relationship between ownership and investment in electronic networks. They argue that ownership is important as ‘it affects the level of network-specific investments, which in turn determine the profitability and in some cases the viability of these networks’ (Bakos and Nault 1997).

Bakos and Nault (1997) explain, utilizing incomplete contract theory, that under-investment is particularly problematic in electronic networks. Additionally, Klueber et al. (2001) argue that electronic marketplace success depends on a strong revenue model, which may not be achievable without adequate investment. Two types of investment are evident in electronic networks; contractible and non-contractible/cooperation (Bakos and Nault 1997). In relation to contractible investment, Bakos and Nault (1997) propose that participants make investment decisions based on the contractible payoffs receivable under a given governance (control) structure. Like any other organization, electronic marketplaces require substantial investment in specific assets such as information, expertise, training and human capital. These investments are non-contractible and crucial. Thus, gaining the cooperation of parties to invest such resources is paramount to the success of the marketplace. Taking these issues into account, we propose that the fit between the governance and investment constructs (Figure 4) will affect the performance of an electronic marketplace.
marketplace. Fit is operationalized by observing the compatibility of the marketplace governance (control) structure with its investment profile.

Trust/security-based mechanisms

Trust has been identified as a key factor in successful business relationships. Dai and Kauffman (2002) acknowledge that their framework is limited, as it does not deal with trust. Other authors note that as is the case in traditional exchanges, trust is considered crucial in online transaction processing (Ba et al. 1999; Brnjolffsson and Smith 2000) due to the impersonal nature of the environment (Ba and Pavlou 2002). Indeed Ba and Pavlou (2002), quoting Lee (1998) note that ‘buyers in online marketplaces have to rely on electronic information without having the ability to physically inspect the product, hence, they are vulnerable to additional risks because of potentially incomplete or distorted information provided by sellers.’ Indeed Ba and Pavlou (2002) state that opportunism could erode the foundations and even lead to failure of an electronic marketplace. They argue that trust can mitigate information asymmetry by reducing transaction-specific risks.

Therefore, achieving trust in the vendor (Money et al. 1998) and trust in the technology (Kim and Prabhakar 2000) is crucial in the context of achieving and maintaining trust in an electronic marketplace. Kim and Prabhakar (2000) noted that putting in place security mechanisms in the guise of guarantees can help to maintain and improve the level of participant trust. Trust and security-based mechanisms are safeguard protective measures that help to determine the level of trust that participants have in electronic marketplaces. Such protective measures include security technologies (Ratnasingham and Kumar 2000), legislation (Markus 1983; Soh and Markus 2002), third party assurance seals (Noteberg et al. 1999) and online communities (Raisch 2001). Fit is once again operationalized through observing the compatibility of the trust and security-based mechanisms construct and changes in marketplace performance (see Figure 5).

To conclude, we have evolved Bensaou and Venkatraman’s model of IOS performance to take into account the differences between electronic marketplaces and IOS presented in Table 2. In addition to their information processing view, we have also included the value added/demanded construct, the governance/investment construct and the trust/security-based mechanism construct. Consequently, we propose a new model for assessing the performance of an electronic marketplace, as shown in Figure 6. Table 3 defines each of the constructs and variables included in the model. The model incorporates elements that emanate from transaction cost theory, resource dependency theory and social contracting theory. Thus, when combined with the information processing perspective of Bensaou and Venkatraman, it may provide a more holistic explanation of the performance of an electronic marketplace.

We operationalize fit in our model by examining the compatibility of the four constructs within our model. Values within the constructs may change over-time. However, we argue that changes within a single construct will not directly impact upon performance. It is the fit between constructs that impacts upon the performance of the electronic marketplace.

RESEARCH APPROACH

The objective of this research is to explore the development of a new conceptual model for assessing the performance of an electronic marketplace. Our research questions are:

1. Do the elements included in our model impact upon marketplace performance?
2. Is the fit between the constructs useful in explaining the performance of an electronic marketplace?
Marshall and Rossman (1989) argue that there is a need for research to focus on ‘discovery’ and ‘theory building’, and be ‘exploratory’ in nature, when the state of knowledge in a field is at an early stage of investigation. The unit of analysis must also provide for sufficient breadth and depth of data to be collected to allow the research objective to be answered. Galliers (1992) believes that a case study is a valid research method for theory building and theory testing. The single case study method is considered to be a potentially rich and valuable source of data, suited to exploring relationships between variables in their given context (Benbasat et al. 1987), and is appropriate where it represents a critical case (Yin 1994). The subject of this study was chosen as it represents a critical case in the cotton industry. Data were gathered over an 18 month period from September 2002 to April 2004. The entire Dealcotton team (six people) were interviewed on a number of occasions throughout this period using a semi-structured interview format. Four marketplace participants (buyers and sellers) were also interviewed. Details of the personnel interviewed are outlined in Table 4.

**FINDINGS AND ANALYSIS**

This section takes the following format. An introduction to the environment of the marketplace studied is provided. The performance of this marketplace is...
### Table 3. Definitions of constructs and variables

<table>
<thead>
<tr>
<th>Construct</th>
<th>Variables</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information processing needs</td>
<td>Environmental uncertainty</td>
<td>The information needs of the participants within a marketplace. The uncertainty in the environment that impacts the information processing needs of the users of the marketplace.</td>
</tr>
<tr>
<td></td>
<td>Partner uncertainty</td>
<td>The uncertainty in relation to other participants which impacts the information processing needs of the participants in a marketplace.</td>
</tr>
<tr>
<td></td>
<td>Task uncertainty</td>
<td>The uncertainty in relation to the tasks that participants must undertake, which impact the information processing needs of the participants in the marketplace.</td>
</tr>
<tr>
<td>Information processing capabilities</td>
<td>Structure</td>
<td>The information processing capabilities of the marketplace. The information processing structures that are in place in the marketplace.</td>
</tr>
<tr>
<td></td>
<td>Process</td>
<td>The information processing processes that are in place in the marketplace.</td>
</tr>
<tr>
<td></td>
<td>IT</td>
<td>The information processing technology in the marketplace.</td>
</tr>
<tr>
<td>Value added</td>
<td>Market reach</td>
<td>The value added for stakeholders through participation in the marketplace. The degree to which the marketplace extends the ability of participants to meet the requirements of buyers/sellers.</td>
</tr>
<tr>
<td></td>
<td>Pricing</td>
<td>The impact that the marketplace has on pricing of goods/services for the participants (buyers, sellers).</td>
</tr>
<tr>
<td></td>
<td>Costing</td>
<td>The ability of the marketplace to decrease participants operational costs (buyers, sellers).</td>
</tr>
<tr>
<td></td>
<td>Best practices</td>
<td>The ability of the marketplace to purport best practices for the industry sector in which the marketplace operates.</td>
</tr>
<tr>
<td></td>
<td>IT solution</td>
<td>The inherent value added through use of the IT solution.</td>
</tr>
<tr>
<td>Value demanded</td>
<td>Industry structure</td>
<td>The configuration of the industry sector in which the marketplace operates.</td>
</tr>
<tr>
<td></td>
<td>Business strategy</td>
<td>The business strategy of the stakeholders who utilize the marketplace. The mechanism that controls and manages the marketplace.</td>
</tr>
<tr>
<td></td>
<td>Ownership</td>
<td>The manner in which equity in the marketplace is divided.</td>
</tr>
<tr>
<td></td>
<td>Equity risk</td>
<td>The level of risk attached to investing in marketplace equity.</td>
</tr>
<tr>
<td>Investment</td>
<td>Contractible</td>
<td>Stakeholders' investment in the marketplace. The resources invested by a stakeholder in the marketplace which are included in a contract.</td>
</tr>
<tr>
<td></td>
<td>Non-contractible</td>
<td>The resources that are invested by a participant in the marketplace which are not included in a contract.</td>
</tr>
<tr>
<td>Trust</td>
<td>Trust in vendor</td>
<td>The level of perceived risk attached to the marketplace. The reputation and perceived risk of the party selling the good/service.</td>
</tr>
<tr>
<td></td>
<td>Trust in application</td>
<td>The level of perceived risk attached to the information technology utilized by the marketplace to interact with participants.</td>
</tr>
<tr>
<td>Security-based mechanisms</td>
<td>Technology</td>
<td>Mechanisms which are implemented to decrease the perceived risk attached to the marketplace. The security technologies implemented by the marketplace.</td>
</tr>
<tr>
<td></td>
<td>Legislation</td>
<td>The creation of a community within the marketplace where participants can openly discuss experiences/issues which impact upon the sector and the marketplace.</td>
</tr>
<tr>
<td></td>
<td>Online community</td>
<td>Independent assurances given by a third party about the marketplace. The rules and regulations implemented by a third party which impacts upon the marketplace.</td>
</tr>
</tbody>
</table>
then explained using the model outlined in Figure 6 under each of the following headings; (i) Information processing needs/capabilities (ii) Value added/value demanded (iii) Governance/investment (iv) Trust/security-based mechanisms.

Case study environment

Cotton is a commodity that is traded worldwide. Traditional trading methods are the norm in the industry, and cotton merchants enjoy longstanding relationships with their customers and suppliers. Dealcotton was launched in 2001 as the first online international exchange for the cotton industry. At the time of the study, there were two major marketplaces trading cotton. Many of the parties utilizing Dealcotton are based in third world countries, where the communications and IT infrastructure is very poor. An examination of the marketplace using the constructs presented in table one is shown in Table 5.

Dealcotton’s performance explored

The focus of the marketplace, at its inception in 2001, was to provide a forum where buyers and sellers could trade cotton. An auction structure was implemented whereby the market would set the price. Management implemented this structure initially as they believed that this was what buyers and sellers wanted the marketplace to provide. However, the Business Development Manager stated that ‘this model was abandoned in 2002 because growers and merchants weren’t willing to publicly disclose the price at which they were willing to sell their cotton.’ Dealcotton’s performance had been suffering because they weren’t successful in getting buyers and sellers to utilize the marketplace. The Business Development Manager stated that ‘some people posted offers or posted enquiries but as far as getting anyone to respond with a genuine counter offer or counter bid, it just didn’t happen.’ Consequently, in order to improve their performance, Dealcotton abandoned the auction model. They have now expanded beyond traditional trading to provide a broad range of information exchange services that facilitate contract-based integration of both internal and external documents between buyers and sellers.

Dealcotton utilizes a number of performance elements in order to access their performance. These are outlined in Table 6. This table illustrates how the marketplace’s performance improved between 2001 and 2004. We will now explore this improvement using the model developed previously (Figure 6).

Information processing needs/information processing capabilities

The cotton industry suffers from a range of uncertainties. There is a great deal of price volatility due to environmental and partnership uncertainties. In addition, cotton is a natural, grown fibre that is highly dependent on weather and water conditions. As a result, the production environment is fraught with uncertainty and risk. At the time of the study, a vast surplus of cotton was held in inventory across the world. It was evident that trading parties from diverse geographical locations were entering and leaving the cotton market on a daily basis due to legal and financial risks. The information processing needs of parties utilizing the Dealcotton marketplace were high. The cotton industry supply chain was complex and fraught with uncertainty.

The supply chain in the cotton industry is complex with gins, buyers, suppliers, warehousers, banks, insurers and underwriters all having a role to play in cotton trading. Therefore the task of procuring cotton is
rather complex. In addition, cotton is traded worldwide with parties in various countries operating under different rules and applying different standards. Cotton is classified according to many grades and types by different countries and international merchants, resulting in the possibility of huge disparities. Often a contract for one grade and type results in a different grade or type being shipped. Thus, the availability of accurate and reliable information is crucial.

For Dealcotton, operating in such a volatile environment meant that providing accurate and timely information on all aspects of the global marketplace was crucial. When Dealcotton was launched, the structure adopted was an auction model that aimed to provide participants with accurate and timely information. It was believed that this structure would positively impact the quantity of cotton (number of bales) traded through the marketplace. However, this approach had limited success as most participants obtained price information externally from the Cotlook ‘A’ index, a third party information bureau, and the New York Futures Exchange. Therefore, the information processing capabilities of the marketplace were somewhat redundant. A lack of liquidity in the marketplace resulted in poor turnover figures. Lack of significant improvements in performance indicators resulted in this structure being abandoned in favour of a closed marketplace structure in early 2002. Using this structure, trades are processed in a private corridor between those parties involved in a specific trade.

This structure maximizes the amount of task-specific information available to each party, and also provides environmental details including price. With the change in structure and the advent of a new workflow management system in 2002, Dealcotton, through IT, put in place processes to ensure that cotton adheres to certain predefined standards. By utilizing information technology, traders receive accurate up-to-date information on quality, price and shipment details. A notable improvement in the performance of Dealcotton occurred as a result of meeting the information processing needs of buyers and suppliers of cotton. Dealcotton management believe that the improved compatibility between Dealcotton’s capabilities and the needs of buyers and suppliers is a key contributory factor in the improved performance (number of bales traded, turnover and commission earned) between 2002 and 2003.

## Value added/value demanded

The importance of value added in a marketplace is noted by Dealcotton’s MD who states that ‘if you’re not adding value, there is no reason to have a marketplace.’ The value added through price discovery in Dealcotton was negligible due to the low margin nature of the business, the high risks, and the relatively widespread availability of price indicators. Thus industry structure and the business strategy of participants are important. The industry structure dictates that the price of cotton is usually determined by external mechanisms such as the Cotlook ‘A’ index or the New York Futures Exchange. It was clear that the performance of the marketplace was not positively impacted by full price transparency. ‘The actual reason is that the textile mills for business reasons don’t want their prices being fully transparent’, states the Dealcotton MD. The price discovery element provided with the auction model was not what buyers and suppliers demanded, and was abandoned by

### Table 6. Dealcottons performance

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004 (April)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Financial</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turnover: +20%*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales (Commission earned by Dealcotton)</td>
<td>$125,000</td>
<td>$1,112,500</td>
<td>$1,375,000</td>
<td></td>
</tr>
<tr>
<td><strong>Customer</strong></td>
<td>No of bales: 50,000</td>
<td>No of bales: 100,000</td>
<td>No of bales: 650,000</td>
<td>No of bales: (predicted) 850,000</td>
</tr>
<tr>
<td>No of buyers/sellers: 4</td>
<td>No of buyers/sellers 10</td>
<td>No of buyers/sellers 15</td>
<td>No of buyers/sellers 25</td>
<td></td>
</tr>
<tr>
<td><strong>Internal business process</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receipt of bids and offers: +20%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Learning and growth</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased management expertise - Cotton industry experts become involved in Dealcotton.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased number of conferences attended</td>
<td></td>
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</table>

*on previous year
Dealcotton. The fact that the auction structure was not aligned with the needs and strategies of the industry and those who participate in the industry is one reason for Dealcotton’s relatively poor performance in 2002.

In early 2002 due to poor performance, it became clear to management that participants wanted reduced transaction costs, post-contract shipment transparency, and increased information availability. In 2002, management decided to develop a workflow management solution for mill to merchant trading. It is configured to handle contract negotiation workflow, including: original offer, counter bid, counter offer, counterparty acceptance, counterparty rejection, finalized contract, PDF contract document and logistics and insurance. The cotton industry supply chain has traditionally been notorious for the amount of paper generated, and the lack of standardization in relation to transactions. The management at Dealcotton believed that participants wanted generic templates to be used in an effort to reduce transaction costs. By utilizing the generic templates of their own workflow management solution, the marketplace improves standardization in the supply chain and consequently reduces transaction costs. By utilizing the Dealcotton workflow solution one market participant noted that he had ‘reduced transaction costs by 50% and cut my time involved in paperwork in half’.

The cotton industry, globally, is notorious for poor practices. Contract defaults, contract washouts (cash settlement to nullify a contract), piracy, and bribes are some of the less attractive elements of the industry. Many bodies, such as the Liverpool Cotton Association and The American Cotton Shippers, have been created to establish best practices and to arbitrate cases brought by members. However, the establishment of best practices has been a slow process due to political manoeuvres and the lack of consensus among those involved in the cotton industry. Deal cotton participants demanded an environment where they could trade cotton divorced from the risks and politics that existed elsewhere in the industry. In response, Dealcotton is striving to establish best practice through their Internet-based cotton trading platform so that financial (counterparty credit), settlement (timely and accurately delivered contracts) and quality risks can be better quantified and managed. By meeting the demands of participants for industry standards and a neutral trading environment, Dealcotton have improved compatibility between the governance (control) structure and investment. Currently, all participants must sign an agreement to trade a minimum number of bales of cotton through the marketplace. This ‘minimum commitment’ is based on an average monthly trading commitment of a pre-specified number of bales per month, and is binding for a period of two years. In 2002, with the change in ownership structure, a strategy was pursued to get participants to commit to use the marketplace on an ongoing basis. The goal of this strategy was to get members to take a contractible financial stake in the marketplace, and to become involved in its governance. This had the effect of improving the compatibility between the governance (control) structure and investment. Currently, all participants must sign an agreement to trade a minimum number of bales of cotton through the marketplace. This ‘minimum commitment’ is based on an average monthly trading commitment of a pre-specified number of bales per month, and is binding for a period of two years. In order to achieve greater involvement, all such investors are given the opportunity to vote people onto the board of Dealcotton. According to the MD ‘it either works or it doesn’t … you want to make sure that people have a true commitment, will get on board, buy shares in the marketplace and trade cotton.’ The data support the idea of Dealcotton in this period.

**Governance/investment**

When launched in 2001, Dealcotton was 100% owned and governed by Dealcottononline, a venture capitalist organization with a goal of maximizing return on investment. The limited success that Dealcotton initially experienced has been attributed to the fact that it was totally governed by venture capitalists without input from marketplace participants. In 2001, Dealcotton’s management got verbal commitment from numerous parties to use the marketplace. However, while many agreed to use Dealcotton to trade cotton, getting parties to actually use the marketplace was difficult.

In an attempt to improve the performance of the marketplace a decision was taken in July 2002 to sell Dealcotton to a US-based company Cotton US. The major advantage of this was not only an injection of contractible capital, but more importantly, the new owners were experts in the cotton industry. Under the new arrangement, the new investors/members could control between 20% and 45% of the equity in the marketplace; thereby having a contractible investment in the marketplace. They also possessed the expertise, contacts and knowledge, considered to be non-contractible variables, to entice key participants in the cotton industry to commit to the marketplace. In order to eliminate the risk of key personnel leaving, many people were tied to long-term contracts. Retaining these is an invaluable investment for Dealcotton, and greatly influences the governance structure of the marketplace.

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that the improved compatibility between the governance and investment constructs was a key contributory factor behind the improved performance figures (number of bales traded, commission and turnover) between 2002 and 2004.

Trust/security-based mechanisms

There are two elements to trust which need to be examined in the context of an electronic marketplace; trust in the vendor and trust in the application. The consensus among those involved in Dealcotton is that achieving trust in the vendor is crucial, with trust in the application being less important. ‘It’s all about trust in the vendor, everything else is secondary’ argues the Managing Director. A large part of the 2002 budget was spent on attending conferences and visiting various parties worldwide in order to increase referrals. Achieving and maintaining goodwill for Dealcotton is according to Dealcotton’s MD ‘critical to our performance’. Management believe that this strategy of attending trade conferences has increased participant satisfaction and increased word of mouth referrals. This, they argue, has contributed to Dealcotton’s improved performance. Dealcotton utilizes the most up-to-date security technologies in order to achieve/maintain the level of trust in the vendor and the application. Dealcotton aims to establish an online community for the cotton industry in an effort to increase ‘trust in the vendor’. However, getting universal approval on legislation in relation to the trading of cotton is impossible with geographical locations as diverse as the United States and Uzbekistan involved in the cotton industry. Therefore, in order to improve trust in the marketplace, all transactions conducted on the Dealcotton platform are subject to the jurisdiction and laws of the courts of the United States.

At the time of the study, Dealcotton did not utilize any third party assurance seals, as many of its members did not believe that there was any real value from doing so. According to Dealcotton’s Business Development Manager, ‘The security mechanisms which we have in place are critical in achieving and maintaining trust in the marketplace … achieving trust is critical to our overall performance.’ It is the opinion of Dealcotton management that the ability of the security-based mechanisms in place to achieve trust in Dealcotton was a key contributory factor to the improved performance of the marketplace between 2002 and 2004.

SUMMARY AND CONCLUSION

The objective of this research was to explore the development of a new conceptual model for assessing the performance of an electronic marketplace. The fit between the elements of each of the four constructs of the model presented in Figure 6 was examined in the context of their impact on performance within a single case.

Between 2002 and 2004, notable improvements were identified in the compatibility between the information processing needs and information processing capabilities constructs in Dealcotton. From the outset, Dealcotton put in place structures and processes, and utilized technology for the efficient delivery of information to participants in the marketplace. Dealcotton aimed to provide price information to their members through the auction mechanism. However, participants did not demand full price transparency from the marketplace. Participants’ needs related to information about the processing of trades and workflow, rather than pricing. The change in the marketplace structure improved the information processing fit as it reduced the uncertainties caused by environmental, task and partnership uncertainties through improved information processing capabilities. This closer fit contributed to the improved performance of Dealcotton between 2002 and 2004.

The abandonment of the auction model also brought about improved compatibility between the value added/value demanded constructs. Through the workflow management solution, which was introduced in 2002, there was deemed to be improved value added for participants through reduced transaction costs and improved processing. Dealcotton also met stakeholders’ needs through the advent of industry best practices, something demanded by traders who had adopted Dealcotton. This closer fit between the value added and value demanded constructs contributed to the improved performance of Dealcotton between 2002 and 2004.

Next the compatibility between the governance and investment constructs was explored. Initially, Dealcotton management got verbal commitments from various parties to trade on the marketplace. Getting people to trade proved much more difficult. Therefore, in 2002, parties utilizing the marketplace were given an opportunity to invest in the marketplace with an associated contractible commitment to utilize the marketplace to trade cotton. Key personnel with the knowledge and expertise, necessary in the context of governing the marketplace, were tied to long-term contracts. Also, participants were given the opportunity to vote members on to the board. All of these initiatives had the effect of improving the compatibility between the governance and investment constructs. This improved fit was one of the key reasons noted for the improvements in Dealcotton’s performance between 2002 and 2004.

The final element of the model is the trust constructs. For Dealcotton, achieving and maintaining trust in the vendor is deemed critical, trust in the application is secondary. Presently, word-of-mouth referrals and security technologies are the predominant mechanisms
utilized to achieve and maintain trust in the marketplace. Such mechanisms have had the effect of improving the level of trust existing in the marketplace. Improving trust in Dealcotton through putting in place security-based mechanisms has according to Dealcotton management been a key contributor to Dealcotton’s improved performance.

The improved fit between the constructs is reflected in the performance of the marketplace, which improved dramatically between 2002 and 2004. From a buyer’s and seller’s perspective, the productivity of shipping documentation has been improved by over 50%. In addition, they have benefited from reduced transaction costs and the improved processing provided by the Dealcotton system. The volume of cotton traded on the Dealcotton platform has increased eight fold in tonnage between 2002 and 2004 and the number of parties signed up to the Dealcotton platform is continuously increasing.

To conclude, this paper has built on the studies undertaken by researchers such as Bensaou and Venkatraman (1992), Dai and Kauffman (2002) and Soh and Markus (2002) by developing a model for assessing the performance of an electronic marketplace, and providing some initial testing. While results from a single case are tentative, it is evident that improved compatibility between the constructs noted in the model was associated with improved performance in the Dealcotton marketplace. However, further research is necessary in order to validate the model and to determine if it explains the performance of other electronic marketplaces. Further research may also explore its usefulness as a means of categorizing the various electronic marketplace business models that exist and their associated performance developing on the works of Dai and Kauffman (2002) and Soh and Markus (2002).

Note

The cotton gin automates the process of removing cotton seeds, spurring mass production of the material.

References


