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eCommerce in service industries: Extending the Socio-Technical Paradigm

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Abstract

The socio-technical framework (STF) is useful for describing how technologies are embedded in social systems and how people, groups and technologies are interrelated. This perspective, however, lacks specific detail and has limited usefulness in explaining the dynamics of actual situations. In this paper we address the question of how to extend the STF to better analyze technologies in their social context. We build on the STF by including the concept of "information ecology" and research on service provision to suggest a more empirically focused way of analyzing the relationships between people and technologies. In particular, we examine changes that have occurred as B2C eCommerce technologies have been implemented in service organizations, using case study findings from retail banking to introduce the concept of 'Coactive Commerce Systems'. This concept provides a theoretically based descriptor for understanding the technologically-mediated interrelationships between organizations and their customers.

Keywords: eCommerce, B2C, IS theories, socio-technical theories, information ecologies, banking

INTRODUCTION

Information systems theories have been developed over several decades to help us understand the impacts of the implementation of new technologies in organizations. For more than thirty years the socio-technical framework (STF) has provided theoretical guidance in conceptualizing the design of information systems as comprising both the social and technical elements working together to achieve an optimal result (see for example Appelbaum, 1997; Lamb and Kling, 2003; Mumford, 1995). The socio-technical approach is, however, a generalized approach that lacks specificity. In this paper we outline a way of extending the STF to provide a more robust, focused and useful way of analyzing technologies in their social context. We build on the STF to provide a more explicit or concrete way of analyzing the changes that have occurred as B2C eCommerce technologies have been implemented in service organizations.

There are many theories and perspectives in the literature such as the technological determinist perspective (Sabel, 1982; Markus & Robey, 1988), the socio-technical approach (Mumford, 1999), the Marxist theories (Braverman, 1975) and feminist views (Wajcman, 1993; Game and Pringle, 1984) used to explain technological change (Knights & Murray, 1994). These theories usually begin with the technology and how the technology affects customers (a customer marketing approach) users or from a management or user perspective. There have been many studies of how users interact with technology and how these insights can be used to improve the way new information systems should be designed from a user perspective (Olikowski and Gash, 1994; Orlikowski, 1992; Orlikowski and Baroudi, 1991). In research undertaken in eCommerce, much of the research has focused on how effectively the technology can be used to improve operational efficiencies or achieve competitive advantage such as the value chain approach and new business models (Porter, 2001; Venkatraman, 2000). We were unable to find, however, any systematic attempts to understand the human resource issues raised by the use of eCommerce technologies.

In this paper, we employ the information ecology approach (Davenport, 1997; Nardi and O'Day, 1999) to extend the STF and provide a better understanding of the changes that eCommerce technologies have brought to organizations. We look particularly at technologies that have introduced multiple service delivery channels between customers and organizations. Services organizations are at the forefront of implementing these technologies (Dewan and Seidmann, 2001) and thus have experienced significant changes in the ways that
through their employees they interact with customers. This has created a set of changes that affect the whole 'information ecology', often in unintended ways. Only by understanding how the range of technology-mediated interactions occurs can we appreciate the implications of the technological systems themselves and the ways they are implemented.

Our discussion of these issues is informed by examples drawn from our research into eCommerce technologies in retail banking and builds on our research findings to illustrate the evolving inter-relationships in that context. Out of this work we propose the concept of 'Coactive Commerce Systems' (CCS) which highlights the diverse activities of customers and employees and the connections between different kinds of interactions. This construct aligns with the Information Ecology approach and is consistent with the sociotechnical framework in that it includes consideration of both the technology system and the associated social relationships.

In this paper we outline the tenets of the STF and then consider the information ecology approach as an extension of that paradigm. We show how eCommerce use in service industries and its consequences can be understood within this framework. Using examples from retail banking, we show how CCS can be used to understand the contemporary service environment. We propose a model for conceptualising how the range of eCommerce technologies in this environment can be seen to constitute an information ecology incorporating CCS.

**SOCIO-TECHNICAL PERSPECTIVE AS A PARADIGM**

Socio-technical systems design can be traced back to the end of the Second World War when Trist and colleagues at the Tavistock Institute found a link between the introduction of technical systems and social systems. The research was undertaken in the coal industry in Britain and the findings were the corner stone of further socio-technical research undertaken in other countries and in many industries. The research found that the introduction of new technology caused stress amongst the workers and a breakdown of the social system (Trist and Murray, 2005) More recently, a number of authors (Checkland, 1994; Checkland and Holwell, 1998; Checkland, 1999; Trauth, 2001; Walsham, 2000; Mumford, 1999) have argued that understanding the societal context of information systems is an essential goal of the discipline and this is becoming more important. The socio-technical paradigm recognised that understanding and addressing the social or organisational context was critical to the outcome of an IS implementation. That is, information systems are embedded within particular organisations and societies and the implementation of new technology changes the social context itself and changes "roles, social structures, norms and attitudes" (Mumford, 1981:279). Mumford (1981) argued that having an appreciation of the social effects of technology assists managers in organisations to develop the most appropriate strategies when implementing new information systems. This perspective is also found in the work of Checkland (1999) who over a period of thirty years developed the view that a rich understanding of the context of the organisational issues will provide the appropriate entry point to the successful development of information systems in the organisational context.

Mumford (1981) asserted that managers must consider how the interests and objectives of many stakeholders can be reconciled with the implementation of new technology – an increasingly complex task! Authors working in the socio-technical area agree that the development and implementation of information systems is a complex process involving many human elements. Trauth (2001) argues that this understanding will become more critical to both researchers and practitioners in the 21st century as we increasingly have to interact in a globalised and uncertain world. Understanding how human beings, in a range of roles, interact with new information systems is important when understanding the successful implementation and use of Information systems (Trauth, 2001).

The STF has 'waxed and waned' over the years for a number of reasons (Lamb and Kling, 2003:200) including a lack of specificity and lack of attention to the study of power and political dynamics (Appelbaum, 1997; Lamb and Kling, 2003). However the STF remains an important general framework that highlights the socially-embedded nature of information systems. One of its key contributions has been to focus on relationships as well as technologies. This provides an important perspective for examining eCommerce which has typically been defined in terms of technologies (see for example, Zwass, 1996; Riggins and Rhee, 1998; Clarke, 2000). If we are to gain real explanatory power from STF, we need to develop it further and ground it in more concrete terms. If everything matters and is related to everything else it is difficult to find focus. We need to understand theoretically the particular nature of the social embeddedness of information systems.

**INFORMATION ECOLOGIES**

One promising conceptual step in grounding the STF and giving focus to the practitioner or researcher is provided by Nardi and O'Day (1999) who proposed the concept of 'information ecology' to understand how technologies are incorporated in local settings. This perspective highlights the interdependencies between the

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1 The use of the term 'eBusiness' acknowledges this to some degree but typically the major focus remains technical.
different components of an information system – when one component is changed this affects all the other components. An information ecology can be understood as 'a system of people, practices, values and technologies in a particular local environment' (Nardi & O'Day, 1999: 49). Davenport (1997) also used the term 'information ecology' as a metaphor in an attempt to understand technology or information in a specific context such as an organisation. By using an ecology metaphor, these authors highlight the characteristics of diversity, continual evolution, locality and the fact that these technologies co-evolve or change together according to the relationships in the system. An information ecology involves many interrelationships and dependencies and any changes will be felt throughout the system. The system coevolves, that is the social and technical aspects mutually influence each other in relation to each other over a period of time. In this way the idea of the information ecology directly focuses on the context of an information system, the relationships within organisations and the links with its environment. By doing so, the information ecology approach draws our attention to how technologies and social arrangements are integrated in a system. Neither the technologies nor the social relationships can be seen as independent of each other.

The focus in an information ecology on locality and diversity highlights the fact that different groups implement the same technologies in different ways and help frame questions about specific users. For example, Nardi and O'Day (1999) argue that a personal computer in a library is likely to be used as a card catalogue. The same hardware configuration in a small business may run a budget and payroll application. The technology is located within a network of relationships and the people that use these technologies have specialised knowledge and influence within the local environment. Examples of information ecologies are libraries, a classroom, engineers using CAD/CAM (computer aided design/computer aided manufacturing) systems and hospitals. In the retail banking context, a transaction with an ATM machine for example is not defined as an information ecology as it is an isolated technology with little interaction between people. However, a bank branch can be seen as an information ecology as it has diverse services and activities.

It is important to note that “the social and technical aspects of an environment coevolve” (Nardi and O'Day, 1999:53). While there is a dynamic balance, there is never a perfect fit and movement is needed to establish equilibrium. There is no guarantee that an information ecology will be free of conflict or considered a success. By extension, an information ecology is always in the process of change.

INFORMATION ECOLOGIES, EBUSINESS AND SERVICE INDUSTRIES

The concept of an information ecology, as an extension of the STF, is valuable for understanding service industries and how B2C eCommerce technologies have changed the way in which customers and organisations interact in this context. Over the last fifty years, there was a significant shift from manufacturing industries towards service industries in industrialised countries (Zuboff and Maxmin, 2002). The dominant jobs in these societies are related to technical and professional work (Gutek, 1995; Zuboff and Maxmin, 2002:80). In 1998, 69 percent of Australia employees worked in the services sector, a level comparable with that found in other OECD countries (OECD, 2000). Thus, the services sector is an appropriate focus for research on the impact of new technologies, as the services sector will continue its importance.

Service industries have utilised B2C eCommerce capability extensively to connect directly with customers (Capelli, 1999) which has changed the way that customers interact with organisations. For example, in the tourism industry users (customers) are increasingly using the Internet to act as their own travel agent (Werthner and Ricci, 2004). The implementation of eCommerce technologies has significantly changed the structure of the travel industry by creating a network that includes market participants. The introduction of these technologies has changed the way consumers interact as they tend to be less loyal, take more frequent holidays with less duration and take less time between choosing and consuming a tourism product (Werthner and Ricci, 2004: 103).

Customers are becoming 'end users' as well as consumers when interacting using online service delivery channels (Vatana sombut et al, 2004). Vatana sombut et al (2004) found that the ability of a customer to use the technology effectively when interacting with an organisation online is particularly important for organisations to retain their customers. Rust and Kannan (2003) argue that eCommerce service delivery channels have had a dual impact. On the one hand, technological advances have provided organisations with the ability to achieve competitive advantage by enhancing service and relationships. On the other hand, they argue that as customers become more familiar with the technologies, customers expect more which forces organisations to make changes in their delivery of electronic services. This leads to increased competition created by customers’ rising expectations.

ECommerce and retail banking

Our study of eCommerce changes in the retail banking industry in Australia illustrates the impact of these changes. A customer traditionally interacted with their bank either by going into their local branch, with some interaction via the telephone and through the postal system. Retail banks traditionally relied on an extensive
branch system and the introduction of new technologies such as ATMs significantly changed the number of branches. Retail banks achieved competitive advantage by adding new branches and as they are expensive, branches were not in every location. The banks that were first to build a large branch network in an area were those that gained a competitive edge (Mols, 2001). However following the introduction of ATMs, the ratio of branches to the population fell from 80 per 100,000 in 1980 to 38 per 100,000 in 1994 (Kitay, 1999). The new technologies opened up new methods for obtaining a competitive strategies and ways of servicing clients that did not rely on the expensive branch system. However, contrary to the popular view that banks have implemented new technologies merely to automate the interaction between customers and the banks, we found that the strategy employed has been more complex. This analysis is reported elsewhere (Blount et al, 2005).

During the last decade banks' service provision strategies have changed significantly to include a multi-channel interaction with the customer utilising ATMs, telephone banking, eBanking, internet services and call centres as well as the branch. In order to be able to utilise these new distribution channels, customers have to be able to not only use the new technologies effectively and efficiently but also know when to choose them. Customers may not feel comfortable using the self-service technologies and many have been found to prefer branches and personal interaction (Regini, et al, 1999).

We need to conceptualise B2C eCommerce systems to focus on relationships and interactions rather than the technologies and business processes if we are to understand the complexity and richness of the changes brought about by these technologies. We found that in the retail banking industry the specific technologies that have altered the way employees of organisations and customers interrelate in retail banks include ATMs, telephone banking, eBanking, Call Centres, Internet Services, Expert Systems and Decision Support Systems. These types of information systems have facilitated the ability of retail banks to deliver products and services through multiple delivery channels. This in turn has changed the way that employees interact with customers, that is, these particular technologies have reshaped the interaction a customer has with an organisation and changed the way that employees interrelate with each other when dealing with customers. In some cases the customer interaction will be entirely electronic, such as the use of eBanking and ATMs, and in other instances there will need to be contact with a bank employee. In all cases, if there is a problem, the customer will need to contact the call centre or go into a branch to retrieve their card or obtain a replacement card. If a customer using eBanking found that they had unauthorised transactions on their bank statement or had been overcharged on their credit card, they would need to contact the Call Centre to resolve the anomaly.

**COACTIVE COMMERCE SYSTEMS**

The information ecology metaphor provides one way to understand the interactions mediated by the implementation of B2C technologies. It helps conceptualise the changing interaction between customers and employees and the resultant impacts on employment. However, we need a description that captures the nature of the relationships between customers and employees (as representatives of the organisation) and how working relationships among employees adjust with the introduction of B2C applications. Building on the STF and the information ecology approach, we propose the concept of “coactive commerce systems” (CCS). The term coactive is taken from the ecology discipline and means “any of the reciprocal actions or effects, such as symbiosis, that can occur in a community” or more commonly coactive means a “joint action towards a common goal or end” (Houghton Mifflin Company, 2005). This definition is meaningful as the types of information systems explored in this paper rely on both the customer and the employee of the organisation operating the system in various ways.

CCS can be distinguished from traditional information systems in the service sector as they involve customers and staff as end users in an interdependent way. Previous implementations of information systems have been directly linked to the automation of tasks, the streamlining of processes, cutting costs and increasing efficiencies rather than enhancing customer satisfaction or improving the customer experience. Coactive Commerce Systems in contrast provides a useful concept for analysing the impact of B2C eCommerce technologies specifically related the changing interaction between customers and employees.

**CCS interaction in an electronic banking environment**

Retail banks have implemented two broad categories of coactive commerce systems that are used either to interact directly with customers or to support employees in their interaction with customers:

- **Self-Service Technologies** which include ATMs, eBanking, automated telephone banking, mobile banking, expert systems and other services provided over the internet.
- **Employee Support technologies** which include Call Centre technologies, Customer Relationship Management, Complaint Tracking Systems, Intranets and Decision Support Systems.
We have identified three major ways in which Coactive Commerce Systems are used in this sector:

- **Self Service online.** The customer uses information systems from the self-service technologies category to move money between accounts; pay bills or get a loan approval online. This interaction relates to the automation and streamlining of routine transactions, saving time and money for both customers and the organisation.

- **Arms length interactions.** An employee interacts directly with the customer via the telephone or email, using information systems such as Call Centre technologies, the organisation’s intranet, front office systems or complaint tracking. These transactions range from simple to medium complexity such as the customer lodging or following up a complaint. The technologies are used to assist brief interactions.

- **Extended interactions.** A bank employee engages the customer in a more extensive interaction, usually face-to-face. This would involve complex transactions and advice to the customer that may have a significant or long term impact on his/her financial position such as major loans or investment decisions involving shares and property. The technologies that support face to face interactions include customer relationship management and decision support systems. They assist both the customer and service provider and this interaction may take place over time and entail a number of separate events.

Gutek’s work (1995) provides a useful way of thinking about the changing nature of interactions between customers and employees of organisations. Gutek (1995) believes that the way employees and customers interact is changing significantly due to the proliferation of service industries as well as the introduction of new technologies. Gutek (1995: 1-9) distinguishes three basic types of interaction between a customer and a provider and argues that the distinction between these is important as it has an impact not only on how organisations compete but also directly relates to employee capabilities and skills.

- **Encounters**, consist of single passing transactions between customer and provider. The customer conducts a service transaction with one or more functionally equivalent service providers. For the majority of transactions in the banking industry, customers interact with the bank via encounters e.g. for the next available teller or the next available ATM.

- **Relationships** occur where a customer and a provider know each other both as individuals and role occupants. They develop a history of shared interaction where they expect and anticipate future interactions. Relationships are based on formal organisational structure and role expectations. In the past a number of customers had a “relationship” with their bank manager who knew them personally and would know them and their family dealings intimately.

- **“Pseudo-relationships”** occur when an organisation attempts to mimic a relationship. For example, an employee may address a customer by name in an interaction to develop a sense of a relationship, when it is, in fact, an encounter (where an employee has knowledge about a customer such as through a CRM system but the customer has no knowledge about the employee).

The role technology plays will depend on whether the interaction is an encounter, a pseudo-relationship or a relationship. Gutek (1995) maintains that information technology plays a more central role in delivering services though encounters and pseudo-relationships – whereas a relationship interaction utilises technology rather as a support function. This would suggest that eCommerce technologies tend to support interactions based on “encounters” or “pseudo-relationships”, whereas service delivery based on “relationships” is less common and may be reserved for the more important customers whose business is of high value to the organisation. Gutek’s work is a useful addition to the socio-technical approach. Even though it doesn’t deal with B2C technologies, it assists in thinking about how technologies and individual actions are related in specific situations and is consistent with an information ecology approach.

In order to demonstrate how one might incorporate the STF, the information ecology approach, the concept of CCS and Gutek’s service typology, we have drawn insights and examples from our case study research undertaken in two Australian banks in 2002 and 2003. One bank (the Australian Union Bank or the AUB) was small and localised while Lawson Central Bank (LCB) was one of the four major banks with operations Australia wide and internationally. The data collected consisted of semi-structured interviews and analysis of documents relating to strategies, policies and procedures relevant to eCommerce implementation. The questions were designed to elicit in-depth responses and were conducted with bank personnel holding a variety of roles in the two banks. A total of 24 interviews were conducted with 33 respondents. The data were analysed using a meaning condensation approach (Kvale, 1996). This required interrogating the data for central themes and linking this back to the theories.
COACTIVE COMMERCE SYSTEMS AS INFORMATION ECOCOLOGIES

The CCS approach extends both the STF and Information Ecology paradigms by providing a more tangible way of analysing how service organisations are implementing B2C eCommerce and the specific way it is changing the way employees and customers interact. The data from our research into the retail banking industry shows how this level of analysis explicitly details the link between the implementation of the new technology and the changing interactions between the service organisation and the customer. The following three interactions are dynamic and customers and employees will move between them depending on the product or service the customer needs.

1. **Self Service Online**

Service organisations have implemented technologies with a focus on cost cutting and the automation of functions (Child, 1985). The first level of these interactions can be described in Gutek’s terms as an encounter since the interactions are numerous and the transactions are straightforward and simple. This includes the self-service technologies which are available 24/7 and the ability to track transactions and solve problems online. Customers want to perform their transactions at their own convenience and expect that the service provided will be sophisticated enough to meet their needs. These interactions are mediated by B2C eCommerce technologies without any intervention from a bank employee. Customers receive consistent service on demand and must acquire the skills and expectations that impel them to use these systems.

The evidence from our case studies indicates that retail banks utilise these types of B2C eCommerce technologies to streamline costs and encourage customers to use self-service technologies. One way retail banks encourage customers to use these technologies is to charge fees for using the more expensive face to face services such as a teller in a branch (as opposed to using an ATM). The AUB decided to charge fees for the customers using the face to face service delivery channels for simple transactions such as withdrawal of cash. This didn’t always have the desired effect; however, as the bank discovered that customers would use the ATM to withdraw cash and then come into the branch anyway to have a chat, thereby keeping the tellers from doing other work. In the second case study there had been a deliberate strategy for some years to move customers from the more expensive face to face service delivery channels into the electronic service delivery channels. This was achieved by charging fees for customers utilising the more expensive channels. Another strategy had been for bank employees to “walk the queues” – a tactic of asking customers in a queue waiting to see a teller or customer service officer to use the ATM, telephone banking or ebanking.

The LCB had come the realisation that they had to down grade their expectations of what internet technology could do “I think we have modified both our expectations of it [internet technologies] and what we can do with it and now very much see it as just another distribution channel, another way of doing business with our customers.” Both banks were able to provide self-service technologies 24/7 and both were investing considerable resources in ensuring these self-service CCS were accessible and meeting customer expectations, but acknowledged that automated transactions were not sufficient.

2. **Arm’s length interactions**

The second level of engagement requires some interaction with the organisation through an employee. These interactions may be initiated due to problems with self-service technologies or a customer needing an answer that can’t be found using these technologies. These interactions are at arms length but supported by technologies such as call centre technologies. Employees follow a designated script and if the interactions require more complex assistance, the customer will be referred to another employee, for example a financial advisor in the case of investment advice.

This type of interaction involves direct interaction between the customer and a bank employee. The customer may want to talk to someone on the telephone or in a branch. The queries will be relatively straightforward, such as requests for advice on mortgage interest rates, insurance enquiries and loan information. In general the transactions will range from the straightforward (problem with account) to moderately complex (mortgage loans, insurances). The employees involved at this level would include call centre employees and branch staff. The types of employee skills and capabilities needed to deal with these customer issues involve communication, problem solving and interpersonal skills.

The coactive commerce systems in this context can be seen to “informate” jobs (Zuboff, 1988), that is, these technologies provide employees with the contextual information they need to interact effectively with customers, but only to a minimal degree. In Gutek’s (1995) terms, these interactions would constitute a pseudo-relationship with attempts to engage the customer. One way that organisations do this is to use the customer’s name. This is done by using technology to look up the customer name and other personal details such as address, spouse name or children’s name to imply a more extensive relationship. Customers, on the other hand, do not have any
information about the employee they are interacting with and there is little reciprocal interaction. A customer does not necessarily deal with the same employee every time they have an interaction of this type.

There was evidence in both case studies that call centre employees used the tactic of addressing the customers by name in conversation. Branch staff were also instructed to use the customer’s name several times throughout an interaction, whether they were known to them personally or not. In the AUB there was little emphasis on automating call centre functions as the bank was known for its customer service and the bank was attempting to keep this as a key differentiator with its competitors. An illustration of this approach was that each email received by a customer was answered personally. LCB utilised call centre technologies to automate some functions to obtain cost efficiencies. In both case studies the call centre was in-house (that is, it was not outsourced to another organisation).

The AUB used the intranet in an ad-hoc manner, due in a large part to there being no owner and many employees found it cumbersome to use. For example, the HR Department had spent a considerable amount of time developing formal policies and procedures such as recruitment and induction which were available on the intranet for managers to use, but had no mechanism in place to ensure these policies and procedures were adhered to. Although there was an induction toolkit, it had not been integrated into performance management.

In contrast, LCB was in the process of implementing a staff portal to harness the vast amount of information on the intranet in an attempt to provide employees with better support to interact with customers. The intent was to be able to allocate specific applications and tools to a particular role, rather than requiring staff to trawl through information which might not be relevant to their position in the organisation (although at the time of the interviews this had not yet been implemented).

3. Extended interaction
A more extensive interaction is required for complex or on-going financial advice. This is the most sophisticated level of interaction. Examples include wealth management, superannuation advice and specific investment recommendations. These interactions require the employee with significant expertise in financial services, who understands the implications of recommending particular products and services including the complexity of the market. The employee needs good communication and interpersonal skills and the ability to solve problems at a high level. In this type of interaction the customer is looking for a high-value service and expects the employee to be knowledgeable about all aspects of their current and future financial choices. This interaction is likely to take place on a face to face basis and would involve more senior bank employees. In some situations, particularly if one is wealthy, a personal banker is assigned.

For these extended interactions, the CCS “informate” jobs (Zuboff, 1988) at a high level and are used to solve more complex problems using, for example, decision support systems. In this scenario, it is likely that a “relationship” would be established, especially if there was a significant exchange of information or many interactions occurred. If a personal banker was assigned to a customer and the customer had a reciprocal knowledge of the employee, the employee and the customer might come to know each other as individuals.

These CCS and the relationships that they entail have important implications for the service strategies of organisations. These are not static systems but evolve as both organisations and customers change. This is supported by our study of the retail banking sector. At AUB it was clear that the bank thought that it had a “relationship” with its customers although in most cases customers dealt with more than one employee, especially if they rang the call centre. This bank believed that for it to continue its success, it needed to emulate the branch experience in its non face to face service delivery channels. The manager responsible for implementing eBanking claimed “…so our challenge in the online services side of things is to replicate that highly desirable experience they get when they walk into one of our branches when they do it online”. This suggests a weakening of the “relationship” type interaction and the question for is the bank was whether they could turn an electronic “encounter” into more of a “relationship” interaction.

In the LCB, most interactions of this type were pseudo-relationships as the customer dealt with many employees when interacting with the bank. A key objective was to meet more customer needs at their first point of contact with the bank and have fewer “hand-offs” (a key customer complaint is that they are passed from one bank employee to another before their need or complaint could be dealt with). An initiative was designed to reduce these complaints. LCB had recently introduced a workplace learning tool or communication maps to give all employees in the organisation clear information about what is happening in the economy, the banking industry and the bank. The employees interviewed reported an increased level of job satisfaction as their skills improve (which was also reported separately by the branch manager).

The conceptual framework outlined above gives us a more specific way of thinking about how customers interact with organisations using eCommerce technologies and how employees and managers deal with these issues. A CCS in a service organisation is depicted schematically in Figure 1. It shows the perspective of the customer and employee as each uses the system. The bulk of interactions are routine and online, performed by
the customer operating the CCS without assistance. The employee has no direct involvement but must understand how the system appears to the customer and how it operates within the organisation. Most of the direct employee-customer interactions take place at the pseudo-relationship level (indicated by the middle level of the CCS). These interactions are an important interface between the organisation via its employees and the customer. They are sporadic and transient; a technical problem may be solved or a customer may be referred to a higher level of service. Relationship-based interactions are rare but intense (as shown at the top of the diagram) and an employee is required to provide personal attention to clients, often solving complex problems for them.

Customers must know how to use self service technologies and understand when it is appropriate and effective to use them. This will increasingly be their normal way of transacting with the organisation. These transactions do not require employee involvement, but employees dealing with customers directly need sufficient knowledge of self services technologies to solve customers' problems and assist them when required, directing them tactfully to the best form of interaction. Employees' involvement is less frequent (e.g., telephone inquiries to call centre staff) but they also require interpersonal and problem-solving skills, the ability to conduct brief but satisfying interactions over the phone or the inquiry counter, knowledge of the organisation and its operations and good teamwork skills to coordinate with other bank staff. Staff conducting extended interactions will need traditional client management skills, the ability to use the technology support systems and a detailed understanding of how all the systems, both technological and organisational, in the information ecology are linked. Bank management need to maintain the mix of applications and manage the technological and human resources to provide the right mix of cost-efficient, easy-to-use, reliable service and satisfying interactions appropriate to their inquiry or service need. Understanding which level of interaction is relevant to each application in a coactive commerce system will provide managers with guidance on the most appropriate way to implement the new B2C eCommerce applications in terms of both customer needs and employee capabilities and skills. For example, having highly skilled employees dealing with simple transactions would be a waste of resources and unsustainable from a cost perspective. Conversely, leaving complex interactions to inexpert staff or conducting them in a perfunctory manner would alienate customers. In sum, all systems and actors need to be incorporated in a holistic and integrated system, strategically oriented to achieve an organisation’s goals in its target market.

CONCLUSIONS AND FURTHER RESEARCH
This paper has provided a conceptual framework to help us understand the complex interactions between customers, organisations (as represented by employees) and eCommerce technology and business processes. We
employ an ecology metaphor – coactive commerce systems – that focuses on the social and organisational embeddedness of technology and the implications this has for major groups of actors (employees, customers and to a lesser extent managers). This provides a way of conceptualising technologically-mediated interactions within a socio-technical information ecology paradigm and advancing the empirical focus of the paradigm.

The identification of coactive commerce systems can also provide guidance to practitioners when implementing and managing B2C eCommerce technologies including a variety of employee management issues such as recruitment and training of employees. Service organisations are looking for ways of managing the balance between containing costs and providing the self-service technologies so that customers can perform simple transactions as well as the technologies to help employees facilitate more complex transactions.

Retail banks in the Australian context have had to change the way they compete by rethinking their strategic positioning in the market. In the 1980s the branches were being used as the key way of interacting with customers. The introduction of eCommerce has introduced new ways for services to be delivered to customers and as a result employees have to interact with customers in a variety of ways. Our research on retail banks’ implementation of B2C eCommerce shows that it is important to understand how the information systems affect the way customers and employees interact to provide the appropriate level of customer service. This requires a rethink of employee skills and capabilities and how they are managed. It is a complex area as it depends on the business objectives of the B2C eCommerce technologies, the level of sophistication of the technology and the knowledge of the customers as to what the most appropriate human resource strategies may be for a service organisation such as a retail bank to achieve competitive advantage. The CCS framework presented in this paper provides a way for service organisations such as retail banks and their employees to understand the various interactions between customers, employees and the new technology. It also provides a way for customers to understand the best way for interacting with service organisation to achieve the most satisfactory and cost effective outcome for their needs.

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