

Misaligned Market: The Importance of Industry Context in Technology-Mediated Exchanges

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ABSTRACT

This article examines e-marketplace adoption difficulties from a contextualist perspective. The analysis of industrial characteristics will unearth the adopter's supply chain practices and the contextual features which are unfavorable for e-marketplace deployment. To gain a deeper understanding, this research examines an unsuccessful e-marketplace adoption for agricultural industry in China. The tension created by these two incongruent contexts results in a misaligned market, as a free-market principle (assumed to be an integral part of the e-marketplace) is imposed on an agricultural market exchange which is characterized by a regulated business environment and a monopolistic market, and which emphasizes variances in product quality, tacit product specification, exclusive suppliers, and spotty purchasing. Practical and theoretical implications of the findings are discussed with reference to technology adoption and technology-organization alignment literature.

Keywords: agricultural industry; case study; contextualist perspective; e-marketplace; industry characteristics; technology-organization alignment

INTRODUCTION

Rapid economic development in Asia has heightened the need for entrepreneurs to adopt proven innovations in the hope of catching up with their Western counterparts (Avgerou, 2002; Walsham, 2001). This is especially true in the case of modern China, and in the use of the e-marketplace to streamline the supply chain for productivity gains. Hitherto,

more of the e-marketplace initiatives have sadly been disappointing ventures, rather than satisfactory endeavors. Many in the industry speculate that the unfulfilling technology initiatives have been caused by various adoption barriers (Ranganathan, Teo, Dhaliwal, Ang, & Hyde, 2001; Tan & Wu, 2002; Zhu, Kraemer, & Xu, 2002). Moreover, in developing countries, ineffective technical and social

infrastructures, particularly with regard to Internet connections and payment gateways, have significantly prevented the productive use of e-marketplace (Farhoomand, Tuunainen, & Yee, 2000; Markus & Soh, 2002). Current literature provides informative insights into these roadblocks.

Awareness of the roadblocks enables policy-makers to improve the conditions that facilitate technology adoption. Nonetheless, most of the previous analyses did not give much consideration to the role of local context in technology adoption. This gives rise to those context-related studies which suggest that the ineffective adoption of e-marketplace is moderated by national cultural patterns (Bagchi, Hart & Peterson, 2004; Heeks, 2002; Shore & Venkatachalam, 1996) and social context (Avgerou, 2001; Kumar, van Dissel, & Bielli, 1998; Riggins & Mukhopadhyay, 1994). However, the main thrust of these studies has been the examination of the generic cultural traits. They have not yet had an opportunity to examine the contextual characteristics in a specific industry. Thus far, relatively little is known about whether an e-marketplace is suitable for an organization situated in a particular business environment. It is foreseeable that adoption difficulties seen in the computer industry (emphasizing mass production and cost advantage) may vary significantly from those identified in the pharmaceutical industry (with a focus on product liability). Inevitably, such insensitivity to industry context may lead to the implementation of a proven e-marketplace for the wrong industry, thereby creating a “misaligned market”.

This article aims to address this misaligned market issue and is organized as follows. The next section explains

how a contextualist perspective is used. This is followed by a description of how data are gathered and analyzed. Next, an e-marketplace adopted for an agricultural company in China is examined. The findings elaborate on the “misaligned market” by examining the unfavorable contexts at both industry and supply chain level. On this basis, this study examines why the online market has been perceived as unsuitable for the agricultural sector. Finally, the implications of the research are discussed.

THEORETICAL BASIS

Business-to-business (B2B) e-commerce, better known as the e-marketplace, has recently captured the growing interest of executives (Ash & Burn, 2006; Kambil & van Heck, 1998; Johnston & Vitale, 1988). An e-marketplace is a technological platform from where buyers and suppliers participate in the exchange of products or services, and negotiate business transactions over the Internet (Kaplan & Sawhney, 2000). In an e-marketplace, suppliers can renew product categories in a real-time manner and engage in online exchanges with buyers. Buyers can also engage in online bidding to facilitate supply chain collaboration, thus reducing purchasing costs and improving transaction efficiency (Malone, Yates, & Benjamin, 1987). The case study of Li and Fung provides an excellent example of how the e-marketplace can be used to integrate a sophisticated global supply chain (McFarlan & Young, 2000).

Nonetheless, most of these e-marketplace initiatives have not been successful outside the U.S. context (Avgerou, 2001; Dhawan, Mangaleswaran, Padhi, Sankhe, Schween, & Vaish, 2000; Kendall, Tung, Chuan, Hong, Ng, & Tan, 2001; Scu-

pola, 2003). Two streams of investigation have attempted to address this issue. The first stream of studies examines adoption barriers in terms of the lack of resources for adopting innovations, low perceived benefits, lack of champions in the organization, low absorptive capacity of the recipient organization, and lack of security mechanism and environmental constraints (Farhoomand et al., 2000; Pavlou, 2002; Ranganathan et al., 2001; Tan & Wu, 2002; Zhu et al., 2002). Most of these studies are based on the Technology Acceptance Model (Davis, 1989). The key finding is that e-marketplace implementation is difficult because adoption conditions are ineffective. However, these barrier analyses remain reticent on the issue of context and provide little explanation on the mediating effect stemming from the local context. Without a good understanding of context, one cannot grasp the totality of the social situation and thus the analysis of technology adoption is bound to be incomplete (Kostova, 1999; Pettigrew, 1987).

By way of compensation, the other stream of studies thus focuses on context. Several studies examine how national cultural differences between the source and recipient may make or break a global technology adoption project (Bagchi et al., 2004; Heeks, 2002; Shore & Venkatachalam, 1996). From this perspective, global technology adoption is determined by the cultural compatibility of the source and the recipient's country. For example, people in an individualist culture are more concerned with rationality and they are more likely to use technology as a tool to boost productivity; whereas people in a collectivist culture are more relationship-oriented and have a more conservative attitude toward the use of technology.

Based on this logic, technology is more effectively adopted if both the source and recipient belong in a compatible, homogeneous culture (such as the U.S. and U.K.). In contrast, technology is less likely to be adopted if the source and recipient come from incompatible, heterogeneous cultures (such as the U.S. and China, which represent individualist and collectivist cultures, respectively) (Bhagat, Kedia, Harveston & Triandis, 2002; Kedia & Bhagat, 1988). Other researchers have also found that resistance may stem from societal contexts (Avgerou, 2001; Kumar et al., 1998; Riggins & Mukhopadhyay, 1994). For example, in Cyprus, the family ownership structure is a major obstacle to the implementation of the e-marketplace (Avgerou, 2001; also see an analysis of ownership structure in Yoo, Choudhary & Mukhopadhyay, 2001). In the city of Prato (Italy), the textile traders found the task-oriented e-marketplace not conducive to supporting transactions in their relationship-based culture (see another analysis in the New York apparel industry; Uzzi, 1997). The key finding is that to make technologies acceptable, the implementer needs to assess how technology may cause disruption in the recipient's social context. Nonetheless, these context-based analyses mainly examine the generic cultural traits within a nation and society; and such assessment could lead to over-simplistic assumptions, such as the Chinese are a collective society while the Americans are an individualistic society. We are left wondering whether an e-marketplace will be "suitable" for an organization based in a specific business context. One must also note that, even though users may be willing to accept the e-marketplace initially, they may encounter disruptions of everyday

practices through the use of technology, and eventually abort the technology.

Hence, to assess whether a technology can be used effectively, we need to analyze the alignment between the technology and the organization. For instance, Soh, Sia, Boh, and Tang (2003) examined the implementation of an enterprise system, which was provided by a U.S.-based vendor in three Singapore hospitals. They found that the technology's structural properties were misaligned with the organizational functions. For example, the technical functions of patient management were inconsistent with the organizing principles deployed in these hospitals. The enterprise system thus became too restrictive for managing bed allocation in hospitals.

From this standpoint, technology should not be treated as if it existed in a vacuum. Unsuspectingly, technology creators, such as the developers of packaged software, inscribe their vision or view of the world into the technology when they create it (Bloomfield & Vurdubakis, 1997; Knights, Noble & Willmott, 1997). Their view of the world is influenced by the particular settings of their industry and draws on the rules, values, and norms that are a part of their business context when they develop the technology. As DeSantics and Poole (1994) point out, by considering technology as the product of human actions, technology contains a certain "spirit" which Kling and Iacono (1989) refer to as "institutional characteristics". In this "spirit", a technology is embedded with preconfigured procedures, routines, and practices (Soh & Sia, 2004; Soh et al., 2003). When a firm adopts a technology, it inevitably transfers the embedded "spirit" to the local context. In other words, once the technology is adopted, the recipient organization will either be shaped into

the "spirit", which is embedded in the technology, or reject the transfer of such a "spirit" if both prove incompatible, thereby disrupting the local routines. Therefore, to understand the suitability of technology, we need to examine how the contextual features, at both the organizational and industry level, may affect the adoption of the target innovation (Kostova, 1999).

To date, the existing studies on technology-organization alignment have largely examine the enterprise system (Newell, Swan, & Galliers, 2000; Soh & Sia, 2004), Geographical Information Systems (Walsham & Sahay, 1999), and computer-mediated communication (Majchrzak, Rice, Malhotra, King, & Ba, 2000). The issue of alignment has received scant attention in studies on e-marketplace adoption, with the exception of Barrett and Walsham (1999) which discuss vocational cultural variance in e-trading while paying greater emphasis on cognitive conflicts between traders and underwriters. Schultze and Orlikowski (2004), on the other hand, analyze work transformation in e-marketplace adoption with regard to the insurance sector. None of these studies have yet examined the alignment issue. Furthermore, the current studies are limited in examining the misalignment of structural functions (Soh & Sia, 2004; Soh et al., 2003), adopter perceptions (Walsham & Sahay, 1999), and management process (Lee & Lee, 2000; Majchrzak et al., 2000; Newell et al., 2000). What is missing is an analysis of the local "spirit", in the words of DeSantics and Poole (1994). The analysis of local "spirit" makes it possible to predict whether a technology may be effectively "aligned" with a specific organizational context.

To bridge this gap, this study examines the alignment of technology-organization

through a contextualist analysis (Kostova, 1999; Pettigrew, 1987). It is essential that this analysis be in two parts: the first part involves an examination of industry context in which organizational practices are shaped; while the second entails an analysis of the supply chain context in which actual purchasing practices (market activities) occur. The next section contains an explanation of how the contextualist perspective is employed.

RESEARCH METHODS

The case research method is employed for this study because it is a useful method for examining “what”, “how”, and “why” questions (Yin, 1994). To provide a rich contextual analysis, a single case study is conducted to explore online market adoption in an agricultural (trading) company in China. The arrangement of the research site, as well as the collection and analysis of data, is explained in the next section.

Research Setting

This case study is concerned with a major e-marketplace initiative, called WorldMarket (all names presented here are pseudonyms), launched in China in early 2000. WorldMarket was incorporated by a government agency to provide market-making services to a range of industries. This online market was built upon a technological platform provided by a leading international e-marketplace vendor, populated within Fortune 500 companies between 2000 and 2004. In the early stage, WorldMarket established the e-marketplace as a transactional platform and provided online procurement and bidding, thus catering for the needs of key Chinese enterprises in Beijing. It was

modeled after Global Sources (see www.globalsources.com) with the intention of boosting the transaction efficiency of suppliers, and promoting global trading with international buyers. However, during the first two years, this e-marketplace received a cold response. Most private companies found that the purchase of the systems and associated services could easily cost millions of dollars, which was unaffordable for most of them. Subsequently, starting in 2002, WorldMarket began to target larger state-owned enterprises which were able to afford the investment and aimed to establish an industry portal such as e2Open for the electronics sector. As WorldMarket was supported by the government, it was anticipated that the attraction of major state-owned enterprises would be much easier and AgriCo was one of their key targets.

Established in 1952, AgriCo's business scope includes the exchange of agricultural and grain products. The WorldMarket team perceived AgriCo as an excellent candidate for online market adoption because of its massive transaction volume. However, the adoption was rejected before long by AgriCo. WorldMarket was puzzled about this rejection with regard to four aspects. First, as WorldMarket was also a government agency, there should not have been a trust-related issue. Second, since AgriCo needed to process large volume exchanges of goods on a daily basis; an online market would definitely add value to its procurement practices. Third, AgriCo had both abundant resources to invest in such a system and a full-fledged e-business department to promote online transaction. AgriCo surely had the technological capabilities for online market implementation. In fact, AgriCo assigned two vice presidents to ensure the realization of elec-

tronic commerce. The internal resistance should have been minimal. Fourth, WorldMarket had learned to appropriate the online market so as to adapt to the local needs of Chinese enterprises, such as modifications of system features, language, and taxation matrices. There should have been a minimal amount of “cultural shock” when the online market was adopted. Such was the institutional background and the technological conditions under which this research commenced.

Data Collection and Analysis

This study is part of a broader research project which aims to investigate e-marketplace adoption issues in Asia. Between 2003 and 2004, data were collected through personal interviews, and from company archives and project documents. Each interview lasted for approximately one hour and thirty minutes. Data collection generally involved three main tasks. First, 12 senior executives and purchasing officers in AgriCo were interviewed. The interviews did not ask them to explain their “perceptions” regarding why they accepted or rejected the online market. Rather, the executives were asked to explain the characteristics of the agricultural industry in China (the industry context): the challenges involved in their daily purchasing practices and the concerns with regard to their sourcing activities (the supply chain context). This helped to sensitize the practices situated in the local context. Second, five practitioners or senior executives from the agricultural industry were interviewed to further determine industry dynamics. The researcher also spent a week with a purchaser to gain an insight into his two-year experience as a hands-on sourcing employee (2004 to 2006). This enhanced the understanding of purchasing practices in the agricultural industry. Third,

the researcher interviewed two selected farmers and one industry expert with an in-depth understanding of the operation of agricultural associations. This was in order to understand the issues concerning the sourcing aspects of the agricultural supply chain. Regular contacts with informants in the recipient organization were maintained through telephone calls and e-mails. The fieldwork was extended to include a visit to WorldMarket and AgriCo in Beijing in September 2004. On-site visits were conducted in order to observe the purchasing practices *in situ*. Subsequently, in April and July 2006, the description of supply chain practices was reviewed by an industry expert to improve plausibility.

The above efforts provided an understanding of the practices situated in the recipient’s organization. To further the understanding of the e-marketplace upon which WorldMarket was based, the researcher visited the vendor’s Asia Pacific headquarters in Singapore. In-depth interviews were conducted with eight senior executives of WorldMarket. The aim was to understand the functions and features of the online market provided by WorldMarket. The researcher also attended biweekly user training seminars for a three-month period to understand the full range of technological features. Next, between July and October 2004, intensive visits were arranged to 24 multinational companies across different industries (such as Johnson & Johnson and Singapore Technologies Engineering) to understand how the system is used in real situations.

The data were thematically analyzed (Miles & Huberman, 1994). A two-stage coding procedure were used. First, data were coded according to two categories: WorldMarket’s generalized practices (source) and AgriCo’s situated practices

(recipient). Then, the data of the two categories were analyzed to identify the differences between the generalized and situated context. This facilitated an understanding of how the e-marketplace might complement or disturb the local context. During the data analysis, the researcher reiteratively interacted with the purchasing officers at AgriCo in order to understand the potential impact of the online market on their actual practices. On this basis, the adoption potential of WorldMarket was assessed with regard to why the adopter might consider the online market as unsuitable, resulting in non-adoption. Special effort was made to understand context characteristics, and the data were coded according to the business and supply chain context. Inductively, subthemes emerged from the two levels of context: the “business context” containing analyses of industry regulation and market characteristics and the “supply chain context” which is concerned with procurement and contains analyses of product quality, product specification, number of suppliers and their relationship, and purchasing volume. To address reliability and validity concerns, two research associates were invited to code the data independently to enhance inter-rater reliability, and member-checking was conducted on the participant organization and technology vendor to ensure validity (Miles & Huberman, 1994).

RESEARCH FINDINGS

Case Background

WorldMarket is an Internet-based e-marketplace system facilitating product exchanges and transactions. Its main functions include e-catalogue, e-procurement, and e-auction. E-catalogue provides a product portal in which suppliers can

publish their product specifications and prices, while buyers can search and retrieve procurement information. E-procurement provides functions for gathering RFI (Request-for-Information), RFP (Request-for-Proposal), and RFQ (Request-for-Quotation) and for purchasing through the online market, while e-auction facilitates online negotiation through reverse auction. There are generally two types of e-marketplaces: e-hierarchy and e-marketplace (Malone et al., 1987). In an e-hierarchy, buyers employ an online market to connect with their suppliers within the validated network; in an e-marketplace, a market maker normally acts as a neutral third-party (or intermediary) mediating between buyers and suppliers in the e-marketplace. WorldMarket belongs in the second category.

In 1998, WorldMarket launched its first portal to provide government reports and trading news for Chinese enterprises. In the 2000s, with the rapid growth of the Internet, WorldMarket transformed the portal into an e-marketplace and offered market-making services. The vision was to establish a “global trading web” which was connected to e-marketplace portals internationally. However, in spite of the enthusiasm, this global trading web vision was unrealized. Table 1 provides a summary of the two marketplace contexts: one leaning favorably towards the e-marketplace and the other unfavorable against it. Next, the comparison between the two is explained.

Generalized Context Embedded in the Technology

Industry Context

WorldMarket’s e-marketplace system was developed by a major U.S.-based technology vendor. This technology

Table 1. A misaligned market: Characteristics of unfavorable context for e-marketplace

	Contexts Favorable for E-Marketplace	Contexts Unfavorable for E-Marketplace	Impact Assessment
Business Context	<i>Unregulated Industries</i> Example: Electronics components are purchasing items that are suitable for competitive online negotiation using e-marketplace.	<i>Highly Regulated Industries</i> Example: The use of e-marketplace is not possible for grain products as the agricultural market is highly regulated in China. Imbalance of supply and demand may affect national inflation and induce economic crises.	<i>E-marketplace may induce national inflation in macro-economic environment.</i>
	<i>Competitive Marketplace</i> Example: Computers and peripherals are sold in a highly competitive marketplace where many similar products are available.	<i>Monopolistic Marketplace</i> Example: The grain industry in China is based in a monopolistic market where there are limited suppliers. As Chinese agricultural market is mediated through planned market and futures market, free-market types of exchange become unsuitable. Confidentiality of market information is also another major concern.	<i>E-marketplace adoption will encourage opportunism</i>
Supply Chain Context	<i>Standard product quality</i> Example: Electronic products follow a common quality standard (e.g., ISO 9001) that is suitable for a standard control procedure.	<i>More variances in product quality</i> Example: Natural environment affects product quality. Production volume may not be predictable. Production resumes are not standardized and formalized at present, product quality is evaluated through human inspection.	<i>E-marketplace adoption may result in trade repudiation</i>
	<i>Explicit product specification</i> Example: The specification of electronic appliance products can be described explicitly and broken down into detailed components.	<i>Tacit product specification</i> Example: The specification of most agricultural products contains tacit knowledge and may not be articulated clearly in specific terms.	
	<i>Many suppliers</i> Example: An aviation production firm can easily procure from a qualified list of 3,200 suppliers.	<i>Exclusive suppliers</i> Example: The purchasing agent and farms are engaged in a collaborative relationship.	
	<i>Volume purchasing</i> Example: E-marketplace assumes a centralized purchasing function. Procurement can be consolidated across different departments.	<i>Spotty purchasing</i> Example: In agricultural supply chain, purchasing is fragmented across different departments and different categories, and such a spotty purchasing model may not be conducive to e-marketplace use.	

assumed a “free-market” economic environment which mediates the transactions between buyers and suppliers, according to Williamson (1981). The online market has been designed to reduce asymmetric information, so that buyers can identify suitable products quickly. In addition, suppliers are able to gather market information efficiently and adjust their prices and services responsively. Given this free-market assumption, buyers and suppliers are rational self-interest actors, whose aim is to maximize their benefits. In a perfect market, a product’s price would be reduced to its most reasonable level as a result of intensive competition among multiple suppliers.

Supply Chain Context

Based on this free-market assumption, buyers and suppliers have an arms-length relationship (Hsiao, 2003; Schultze & Orlikowski, 2004). Buyers are required to specify their purchase requirements. They often aggregate purchase volume, invite multiple bidders, and conduct competitive bidding in order to obtain the most economical pricing. In addition to pricing, buyers may incorporate other measures, such as product quality, delivery time, and services, into the competitive bidding, otherwise known as “transformation bidding”. Contracts are awarded by buyers through the based measure of rational factors (e.g., price, delivery terms, and product quality) rather than purely through past relationships. If a supplier is unwilling to participate in the competition, the buyer can always replace the supplier with other suppliers offering similar products. In an ideal online market, market making activities, that is, from request for quotation, supplier selection, competitive bidding to contract award, are mediated

through an Internet-based system. Through an online market, buyers may achieve cost-saving and ensure deal transparency, while suppliers may benefit from reduced transaction costs and achieve exchange efficiency.

Practices Situated in the Recipient Organization

Industry Context

The analysis can begin by examining how grain products are produced and exchanged. The quality of grain products depends largely on the natural environment. The same type of seeds, farmed in the same soil by the same farmers employing the same methods, may yield different degrees of product quality because of variances in the environmental conditions. Citing the production of wheat in North China, for instance, the date and amount of snowfall will influence the harvest yield. If snow falls too early in the planting season, the growth of the wheat will be impaired by insufficient sunshine. If the snow comes too late, pests may not be winter-killed. Moreover, the amount of snowfall will also influence the growth of wheat. For example, insufficient snowfall means that snow cover will not be thick enough to protect the wheat; and if the thaw sets in prematurely, it might harm the production of wheat. But when heavy snowfall occurs, it might overwhelm the grain and the wheat production may be reduced consequently. Since the natural environment affects the growth of seeds, many varieties of the grain products may be harvested consequently.

The grain industry in China is characterized by a regulated market. With regard to demand, since grains are daily consumption, their demand is stable and the resulting impact on their price is rela-

tively measurable. On the contrary, grain supplies will greatly affect its pricing in the market. Insufficient supplies will result in an increase in the market price and subsequently impact the price of general commodities, leading to inflation, and resulting in nationwide economic crises. Therefore, grain products are closely monitored and controlled by the People's Republic of China (PRC) government. The Chinese government only allows state-owned enterprises to exchange grain products. Private-owned enterprises are not permitted to trade in grains directly with farmers. A procurement manager in AgriCo explained:

If private-state enterprises were allowed to trade in grains, farmers would not want to sell the grains to the government when the market price is higher than the government's acquisition price. This may affect national grain storage. Even though farmers do sell the prescriptive amount of the grain to the government, the quality is hard to guarantee. This is because farmers will sell the better products to private enterprises to maximize profits, and sell the more inferior products to the government agencies.

The state adopts a two-tier system in purchasing grain products: the planned system and the market-based system. Under the planned system, the state entrusts a large-scale state-owned enterprise, like AgriCo, to procure grains from farmers. These entrusted enterprises purchase grain products at a promissory price from farmers according to national grain policies. In the market-based system, the grain price is determined by supply. This means that the farmer's income may fluctuate within

a harvest year owing to price fluctuations in the market. This phenomenon prompts the state to engage the "farm-produce-for-order" principle, which is similar to the "make-to-order" principle, in order to share risks with farmers. Thus farmers would sign a contract with the procurement agencies before production commences. Then, farmers will produce grains according to terms of the contract. In this way, farmers' risks are transferred to the procurement agencies, which, for their part, turn to the futures market to reduce their transaction risks.

Supply Chain Context

As an entrusted agency, AgriCo purchases grain products through an exclusive relationship with farmers and minimizes business risks in the futures market. Primarily, buyers categorize different types of grain products and evaluate product quality. In contrast to industry commodities, there is a greater range of grain varieties. A grain product is usually classified in terms of breeds. Each category will be grouped into subcategories according to cultivation conditions, such as temperature and soil. For instance, while there are more than 10 varieties of wheat, there are even more categories of nuts and vegetables. Furthermore, deep tacit knowledge is required to identify the quality of the products. A sourcing executive in AgriCo noted the simplest inspection principle:

To examine its rigidity, wheat should be cut into two halves transversely. If the transverse section looks hard and transparent, and the vitreous body occupies more than half of the section, then this wheat is a breed of hard-white wheat. If the transverse section looks soft and opaque, and the floury body occupies more than half

of the section, the wheat is a breed of soft-white wheat.

To acquire the tacit knowledge of grain products, buyers need to develop their authentication capability *in situ*. They send specialists to the field and spend years working with farmers. A novice buyer usually takes two or three years to become an experienced buyer, specializing only in a few varieties of grain products. Even the most experienced buyers find it difficult to acquire in-depth knowledge of all types of grain products. With certain products (such as organic fruits and vegetables), farmers also need to submit a “production resume” which describes the detailed production process and verifies the origin of production. The preparation of a “production resume” is not consistent across different Chinese cities. Therefore, human inspection continues to be required to certify the value of agricultural products.

In a futures market, dealers, investors, and buyers need to work together to complete a transaction. The dealers’ major obligation is to balance the market price, while AgriCo as a buyer will monitor the price fluctuations in the futures market and procure grain at the lowest cost. At the other end, investors employ capitals to leverage the price of futures. Their aim nonetheless is not to purchase grains but to maximize profits from transactions. In such a situation, buyers strive to keep their market information confidential in order to counter the opportunistic behavior of investors. One procurement manager in AgriCo explained such practices:

For instance, although we intend to purchase 100,000 tons of wheat, we won't put our demand on the market collectively. Usually, we will divide our demand into

several lots, and put them into the market separately. Our aim is to create a situation that convinces farmers and investors that the supply is greater than the demand in order to lower the price. For this reason, investors use capitals to invest on the futures market by guessing our actual demand and the bottom-line price. Therefore, information is the golden key in winning this game.

In addition to the information on grain products, the information on packages must also be kept confidential. For example, if the information on procurement volumes and the type of packaging bags is leaked, the investors can estimate AgriCo’s supply volume of each product in the futures market. This will result in significant losses, consequently.

Difficulties of Technology Adoption

Based on the analysis given above, six areas of misalignment can be identified: regulatory environment, market structure, product quality, product specification, supplier base (and relationship), and purchasing pattern (see Table 1). These misalignments may result in three major concerns which are next discussed. These concerns are not unfounded fears, and they influence the adopter to form opinions about the applicability of online marketing. The next section is dedicated to examining how these concerns may be induced by the misalignments.

1. **E-marketplace adoption may result in national inflation.** As grain production affects the general consumer market, the Chinese government needs to intervene in the market transactions of agricultural products.

WorldMarket's e-marketplace is based on free-market assumptions and encourages perfect competition in which price is decided by supply-demand relationships. This principle is not aligned with the government's intention to regulate the agricultural market. The government's prime agenda is to avoid the market failure. For example, a grain product may be affected by environmental conditions and lead to a reduction in supply. With insufficient supply, the price of a grain product will increase. In the worst case scenario, when the price is raised dramatically, national inflation will result and lead to economic crises. In both situations, AgriCo's executives have much to lose by participating in the public marketplace; and the e-marketplace is hence considered a disruptive tool.

Moreover, to protect farmers' incomes, the Chinese government has stipulated national policies for grain acquisition. For example, government agencies employ a "farm-produce-for-order" policy to minimize farmers' production risks. When grain products are exchanged over the e-marketplace, prices will be determined by the market terms. This exchange model is suitable for commodity products. However, in such a situation, most farmers' incomes will be affected by the fluctuation of their production, if they were allowed to participate directly in the marketplace. Farmers could dump their products in order to balance the price-drop. Worse still, they could end up living in poverty. This in turn might lead to riots, which is a serious political concern considering the country's history. Although the e-marketplace may achieve cost reduction and increase supply

chain efficiency, it is perceived by AgriCo as a potential risk driver for disrupting supply chain integration and triggering farmers' rebellion. Besides, there is little interest in employing the e-marketplace, considering that AgriCo already has a monopolistic position in the market.

In brief, the e-marketplace is more suitable for commodity products such as electronic components widely used in the computer industry and in a less regulated environment. A highly regulated environment, such as that of the agricultural industry or the aviation petroleum industry, is unfavorable for adopting the e-marketplace.

2. **E-marketplace adoption will encourage opportunism.** In the futures market, it is imperative for buyers to ensure that all product and transaction information remains confidential in order to avoid the opportunistic behavior of investors. In addition, the leaking of purchasing information by AgriCo will also incur administrative sanction on the part of the government. Therefore, for both direct and indirect procurement, transaction information is strictly controlled by AgriCo. It was only in 2004 that AgriCo began to incorporate its private online market for selective items in a conservative manner. It is not too difficult to understand why implementing a public e-marketplace is both economically unwise and politically incorrect for AgriCo. Even though WorldMarket is also incorporated by a state agent in the information and communications sector, there is no motive for AgriCo to trust the market-maker as the temptation to leak out trading

information makes such collaboration a risky business.

- 3. E-marketplace adoption may result in trade repudiation.** With a greater range of grain varieties, grain products are naturally affected by cultivation conditions. The process of authentication requires the sophisticated product knowledge of experienced staff. The e-marketplace assumes that all products exchanged in the electronic platform can be specified explicitly in an e-catalogue. As such, product exchanges can be mediated by rational measures, such as product quality, delivery time, and service terms. However, with agricultural products there are indistinctive product categories, inconsistent production resumes, and complex product verification processes, all requiring tacit product knowledge. If agricultural products are to be exchanged within such an e-marketplace, buyers and suppliers will incur both greater repudiation and losses. Naturally, the repudiation issue has never occurred before for one reason. In such a market, buyers and suppliers are engaged in a collaborative, rather than competitive relationship. In contrast to one-time volume purchases for commodity products, such an exclusive buyer-supplier relationship is more useful in facilitating effective market coordination in relatively small-volume purchases made in multiple batches (cf., the findings in Uzzi, 1997). There is no need for buyers and suppliers to “compete” over price (echoing Kumar et al., 1998). Hence, although e-marketplace is an effective tool for mediating commodity exchanges, it is less meaningful and

not relevant in AgriCo’s supply chain context.

IMPLICATIONS AND CONCLUSIONS

This study examines industry context with the aim of understanding e-marketplace adoption difficulties. This research offers two major contributions to current literature. First, the current literature has focused largely on identifying adoption barriers (Ranganathan et al., 2001; Tan & Wu, 2002; Zhu et al., 2002) and cultural variance (Bagchi et al., 2004; Heeks, 2002; Shore & Venkatachalam, 1996). These studies merely analyze the conditions in which technology adoption has occurred. Generally, these analyses could help us to understand how these barriers may impede technology acceptance; but they do not indicate whether a technology may not be “applicable” for the recipient’s context. The proposed analysis looks into the local business context and assesses how “applicable” it is to transfer the e-marketplace (assumed to possess a specific set of contextual characteristics) into the adopter’s context. In the case of World-Market, technology adoption was unsuccessful not because the e-marketplace system was too complex, and China’s technological infrastructure and adoption conditions were not well-established or that the adopter simply had no resources to invest in a technology-mediated exchange (cf., Markus & Soh, 2002). It was also not because there was incongruence in the national culture: for example, the adopter’s culture is collectivistic (as typifies Chinese enterprises) so that the adopter rejects the technology which is developed in an individualistic culture (which is typical of the U.S.-based vendor). Attributing

the problem to national culture could be misleading. Evidence indicates that Nissan also had encountered many difficulties in adopting Toyota's production system, even though both are Japanese companies, whereas General Motor was able to transfer Toyota's system, which was similar to Nissan's, successfully (Wilms, Hardcastle & Zell, 1994).

Theoretical Implications

This study offers three main contributions to the technology adoption literature. First, this study provides a seminal analysis on technology-organization alignment in e-marketplace adoption situations. Previous studies have placed greater stress on enterprise systems and thus their analysis leans towards an enterprise's corporate strategy, management process, organizational structure, and people's roles/responsibilities (Newell et al., 2000; Soh & Sia, 2004). Studies on geographical systems, in contrast, emphasize the transitions in temporal and spatial practices (Walsham & Sahay, 1999). The subject of online market is an area which has been neglected by current analyses. This article is an initial attempt to examine the alignment issue underlying e-marketplace adoption. In examining whether an e-marketplace may be aligned with the local context, this research examines the exchange assumptions embedded in the technology (cf., Barrett & Walsham, 1999; Kumar et al., 1998; Schultze & Orlikowski, 2004).

Second, using a contextualist perspective, it suggests an alternative approach to analyzing technology adoption through technology-organization alignment analysis. To understand why an e-marketplace fails to be adopted, we need to analyze the characteristics of the local context at both the supply chain and industrial

level, so as to examine whether the local context is aligned with the transaction principles assumed in the e-marketplace. This comparative analysis could help the implementer understand why an e-marketplace is considered impractical, irrelevant, and disruptive by the adopter. This case study illustrated that AgriCo had no major barrier in the adoption of the online market, as far as technology infrastructure, financial viability, and adoption condition were concerned. By examining the local practices, this study identifies the misaligned business contexts, which illustrate the unfavorable features for e-marketplace adoption. The potential risk of imposing the e-marketplace in the adopting organization thus becomes clear. This study suggests an emphasis on technology suitability (that is, understanding why technology is considered inapplicable), rather than merely concentrating on technology acceptability (i.e., identifying conditions that prevent technology acceptance).

Third, this study invites an alternative reading of how technology could be aligned with the organization. The current studies suggest a mutual adaptation of technology features and organizational configuration by adapting the structural functions of technology into the specific institutional properties within an organization (Lee & Lee, 2000; Soh & Sia, 2004; Soh et al., 2003). From the contextualist perspective, this study suggests a different viewpoint: that is, whether a technology can be adapted into an organization is also determined by the compatibility between the generalized contextual characteristics (e.g., an assumption of free-market exchanges) embedded in technology and those situated in the adopting organization (such as in an agricultural business environment and supply chain). If such contextual

characteristics are favorable for free-market exchanges, the use of technology as a means to restructure local practices (of economic exchanges, in this case) could be effective. However, if the adopter's contextual characteristics are unfavorable for free-market exchanges, then technology adoption could face severe difficulties and appropriating organizational arrangements to adapt to the technology may not be a good idea (cf., Lee & Clark, 1997). At any rate, we should analyze the characteristics of the situated context so as to assess strategies to technology adoption. In the case AgriCo, the e-marketplace is best managed internally; employing an external market-maker is considered inappropriate. The analytical method can be generalized to other technological applications through analyzing the contextual features and organizing principles.

Practical Implications

In practice, this analysis can assist firms to assess the applicability of online market adoption, especially in noncommodity industries and in Asian contexts. Using the proposed framework, the implementers can evaluate whether an e-marketplace is suitable for their firms by examining the characteristics of the local context. Although this study examines the e-marketplace adoption in an agricultural firm, the contextualist analysis is undoubtedly applicable to online market implementation in other business contexts, such as the telecommunications, computer, and pharmaceutical industries.

The analysis of "misaligned market" provides three practical lessons. First, executives need to be sensitive to misalignment analysis at a deeper level. The misalignment analysis will inform the implementer as to whether the in-

tended system may fit for a particular industry. Hence, while an e-marketplace embedded with a free-market model may fit for commodity-oriented industry (e.g., electronics), it may not be useful for other industries that embrace other exchange logics, such as agricultural, telecommunications, pharmaceutical, and shipping industries. This study offers the implementer a framework to assess (1) what the exchange logic is embedded in the e-marketplace and (2) whether the adopting firm's exchange principles (situated in a specific industry) are suitable for such exchange logic. Here, this analysis is not referring to functional misalignment (cf., Soh et al., 2003). This article is to illustrate the misalignment between the exchange logic embedded in technology and that situated in the adopter's purchasing (supply chain) activities. The analysis of underlying exchange logic has not yet fully explored in current studies and practices (cf., Avgerou, 2001; Farhoomand et al., 2000; Kambil & van Heck, 1998; Kumar et al., 1998).

Second, practitioners might ask: "so, what can be done about this misalignment?" This study, at this stage, is unable to provide a comprehensive resolution and suggest how to turn a misaligned market into a suitable market for the adopter. This would require continual research efforts. With this precaution, a tentative lesson is to suggest the procurement executives to assess the potential impact of implementing misaligned exchange logic into the organization. Firms need to deploy e-marketplace by considering their industry dynamics. For example, in the agricultural industry, an exclusive market which focuses on supply chain coordination might be needed. To generalize this insight, in the telecommunications industry, an e-

marketplace might need to be designed to facilitate knowledge transfer between the buyer and suppliers. However, we must note that this study does not propose to localize a free-market assumption e-marketplace into the adopter's context. This resolution might encourage executives to modify an unfitted system to suit the organization. A metaphor of this would be to purchase a Gucci suit (stressing on slim cut) and try to modify it for a sturdy man. Such modification would be awkward for the implementer (the tailor), the adopter, and the technology provider (Gucci). This is why this article stresses more on the assessment of misalignment rather than on the modification of technology features and organizational configurations.

Third, this research provides practical insights for CIOs (Chief Information Officers). As the e-marketplace has been shown to have a significant impact on procurement practices, it is imperative that CIOs be involved in technology implementation. However, they often focus too much on technical implementation of online markets and neglect the local business context, which is an issue of technology applicability. They need to assess carefully whether their firms' procurement practices are aligned with the generalized practices brought about by the technology. As this case study has illustrated, imposing a free-market into an agricultural market could disrupt local practices. The contextualist framework can assist CIOs in minimizing e-marketplace adoption difficulties and reducing supply chain risks.

In conclusion, this study proposes a viable alternative analysis to examining technology adoption difficulties. The investigation of e-marketplace adoption should not be confined to the ineffective infrastructures in which technology oper-

ates and misaligned technology features. The analyses of local context are important too. More importantly, to prevent adopting a right technology for a wrong context, we need to examine the suitability of technology. This necessitates the examination of local business context so as to assess whether a technology is *applicable*, rather than just *acceptable*, with respect to a specific industry setting. This article suggests an analytical framework to undertake the alignment of technology-organization. Future theoretical development would need to extend the contextualist perspective, with the focus on industry dynamics, rather than on societal context. This would enable researchers to examine technology adoption in other industries, such as the telecommunications, computer, and pharmaceutical sectors. In practical terms, the analysis of unfavorable contextual characteristics will provide a reality-check for evaluating a technology's adoption potential in an organization. In implementing technology-mediated exchanges, we must be sensitive in not imposing a misaligned market into the local marketplace.

ACKNOWLEDGMENT

The author is grateful the generous support and assistance of participant companies. Li Yao, Chen Shin-Horng, and Lei Yi-Jie offered great help in early data collection and research assistance. This project is funded by the National University of Singapore (RP: 314-000-031-112) and this article was written during TLI-AP (The Logistics Institute, Asia Pacific; NUS-GeorgiaTech) fellowship.

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