

# B2B e-commerce adoption decisions in Taiwan: The interaction of cultural and other institutional factors

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## Abstract

Business-to-business (B2B) e-commerce has become an important initiative among firms in the last few years. This study is based on data derived from over 20 interviews with CEOs, CIOs, and MIS managers in electronics and textile companies in Taiwan. This study contributes to existing literature by describing the degree to which various organizational, industrial, governmental and cultural factors influence B2B e-commerce adoption decisions in Taiwan. It is one of the first studies investigating the interaction of B2B e-commerce adoption decision factors and provides insights into the impact of Chinese culture on B2B adoption. Results indicate that organizational, industrial, governmental, and cultural factors do indeed influence B2B e-commerce adoption decisions. In addition, the nature of the cultural influence is dictated by industry conditions.

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**Keywords:** B2B e-commerce adoption; Taiwan; Chinese culture; Organizational factors; Industrial factors; Governmental factors

## 1. Introduction

In recent years, many firms have been undergoing profound transformations in the pursuit of reducing costs and providing better services to customers. Whole value chains between firms and their customers and suppliers are being re-engineered. Inter-organizational systems have been an essential part of managing these changing relationships. In addition, the increasingly internationalization of products and companies has created the need for cross-border inter-organizational relationships that rely on B2B e-commerce systems. Although some research has begun to address adoption of information technology (IT) in general and e-commerce in particular in emerging economies (e.g., India [19], Singapore [61], Malaysia [42], Mexico [27], Brazil [63], and South Korea [43]), there are still many research questions left unanswered.

Despite previous theoretical arguments suggesting that organizational, governmental, industrial and cultural factors have a similar impact on IT and B2B e-commerce adoption, very little empirical research has looked at the extent to which this is true [24,57]. In addition, little research has investigated the magnitude of all these factors on B2B e-commerce adoption in emerging economies. Therefore, the purpose of this paper is twofold. First, we delineate some salient features of organizational, industrial, governmental, and cultural factors that support or hinder the decision to adopt B2B E-commerce systems in Taiwanese companies. Second, we describe the magnitude of the results as they apply to B2B e-commerce adoption decisions in two different industries in Taiwan.

## 2. Background on Taiwan

As a Newly Industrializing Economy (NIE), Taiwan is unique among Asia-Pacific countries. Both Taiwan's GDP and GDP per capita are situated in the middle of

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the 21 members of the Asia-Pacific Economic Cooperation (APEC), below the US and Hong Kong, and above China [5]. In 2001 Taiwan's Global Competitiveness Ranking (GCR) was 21st [68] and its Network Readiness Index (NRI) ranking was 15th [69]; these rankings are commensurate with Taiwan's economic performance amongst APEC countries. Taiwan produced US\$ 22,157 million worth of IT hardware in 2000, ranking it fourth in the world, just behind the US, Japan, and Singapore [14]. However, Taiwan spent only 1.47% of its GDP on IT products in 2000, below the average of APEC countries. IT applications (e.g., websites, Intranets, electronic data interchange, call centers, and electronic funds transfer) used by the manufacturing industry in Taiwan were below the global average [13]. Despite a well-developed information infrastructure and export-driven economy, Taiwan's B2B e-commerce sales comprised less than 1% of its GDP in 2000 [29].

According to United Nations Conference on Trade and Development (UNCTAD) *E-commerce and Development Report 2004*, while economic levels and adoption of information and communication technology (ICT) have a positive correlation, countries with similar levels of GDP have very different levels of adoption of ICT, and vice versa [66]. Given the contradictory macro-statistical facts between Taiwan's economic performance and IT application use, we are interested in understanding what drives B2B e-commerce adoption by companies in different industries in such an emerging economy. In this paper, we focus specifically on how the organizational, industrial, governmental, and cultural factors support or hinder the decision to adopt B2B e-commerce by Taiwanese companies.

### 3. IT Adoption literature review and its application to Taiwan

#### 3.1. B2B E-commerce

B2B e-commerce encompasses a wide range of technologies and there is no standard definition. For the purposes of this paper, we have defined B2B e-commerce as the process of deploying information and communication technologies to support the entire value chain from suppliers through the firm to customers [52]. More traditionally, e-commerce has involved the use of electronic data interchange (EDI) in which suppliers' and customers' computers are able to send formatted messages electronically. EDI has been the basis for early supply chain management (SCM) systems. The Internet has opened up a new set of B2B applications. Moving beyond simple web-based ordering systems, customer relations management (CRM) systems allow suppliers to facilitate cooperation and collaboration with their customers [51]. Certain manufacturers are even providing customers with limited electronic access to their enterprise resource planning (ERP) systems to provide them data on the production process and to allow for more advanced forms of electronic collaboration. What is impor-

tant about these examples is that the SCM, CRM and ERP technologies are built on the foundation of mutual interdependence in the buyer-seller relationship [16,56].

We can draw from models of IT adoption to understand B2B e-commerce adoption decisions. IT adoption models recognize both organizational and extra-organizational factors. A brief review of both the conceptual and empirical literature provided below discusses some of the most important factors that affect IT and B2B e-commerce adoption decisions. Where relevant we also report on studies that have evaluated IT/B2B e-commerce adoption in Taiwan.

#### 3.2. Organizational factors and IT adoption

Innovation and adoption research has been used to theoretically explain the relationship between organizational factors and IT adoption [54]. For example, organizational behavior researchers explain the intention of organization adoption of new technology by applying general social-psychological models to the IT context [15]. Such models include the technology acceptance model, the infusion model, and the task-technology fit model [7]. These models focus on characteristics of the technology or users' perceptions of the technology, and assume that the innovation adoption decision is based on rational decision making [30].

Organizational readiness and the degree to which IT infrastructure is sophisticated have often been identified as predictors of successful IT adoption [39]. A cross-country case study, however, shows that organizational readiness is in fact low in many countries due to business cultures that do not support innovation and the use of new technology [29].

The size of the organization has also been identified as a predictor of IT and more specifically, SCM systems adoption [54,57]. Large firms tend to be leaders in adopting e-commerce, as they possess the IT resources and capability to leverage IT investments over a large revenue base. Therefore, some researchers have argued that the dominance of small and medium-sized enterprises (SMEs) in emerging economies poses a structural inhibitor to e-commerce adoption and use [29]. However, a recent empirical study shows that contrary to this belief, firm size does not have a significant effect on B2B e-commerce adoption [30]. Chen [14] found that small firms in the IT industry in Taiwan are pressured to adopt B2B e-commerce systems but do not do so because of the financial and human resource costs. Trappey and Trappey [64] suggest that other organizational considerations for B2B e-commerce adoption decisions in Taiwan are the IT/MIS department budgets; risks associated with upgrades, re-design, and implementation of e-commerce systems; and return on investment.

It has been widely recognized that the support of top management is a crucial success factor in IT adoption [53,54] because top management support and commitment gener-

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