E-BUSINESS ADOPTION:
FROM THE ECONOMIC AND STRATEGIC MANAGEMENT PERSPECTIVES

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ABSTRACT
This study proposed a model to investigate e-business adoption from the economic and strategic management perspectives by incorporating network externalities and strategic information orientation. The model was tested using survey data from 307 international trading companies in China. The results indicated that both network externalities and information orientation were important e-business adoption enablers. The influences of these two factors on e-business adoption were partially mediated by the firm’s expected benefits from e-business adoption.

Keywords: E-business Adoption, Network Externalities, Information Orientation

INTRODUCTION
E-business adoption is a complex and important decision faced by a company because it requires business process changes and significant financial investments [23]. Various factors influencing e-business adoption have been identified and investigated in previous studies, using the technology-organization-environment framework, institutional theory, and diffusion of innovation theory (e.g. [3, 22, 25]). The present study investigated e-business adoption from the economic and strategic management perspectives. Specifically, network externalities and information orientation were proposed to influence e-business adoption. Few studies have examined e-business adoption from these perspectives [24].

Network externalities, or network effects, refer to user benefits being associated with the size of the network [13, 14]. The concept of network externalities has been used in a number of analytical models to improve the understanding of e-business adoption (e.g. [1, 2, 18]). However, there has been limited empirical testing of these models [15, 23].

Information orientation refers to a company’s deeply rooted set of values and beliefs regarding information activities [7]. As an important measurement of a firm’s capability, information orientation defines the resources to transcend individual capabilities and unify the resources and capabilities into a cohesive whole [6]. Therefore, information orientation may have fundamental influences on e-business adoption. However, few studies have examined the influences of information orientation on e-business adoption.

The objective of the present study was to investigate the impact of network externalities and information orientation on e-business adoption. We proposed that network externalities and information orientation influence e-business adoption directly and indirectly.

CONCEPTUAL MODEL AND HYPOTHESES
The conceptual model is presented in Figure 1. In the model, network externalities and information orientation were proposed to positively influence e-business adoption. Meanwhile, we also incorporated expected benefits to mediate the influences of network externalities and information orientation on e-business adoption. The control variables of ownership, industry type, size, and age also were proposed to influence e-business adoption.
Network Externalities

Network externalities enhance the value of e-business as the size of the e-business network increases. Thus, there is an incentive for companies to adopt e-business as more companies adopt e-business. Network externalities may influence e-business adoption in two ways. First, the participation of vertical partners in the supply chain, such as suppliers and customers, may require companies to adopt e-business in order to build compatible inter-organizational systems. Second, e-business diffusion among horizontal peers also may motivate companies to adopt e-business [22]. As more peers adopt e-business, a larger market for complementary goods, such as hardware, software, and e-business related professional services (e.g., payment, logistics, and network security) will emerge. This will accelerate e-business adoption, as the larger market may result in intensified competition and force product and service price reductions. Therefore, we expect that network externalities have significant influences on e-business adoption.

\[ H_1: \text{Network externalities significantly accelerate e-business adoption} \]

Expected Benefits

Expected benefits refer to the operational benefits a firm expects from e-business adoption. The potential benefits may include cost reduction, productivity improvement, and market expansion [16, 23]. By using Internet-based technologies, firms are able to reduce information asymmetry, facilitate expansion into new markets, and reach new customers.

The expected benefits derived from value chain coordination, market expansion, and cost reductions should increase as network externalities increase [17, 24]. Zhu et al. [24] found that higher network externalities resulted in higher expected benefits in the context of open-standard inter-organizational system adoption. Therefore, we hypothesize:

\[ H_2: \text{Network externalities positively influence a firm’s expected benefits from e-business adoption} \]

A firm’s benefit expectation may be an important decision factor for e-business adoption. Innovation diffusion theory suggests that perceived benefits are an important driver of new technology adoption [19]. Therefore, we hypothesize:

\[ H_3: \text{A firm’s expected benefits from e-business adoption positively influences e-business adoption} \]

Information Orientation

The values and beliefs represented by information orientation can offer guidance to managers about the opportunities and risks in e-business adoption. In addition, the values and beliefs can legitimize the willingness of managers to commit their efforts to e-business [3]. Meanwhile, a stronger information orientation may facilitate information acquisition and dissemination, promote the development of new knowledge [9], and increase the diversity of knowledge [20], improving an organization’s ability to innovate [5]. This will help the firm to recognize
new opportunities, which will spur the firm to
develop new strategic initiatives for innovation, such
as e-business adoption. Together, this suggests that:

\[ H_4: \text{Information orientation positively relates to } \]
e-business adoption

Stronger information orientation means that a firm
highly values information-related strategies and has
higher expectations in terms of information’s various
benefits. Since companies with higher information
orientation may have obtained better information
infrastructure and implemented more flexible
organizational structures, they also may expect higher
returns. This leads to:

\[ H_5: \text{Information orientation positively relates to } \]
expected benefits

Controls

Contextual characteristics could influence e-business
adoption. The widely cited contextual factors are firm
size, firm age, ownership, and industry type [3]. We
included these factors in our research model as
control variables.

METHODOLOGY

Measurement items were developed based on a
comprehensive review of the literature. The
development of our measurement items followed the
three successive stages of theoretical specification,
statistical testing, and refinement [21]. The measures
of network externalities were adapted from Zhu et al.
[24]. The measures for information orientation were
developed by combining expert opinions and
adaptations from previous studies [11, 12]. Expected
benefits were measured in terms of cost reductions,
productivity improvements, better communication,
improved personnel management [16, 23], and new
business opportunities [3]. E-business adoption was
measured as the extent to which e-business was
diffused into routine business activities and processes
[3]. Firm size and age were measured using the
number of employees in the firm and the number of
years the company had operated in China,
respectively [22, 25]. The measures of ownership and
industry type were also adapted from previous studies
[3].

Our sample was selected from a database of 2,075
Chinese international trading companies published by
the Beijing Municipal Bureau of Commerce. To help
respondents better understand the questionnaire
instrument and to improve the survey response rate,
we collected our data by personally-administered
interview surveys rather than mail surveys. We first
phoned all of the 2,075 registered trading companies.
After 812 companies agreed to participate in the
survey, follow-up phone calls were made to schedule
interview appointments with IT managers or
operations managers of 500 companies randomly
selected from those 812 companies. Appointments
with 54 of the 500 selected companies could not be
arranged, so formal interviews were conducted with
senior IT managers or operations managers from the
remaining 446 companies. A total of 307 interviews
were successfully completed, representing a 14.8%
response rate.

ANALYSES AND RESULTS

PLS-Graph 3.00, a Partial Least Squares (PLS) tool,
was used in this study to assess the measurement
model and structural model. PLS is a powerful SEM
technique that has been used extensively in
information system research [8]. PLS was used in this
study because our model had formative constructs,
which could not be handled by other SEM methods.
In addition, PLS does not place a high requirement
on sample size or normal distribution of source data
[4, 8].

After considering the relationships of the
measurement items and their respective constructs,
we specified all first-order constructs as formative
constructs [4]. We used a bootstrapping estimation
procedure to assess the significance of the factor
weights of the scales in the measurement model and
the path coefficients in the structural model [8]. The
results showed that all measurement items had
significant \((p<0.001)\) weights and acceptable
magnitudes [4], suggesting acceptable measures of
reliability and validity.

The structural model was assessed by estimating the
path loadings and the \(R^2\) values. Path loadings
indicate the strengths of the relationships between
the independent variables and dependent variable.
Interpreted like multiple regression results, \(R^2\) values
indicate the amount of variance explained by the
exogenous variables and measure the predictive
power of the structural models. The results of our
hypotheses testing are presented in Figure 2.

As indicated by path loadings, network externalities
had significant influences on e-business adoption and
expected benefits \((b = 0.274 \text{ and } 0.427, \text{ respectively};
\ p<0.001)\). This result confirmed our theoretical
expectation and provided support for \(H_4\) and \(H_5\). The
significant loadings from expected benefits to e-
business adoption \((b = 0.320, \ p < 0.001)\) provided support for \(H_3\).

The path from information orientation to e-business adoption was highly significant \((b = 0.195, \ p < 0.001)\), indicating information orientation facilitates e-business adoption. This provided support for \(H_4\). The path from information orientation to expected benefits also was significant and of high magnitude \((b = 0.597, \ p < 0.001)\), suggesting support for \(H_5\).

Regarding controls, ownership and industry had significant influences on e-business adoption \((b = 0.204, \ p < 0.01\) and \(b = 0.166, \ p < 0.05\), respectively). The influences of company and company age were not significant.

As shown in Figure 2, our model explained 52.3% of the variance in expected benefits and 43.5% in e-business adoption.

**DISCUSSION**

The support for \(H_1\) indicated that e-business adoption was influenced by network externalities. This implies that companies are more likely to benefit from e-business adoption when their peer and partner companies support e-business. Thus, companies are more likely to adopt e-business when greater network externalities exist. This finding was consistent with several previous studies. For example, Granovetter [10] suggested that decisions to engage in a particular behavior depended on the perceived number of similar others in the environment, especially resource-dominant organizations that had done likewise. Teo et al. [22] found that the greater the interorganizational technology adoption among competitors, suppliers, and customers, the greater the likelihood that organizations would adopt this technology.

The mediation effect of expected benefits was manifested by the large path loadings from network externalities and information orientation to expected benefits and the significant path loading from expected benefits to e-business adoption. However, it is interesting to note that the direct effects from network externalities and information orientation were still significant. This implies that network externalities and information orientation influence e-business adoption for reasons other than expected benefits [25].

**CONCLUSION**

Drawing on economic perspectives of network externalities and strategy management perspectives of information orientation, this study proposed a conceptual model to examine two e-business adoption enablers. The model was tested using the dataset from our personally-administered interview survey. The results gauged the significant roles of network externalities and information orientation on e-business adoption. The effects of network externalities and information orientation on e-business adoption may partially contribute to the
expectation of benefits from e-business adoption, such as cost reductions, market expansion, and supply chain coordination.

REFERENCES