

Business Models and Firm Performance: Based on the Information Technology View

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Strategy, e-business,
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ABSTRACT

This paper examines strategic issues related to the emerging concept of business model in the context of China's securities industry. Through a brief literature review, theoretical connections between strategy and business model are proposed, and the key components of business model are identified. A research hypothesis concerning the relationship between e-business strategy and e-business model is then developed by refining relevant concepts. Accordingly, an empirical analysis is conducted, based on an online survey on 57 securities companies certified for online securities businesses in China. Overall, research findings indicate tentative support to the research hypothesis. Theoretical and practical implications are also drawn.

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1 Introduction

The incoming internet age has witnessed the emergence and increasingly broader diffusion of e-business over the last fifteen years. Among the many industrial sectors equipped with advanced information technologies (IT), the securities industry, with its earlier adoption of electronic networks and digital nature of transactions, has appeared as playing a pioneering role in promoting e-business applications. A growing amount of securities trading is now conducted over the internet, mobile phones and cable TVs. It is estimated that, from 1996 to 2001, the proportion of online securities trading volume had increased from 7% to more than 20% in the United States (U.S. Securities and Exchange Commission, 2001). A similar trend has also taken place in the Asia Pacific region. Taken Korea as an example, the proportion of off-site securities trading had increased from virtually zero in 1998 to more than 50% in 2001 (OECD, 2001). In short, data for online securities trading in various countries indicate the significance of e-business channels in future development of the securities industry.

In China, online securities businesses are also gaining momentum. A multimedia, public online trading system was launched in a trading branch located in west Guangdong Province by the Zhongxin Securities Co. Ltd. in March, 1997. The event is widely acknowledged as the starting point of online securities trading in China. Since then, e-business applications have been increasingly adopted by domestic securities companies. According to statistics provided by the China Securities Regulatory Commission (CSRC), online securities trading has accounted for 58.54% of the total trading volume in 2007, while the corresponding ratios in the previous three years are 4.38%, 8.99% and 14.90%, respectively. Starting from 2001, the CSRC has conducted periodical review to issue certificate of online securities businesses for domestic securities companies, with 136 companies authorized so far. Thus it can be expected that e-business will maintain strong growth in the near future.

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The adoption of e-business applications is always accompanied with strategic changes. From a strategic management point of view, the viability and sustainability of e-business strategies are largely dependent on their methods of value generation, i.e. their business models. This is especially worth noting in the setting of securities services, given the vast opportunities (and risks) accompanying the process of accelerated offline-to-online value migration in recent years (Barber and Odean, 2001). Thus in-depth studies on business models are of great value to future development of e-business in the securities industry. To date, however, less research attention has been paid to such studies, especially those conducted in the securities industry, and this paper aims at filling this knowledge gap.

The remaining part of this paper is organized as follows: In section 2 we undertake a comprehensive literature review to establish a theoretical background for studying business models, and sort out key components of e-business models with special reference to the securities industry in China. Research hypothesis is formulated accordingly. Section 3 deals with research methods, and section 4 presents an empirical analysis revolving the research hypothesis, based on an online survey on securities companies operating in China. Then, in section 5 we elicit further implications from research findings, and comment on limitations of the study.

2 Literature Review and Research Hypothesis

Business model has been a frequently quoted concept in recent years. In the United States, a number of noted business models, such as Amazon's One-click Shopping Process Model and Priceline's Reverse Auction Model, were even approved as patents, drawing intensive attention from both academic community and business circle (Dickinson, 2000).

2.1 Business models in an e-business context

To date, most discussions on business models are conducted with reference to e-business applications in the emerging internet economy. The internet economy is dependent on the four layers of infrastructure, application, intermediary and business development (Barna et al, 1999). Extensive interactions with customers taken place on the intermediary layer and the business development layer provide significant opportunities for creating innovative business models, which represents unique combinations of the three streams of value, income and logistics (Mahadevan, 2000). In a broader sense, business model can be conceptualized as an architecture comprising the streams of products, services and information. Business model also expresses, explicitly or implicitly, the roles of key players and their sources of income (Timmers, 1998). The strategic management scholars, from an academic point of view, describe strategy and business model as 'closely related' concepts. Specifically, strategy deals with a company's competitive initiatives and business approaches, while business model concerns whether the revenues and costs flowing from the strategy and demonstrates that the business can be amply profitable and viable (Thompson and Strickland, 2003). Similarly, Applegate et al (2003) defined business model as the combination of an organizations' business concept defines its strategy, an organization's capabilities define resources needed to execute strategy, and a high-performing organization returns value to all stakeholders. According to Afuah and Tucci (2001: 3-4), the relationship between strategy and business model could be explicitly translated, since business model signals the approach by which a firm builds its resources to offer customers better value than its competitors and to make profits doing so. Thus, business model is what enables a firm to have a sustainable competitive advantage, to perform better than its rivals in the long term.

In short, business model has become a variable which is of strategic significance in understanding modern business operations, especially in the emerging internet economy. Although authors may place various emphases on their discussions, it is obvious that the nature of business model lies in its linkage with strategies to ensure sustainable operations and long term profitability in the competitive marketplaces. Put differently, a company's business model is management's model of how the strategies they pursue will allow the company to gain a competitive advantage and achieve superior profitability (Hill and Jones, 2004). Therefore, the coherence between strategy and business model becomes a central concern.

Recent studies tend to place emphasis on identifying the key components of business models in general. Alt et al (2001) provided an initial list of strategic goals, customer orientation, technologies, processes, collaboration, legal issues. Subsequent additions and variants include scope of operation, related activities, pricing, profit (Afuah and Tucci, 2001); technology, complementary assets, cost structure and profit potential, customers (Chesbrough and Rosenbloom, 2002); market opportunities, products and services, competitive dynamics, people and partners, organization and culture, operations, marketing/sales, innovation, infrastructure, benefits, brand and reputation, financial performance (Applegate et al, 2003: 47). Through a comprehensive review, Torbay et al (2002) concluded that key components of business models can be generally organized into the following categories: (1) innovative goals, values and capabilities, (2) intimacy, services and brands that nurture customer relationships, (3) infrastructure based on resources, assets, processes and collaborative networks, and (4) sources of income and other financial concerns. Interestingly and notably, a similar categorization was also proposed by another study (Osterwalder, 2002).

The aforementioned discussions indicate a close relationship between strategy and business model. Further, from a theory development point of view, the delineation of business model into key components may lay an initial basis for testing such a relationship empirically. This conceptualization process is reflected in figure 1.

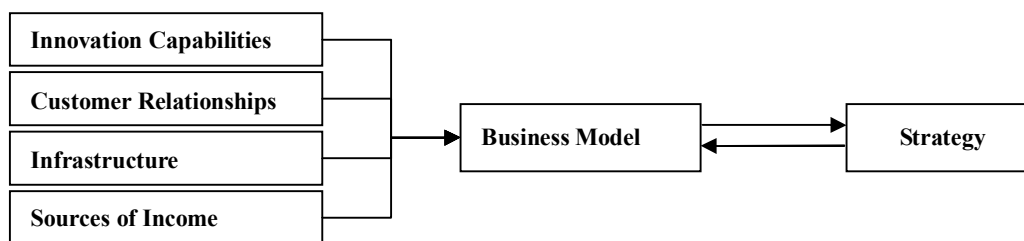


Figure 1. Conceptualizing the Relationship between Strategy and Business Model

2.2 E-business models for the securities industry: a comparative perspective

As discussed earlier, e-business strategies have been widely adopted in the securities industry. In the developed markets, well-established securities companies have formulated corresponding e-business models through e-business operations over the last decade. For example, Charles Schwab has applied network-based information technologies innovatively to enhance quality and intensity of comprehensive services, leading to a broaden sources of income (Tempest, 1999a; 1999b). Emerging as a 'pure player', E*Trade has focused on the digitalization of securities trading, enabling the company to offer discounted prices and gain a competitive edge accordingly (Glew, 1996). Meanwhile, Merrill Lynch and Morgan Stanley have re-configured their strong off-line infrastructures with newly-developed online applications to adapt to the changing market conditions (Rangan and Bell, 2000).

According to Fan et al (2002), there are four major characteristics of the shifting business models in line with the adoption of e-business strategies in the securities industry, as follows: (1) from broker to personal intelligent agent, in which innovative research and development (R&D) plays a critical role, (2) from trading to full services, thus broadening and deepening customer relationships, (3) financial intermediaries and other institutions emerged as facilitators, reflecting the significance of strategic collaboration in infrastructure development, and (4) the increasing importance of developing a diversified income sources, in light of the fallen profits generated from the incoming commodity-type securities business.

Although securities companies in China are adopting e-business technologies similar to their counterparts in the developed markets, they are also dealing with other location-specific market conditions, which may lead to certain unique characteristics of business models. For example, the Chinese securities companies are facing an emerging market, where e-business is a relatively new phenomenon to most firms and investors. Companies specialized in applications of information technologies are always the pioneers in exploring business opportunities in the securities industry. The traditional securities companies, though aware of the great potential of IT applications, are less sophisticated in, and not well-prepared for, promoting technological innovations, given the relatively new history of e-business (Lin and Xiong, 2001). Consequently, strategic collaboration between IT companies and securities companies is likely a key factor in strengthening e-business infrastructure, which, in turn, is an important component of a business model. Moreover, in order to develop sustainable competitive advantages in the transitional China market, securities companies have to nurture adaptability and innovative capability simultaneously (Lin and Wang, 2004). To this regard, the function of research and development (R&D) is of unparallel significance for business innovation, which is another component of business model. Compared to their internationally established counterparts, China's securities companies are still in an early stage of e-business development, and they must place priority on IT-enabled R&D activities because numerous opportunities and channels prohibited previously have now made available by the new information platform.

To summarize, in the context of China's securities industry, the components of e-business model could be refined to appropriately reflect the reality. Specifically, strategic collaboration and securities research could be introduced to approximate infrastructure and innovation capabilities, respectively.

2.3 Research hypothesis

The above literature review highlights that, conceptually, strategy and business model should be coherent. Key components of business model are identified, and reflections in practice with special reference to e-business applications in the securities industry in China are drawn accordingly. Consequently, the following research hypothesis is formulated:

H: There is a positive relationship between e-business strategy and e-business model.

The next two sections deal with research methods related to empirical test of the hypothesis and research results, respectively, based on an online survey conducted in securities companies operating in China.

3 Methods

3.1 Sample

By the time the online survey was conducted, there were 134 officially-approved securities companies in China, among which 89

companies were authorized by the CSRC as certified institutions for online securities businesses. For the 89 securities companies certified for online businesses, only 57 of them were included in the CSRC statistics because the remaining 32 certified companies were considered as 'inactive' in conducting online trading. Accordingly, those 57 securities companies with online business records were finally included in the sample (see the appendix for a full list of the sample companies).

3.2 Measures

In this study, the dependent variable, i.e. e-business strategy, was broadly defined from a strategy implementation point of view. More precisely, e-business strategy was approximated as the scope of IT applications in securities trading and other related businesses. As the literature shows, e-business model has been conceptually categorized into the four components of innovation capability, customer relationships, infrastructure and sources of income. Further elaboration of the previous section has also indicated that, in the context of securities industry, the components of e-business model could be refined as securities research, customer relationships, strategic collaboration, and sources of income. These refined components, therefore, were treated as independent variables in empirical analysis.

Based on the aforementioned conceptualization, a pilot study was conducted in October, 2007, with the purpose of deciding various dimensions of the dependent variable and independent variables involved. Executives from three securities companies, two IT companies focusing on applications in the securities industry, and two securities research companies, were interviewed by telephone. Conversations were documented, aggregated and categorized. In light of the limited scope of this study, only the six most mentioned items for each variable were specified and included. Measures for each research variable are thus obtained. Table 1 shows the result.

Table 1. Research Variables and Corresponding Dimensions

Variable	EB Strategies (IT Applications)	Securities Research	Customer Relationships	Strategic Collaboration	Sources Of Income
Dimensions	Web-Based Applications	News Release	Account Processing	Banking Institutions	Brokerage
	Centralized Transactions	Market Research	Member Registration	Securities Companies	Investment Banking
	Call Center	Research on Macro-economy	Customer Community	Foreign Institutions	Self-Contained Businesses
	Wireless Applications	Industry Research	Customer Training	Telecom Companies	Asset Management
	Online Road-Show System	Company Research	Customized Services	IT Companies	Interests
	CRM System	Other Research	Brand Image	Insurance Companies	Consulting

3.3 Procedures, data codification and analytical model

An online survey on the 57 sample companies were conducted in February, 2008. Web sites of the sample companies were browsed and analyzed in depth. Content of the online survey covers all the variables involved in the study. Information sources available from public media, such as information obtained from search engines and other related information released periodically by professional securities publications, are also used to supplement data obtained from the online survey.

Two-point dummy variables were introduced to measure dimensions of each variable. Specifically, each dimension of a variable was recorded with a value of 1 if the survey indicated a result of 'yes', and 0 otherwise. Therefore, the value of a variable, which is the sum of the values recorded for its various dimensions, was expected to be ranged from 0 to 6.

Based on the identified variables, the following multiple linear regression model was developed for testing the research hypothesis:

$$Y = \beta_0 + \beta_1 * X_1 + \beta_2 * X_2 + \beta_3 * X_3 + \beta_4 * X_4 + \alpha$$

Where Y denoted for the dependent variable of e-business strategy, and X1, X2, X3, X4 denoted for the independent variables of securities research, customer relationships, strategic collaboration, and sources of income, respectively. β_0 denoted for the constant term. β_1 , β_2 , β_3 and β_4 denoted for the partial regression coefficients corresponding to X1, X2, X3, X4, respectively. α denoted for the random disturbance.

4 Results and Analysis

This study used statistical software SPSS 11.0 to process data. Descriptive statistics were summarized in table 2, while results of multiple regressions were presented in table 3.

Table 2 Descriptive Statistics

Variable	Mean	Std. Deviation	No. of Samples
Y	2.631579	1.55416	57
X1	4.859649	1.273894	57
X2	3.298246	1.580743	57
X3	2.982456	1.026284	57
X4	4.087719	0.851064	57

In table 3, the mean value of Y (2.631579) indicates a moderate extent to which e-business strategies were implemented, although considerable differences existed among the sample companies. Concerning the variables related to e-business model, securities research (X1) and sources of income (X4) scored greater mean value than customer relationships (X2) and strategic collaboration (X3). However, as indicated by the standard deviation data, the sample companies also appeared as with greater differences in securities research and sources of income than in customer relationships and strategic collaborations.

Table 3 Results of Multiple Regressions

Variable	Coefficient	t-test	p
Constant	-1.358	-3.330	0.002
X1	-0.039	-0.503	0.617
X2	0.814	14.058	0.000
X3	0.186	2.107	0.040
X4	0.231	2.023	0.048

F=85.918 (p=0.000) , R²=0.869

Data presented in table 4 should be interpreted step by step. First, the coefficients of partial regression β_2 , β_3 , and β_4 were all with positive estimated value and passed test of significance at the 95% confidence level. In other words, consistency between the dependent variable of e-business strategy and the independent variables of customer relationships, strategic collaboration and sources of income was confirmed. Specifically, extensive IT applications were likely to associate with more comprehensive customer services, broader range of strategic collaboration among securities companies and other institutions, and diversified sources of income.

Second, the coefficient of partial regression β_1 failed to pass test of significance. From a methodology point of view, the conceptualization of X1 as securities research may need to be refined. However, follow-up conversations with professionals in the securities industry tended to offer different explanations: To date, most securities research in China is oriented toward current, rather than potential, customers, making it difficult to grow into an independent business to generate significant income. In addition, securities research in the China market is still in an early stage of development, and investment related to digital research platforms and tools should be cautious because of their limited application at present. However, given the increasing importance and accelerated speed of e-business applications in the development of the securities trading, a closer association between e-business strategy and securities research could be anticipated in the near future.

Last but not least, the larger value of the multiple coefficient of determination (R²=0.869) suggested a considerable degree of goodness of fit of the model. Result of the F-test (p=0.000) also indicated the overall significance of the regression. As a supplementary analysis, the issue of multicollinearity was also dealt with by calculating correlation and partial correlation coefficients among the independent variables. Slight multicollinearity was detected, as the values of two coefficients approached 0.3. However, for the purpose of an exploratory study, the research result as a whole could still be deemed as acceptable.

In sum, the research hypothesis, which states a positive relationship between e-business strategy and e-business model, could be regarded as tentatively supported.

5 Conclusion

The results of this study add new insights into the emerging literature on business models. Theoretical and practical implications can be drawn accordingly. Theoretically, the proposed relationship between e-business strategy and e-business model is empirically explored and tentatively confirmed with special reference to China's securities industry. This may provide an initial basis for further research in similar directions. In practice, results of this study may indicate a novel path for formulating, implementing and evaluating corporate strategies in the e-business arena. That is, strategic management in the information age should keep in line with the development of a sound business model in general and key components of the business model in particular, which would prove as the sources of core competences for sustainable operations.

There are a number of limitations of this study. Only three of the four independent variables passed the test of significance. Multicollinearity was not excluded. Thus, a refined research design is called for. More important, the extent to which the results of this study can be generalized remains to be discussed, because the research is taken place in a specific industry of a specific country. However, such limitations should be considered as signaling opportunities, rather than forming barriers, for future studies.

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