

Development of E-Business Solutions in the Internet Retail Industry

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Abstract

The Internet retail industrial volume is increasing continuously, while Information Technology (IT) has not been fully implemented in the Internet retail industry due to factors such as the lack of standards. The current study aims at developing standardized e-business solutions in the Internet retail industry based on value chain analysis in order to accelerate IT adoptions, thereby increase business values. Specifically, three phases were involved. In the first phase, general e-supply, e-value, and e-customer chain models for the Internet retail industry were presented to show how IT could be adopted efficiently. In the second phase, e-business solutions in the Internet retail industry were developed by mapping from the three chain models. In the third phase, the current patterns of IT adoptions in the Internet retail industry were presented by investigating applications of e-business solutions in the top ten dominant companies. From the study, IT adoptions facilitate the companies in the retail industry to gain competitive advantages over their brick-and-mortar competitors. The standardized e-business solutions for the companies in Internet retail industry are categorized as basic and specific solutions. The former are the solutions needed by every company in Internet retail industry; and the latter are the solutions needed only by companies operate in specific market segment.

Keywords: standardize e-business solutions, IT adoption, e-value chain management, competitive advantage, Internet retail industry

1. INTRODUCTION

Internet retailer boomed with the development of the Internet and World Wide Web (WWW). Recognizing the power of the Internet, venture capitalists invested billions of dollars into new firm to establish the online commerce (E-commerce: Consumer Product, 2004). Amazon.com was one of the first Internet retailers. The company's website was established in 1995, selling books with extensive electronic lists of titles. In 1997 the company began to generate substantial revenues ahead the tradition book retailer as Barnes & Noble, which later established its own website to catch up its competitor (E-commerce: Consumer Product, 2004).

Internet facilitates the Internet retailer to gain the competitive advantage over the brick-and-mortar retailer. It provides greater accessibility, wider variety, and lower price. These advantages facilitated the growth of the Internet retailers (O'Brien, 2003). Because of these competitive advantages, the global Internet retail market has continued to expand over the traditional retail outlets. After the massive growth in the later 1990 and early in 2000, the industry has still maintained double-digit annual revenue increases, therefore easily exceeding all other retail sectors (Global-Internet Retail, 2004).

This study is a pioneer effort aimed at developing standards for e-business applications in the Internet retail industry. Specifically, it intends to:

- 1) develops e-value chain in the Internet retail industry to show how IT could be adopted efficiently along all links in the e-value chain;
- 2) maps e-business solutions from the e-value chain model and identify standardized e-business solutions in terms of business-to-business (B2B), business-to-customer (B2C), customer-to-business (C2B), and business-to-internal (B2I); and
- 3) analyzes current patterns of IT adoptions in the Internet retail industry by investigating e-business applications in the top ten dominant companies.

This paper is organized as follows. Section 1 reviews the industry history and briefly introduces the overall study. Section 2 develops conceptual model to show how IT could be adopted and managed in the Internet retail industry. Section 3 presents methodology on developing standardized e-business solutions by mapping from the e-value chain model. Data collections on e-business applications in the top ten dominant companies are performed. Section 4 provides data analysis to find implementation patterns for e-business solutions in the top ten dominant companies. Section 5 and 6 presents discussions and conclusions, respectively.

2. CONCEPTUAL MODEL

The analysis of value chain is important for understanding how a company position itself against its competitors. Using this value chain model any firm can benefit by improving its costs and performance in each value creating activity. The common definition of value chain differs among experts (Lee *et al.*, 1997; Shin *et al.*, 2000; and Tan, 2001).

Value chain is defined as series of transformation process that move a good or service from inception to final customer. Ideally, each step increases the worth or the value of the item in the eyes of the next customer (Knod & Schonberger, 2001). Another definition refers value chain as series or chain of basic activities that add value to its products and service, and thus add a margin of value to the firm (Porter & Millar, 1985 as cited in O'Brien, 2003). Another definition of value chain in industry is the linked set of value-creating activities from the basic raw materials to the disposal of finished product by the end use customer (Hansen & Mowen, 2003).

Marcolin and Gaulin (2001) defined value chain of the Internet retail as the adoption of an e-commerce model that move all links of the business value chain on-line. In this study, e-value chain is defined as an implementation of e-commerce applications on each process along the chain to increase competitive advantages of business.

Porter's description of value chain provides a good reference tool to analyze how a com-

pany positions itself relatively to other companies. It breaks many activities in a company into nine activities, and then classifies these activities into five primary and four support activities (Porter, 1985). According to Porter (1985), the primary activities are:

- 1) *Inbound Logistics* - involve relationships with suppliers and include all the activities required to receive, store, and use inputs.
- 2) *Operations* - include all the activities required to transform inputs into outputs.
- 3) *Outbound Logistics* - include all the activities required to collect, store, and distribute the output.
- 4) *Marketing and Sales* - include activities inform buyers about products and services, induce buyers to purchase them, and facilitate their purchase.
- 5) *Customer Service* - includes all the activities required to keep the product or service working effectively for the buyer after it is sold and delivered.

Support activities are:

- 1) *Procurement* - is the acquisition of inputs, or resources, for the firm.
- 2) *Human Resource management* - consists of all activities involved in recruiting, hiring, training, developing, com-

pensating, and (if necessary) laying off personnel.

- 3) *Technological Development* - pertains to the equipment, hardware, software, procedures, and technical knowledge brought to bear in the firm's transformation of inputs into outputs.
- 4) *Infrastructure* - serves the company's needs to tie their various parts together. It consists of functions or departments such as accounting, legal, finance, planning, public affairs, government relations, and quality assurance.

Value chain concept can be used to strategically position the applications within Internet retail companies to gain the competitive advantage. Based on Porter's value chain model, an Internet retail industry's value chain model is developed in Figure 1.

Figure 1 shows how IT can facilitate both primary activities and supporting activities. For example, Automated Just-in-Time Warehousing would decrease the inventory level. Virtual Store Front will eliminate the cost of space lease. E-Billing and e-Payment will facilitate both buyer and seller to do the transactions in easier and cheaper way. Also, e-Training, e-Hiring, and e-Learning can decrease the cost of traditional HR service and hence improve the quality of employees.

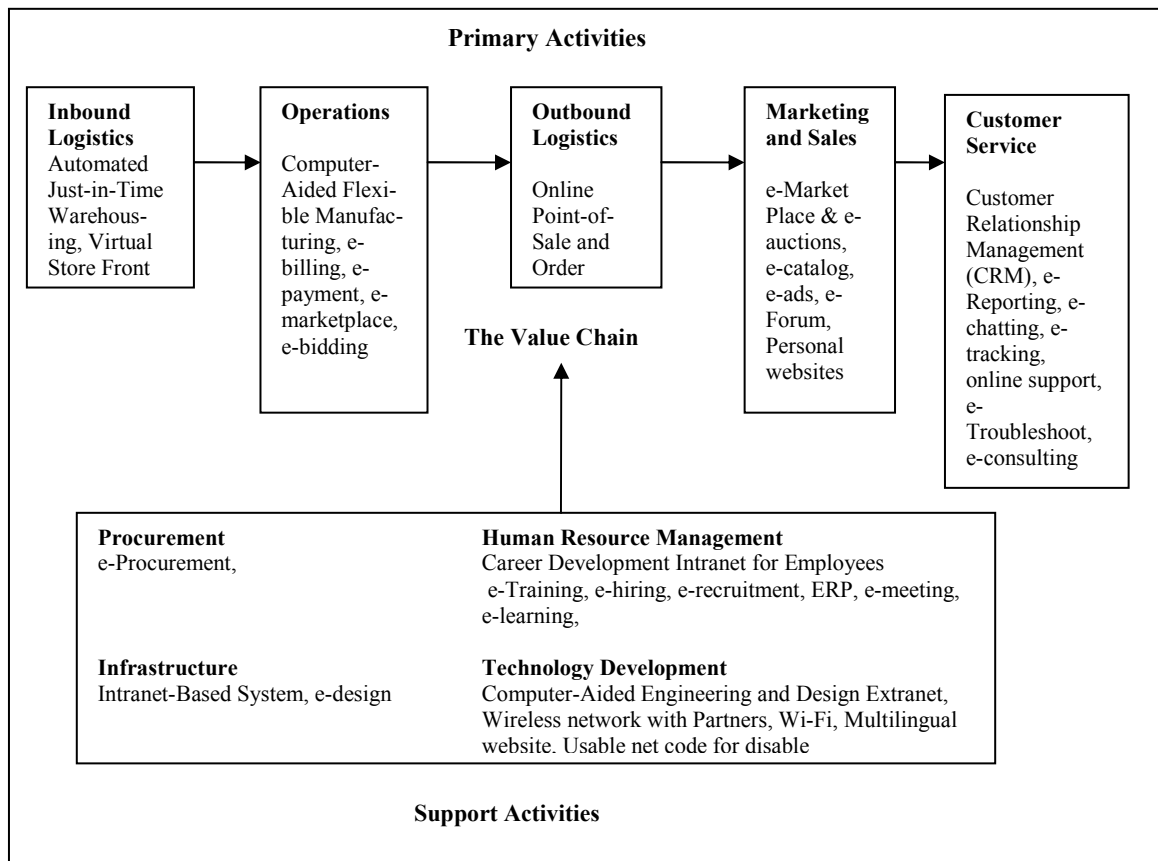


Figure 1: e-Value Chain in Internet Retail Industry

3. METHODOLOGY

E-Business Solutions Standardization

Five basic categories of e-business applications are described in terms of Business-to-Business application (B2B), Business-to-Consumer application (B2C), Consumer-to-Consumer application (C2C), Consumer-to-Business application (C2B), and Business-to-Internal application (B2I) (Heizer & Render, 2004).

This study develops a set of standardized e-business solutions by mapping from e-value chain model related to e-business processes in terms of B2B, B2C, C2B, C2C, and B2I. There are a total of fifty-two solution items, with nine items in B2B, twenty-three in B2C, four in C2B, ten in C2C, and six in B2I. The definitions of these e-business solutions and more in-depth explanations are provided in Table 1 (see Appendices).

Data Collection

Ten dominant companies in Internet retail industry were selected in this study, including Amazon.com, Office Depot, Ebay.com, Staples.com, Priceline.com, Buy.com, Inc., Overstock.com, Drugstore.com, GSI Commerce Inc. and Blue Nile, Inc. The first five companies were the top five leaders in global Internet retailers in 2003 (Global-Internet Retail, 2004). Buy.com Inc. was a leading online superstore with revenues totaled roughly \$400 million in 2002 (E-commerce: Consumer Products, 2004). Others are major publicly trade online retailer in the Internet retail industry (Kessler, 2005).

Senior-level IT experts and managers in the E-Business & Information Management departments in the top ten Internet retail companies were interviewed through face-to-face, phone calls and/or e-mails. Some information is also obtained through companies' website. During the interviews, descriptions of standardized e-business solutions in the Internet retail industry (Table 1)

were provided first to the subjects. Then, subjects were asked to provide information on the implementation of these e-business applications for the companies they were familiar with.

Based on obtained information, the ratings on e-business solutions implementation for these top ten companies are conducted and presented in Table 2 (see Appendices). The variable applications were assigned points according to the implementation levels. A score of 2 indicates the e-business solution is fully implemented, 1 indicates the e-business application is partially implemented, and 0 indicates the e-business application is not implemented at all.

4. FINDINGS

E-Business Solutions Adoption Patterns

The e-business applications data collected from the ten top performing Internet retail companies are tallied and categorized for further analyses and discussions. Table 3 (see Appendices) presents the analysis of the e-business implementation status by applications sub-category. The e-business applications were sorted in the descending order of average level of usage in each application.

The primary findings from Table 3 are:

- 1) The implementation of e-business applications can be classified into three categories: the most widely implemented applications (90% and above) include A1, A2, A4, A5, A8, A9, B1, B2, B3, B4, B5, B8, B9, B10, B14, B17, B19, B21, C4, E2, E3, E4, and E6; the widely implemented (60% to 89%) include A3, A7, B6, B13, B15, B20, B23, E1, and E5; and the least implemented (59% and below) include A6, B7, B11, B12, B16, B18, B22, C1, C2, C3, D1, D2, D3, D4, D5, D6, D7, D8, D9, and D10.
- 2) Customer Feedback (C4), Automate Workflow Processes (E3), and Document Management (E4) are the applications that are clearly most implemented with 100% usage among the analyzed companies.
- 3) Both B2B and B2C applications are widely used among the companies at the level higher than 90%.

- 4) The Supplier Procurement Chains (E6) is one of a highly implemented application.
- 5) The least commonly used applications are Negotiating System (B7), Accessible Web Content (B12), Internet Application Services (B18), Telecom Cellular Services (B22), and Consumer Price Bidding (C1).

E-Business Applications Versatility

The e-business applications versatility of the top ten selected companies was studied in this section. The companies were sorted by the descending order of overall score of e-business application usage level. The results of study are presented in Table 4 (see Appendices).

From Table 4, no company fully implements all the applications. The top three companies that implement the most e-commerce applications are: Amazon.com with a usage level of 88 %, Overstock.com with a usage level of 77%, and Office Depot with a usage level of 66%. GSI commerce implements the least e-commerce applications with a usage level of 29%. EBay.com does not implement any B2B applications on its business. And Priceline.com is the company that implemented the most C2B application with a usage level of 75%

Amazon.com, Overstock.com, and eBay.com are the companies that fully implemented C2C applications with a usage level of 100%. Most companies fully implement B2I applications with a usage level of 100%, except Overstock.com, Priceline.com, and Staples.com.

5. DISCUSSIONS

IT can facilitate each step of value chain. Customer satisfaction is the main ingredient of business success. Customer needs high level of quality, high degree of flexibility, high level of service, low cost, high speed, and less variability (Knod & Schonberger, 2001). From this study, IT is an important tool to help the business to meet these basic customer needs. For example, Automated-Just-in-Time Warehousing could shorten the lead time of operation. The virtual store front saves the cost of physical store. Online point-of-sale and order increases the accessibility to the retail business by allowing the

customers to buy the product 24 hours/day. The online support system satisfies the customer's need with the lower cost. And the e-training decreases the cost in recruiting process and increase the employee's quality.

IT can support the flow between the company and its suppliers. Suppliers are a part of the retail industry supply chain. They supply the products to the company. Nowadays, customers buy product from Internet more than in the past. An Internet company might sell a million of product with in a day; and the old-time order system could not handle the high volume of transactions effectively. By the advantage of IT, the automate supplier procurement system will help a company to improve the efficiency and effectiveness of its operation.

IT adoptions which involved with customer satisfaction and its operation are basic applications which are implemented by every company in the industry. From this study, every company adopts IT to satisfy its customer needs by fully implementing the Customer Feedback (C4), Automate Workflow Processes (E3), and Document Management (E4). Customer feedback helps a company to better understand their customer's need; therefore, it can pervade a high level of service. Integrated system as ERP helps the company to manage their asset effectively. And database management system increases the speed of day-to-day operation, decreases the variability of product, and facilitates the staff's operation.

IT adoptions pattern reflects the business activities of companies. From this study, both B2B and B2C applications are widely used among the companies. It implies that most companies operate in businesses market, consumer market, or both. Companies which have the auction activities show the high degree of C2C implementations. For example, Amazon.com, Overstock.com, and eBay.com, which operate their online auction through their website, have the C2C usage level of 100%. Some companies which focus on small industry segments will have different versatility in each category. For example, eBay which is a world biggest marketplace has no implemented B2B applications, contrast to its fully implemented C2C applications. GSI commerce which has businesses with only the business market

has zero percentage of B2C and C2C applications. Priceline.com which allows the customer to offer the price to its website through "name the price" program to its customer shows the C2B usage of 100%.

The success of IT adoption will increase the competitive advantage of company. From this study, the first leader of the market as Amazon.com has the highest rank of IT implementations. This would confirm that Amazon.com was successful in using IT strategically to compete with competitors. Amazon.com has fully implement B2I applications with usage level of 100%, contrast to its competitors as Overstock.com and Staples.com. The higher level of B2I implementation reflects the concern of company on employee satisfaction. The successful company treats the employees as its customers. And the satisfied employees would provide quality and responsive service at low costs (Knod, M. & Schonberger, 2001). The implement on B2I applications will improve the employee performance, thus results in the success of companies over the competitors.

Some IT adoptions can enable company not only to gain competitive advantage, but also to increase the market size. Competitive advantage is something which a company can do but others cannot (Kotler & Keller, 2006). Only Amazon.com implements Accessible Web Portal (B12) and Telecom Cellular Services (B22). The disable and cellular web-access users represent two small segments of the potential customers, and it might not worth for the investments. Because market leader gains the competitive advantage on its market share, adding consumer from these segments to the current market will increase the market size of Internet Retail buyer; hence it will increase the profit of market leader.

In some case, IT may not facilitate the company's operation. Some IT adoptions may increase the bargaining power of buyer, which would make the market unattractive. Generally, buyer's bargaining power heightens when they become more concentrated or organized (Kotler & Keller, 2006). From this study, no company allows its consumers to established the group and negotiate with them, reflecting on no implementation of Consumer-Initiated Aggregation (C3) applications.

6. CONCLUSIONS

IT can be adopted at each step of value chain to facilitate the companies in Internet retail industry. Successful IT implemented companies will gain competitive advantage over their brick-and-mortar competitors.

The standardized e-business solutions for the companies in Internet Retail Industry are categorized:

The basic e-business solution:

A1, A2, A4, A5, A8, A9, B1, B2, B3, B4, B5, B8, B9, B10, B14, B17, B19, B21, C4, E2, E3, E4, and E6. These solutions are needed for every Internet retailer.

The specific e-business solutions: all B2B solutions for companies in business market; all C2C solutions for companies in auction market; and C1 and C2 for companies in C2B market. These solutions are needed only for the companies which operate in specific market segments.

7. RECOMMENDATIONS

Internet retail industry is growing substantially. Nowadays, the competition in this industry is very high. Companies try to adopt IT on their value chain to gain the competitive advantage over their competitors. From the study, I would recommend the company which has the lower percentage of implementation in their business category would recognize how important of IT implementations.

Beside the items which are mentioned on this study, security and privacy play vital roles on the future of Internet retail industry. Customer hesitates to do the online transaction because of many kinds of Internet fraud. Nobody wants his or her credit card information to be known by the third party. So the company in Internet retail industry should use the high level of security system as firewall or encryption during the transaction process. This would help the customer feel more comfortable to do the online transaction; and hence promote the company's business.

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Appendices

Table 1: Description of E-business Applications

Variable	Application Items	Description
B2B		
A1	Company News Portal	A source of information that will enable the business partners to keep track on the company events and industry's current situation. It provides news, analysis, and brief report about the current situations of industry.
A2	Extranet Interface with suppliers distributors and partners	A use of IT technology to link between suppliers, distributors, and partners.
A3	Marketplace and Auctions	An application which provide the virtual place for companies to exchange their goods
A4	Data Interchange System	A system which standardizes companies documents (as faxes, receipts, etc) before exchange them among partnerships. Everybody would be able to read it by using different kind of platforms
A5	Telecommunication Network	A system which provides the communication through phone, fax, and radio frequency service
A6	Multilingual Website	An application which provides more than one language on the web content
A7	Consulting Service	A service which provides the suggestion on business decision making through extranet system
A8	Billing Options	A service which offers many different methods of payment to customers
A9	Online-Market Clearinghouses	A choice of payment method which customer's money will be authorized to deduct from individual account through direct payment transfer system.
B2C		
B1	Web Store Front	A place on the webpage where customer can look for products and place order.
B2	Product Catalogs	An information about products in electronic form which is provided through Internet
B3	Billing Options	Choices of payment methods which are provided to customers
B4	Secure E-payment Systems	A convenient and cost-saving way for customer to pay bill online. The payment is secured by encryption software which will scramble customer's data before sending to the financial institution
B5	Online Customer Support	An online service which provides to the customer 24 hours/day through e-mail and real-time chatting service

B6	Tracking Systems	A system which provide the online tracking system to each item. Customer can check the order status and track the items online 24 hours/day
B7	Negotiating system	A system which provide the option for customers to negotiate the price or shipping cost when they buy multiple items in one order.
B8	News Group	A system which provide the news and current events about company and industry to the customer group
B9	Electronic Transaction messaging	A system which automatically provide update information about transaction status whether it is success or fail
B10	Consolidated Billing	A billing system which groups the receipt of every items of each customer into one bill
B11	Multilingual Website	An application which provides more than one language on the web content
B12	Accessible web content	An application which provides the accessibility to the online users. Everybody can have unlimited access to the website, even the disabled
B13	Items Comparison	An application which enables users to compare the price or specification of a special product across B2C websites
B14	Data Collection	An application which gathers the data history as sales price, items number, customer information and store within the company's database. Many website use "Cookies" which is a software that enable the website to memorize the customer preference
B15	Customer satisfaction guarantee	A credit which obtained from the certified business ratings program such as Bizrates.com
B16	Customization Tools	Tools which facilitate the customers to customize the product by their preference
B17	Sign on Rebates and Discounts	A option which provide return of money or discount on a special condition basis
B18	Internet Application services	A service which allow customers to send/receive e-mail, and access business information from the Internet
B19	Online Account Management	An application which allows customers to log on to their database and manage their account. It will save the time and increase flexibility on business transaction
B20	Information and Education	An application which provide information and knowledge to the customer; for example, the automotive website provides methodology to fix the car
B21	Insurance and Warranties	An option which company provides insurances and warranties to its product
B22	Telecom and Cellular Services	A service which allows the users to connect to website through wireless communication system
B23	Interactive FAQ's	An application which a list of frequently asked questions and their answers

C2B		
C1	Consumer Price Bidding	An application which allow customers to offer the price to the business website. For example, Priceline.com offers the customer to "name the price". Then the person who offers the highest price will win that auction. This one can called as reverse auction process
C2	Consumer Requests For Quotations	An option which allows customer to send the request for total price quotation from the seller, through e-mail or interactive page input
C3	Consumer-Initiated Aggregation	A party that assembles and represents group of small customers for retail access
C4	Customer Feedback	An application which allows customer to provide feedback through interactive page input
C2C		
D1	Online auctions	An application which allows a person or an organization who wish to sell a good to pay a small listing fee to the Web site operator sets a small bid, and then wait until the auction period ended to see how the auction goes.
D2	Electronic Personal Advertising	A service which allows an individual seller to have a space to advertise his or her product through internet
D3	Web Board or Forum	A service which serves as the virtual community meeting. Everybody can post his or her message on this area
D4	Personal Website	An option which allows each individual seller to have his or her own personal website to sell products
D5	Auctions results	An application which allows customers to see the result after the auction ended.
D6	Internet Application service	A service which allows customers to send/receive e-mail, and access business information from the Internet
D7	Insurance and Warranties	An option which company provides insurances and warranties to its product
D8	Billing Options	A service which offers many different methods of payment to customers
D9	Consolidated Billing	A billing system which groups the receipt of every items of each customer into one bill
D10	Customer Rating	An application which allows customers to provide rating to the other party
C2I		
E1	Knowledge Management and Sharing	An application which collects the knowledge and organize in the easy way for employees to use. The value of knowledge will be create through the sharing process
E2	HR service	An activity which support employees such as e-hiring, e-training and e-rewarding
E3	Automated Workflow Process	A process which helps employees in day-to-day operation by using integrated system as ERP

E4	Document Management	Control number of files, how files are stored, and create the structure database which the data can be easily exploited by employees.
E5	Virtual Teams	Team up the employees through Web Board or virtual teamwork
E6	Supplier Procurement Chain	A procurement method and payment approval, include information on dollar values for purchase, which facilitate the transaction between the retailer and its suppliers

Table 2: Rating on Implementation of E-business Application for Ten Top Companies within Internet Retail Industry

Variable	Amazon	Office Depot	eBay	Staples	Price-line	Buy.com	Over-stock	Drug-store	GSI Commerce	Blue Niles	Total	Total%
B2B												
A1	2	2	0	2	2	2	2	2	2	2	18	90
A2	2	2	0	2	2	2	2	2	2	2	18	90
A3	2	2	0	2	0	2	2	2	2	2	16	80
A4	2	2	0	2	2	2	2	2	2	2	18	90
A5	2	2	0	2	2	2	2	2	2	2	18	90
A6	2	0	0	0	2	0	0	0	0	0	4	20
A7	2	2	0	2	2	2	2	0	2	2	16	80
A8	2	2	0	2	2	2	2	2	2	2	18	90
A9	2	2	0	2	2	2	2	2	2	2	18	90
Subtotal	18	16	0	16	16	16	16	14	16	16		
Subtotal (%)	100	89	0	89	89	89	89	78	89	89		
B2C												
B1	2	2	2	2	2	2	2	2	0	2	18	90
B2	2	2	2	2	2	2	2	2	0	2	18	90
B3	2	2	2	2	2	2	2	2	0	2	18	90
B4	2	2	2	2	2	2	2	2	0	2	18	90
B5	2	2	2	2	2	2	2	2	0	2	18	90
B6	2	2	0	2	2	2	2	2	0	2	16	80
B7	0	0	0	0	2	0	0	0	0	0	2	10
B8	2	2	2	2	2	2	2	2	0	2	18	90
B9	2	2	2	2	2	2	2	2	0	2	18	90
B10	2	2	2	2	2	2	2	2	0	2	18	90
B11	2	2	2	0	2	0	0	0	0	0	8	40
B12	2	0	0	0	0	0	0	0	0	0	2	10
B13	2	2	2	0	2	2	2	2	0	2	16	80
B14	2	2	2	2	2	2	2	2	0	2	18	90
B15	2	2	0	2	0	2	2	2	0	2	14	70
B16	0	0	0	0	2	2	0	2	0	2	6	30
B17	2	2	2	2	2	2	2	2	0	2	18	90

B18	0	1	0	0	0	0	0	0	0	0	1	5
B19	2	2	2	2	2	2	2	2	0	2	18	90
B20	2	2	2	1	2	0	2	2	0	2	15	75
B21	2	2	2	2	2	2	2	2	0	2	18	90
B22	2	0	0	0	0	0	0	0	0	0	2	10
B23	2	2	2	0	2	2	2	2	0	2	16	80
Subto- tal	40	37	32	29	38	34	34	34	0	36		
Subto- tal %	87	80	70	63	83	74	74	76	0	78		
C2B												
C1	0	0	0	0	2	0	0	0	0	0	2	10
C2	0	2	0	0	2	0	0	0	0	2	6	30
C3	0	0	0	0	0	0	0	0	0	0	0	0
C4	2	2	2	2	2	2	2	2	2	2	20	100
Subto- tal	2	4	2	2	6	2	2	2	2	4		
Subto- tal %	25	50	25	25	75	25	25	25	25	50		
C2C												
Variable	Amazon	Office Depot	eBay	Staples	Price-line	Buy.co m	Over- stock	Drug- store	GSI Com- merce	Blue Niles	Total	Total%
D1	2	0	2	0	0	0	2	0	0	0	6	30
D2	2	0	2	0	0	0	2	0	0	0	6	30
D3	2	0	2	0	0	0	2	0	0	0	6	30
D4	2	0	2	0	0	0	2	0	0	0	6	30
D5	2	0	2	0	0	0	2	0	0	0	6	30
D6	2	0	2	0	0	0	2	0	0	0	6	30
D7	2	0	2	0	0	0	2	0	0	0	6	30
D8	2	0	2	0	0	0	2	0	0	0	6	30
D9	2	0	2	0	0	0	2	0	0	0	6	30
D10	2	0	2	0	0	0	2	0	0	0	6	30
Subto- tal	20	0	20	0	0	0	20	0	0	0		
Subto- tal %	100	0	100	0	0	0	100	0	0	0		
B2I												
E1	2	2	2	0	0	2	0	2	2	2	14	70
E2	2	2	2	2	1	2	2	2	2	2	19	95
E3	2	2	2	2	2	2	2	2	2	2	20	100
E4	2	2	2	2	2	2	2	2	2	2	20	100
E5	2	2	2	0	2	2	0	2	2	2	16	80
E6	2	2	2	2	N/A	2	2	2	2	2	18	90
Subto- tal	12	12	12	8	7	12	8	12	12	12	107	
Subto- tal %	100	100	100	67	58	100	67	100	100	100		
Total %	88	66	63	53	64	62	77	60	29	65		

Table 3 E-business Implementation Status among Internet Retail Companies

Applications	Number of companies adopt each application	Level of usage in each application	Average level of usage in each application (%)
C4	10	20	100
E3	10	20	100
E4	10	20	100
E2	10	19	95
A1	9	18	90
A2	9	18	90
A4	9	18	90
A5	9	18	90
A8	9	18	90
A9	9	18	90
B1	9	18	90
B2	9	18	90
B3	9	18	90
B4	9	18	90
B5	9	18	90
B8	9	18	90
B9	9	18	90
B10	9	18	90
B14	9	18	90
B17	9	18	90
B19	9	18	90
B21	9	18	90
E6	9	18	90
A3	8	16	80
A7	8	16	80
B6	8	16	80
B13	8	16	80
B23	8	16	80
E5	8	16	80
B20	8	15	75
B15	7	14	70

E1	7	14	70
B11	4	8	40
B16	4	7	35
C2	3	6	30
D1	3	6	30
D2	3	6	30
D3	3	6	30
D4	3	6	30
D5	3	6	30
D6	3	6	30
D7	3	6	30
D8	3	6	30
D9	3	6	30
D10	3	6	30
A6	1	4	20
B7	1	2	10
B12	1	2	10
B22	1	2	10
C1	1	2	10
B18	1	1	5
C3	0	0	0
<i>Note:</i> Descriptions of applications are presented in Table 1			

Table 4: E-Business Solutions Versatility

Companies	B2B		B2C		C2B		C2C		B2I		Overall	
	Score	%	Score	%	Score	%	Score	%	Score	%	Score	%
Amazon	18	100	40	87	2	25	20	100	12	100	92	88
Overstock	16	89	34	74	2	25	20	100	8	67	80	77
Office Depot	16	89	37	80	4	50	0	0	12	100	69	66
Blues Niles	16	89	36	78	4	50	0	0	12	100	68	65
Priceline	16	89	38	83	6	75	0	0	7	58	67	64
eBay	0	0	32	70	2	25	20	100	12	100	66	63
Buy.com	16	89	34	74	2	25	0	0	12	100	64	62
Drugstore	14	78	34	74	2	25	0	0	12	100	62	60

Staples	16	89	29	63	2	25	0	0	8	67	55	53
GSI Com- merce	16	89	0	0	2	25	0	0	12	100	30	29

Note: In each applications category, the percentages of each are computed by dividing the total ranking score of each company with the full implementation score (number of applications item X 2). For example, the fully implementation score for B2C is equal to 52 (23 items *2). Amazon has total ranking score of 40, then get the percentage of 87 (40/52*100)