9 The Globalisation of Information Systems in Japanese Companies

Convergence or Divergence?[1]

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Introduction

The 1990s is often referred to as the "lost decade" in Japan, where the bursting of the asset bubble economy left it mired in a prolong recession. In contrast, the "new economy" in the United States and Europe was taking off, spearheaded by highly innovative dot-com companies and fueled by a strong bull market. An International Data Corporation report (IDC 2000) paints a more mixed picture, however. Japan's overall information society index score still ranks among the developed countries, but its Internet infrastructure and informatization scores are closer to those found in developing countries. The main research problem driving our analysis, then, is whether Japan lags behind other countries in the diffusion of e-commerce, and what implications does this have for the flagging Japanese economy?

In answering this question, it easy to compare Japan with other countries, especially to the United States and Europe. This approach biases us toward a convergence model of economic development, however. If the United States is the exemplary model, for example, how would we account for the rapid rise of mobile commerce in Japan? Rather than assuming a strictly exogenous imperative, a recurrent question we ask is to what extent are endogenous factors also affecting the diffusion of e-commerce. To gain purchase on line of analysis, our analytical concern here is the extent e-commerce does and does not diffuse across industries and within establishments, and the consequent impacts on firm performance. Our measure of e-commerce diffusion is based on revenues generated online

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over the Internet (CRITO 2002). The comparative merits and demerits of e-commerce against the existing Japanese style of management suggest it will diffuse unevenly across industries and within companies.

Table 9.1: **Market Size of E-Commerce, 1998–2005** [a]

	1998[b]	1999	2000	2001[c]	2002[c]	2003[c]	2004[c]	2005[c]
Total (million yen)	8,685	12,656	22,414	35,511	46,781	66,304	90,925	141,727
B2B [d]	8,620	12,320	21,590	34,027	43,950	61,270	78,430	125,430
B2B Ratio (percent) [e]	*99.3*	*97.3*	*96.3*	*95.8*	*93.9*	*92.4*	*86.3*	*88.5*
EC Rate (percent) [f]	–	–	*4.1*	*5.0*	*6.6*	*9.2*	*11.5*	*14.1*
B2C [g]	65	336	824	1,484	2,831	5,034	12,495	16,297
B2C Ratio (percent)	*0.7*	*2.7*	*3.7*	*4.2*	*6.1*	*7.6*	*13.7*	*11.5*
EC Rate (percent)	–	–	*0.3*	*0.6*	*1.1*	*1.9*	*3.1*	*4.5*

Source: ECOM 2002

Notes: [a] The definition of e-commerce used for the ECOM study is *"the conduct of commerce"* (e. g., exchange of goods, services, information and money between suppliers and buyers, associated with the commercial transfer of assets between economic units.) *through computer network systems using the Internet technology* (i. e., using the TCP/IP protocol. Network lines include the Internet, extranet, Internet VPN, and dedicated IP lines), *the transactional values of which can be identified* (i. e., giving quotations, providing information and other pre-order conduct are included, as long as it is clearly identified that the conduct has led to purchase and/or sales order).

[b] First year of survey.

[c] Projected figure.

[d] B2B E-commerce is where businesses/government bodies pay businesses in exchange for commodities (goods, services, information, etc.). Includes B2G where government bodies pay businesses in exchange for commodities (goods, services, information, etc.) and E-marketplace where B2B E-commerce on platforms used by multiple selling/buying enterprises.

[e] B2B or B2C percent of total e-commerce.

[f] The proportion of e-commerce against the total interim demands and final demands for the applicable segment.

[g] B2C E-commerce is where households pay businesses in exchange for commodities (goods, services, information, etc.). Mobile E-commerce using mobile terminals. E-commerce involving pre-order stages (quotes, commissioning, etc.) for automobile, real estate, etc.

N. A. = data not available

For the past three years, the ECOM (Electronic Commerce Promotion Council of Japan) has been improving the definition of and data collection on e-commerce to create a reliable database (ECOM 2002). Although the

annual ECOM survey is getting better at capturing current trends, its future forecasts often fail to foresee emerging trends. Moreover, the future forecasts look suspiciously similar to the government policy goals of the e-Japan Strategy. Taking into consideration these caveats, it is still a bit more reliable than many of the consultant generated forecasts.

According to this annual survey, Table 9.1 shows the projected size of the e-commerce market in Japan in FY2002 should amount to nearly 47 trillion yen (ECOM 2002). This is a five-fold increase over the amount of e-commerce transactions in 1998, when this survey first began. By FY2005, the ECOM forecasts the e-commerce market should triple in size to 142 trillion yen. During this period of time, the B2C market should account for 12 percent of total revenues, up from 6 percent in FY2002. In the following sections we disaggregate the B2B and B2C data to examine first the diffusion of e-commerce across industries, and second the nature of Internet use within companies.

Diffusion Across Industries

We seek evidence that the *keiretsu* fault lines across the industry sectors ease and channel the flow of B2B and B2C e-commerce. In addition, since the GEC Japan Database does not include "small-scale businesses" (1–19 employees), we elaborate on the rise of Internet companies to flesh out this side of the diffusion story.

Users of E-Commerce

According to a Ministry of Economy Trade and Industry (ECOM 2002) survey, since the 1990s, the diffusion of the Internet to Japanese companies has increased from less than 10 percent to 96 percent for "enterprises" (>300 employees) and from 6 percent to 45 percent for "establishments" (<300 employees). Table 9.2 orders these individual companies into their industry sub-sectors and type of e-commerce (B2B or B2C) to examine the spread of e-commerce across industries.

Business-to-Business

In Table 9.2 the manufacturing sector accounts for most of the e-commerce transactions across the B2B market in FY2001. The top three manufacturing sub-sectors are electronic and information products (44 percent) automobile (40 percent) and industrial and precision machinery (3 percent). The wholesale/retail sector is difficult to separate from the

Table 9.2: **Users of E-Commerce** [a]

Sector	2000	2001	2006
B2B			
Electronic/Information Products	55.5	44.3	24.7
Automotive	33.6	39.7	18.7
Industrial/Precision Machinery	0.5	2.8	5.6
Iron/Nonferrous/Raw Materials	1.8	2.6	6.6
Textile/Sundry Goods	2.7	2.4	8.8
Food	3.2	2.4	6.5
Transportation/Travel Services	1.3	1.6	5.1
Chemical Products	0.1	1.3	5.7
Info Processing/Software Related Services	NA	1.1	1.8
Construction	1.3	1.1	11.5
Paper/Office Products	< 0.1	0.4	4.1
Utility Related Services	NA	NA	0.7
Communications/Broadcasting Services	NA	<0.1	0.1
Financial/Insurance Services	NA	< 0.1	< 0.1
Total	**21,590**	**34,027**	**125,430**
B2C			
Automotive	24.5	23.4	14.2
Real Estate	21.4	22.0	8.7
PC and Related Goods	11.0	10.0	3.5
Travel	7.4	8.0	14.6
Entertainment	7.2	7.4	6.9
Other Products Sales	6.6	6.6	6.5
Other Services	3.8	4.7	15.6
Financial	5.3	4.3	3.8
Clothing and Accessories	3.3	3.9	8.2
Food	4.0	3.8	7.3
Hobbies/Misc./Furniture	2.7	3.3	6.5
Books and Music	2.4	2.3	3.3
Gifts	0.5	0.5	1.0
Total	**824**	**1,484**	**16,297**
(Digital Contents)	**50**	**93**	**–**

Source: ECOM 2002

Notes: Total percentages do not add up to 100 percent due to rounding errors.
NA = data not available

manufacturing related component in the ECOM data, but at face value, the textile and sundry goods (2 percent), food (2 percent), and paper and office products (<1 percent) are the most obvious candidates. That is, wholesalers more than retailers. In the bank and finance sector, the financial and insurance services account for a nominal 0.03 percent. Since the GEC10 Survey uses the standard industrial classification (SIC) to define the range of industries for inclusion in this study, we note that missing from Table 9.2 are the wood products, furniture, leather, and ceramics industries. These sub-sectors correspond roughly to companies falling outside the inter-firm boundaries of the horizontal and vertical *keiretsu*. In short, the diffusion of B2B e-commerce roughly follows the contours of the horizontal and vertical *keiretsu* relationships and spills-over into recently liberalized sectors. In contrast, where establishments have weak ties to a *keiretsu* group and/or where market entry is still regulated, we find nominal e-commerce activities.

Where the ECOM data becomes more problematic is in its future forecasts of e-commerce trends. By FY2006, the ECOM projects the electronic and information products (25 percent) and automotive (19 percent) sub-sectors should continue to top the B2B market. In addition, the industrial and precision machinery should grow to 7 percent, joined by the chemical products (7 percent) and iron and nonferrous metals (8 percent). This scenario suggests a greater integration of the supporting industries – that is, the cluster of companies in the materials industries, material processing industries, and associated industries (dies and molds, machine tools, founding and forging machinery, industrial furnaces, etc.) – at the foundations of the vertical *keiretsu* production networks. These sub-sectors are relevant to an export-oriented economy, however it is already clear that China and the other Asian economies will come to dominate the low and middle-technologies in these sub-sectors, pushing Japan to move up the technological ladder to more knowledge-intensive technologies. This suggests the ECOM forecast underestimates the potential growth in the service sector as an important B2B player in the future.

Our quasi-measures for the wholesale and retail sector also suggest greater growth in the textile and sundry goods (9 percent), food (7 percent), and paper and office products (4 percent). These are the sub-sectors where intense competition and consumer preferences require companies to pursue greater rationalization of their distribution channels. Although bank and finance business should increase as the economy improves, the ECOM projects only a nominal 0.03 percent growth in its online business.

Business-to-Consumers

In Table 9.2, across the B2C market in FY2001, the retail and wholesale sector accounts for significantly more of the e-commerce revenues than the other two sectors in this study. The top wholesale and retail sub-sectors are automotive (23 percent), PC and related goods (10 percent), clothing and accessories (4 percent), food (4 percent), hobbies (3 percent), and books and music (2 percent). This list of sub-sectors essentially covers all the segments in the wholesale and retail sector, but the depth of this diffusion is shallow. In contrast, the bank and finance sector, the financial services account for four percent of B2C total revenues, and the manufacturing sector a nominal amount.

By FY2006, the ECOM projects travel (8 percent → 15 percent) will move near the top of B2C list and replace real estate (22 percent → 9 percent) as the top services sub-sector generating B2C revenues. The automotive (23 percent → 14 percent), PC and related goods (10 percent → 4 percent) and finance services (4 percent → 4 percent) sub-sectors will contract, but the clothing and accessories (4 percent → 8 percent)), food (4 percent → 7 percent), hobbies (3 percent → 7 percent), and books and music (2 percent → 3 percent) should continue to grow. While the ECOM forecasts are becoming more accurate, it tends to miss nascent trends. We note that these are youth-oriented markets, but the rapid aging of Japanese society suggests other types of B2C services will emerge in the near future. This fundamental demographic trend is virtually ignored in the ECOM forecast. Thus, we expect further growth in the above industries; however, the major players five years down the road may look very different.

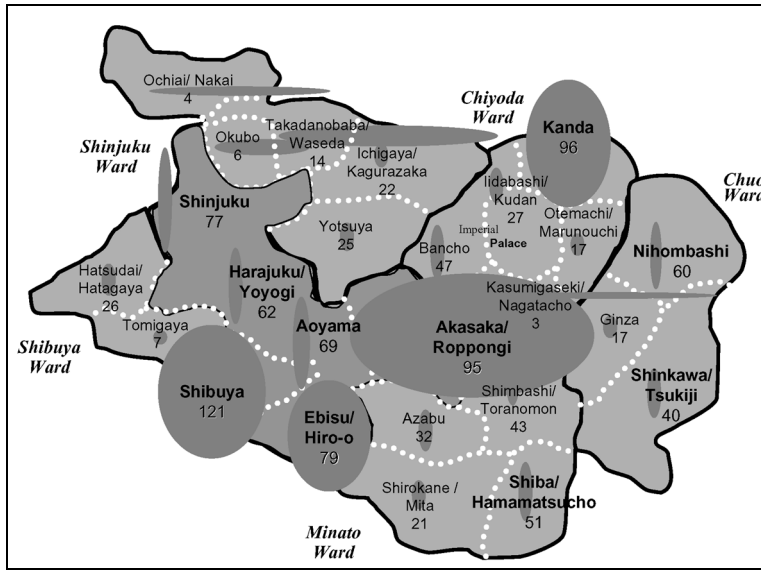
LOCATIONS AND STRUCTURE OF E-COMMERCE COMPANIES

In this section, we turn to the dot-com companies challenging the established brick-and-mortar business models of Japanese companies. Dot-com companies came from nowhere in the 1990s to become a nominal part of the industrial landscape over the past decade. In this connection, we ask, "Where do dot-com companies come from?" If you ask a knowledgeable person in Japan what is a prototypical e-commerce company, most close observers would mention one associated with the Bit Valley. We examine the geographical location and organization of these e-commerce companies in this section.

Clusters of Innovation

From 1999 a hot topic among Internet business people in Japan was the Bit Valley scene, a community of the Internet entrepreneurial companies situated in the Tokyo ward of Shibuya. One reading of the Chinese characters for Shibuya is bitter valley, leading to the moniker Bit Valley. The word bit is meant to convey the obstacles these entrepreneurs have had to overcome (bitter), their aspirations to create a Japanese version of Silicon Valley (valley), and the geographical location (Shibuya). Bit Valley led to the birth of the Bit Valley Association (BVA), a non-profit organization aimed at promoting personal contacts between people engaged in Internet businesses.

Figure 9.1: **Clustering of Internet Companies in Tokyo**



Source: Yukawa 2003

A Fujitsu Research Institute survey reveals that there are 1,541 Internet companies in the 23 wards of Tokyo at the end of February 2001 (Yukawa, 2003). Figure 9.1 shows the detailed breakdown of the wards with the highest density of Internet companies. Out of the 1,061 companies responding to the survey, 426 are located in the five central wards of Tokyo, especially Shibuya-ku, Shinjuku-ku, Chiyoda-ku, Chuo-ku and Minato-ku.

The increasing concentration of Internet companies in the Akasaka-Aoyama-Shibuya corridor of Bit Valley fame from 1994 is mainly explained by the unique social amenities catering to the lifestyle of young entrepreneurs. Yukawa (2001) has found that some attributes of the locations where Internet companies cluster include (1) the fulfilling social amenities for the young generation; (2) the existence of affordable spaces; (3) the existence of artists; (4) the existence of related educational institutions and (5) existing industries as the clients and the sources of human resources for Internet companies. These characteristics have developed in other parts of Tokyo, leading to a revival of declining urban areas. For example, the Kanda area, with the third large concentration of Internet companies in Tokyo, has become identified with the animation (*anime*) industry, where Japanese entrepreneurs have leaped to international fame in game software and animated pictures.

Other clusters of Internet companies are located in Sapporo in northern Japan and Fukuoka in southern Japan. The increasing numbers of clustering cases bring into relief the classical importance of private-public partnerships, involving the government, universities, and businesses, as another contributing factor to these clustering of Internet companies (Yukawa 2001). In addition, this geographical dispersion of industry clustering outside the Tokyo and Osaka corridor is a healthy example for stimulating economic activity in the less urban areas of Japan.

Organizational Structure

Approximately 24 percent of the Internet companies were founded before 1990, and the remaining 76 percent thereafter. Table 9.3 shows that the average Internet company is capitalized at less than 30 million yen. Most have less than 10 full-time employees and less than four part-time employees. By capitalization and establishment size, these Internet companies would be classified as small-scale businesses. Since this type of companies are not covered by the GEC Japan Database, we add this section to flesh out this emerging segment of the e-commerce economy.

The main business activity of these companies is concentrated in the area of Internet application companies (55 percent). Consulting companies, website developers, search engine applications, multimedia applications, and software and databases applications for the Internet are the main types of businesses. Intermediary companies providing products and services is the next largest category, accounting for 22 percent of the cases. For the B2C related business activities, market-makers providing online brokerage, travel services, advertising, and etc. characterizes this category. The infrastructure (10 percent) and e-commerce (8 percent)

companies, the last two categories, bring into relief the supply side of the story – the local capacity to implement e-commerce. The low level of business activities in the last category is due to the low level of enterprise integration activities among Japanese companies.

Table 9.3: **Organizational Characteristics of Bit Valley Internet Companies**

Establishments		Business Activities	
Founding (year)	**Percent**	**Business**	**Examples**
<1990	23.7		Telecommunications
1990–93	12.8		ISP
1994–97	30.4	Infrastructure 9.5 percent	Security provider
>1998	33.0		Hardware for networking
Capital (million ¥)	**Percent**		Data Center, ASP, Payment System, etc.
<10	8.9		
10–29.9	39.5		Consulting
30–49.9	8.7		Creation of websites
50–99.9	11.0	Application 54.5 percent	Search engines
>100	31.9		EC and multimedia applications
Employees (#)	**Percent**		Software and Databases for the Internet
Full-time			
<4	20.8		Market maker
5–9	20.4		Online broker, travel agency
10–24	28.4		Portal
25–49	13.6	Intermediary 22.3 percent	Content provider
>50	15.1		Internet advertising
Part-time			Content aggregator
<4	58.3		Research, etc.
5–9	19.5		
10–19	10.4	E-Commerce 7.8 percent	Online shopping
>20	11.7		Auctions, etc.

Source: Yukawa 2001

E-commerce Companies Established

It is difficult to enumerate the number of domestic Internet companies established from 1994, which is the year the commercial use of the Internet is claimed to have started on a full scale in Japan. There are many websites that connect buyers and sellers, such as online recruitment. These intermediary businesses often times run their websites from community sites and in many cases their source of revenue cannot be easily

identified. In the absence of data on all Internet companies in Japan, we limit our discussion to a survey of Internet companies in the Kanto region of Japan (Yukawa 2003).

Local vs. Global Companies

According to a survey by Yukawa (2003), most new Internet companies are actually hybrid domestic companies. There are few pure domestic dot-com companies that dominate the local market like Amazon.com or e-bay does in the United States. For example, the auction site operated by Yahoo Japan and the online bookstore, Amazon.co.jp are the most popular websites in Japan. But Yahoo Japan is not regarded as a pure domestic company because of Yahoo (US) large equity stake, and Amazon.co.jp is a Japanese website of its American parent company. In addition, Japanese dot-com companies tend to base their business models on those found in successful American Internet companies. Many of the Internet companies established by the pioneer Softbank Company, for example, are American versions adapted to the Japanese market.

As for the types of domestic Internet companies established from 1994, Yukawa (2003) finds most Internet companies conduct B2C transactions. Table 9.4 shows these companies are mainly in the wholesale and retail sector and the bank and finance sector, but almost none in the manufacturing sector. In the travel industry, market reorganization accompanies the diffusion of e-commerce. For example, Kokunaisen.com, which was jointly established by three large airline companies in 2000, deals with domestic air ticket bookings for all three companies. Given the rigid divisions separating the major *keiretsu*, this type of intra-industry cooperation was virtually inconceivable before the diffusion of e-commerce. Moreover, the bank and finance sub-sectors are fairly well represented. In the field of finance, most of the major finance companies have taken large equity states in online brokers such as E*TRADE Securities and MONEX rather than establish their own subsidiary.

The major brick-and-mortar companies are now conducting e-commerce in such sub-sectors as online shopping and securities brokerage. Most of established convenience stores (CVS), for example, have built their own website to start online shopping since the late 1990s. The *keiretsu* companies, especially the *sogo shosha* (general trading companies) and financial services companies have been particularly active in this regard. For example, the largest CVS, Seven-Eleven Japan, established 7dream.com in 2000 through joint capital investment from six large companies, such as NEC and the Sony Corporation. In the same year, Family Mart established Famima.com, a joint venture with other large companies

Table 9.4: **Major Newly Established dot-com Companies (partial list)**

	Year of Establishment			
	<1998	**1999**	**2000**	**2001**
B2B				
	Info Mart	EC-COM	MetalSite Japan Kouzai.com Smart Online Corp. Food Net	
B2C				
MANUFACTURING				
WHOLESALE and RETAIL				
Auction		DeNa Price-down Engine		
Books		e-Shopping! Books cbook24.com	Book1.Inc	
Car		Autobytel	MPEC	
Flower		Flowerfarm		
Food	Oisix (97)		Winetsu.com	
Games				GameOn
Cyber Mall	Rakuten (97) ARSeed (97)	Bizseek Netprice eLady	e-seikatsu CURIOCITY	
Photo Printing	Digipri (96)			
Pharmaceuticals	Online Store (95)	INDI		
Publishing			Book-ing Digi-Book, Japan	
Toy		e-Shopping!Toys		
Travel	ComNet Enterprise (97)		Tavigator Skygate Kokunaisen.com	tabini
BANKING and FINANCE				
Bank		Web Lease E-LOAN Japan		Sony Bank
Securities	E*TRADE	MONEX kabu.com JET Securities		
Commodity Futures			e-Commodity	

Source: Yukawa 2003

such as Toyota Motor and NTT Data. The other CVSs are now following Seven-Eleven and Family Mart's click-and-brick business model by building their own website for e-commerce. This business model is now spreading throughout the retail sector, especially among department stores and various other types of retailers trying to fend off on-line competitors.

Independent vs. Subsidiary

By fiscal year 2000, Sotec Company became the first Japanese company to surpass ¥10 billion in online sales. Notably absent from Table 9.5 are dot-com companies such as Rakuten and others that have attracted media attention. Instead, the list consists of well-known companies such as Sofmap, a PC (personal computer) and peripheral retailers in the Kanto region (Tokyo/Yokohama). A drawing card to their website is that consumers can earn points that can be used for future purchases. Rounding out the list are well-know companies such as Cecile, Japan Air Systems, Prince Hotels, Yodobashi Camera, Kinokuniya, and etc. In short, the top 20 companies deriving revenue through the Internet all share one common characteristic: they are relatively well-known brick-and-mortar companies that have established click-and-brick business models.

Most of the new Internet companies are not independent because the entrepreneurial environment in Japan is not well developed (Tachiki et al. 2002). In the absence of bank loans and alternative financial options, entrepreneurs finance their new companies from personal resources. For cash strapped entrepreneurs, this leads to large cash drain on parents and relatives or an excessive financial dependence on large companies. This is a major reason that the Bit Valley area has not become a full-fledged cluster like the Silicon Valley, where venture capitalists play active roles to coordinate the innovation by matching people and new technologies. Moreover, the large companies themselves tend to establish their own subsidiaries to start new Internet businesses, squeezing out some of the smaller players.

The company listings on the MOTHER (Market for the High-Growth and Emerging Stocks) Board should provide one indicator of the maturity of Internet companies in Japan. The MOTHER board was created in November 1999. Compared to the rules for listing on the first (large companies) and second (SMEs) sections of the Tokyo Stock Exchange (TSE), the basic idea motivating the MOTHER board is to ease the minimum capitalization and number of profitable year requirements before an entrepreneur can list on a stock exchange. Conventional wisdom suggests a new stock exchange should have a critical mass of around 50

Table 9.5: **Leading Users of E-Commerce, 2000**

Company Name	Sales (¥ mil)	URL	Main Items
1 Sotec Company	10,279	www.sotec.co.jp	PCs, peripherals
2 Sofmap Company	9,536	www.sofmap.com	PCs, peripherals
3 Xing Inc. (JOYSOUND)	5,000	www.xing.co.jp	Online music distribution, cell phone call melody
4 Cecile Company	4,283	www.cecile.co.jp	Clothing, sundries, etc.
5 Japan Air Systems Company	3,654	www.jas.co.jp	Airline tickets
6 Entertainment Plus Inc.	3,600	eee.eplus.co.jp	Various tickets
7 Prince Hotels, Inc.	3,511	www.princehotels.co.jp	Hotel reservations
8 Yodobashi Camera Company	3,421	www.yodobasi.com	Consumer electronics
9 Kinokuniya Company	3,000	www.kinokuniya.co.jp	Books
10 Nissen Company	2,427	www.nissen.co.jp	Clothing, sundries, etc.
11 Sega Corporation	2,153	www.d-direct.ne.jp	Game software, toys, amusement goods
12 Giga Networks Inc.	1,837	www.giga.co.jp	Online music distribution, cell phone call melody
13 Freeway Company	1,800	www.freeway.co.jp	PCs, peripherals
14 Book Services Company	1,694	market.bookservice.co.jp	Books
15 Murauchi Company	1,619	www.murauchi.co.jp	PCs, peripherals
16 Nikkei Business Publications, Inc	1,479	store.nikkeibp.co.jp	Books
17 Mytrip Net Company	1,087	www.mytrip.net	Hotel reservations
18 Fancl Corp.	1,000	www.fancl.co.jp	Pharmaceuticals, cosmetics
19 Laox Company	1,000	www.laox.xo.jp	PCs, peripherals
20 Nihon Ryokou Kurabu Tomonokai Co.	1,000	www.jtam.co.jp	Travel

Source: Nihon Keizai Shimbun 2002

listed companies; but, by 2001, only 26 companies had listed on the MOTHER Board (TSE 2001). Moreover, the NASDAQ Japan has withdrawn from its collaboration with the Osaka Stock Exchange because the market has not grown as fast as originally anticipated. These developments will hinder the creation of Internet companies that are independent from the pull of the *keiretsu* companies.

DIFFUSION OF E-COMMERCE

The diffusion of e-commerce across the three industry sectors essentially follows two paths. First, the most global-oriented *keiretsu* companies are the major carriers of B2B e-commerce across the manufacturing sub-sectors and then spreading to the vertical *keiretsu* in the wholesale and retail sector and the bank and finance sectors. Second, the domestic-oriented wholesale and retail sector emerge unexpectedly as the most active in B2C e-commerce. By this connection, we found that the liberalization and deregulation of specific sub-sectors creates economic space for SMEs, especially Internet companies, to flourish online. After an initial euphoric take-off period, access to capital has been a constraining factor in their further growth, forcing them into the orbits of the *keiretsu* companies.

ADOPTION WITHIN COMPANIES

We seek further evidence about the ways e-commerce technologies are replacing or complementing existing business practices to meet online B2B and B2C customer demands. We use the CRITO GEC Japan Database to develop this analysis one step further to reveal the hybrid diffusion of e-commerce within companies. If customer demand is the main driver of Internet use in Japan, the "voice of the customer" is the point of departure for understanding the adoption of Internet use within Japanese companies – that is, starting with the sales and after-sales segments of the value chain closest to the customer in contrasts to the conventional wisdom of new product development beginning with R&D (Akao, 1990). Since the CRITO survey does not cover all segments of the value chain, we only focus on customer services, sales, distribution channels, and procurement segments.

Customer Services

One common definition of a customer in Japan is "the person(s) or organizational unit that is the next step in your process for taking a product or service from concept to market" (Tachiki, 2000). Table 9.6 shows Japanese companies (15 percent) are half as likely to provide both B2B and B2C online services to customers than the global average (33 percent). Moreover, they are slightly more likely to provide only either B2B (14 percent) or B2C (19 percent) services to customers than the global average (11 percent and 13 percent respectively).

Table 9.6: **Online Services**

Percent indicating a significant factor	Estab. Size		Industry Sector			Total	
	SME	Large	Mfg.	WRD	B/F	Japan	Global
Type of Online Service [e]							
Percent B2B only	29.3	45.4	53.6	22.3	18.5	29.8	23.1
Mean percent of online business services [f]	*14.1*	*22.5*	*37.6*	*0.7*	*2.0*	*14.5*	*11.0*
Percent B2C only	18.6	21.2	3.8	23.0	35.4	18.7	12.9
Mean percent of online consumer services [g]	*5.6*	*14.3*	*1.1*	*10.6*	*7.0*	*6.0*	*7.6*
Percent both B2B and B2C	14.5	33.4	24.0	11.7	27.0	15.2	33.3
Percent of Mfg. websites which support [h]							
Product specification	94.0	83.7	93.3			93.3	79.9
Product configuration	74.6	76.1	74.7			74.7	54.7
Service and technical support	47.3	54.4	47.7			47.7	54.4
Account information	24.6	12.3	23.8			23.8	17.0
Order tracking	27.4	14.0	26.6			26.6	21.5
Percent of WRD websites supporting [h]							
Product catalogue	99.1	60.1		98.1		98.1	69.8
Gift certificates and/or registry	49.3	31.3		48.8		48.8	20.6
Product reviews	1.2	53.4		2.6		2.6	48.6
Account information	0.3	38.0		1.3		1.3	21.7
Individual customization	0.3	11.1		0.6		0.6	21.3
Percent of B/F websites supporting [h]							
Online services (e. g., filing applications, claims, paying bills, transferring funds)	65.3	87.7			67.8	67.8	53.9
Access to account information	65.3	87.7			67.8	67.8	57.3
Online tools (ex. research & planning tools, etc.)	39.8	36.0			39.4	39.4	52.0

Source: CRITO Global E-Commerce Survey, 2002

Notes: See notes a-d for Table 9.2.

[e] Percents are based on the full sample (all establishments). Exact wording of question: "Are these online services to other businesses or to consumers or to both?"

[f] Percents are based on the full sample (all establishments). Exact wording of question: "What percent of your establishment's total services to businesses are conducted online?"

[g] Percents are based on the full sample (all establishments). Exact wording of question: "What percent of your establishment's total services to consumers are conducted online?"

[h] Percents are based on only those establishments that have a website and conduct business within the specified sector.

For those companies that conduct B2B or B2C, the percentage of online transactions for business services (15 percent) and customer services (6 percent) respectively is roughly similar to the global averages (11 percent and 8 percent). These rather unremarkable findings become more insightful when we consider that in the manufacturing sector, the customer is the next business unit in going from the forging of raw materials into parts and then assembling the components into a final product (i. e., supplier-assembler relationship) and in the wholesale/retail sector and the bank/financial sector it covers essentially the individual consumer. Consistent with these sector definitions of a customer, the adoption of online services across the industries follows the globalization fault lines in the Japanese industrial landscape: B2B online services are more likely in the manufacturing sector (54 percent) followed by the wholesale and retail sector (22 percent), and finally the bank and finance sector (19 percent), whereas B2C online services follows the reverse pattern beginning with sectors with the most direct consumer contact (bank and finance (35 percent) and wholesale and retail (23 percent) and then manufacturing (4 percent). Moreover, large companies are more likely to provide online services than SMEs. This overall pattern of online services underscores that the B2B and B2C stories are different and re-confirms our earlier general finding that Japanese companies use the Internet for special purposes within business functions rather than systematically integrating it across business units.

Table 9.6 distinguishes the types of online service use by industry sector, allowing us to understand why it is more segmented than integrated in Japanese companies than the global average. The manufacturing sector uses its website more for B2B procurement transactions (release information on product specifications (93 percent) and product configuration (75 percent)) than for back office functions such as service and technical support (48 percent), account information (24 percent), and order tracking (27 percent). The wholesale and retail distribution sector focuses particularly on the marketing side of B2C transactions (product catalogue (98 percent) and gift certificates and/or registry (49 percent)), but noticeably less so for sales functions such as product review (3 percent), account information (1 percent), and individual customization (1 percent). The bank and finance sector packages online services (68 percent) with access to account information (68 percent) for sales functions, but less so for marketing functions such as providing online tools (40 percent). The story that emerges from Table 9.6, regardless of industry sector, is that companies provide online services to meet their immediate customer demands, but they are less likely to provide online services where privacy is paramount, elaborat-

ing on our earlier findings about the defining factors dividing the drivers for and obstacles to e-commerce.

This story changes somewhat by establishment size. SMEs in the manufacturing sector clearly conduct more of their customer services online, both for procurement and back office functions, than larger companies. For the wholesale and retail sector, the SMEs are more active in conducting sales related to product catalogue and gift certificates, but the large (wholesale) companies provide greater access to product reviews, account information, and individual customization. In the bank and finance sector, the SMEs (regional banks, trust banks, securities) are less likely than large *keiretsu* banks to conduct customer service over their websites, but they are slightly more likely to provide access to online tools. For SMEs in the manufacturing sector and to some extent in the bank and finance sector, they are moving online to allow the voice of the customer to reverberate electronically further back into their value chain, whereas in the wholesale and retail sector they use their web-sites to reach out to new customers. Anecdotal evidence suggests these are SMEs falling outside a *keiretsu* nexus and/or falling within a segment of the economy undergoing liberalization or deregulation, but further research beyond the GEC Japan survey is necessary to development this storyline.

Sales

Moving the voice of the customer electronically back into the sales segment of the value chain, in Table 9.7, Japanese respondents report less online sales to both businesses and customers (13 percent), to businesses only (7 percent), or to customers only (1 percent) than the global average (15 percent, 13 percent, and 7 percent respectively). Nevertheless, when we limit the sample to only those Japanese companies actually conducting B2C, they are almost twice as likely to conduct sales online than the global average (36 percent versus 19 percent). Turning to the B2B story, Japanese companies (15 percent) are just as likely as the global average (15 percent) to conduct business sales online. In addition, 94 percent of the Japanese companies support online payments through their websites compared to 34 percent for the global average. This suggests a bimodal split in the use of e-commerce among Japanese companies: a large majority of companies conducting very little B2C and B2B sales online as opposed to a distinct minority of companies intensively conducting on average a third of their B2C sales online with a strong link to their accounts receivable system.

Table 9.7: **Online Sales**

Percent indicating a significant factor	Estab. Size		Industry Sector			Total	
	SME	Large	Mfg.	WRD	B/F	Japan	Global
Type of Online Sales[e]							
Percent both B2B and B2C	12.8	13.0	2.1	16.3	16.0	12.8	15.0
Percent B2B only	7.0	14.1	28.5	0.5	0.2	7.2	12.9
Percent B2C only	1.3	5.1	1.7	0.5	13.3	1.4	7.1
B2C							
Mean percent of total consumer sales conducted online (all establishments)[f]	5.0	1.4	0.6	6.6	0.7	4.9	3.8
*Mean percent of those only doing **B2C** sales online*[f]	*36.6*	*8.9*	*16.1*	*39.6*	*3.2*	*35.6*	*18.6*
B2B							
Mean percent of total business sales conducted online (all establishments)[g]	3.0	2.7	2.6	3.3	0.1	3.0	4.0
*Mean percent of those only doing **B2B** sales online*[g]	*15.2*	*11.4*	*8.5*	*19.8*	*1.2*	*15.1*	*15.1*
Web Payment							
Percent of web-sites that support online payment (only those doing online sales)	96.6	71.1	100.0	64.2	31.6	94.1	33.6

Source: CRITO Global E-Commerce Survey, 2002

Notes: See notes a-d for Table 9.2.

[e] Percents are based on the full sample (all establishments). Exact wording of question: "Are these online sales to other businesses or to consumers or to both?"

[f] Exact wording of question: "What percent of your establishment's total consumer sales are conducted online?"

[g] Exact wording of question: "What percent of your establishment's total business-to-business sales are conducted online?"

The industry sector and establishment size data provide some insight into where online sales activities are most advanced. Table 9.7 shows that when the sample is limited to only those doing B2C or B2B sales online, the wholesale and retail sector conducts a greater percentage of B2C (40 percent) and B2B (20 percent) than the other two sectors. The wholesale and retail sector (64 percent) also reports a high percent of website support for online payment. In contrast, the manufacturing sector conducts only 16 percent of its B2C and 9 percent of its B2B sales online, but backs it up 100 percent with an online payment system. This suggests these two sectors are reorganizing their sales and payment activities to an online system: the wholesale and retail sector for both sales and payment, whereas the manufacturing sector uses hybrid EDI and Internet networks

and payment systems. In particular, the SMEs are more likely to engage in such activities than large companies. Thus, it is the SMEs in the wholesale and retail sector that are the most active minor players using Internet-based networks for B2C online sales.

Distribution Channels

Japanese companies report in Table 9.8 that "completing directly with traditional distribution channels" (38 percent) as the main reason for using the Internet to sell products and services, followed by another 29 percent indicating they plan to use the Internet to replace traditional distribution channels. In other countries this is known as "channel conflict," but in the Japanese context it is a way of getting around channel bottlenecks. The distribution system in Japan is quite hierarchical, consisting of more than three intermediaries between producer and customer. Indeed, foreign companies often cite the complex multi-layered distribution system as a major structural impediment to doing business in Japan. The remaining companies strive to enhance their traditional distribution channels only (22 percent) or expand their distribution channels using the Internet (12 percent). In this segment of the value chain, then, the voice of the customer becomes a function of improving *quality*, reducing *cost*, and decreasing *delivery* time (Tachiki, 1990).

Table 9.8: **How Establishments Use The Internet To Sell Products and Services**

	Estab. Size		Industry Sector			Total	
Percent indicating Internet used to …[e]	SME	Large	Mfg.	WRD	B/F	Japan	Global
CHANNEL CONFLICT							
Compete with traditional distribution channels	37.2	37.8	23.6	47.9	19.2	37.2	27.4
Replace traditional distribution channels	30.0	18.5	3.0	47.5	16.6	29.4	13.2
ENHANCE or EXPAND CHANNELS							
Address traditional distribution channels only	21.4	29.5	48.8	3.7	31.5	21.8	44.1
Address new markets only	11.4	14.1	24.6	0.9	32.7	11.5	15.3

Source: CRITO Global E-Commerce Survey, 2002

Notes: See notes a-d for Table 9.2.

[e] Exact wording of question: "Which of the following statements best characterizes how you are using the Internet to sell products and services?"

Among the three sectors, the manufacturing sector has the greatest number of distribution layers between a company and its customers. This sector

primarily uses the Internet to enhance traditional distribution channels (49 percent) but it is less likely to replace traditional distribution channel (3 percent). Consequently, the EDI supplier-manufacturer networks remain relatively intact but they are moving towards the use of the Internet in the downstream segments of their value chain to distribute products and services. When we look downstream to the retail side of the story, you have supermarkets and department stores dominating the sector, followed by specialty stores, convenience stores, and cooperatives. The supermarkets and department stores are using the Internet to procure fresh and/or reasonable priced products directly from producers for consumers. For example, Aeon. (formerly Jusco Company), a leading retailer, by-passes wholesalers and orders goods directly from domestic and overseas producers. Specialty stores, once a vibrant sector, finds younger consumers are turning to discount stores or the Internet for computers, music, books, etc., forcing them to adopt a click-and-brick business model.

Squeezed between manufacturers and retailers, then, is the wholesale sector that is responding the strongest to the channel conflict questions. The biggest threat to wholesalers is "disintermediation" from the distribution process. In this connection, not only do online purchases pose a threat to their intermediary role, but also the liberalization of this sector (e. g., Large and Small Store Law) has led to the emergence of competitive challenges from direct marketing (telephone call centers, catalogue orders, etc.) and large mega-stores (e. g., Carrefour, Costco, etc.). In response, wholesalers are increasing purchases of private-brands by importing from China and other overseas vendors to by-pass high cost domestic producers (JETRO 2003).

The bank and finance sector reports less channel conflict than the other two sectors, however the "big bang" financial liberalization of the sector in the mid-1990s has opened the door to market entrance from non-bank bank competitors. The Japanese government policies have historically favored debt financing over equity markets and thereby restrict market entry through its monetary policies. Subsequent to the liberalization of this sector and the rise of the e-commerce after 1994, non-bank banks, such as IY Bank and Sony Bank, have been making headway in the area of retail banking and securities, requiring traditional banks and financial services to protect and expand their market share. Consequently, companies in this sector are more likely to use the Internet to enhance traditional branch distribution channels (32 percent) or expand into new markets (33 percent). Overall, the initial impact of the Internet and liberalization has led to a chain reaction spreading across the three sectors and gradually flattening and internationalizing the previously hierarchical domestic distribution channels in Japan.

Table 9.9: **Online Procurement**

	Estab. Size		Industry Sector			Total	
	SME	Large	Mfg.	WRD	B/F	Japan	Global
Percent doing online purchasing	32.4	45.4	54.5	25.9	26.4	32.8	50.8
Mean percent spent on parts for production [e]	*21.1*	*7.5*	*20.0*	–	–	*20.0*	*8.3*
Mean percent spent on goods for resale [f]	*0.0*	*1.4*	–	*0.0*	–	*0.0*	*6.8*
Mean percent spent on supplies and equipment for business is ordered online [g]	0.1	0.5	0.0	0.0	1.6	.01	8.3

Source: CRITO Global E-Commerce Survey, 2002

Notes: See notes a-d for Table 9.2.

[e] Question asked only to those in the manufacturing sector; percent based on all manufacturing establishments. Exact wording of question: "What percent of the money your establishment spends on direct goods for production, such as parts and components, is ordered online?"

[f] Question asked only to those in the wholesale/retail distribution sector; percent based on all wholesale/retail establishments. Exact wording of question: "What percent of the money your establishment spends on goods for resale is ordered online?"

[g] Percent based on all establishments. Exact wording of question: "What percent of the money your establishment spends on supplies and equipment for doing business is ordered online?"

Procurement

When we move further up the value chain, Table 9.9 shows customer demand for Internet-based transactions is weaker in Japan than the global average: only 33 percent of the Japanese companies purchase online compared to the global average of 51 percent. Much of this lag in downstream B2C purchases and integrating suppliers in B2B purchases. Whereas in upstream online purchasing, the manufacturing sector is the most active in procuring online, nearly half of which is parts for production. At the center of a manufacturing company's procurement segment of the value chain is some derivative of Toyota Motor's just-in-time (JIT) and *kamban* delivery system (Monden, 1983). Under this procurement system, companies decide whether to use an open or closed procurement system depending on the product architecture. For products with a modular design – that is, products using standardized, mass-produced components – online procurement is an option. But for integrated product designs – that is, products with high tech core components – a closed EDI system is the most secure way to protect intellectual property (Fujimoto,

2002). Japanese companies tend to use closed EDI networks for integrated product designs, but are more catholic about modular product designs. The subdued pattern of online procurement activity is thereby due to the existence of hybrid EDI and Internet-based networks for procuring parts for production.

The wholesale and retail sector (26 percent) and bank and finance sector (26 percent) are half as likely as the manufacturing sector to purchase online. The outcome for the wholesale and retail sector is consistent with our earlier finding that it is a heavy user of EDI networks. Nevertheless, the GEC Japan Database unaccountably shows no online purchasing for resale goods. For the bank and finance sector, in contrast to its active use of the Internet to reach external customers, its nominal online orders for supplies and equipment suggests less intra-firm online business activities.

Adoption of E-Commerce

E-commerce has diffused within companies in segments of the value chain closest to the customer. However, companies that spend the most on IS and are ready for e-commerce are not necessarily the biggest adopters of the Internet. Harnessed to their EDI legacies, the large *keiretsu* companies have adopted a hybrid open and closed network. Moreover, in the relative absence of privacy and security for Internet transactions, the large *keiretsu* companies have not integrated the Internet across their business functions. The organizational boundaries of Japanese companies still map the *keiretsu* intra- and inter-firm relationships, except at the customer interface and distribution segments. The rise of Internet support services and company interest in outsourcing business processes could possibly drive some change in *keiretsu* relationships in the future, however.

Impacts of the Internet and E-Commerce

The globalization and liberalization of the Japanese economy provides a good picture of the fault lines in the industrial landscape. In this section, we conclude our discussion by examining the impacts of the Internet and e-commerce on the performance of Japanese companies falling on either side of these fault lines, especially in the areas of efficiency, coordination, and commerce.

Table 9.10: **Impacts of Doing Business Online**

	Estab. Size	Industry Sector	Total				
Percent indicating a significant factor [e]	SME	Large	Mfg.	WRD	B/F	Japan	Global
EFFICIENCY							
Internal processes more efficient	28.6	31.5	40.5	25.2	20.7	28.7	33.9
Staff productivity increased	24.3	22.7	25.7	24.6	11.5	24.3	27.2
COORDINATION							
Procurement costs decreased	3.9	12.3	16.2	0.3	0.8	4.2	17.7
Inventory costs decreased	5.4	4.3	20.3	0.3	5.0	5.3	14.0
Coordination with suppliers improved	34.0	27.9	40.4	33.2	10.5	33.8	29.8
COMMERCE							
Sales area widened	3.1	12.3	9.3	0.8	12.3	3.4	31.4
Sales increased	1.1	6.9	1.4	0.4	13.5	1.2	20.5
International sales increased	5.0	5.8	20.6	0.0	0.0	5.0	19.5
Competitive position improved	10.1	9.1	14.6	8.8	6.1	10.1	29.8
Customer service improved	10.9	17.9	42.3	0.8	6.9	11.2	34.8

Source: CRITO Global E-Commerce Survey, 2002

Notes: See notes a-d for Table 9.2.

[e] Exact wording of question: "Using a 5-point scale where 5 is "a great deal" and 1 is "not at all", please rate the degree to which your establishment has experienced the following impacts since it began using the Internet for business. A score of 4 or 5 was classified as "high impact"."

Efficiency

In Table 9.10, Japanese companies are less likely to experience efficiency in internal processes (29 percent) and staff productivity (24 percent) than the global averages of 34 percent and 27 percent respectively. By industry sector, the manufacturing sector beats the global average on internal process efficiency (41 percent versus 34 percent). In our discussion of the GEC Japan Database, the manufacturing sector uses the Internet to rationalize operations management functions. We would have expected a higher degree of improvement in internal efficiencies of the distribution channels for the wholesale and retail sector, and for the back room operations in the bank and finance sector. The bank and finance sector is low on both internal process efficiency (21 percent) and staff productivity (12 percent). The large companies (32 percent) are more likely to achieve internal process efficiency than the SME (29 percent), but the SMEs (24 percent) are slightly more likely to report increases in staff productivity than the large companies (23 percent).

Coordination

On the coordination measures, Japanese companies are less likely than the global average to report decreases in procurement costs (4 percent versus 18 percent), decreases in inventory costs (5 percent versus 14 percent), but it does report more improvement in coordination with suppliers (34 percent versus 30 percent). This is an area where the manufacturing sector has made improvements, and this shows up when we examine the data by industry. The manufacturing sector equals the level of the global average on procurement costs and clearly exceeds it on inventory costs and coordination with suppliers. We attribute this result to the hybrid closed and open networks – that is, Japanese companies have only adopted open e-commerce technologies to the extent they improve on existing business practices. Where this is not the case, they still rely on closed EDI networks. The wholesale and retail sector only outperforms the global average on the coordination with suppliers measure, a segment of the value chain we documented large changes with the introduction of e-commerce technologies. The bank and finance sector reports low results on all three measures. Nevertheless, internal coordination is not a significant issue in this sector. Instead, the more pressing issue is meeting new competitive challenges from non-bank banks (e. g., Sony Bank, IY Bank, etc.). The SMEs are more likely to report decreases in inventory costs and coordination with suppliers than the large companies.

Commerce

Japanese companies have not benefited as much as the companies in the global average on the measures of commerce: widening sales area, increased sales, increased international sales, improved competitive position, and improved customer service. Only the bank and finance sector shows improvement in widening sales area and increasing sales, a key reason companies give for adopting e-commerce. The wholesale and retail sector reports improving its competitive position and improving customer service. Since the wholesale and retail sector and bank and finance sector focus their e-commerce in downstream activities, we would have expected more improvement in these sectors. Perhaps a combination of their domestic oriented market focus and the poor state of the Japanese economy has muted the potential positive impact of the Internet. The manufacturing sector exceeds the global average on improved customer service and increased international sales. By establishment size, large companies have benefited more than the SMEs; however, none of the measures exceed the global averages. Because the diffusion of

e-commerce tends to correct the inefficiency of each trade, large company's full-scale entry into e-commerce is promoting the market reorganization of each trade.

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