e-Commerce in Japan
– The Telecommunications Companies' Approach and Barriers to Implementation –

By Jim Pitchford

What is the Japanese e-Commerce market worth?

There have been a number of assessments of the market worth of e-Commerce in Japan, the most commonly quoted being the Ministry of International Trade and Industry (MITI)/Andersen Consulting's study of 1999. These figures show two striking features (see Figure 1). Firstly, whilst the sexy Business to Consumer applications (B2C) part of e-Commerce is oft-cited by the press as changing the way we live our daily lives, it is the Business to Business applications (B2B) which will command the greatest volume (in terms of transaction revenues). We are told that the B2B market in Japan will by 2003 be some 20 times greater than the B2C market and will involve around 11% of all commercial transactions, compared to only 1% of consumer transactions.

Secondly, and as we have all been told many times, Japan lags behind the US in e-Commerce by 2-3 years; much the same lag as is cited for Internet and PC penetration in Japan.

However if we look at another sector, mobile commerce (or m-Commerce), we see a different story. Here Japan already has more mobile phones than fixed line telephones (61 million vs 58 million according to the Ministry of Posts and Telecommunications (MoPT) data). Some recent forecasts from Nokia show that the world will have more Internet-enabled mobile phones than fixed Internet access lines by 2004. Translating the same parameters to the Japanese market suggests this overtaking will take place here during 2001. Japan's MoPT has also identified that one-third of Japan's Internet users have already purchased something on-

line whilst NTT DoCoMo has shown that more than 14% of its i-mode page accesses are finance or e-Commerce-related.

So when we look at m-Commerce, it is safe to say that Japan is at least 2-3 years ahead of the US where mobile penetration is still much lower.

The third emerging sector to look at is Application Services Provision (ASP). In an ASP environment the software applications are hosted on a server within the Internet instead of on your PC or a server on your Local Area Network (LAN). ASP is the equivalent of the old mainframe times of the computer world except that the connection between the mainframe (now a rack of servers in a web-hosting centre) and the terminal (now a network PC) is over a high speed digital line (typically 128kbit/s or higher) and is shared with other Internet services. Here again

Figure 1

e-Commerce Transaction Forecasts

Japan (Yen bn.)

	1998	2003	
B-C	65	3,160	(1% of commercial transactions)
B-B	8,620	68,000	(11% of commercial transactions)

United States (Yen bn.)

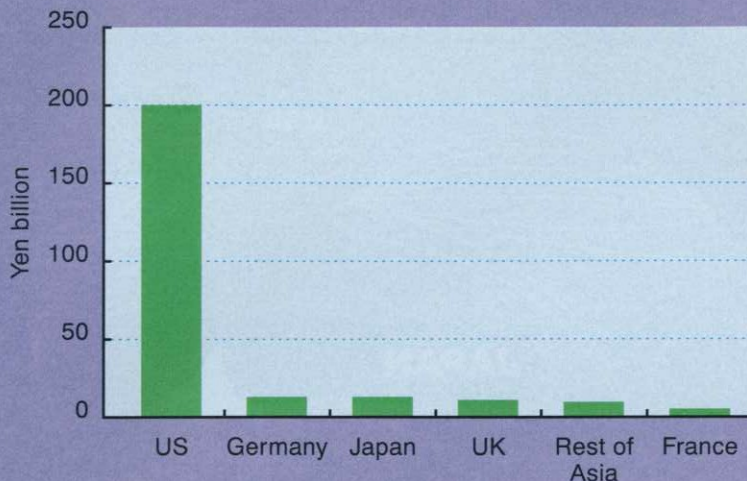|	1998	2003	
B-C	2,250	21,300	(3% of commercial transactions)
B-B	19,500	165,300	(19% of commercial transactions)

Source: Ministry of International Trade and Industry / Andersen Consulting

Figure 2

ASP Markets

Yen billion (vertical axis: 0, 50, 100, 150, 200, 250)

US, Germany, Japan, UK, Rest of Asia, France

market forecasters (this time Ovum) show that whilst Japan will be one of the world's top 3 ASP markets and that it will grow at a heady 122% per annum until 2004, Japan is again well behind the US (see Figure 2).

Why is this? How can Japan's mobile Internet and m-Commerce be so far ahead whilst fixed Internet, e-Commerce and ASP are so far behind?

There are many possible explanations for this dichotomy, including:
• language barriers and character set differences; content on the Internet is predominantly in the English language (with Japanese a very distant second place)
• cultural differences; for example Japanese sales techniques are built more on personal relationships which cannot be replicated for e-Commerce
• shortage of common global standards; as we know, many of Japan's technical standards are unique to Japan
• a different competitive environment; where NTT remains the dominant player in all local access technologies and has kept Internet access charges high, inhibiting development of broad internet usage

• different distribution channel structures in Japan; historically many "middle-men" have been involved in the supply chain, and
• the absence of independent telecommunications regulation; the MoPT continues to act in its dual role of both representative of the owner (of 53% of NTT shares) and regulator. The MoPT has many responsibilities, with the promotion of competition in telecoms and e-Commerce low on the list of priorities.

One clue to the dichotomy is the role of the Telecommunications Company (Telco) and its regulators in the e-Commerce world.

The Telco's Interest in e-Commerce

The numbers quoted in Figures 1 and 2 represent the total value of the commercial transactions which use the Internet at some point during the process – for example for ordering, billing, payment, delivery or progress tracking. Some recent research by IBM shows that the sales commissions generated by these companies would represent as little as 2-3% of the total cost of providing the service, with the remain-

ing costs being split approximately 50/50 between the network/IT systems and web-hosting centers required to host the e-Commerce services. Again the sexy bit, e.g. the e-Commerce engine visible through the browser, accounts for only a small part of the revenue and it is the networks and data centers which account for the majority of the revenue.
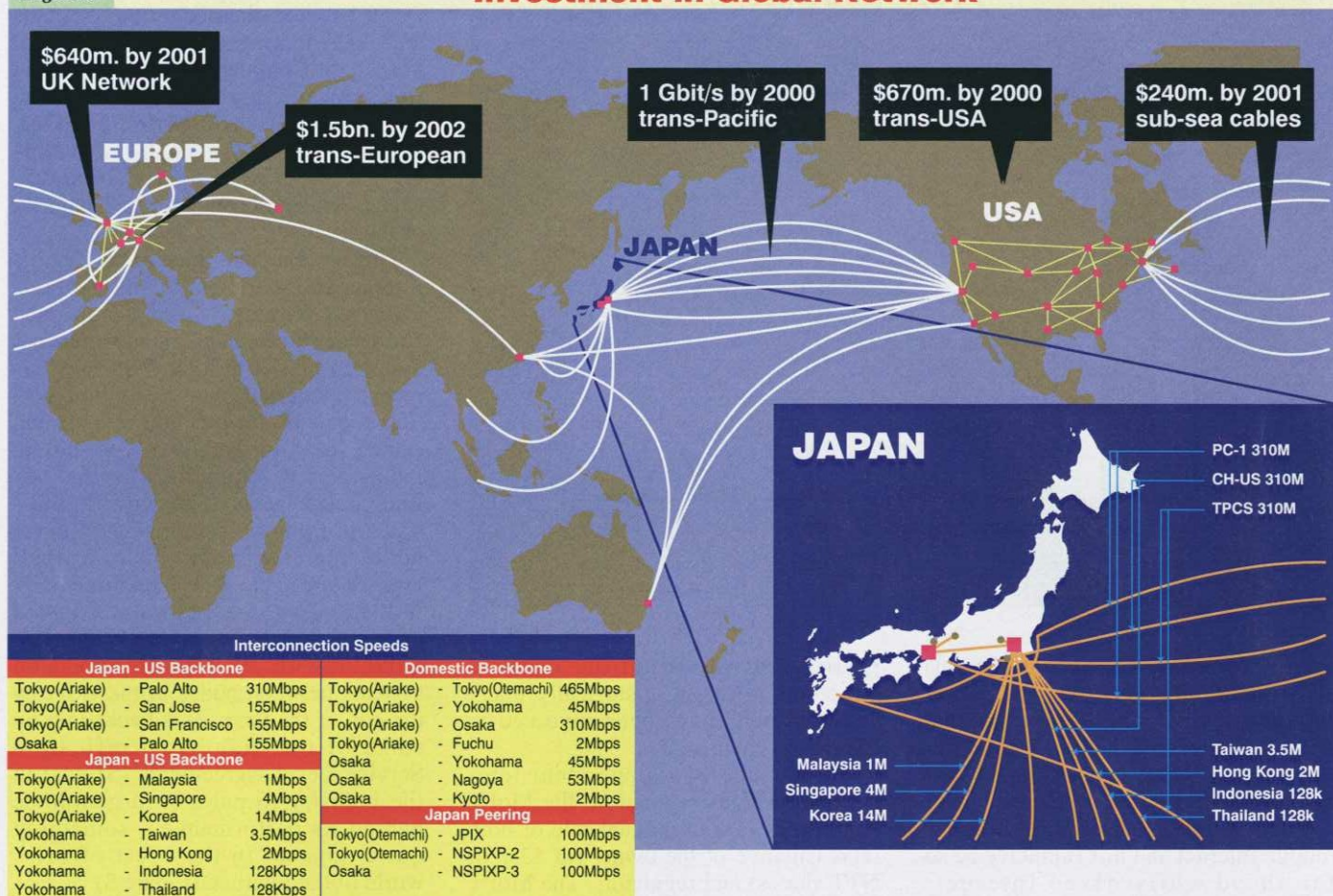
This gives a major clue to the Telco's interest in e-Commerce and explains Cable & Wireless's global approach and recent investments in networks and data centers. Cable & Wireless has recently invested over 2.2 billion sterling in new IP network and web-hosting centers and a further 4.9 billion sterling in IP-related acquisitions in the US, Europe and Japan. The network, illustrated in figure 3, comprising 84 tier 1 nodes represents one of the world's largest and fastest IP backbones and will have submarine capacities in excess of 2Gbit/s across the Pacific and Atlantic with 10Gbit/s transmission systems between nodes in the USA by the end of the year. It is backed up by some of the highest specification Service Level Agreements (SLA's) in the industry to put a firm guarantee behind its performance – something quite unusual in the "best-efforts" world of the Internet. (Figure 3)

Next, Cable & Wireless has been investing heavily in world-class data centers with 20 web-hosting sites coming on line by the end of 2002 and over a million square feet of capacity by the end of 2001. These hosting sites will bring content to the network in the US, Japan and throughout Europe. The special feature of these sites is that they are directly connected to the global network, meaning that content in our centers will travel faster to its destination anywhere in the world – an important feature in the click-click world of e-Commerce decisions.

e-Commerce isn't the only service requiring the high-spec features of network and web-hosting centers. ASP services require much the same and again Cable & Wireless is investing heavily. Cable & Wireless application services (a-Services) will be launched

Figure 3 | **Investment in Global Network**

$640m. by 2001 UK Network

$1.5bn. by 2002 trans-European

1 Gbit/s by 2000 trans-Pacific

$670m. by 2000 trans-USA

$240m. by 2001 sub-sea cables

EUROPE

JAPAN

USA

JAPAN

PC-1 310M
CH-US 310M
TPCS 310M

Malaysia 1M
Singapore 4M
Korea 14M

Taiwan 3.5M
Hong Kong 2M
Indonesia 128k
Thailand 128k

Interconnection Speeds			
Japan - US Backbone		**Domestic Backbone**	
Tokyo(Ariake) - Palo Alto	310Mbps	Tokyo(Ariake) - Tokyo(Otemachi)	465Mbps
Tokyo(Ariake) - San Jose	155Mbps	Tokyo(Ariake) - Yokohama	45Mbps
Tokyo(Ariake) - San Francisco	155Mbps	Tokyo(Ariake) - Osaka	310Mbps
Osaka - Palo Alto	155Mbps	Tokyo(Ariake) - Fuchu	2Mbps
Japan - US Backbone		Osaka - Yokohama	45Mbps
Tokyo(Ariake) - Malaysia	1Mbps	Osaka - Nagoya	53Mbps
Tokyo(Ariake) - Singapore	4Mbps	Osaka - Kyoto	2Mbps
Tokyo(Ariake) - Korea	14Mbps	**Japan Peering**	
Yokohama - Taiwan	3.5Mbps	Tokyo(Otemachi) - JPIX	100Mbps
Yokohama - Hong Kong	2Mbps	Tokyo(Otemachi) - NSPIXP-2	100Mbps
Yokohama - Indonesia	128Kbps	Osaka - NSPIXP-3	100Mbps
Yokohama - Thailand	128Kbps		

in the autumn of this year backed up by a partnership with Compaq (for the provision of customer hardware and service servers) and with Microsoft (to ensure operability of the latest Windows 2000 products within an application services environment). With this combination of partners, Cable & Wireless will be launching a new range of network-based a-Services targeting Small and Medium-sized Enterprises (SME's) in the US and UK this year, to be followed by Japan and the rest of Europe later (see www.cwas.net). This represents a worldwide investment of $500 million by Cable & Wireless and Compaq and involves about 1000 people.

From this it is possible to see that e-Commerce is just one element of a range of capabilities towards the e-enabling of industry. Other Telco's are following suit but few have the same vision of combining data centers, networks and applications throughout the globe with such scale.

Status of e-Commerce in Japan

A quick look at the technical, political and trade issues also gives a clue to the reasons for the slowness of e-Commerce uptake in Japan. e-Commerce requires a plethora of issues to be solved to allow its smooth introduction throughout industry: technical standards for encryption, electronic signatures, e-Money and smart cards, regulatory polices on privacy and consumer protection, removal of national tax barriers and cross border transactions are just a few examples.

In these issues Japan is making progress – smart cards (EU-Japan co-operation), electronic signatures (MITI, MoPT, Ministry of Justice [MoJ]) draft laws, National Police Authority (NOPA), fair competition rules, common e-Commerce market in Asia, MITI on laws to abide by in cross-border trade, on-line auction fraud, etc., though it is difficult to bring all of this together.

So who is actually doing what? Here the answer is less clear as the issues cut across so many ministries and trading organizations. Unlike some countries, for example the UK which now has its own Minister of e-Commerce, in Japan these important issues still lack a single point of focus. Figure 4 gives a summary of some of the organizations that are active in the e-Commerce arena.

Outside the official structures, there are some examples of interesting commercial e-Commerce activities which are unique to Japan.

In the B2C area, separate initiatives are led by the Watsons and 7-Eleven convenience store companies. Rather than relying upon the logistics offered by courier companies, they are using their 24x7 (24hours x 7days)outlet stores as e-Commerce stores. Both payment and collection of the goods ordered over the Internet are handled at the stores. This overcomes two unique Japanese problems, namely the predominance of cash (rather than credit cards) to pay for transactions and the difficulty of delivery to homes within a nation that is often not at home.

So what is missing in Japan? Why do we not feel that Japan is charging forward on e-Commerce and, in particular,

why do we feel Japan does not encourage new investment in e-Commerce by new or foreign players?

One answer lies in the complexity of telecommunications networks and the role held by a dominant local carrier. An unprecedented level of government to government negotiations have recently been required to drive down interconnect prices for calls passed from one carrier to another. This will have a direct knock-on effect to the cost of calls charged to the consumer yet the breakthrough still only achieves an interconnect cost level several times higher than the UK or US market. Yet telephony interconnect is only one part of the equation and really only has relevance in the B2C market. Figure 5 illustrates the plethora of different access techniques required to deliver B2B products directly to business

premises. Each of these offers potential for stalling tactics by incumbent players, be it in terms of reaching agreement on financial settlements, or access to buildings and cable for equipment installation, or concerns over the security of existing services. All of these can be used to effectively block or slow down progress. Without solving the access problem, innovative and performance enhancing e-Services will be slower to deliver here in Japan than they are in other markets.

Again there are signs of progress but perhaps it is still too slow.

• Local loop unbundling for Asymmetric Digital Subscriber Line (ADSL) access has been running on a trial basis and should be extended to a wider coverage area during October. This will give SME's access to higher data

Figure 4	A Summary of the Organizations that are Active in the e-Commerce Arena
Body	**Key Activity**
Ministry of Posts and Telecommunications	Electronic Signatures; e-Commerce rules; all telecoms regulations; e-Settlement; e-Cash; security; infrastructure; international e-Commerce; fraud
Ministry of Finance	Tax
National Administration Agency	Tax
Ministry of International Trade and Industry	Electronic Signatures; e-Commerce rules; all telecoms regulations; credit cards; taxation; fraud; logistics; intellectual property rights; education …
Ministry of Justice	Electronic Signatures; e-Commerce rules
Keidanren (Japan Federation of Economic Organizations)	Electronic Signatures; e-Commerce rules; all telecoms regulations
National Police Authority	Electronic Signatures; e-Commerce rules; internet fraud
Ministry of Construction	e-Commerce infrastructure
Economic Planning Agency	Arrangements for the e-Environment
Electronic Commerce Promotion Council of Japan (ECOM)	Electronic signatures
Ministry of Foreign Affairs	Rights of way for networks

Figure 5 — Internet Access Schematic

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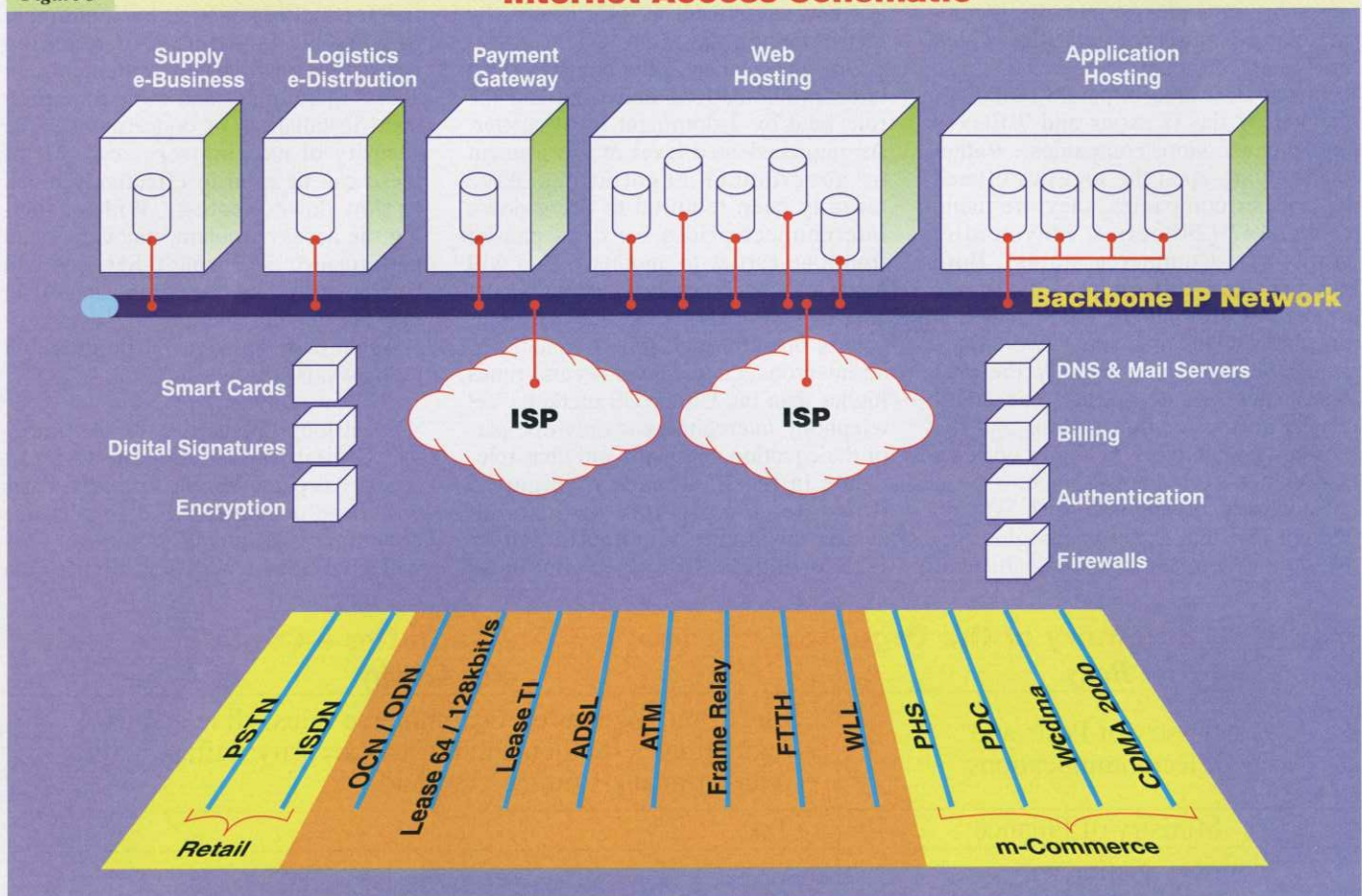
rates (around 700kbit/s) at much more economic rates than historically provided by NTT e.g. Tokyo Metallic Communication ADSL (500kbit/s) is 5,000 yen per month compared to NTT's 128kbit/s lease at 38,000 yen per month.

• NTT has, of course, responded with its own ADSL plans. Time will tell if NTT is able to demonstrate equivalent access to the new ADSL operators as it provides to members of its own group.

• Unbundling of fibre had not been discussed until September this year when the MoPT announced such a possibility by the year-end. This is good news and should be supported. However the rules for achieving this have proved complicated to draft and enforce in other markets and the same must be expected in Japan.

• DoCoMo's i-mode access currently allows two types of content providers – those who are partners of DoCoMo and can use DoCoMo's billing capability for small transactions – and those who cannot and who therefore have to rely on credit cards or alternative billing methods. As those who are partners can have their address listed on the menu screens of the i-mode phone this creates a two-tier structure and is an inhibitor to open access to the Internet. Whilst Internet Service Providers (ISP)'s in the fixed Internet world often offer their own portals (e.g America Online) at least everyone has a choice as to who their ISP is. Not so in DoCoMo's i-mode.

Ultimately an agency or Ministry is needed to comprehensively address all of these issues by acting with sufficient legal authority to force change and with a clear focus upon driving long-term benefit to consumers. This should take the form of an independent regulator for telecommunications, Internet Protocol (IP) and e-Commerce activity.

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