

Outlook #01.2006

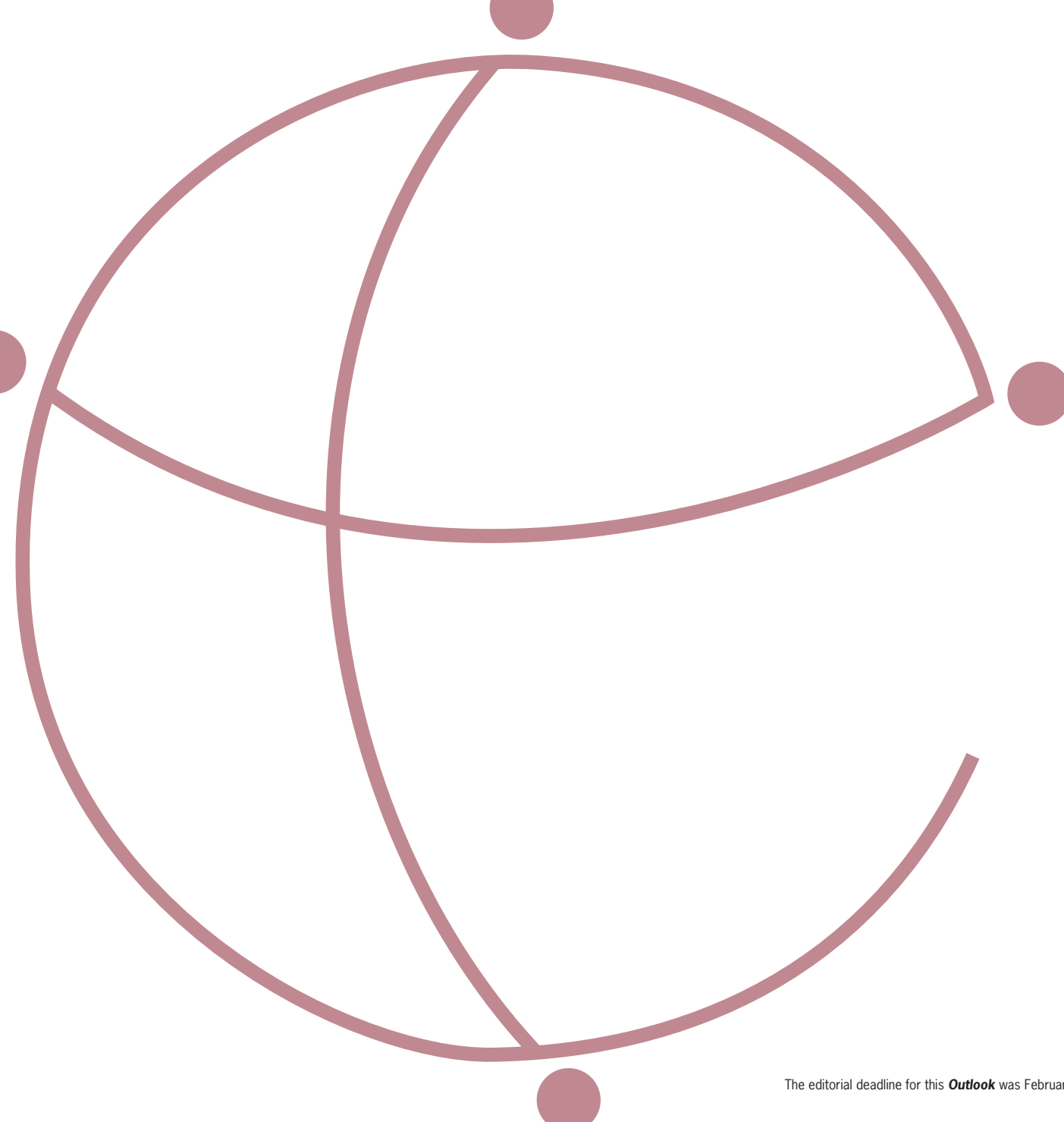


Japan Wireless Operator and Handset Manufacturer Outlook



- **Wireless Telecommunications**
- Health Care
- Financial Services
- Government

- Competitive Intelligence •
- Business Strategy •
- Branding Research •
- Public Opinion Research •



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Key Market Indicators:
2005-2006

Installed Base

Installed Base: 94.3 Million
Prepaid Installed Base: 2.6 Million
Postpaid Installed Base: 91.7 Million
Data Users: 73.8 Million

Handset Sales by Technology

1G Migration Path: 0.8 Million
GSM Migration Path: 14.6 Million
CDMA Migration Path: 11.7 Million
Other (TDMA, PDC, iDEN): 22.9 Million

ARPU

Service Revenue: \$ 66.9 Billion
Monthly ARPU: \$ 61.57
Monthly ARPU (Voice): \$ 45.56
Monthly ARPU (Data): \$ 20.61

**Carrier Market Shares
(by Installed Base)**

DoCoMo: 54.4%
KDDI (au + TU-KA): 25.9%
Vodafone KK: 16.0%
Willcom (PHS): 3.7%

Source: IEMR

Market Forecasts:
2005 - 2010

IEMR FORECAST							
	2005	2006	2007	2008	2009	2010	CAGR, 2005 - 2010
Total Installed Base (Thousands)	94,282	97,425	99,812	101,620	102,986	104,019	2.0%
Penetration Rate, %	74.5%	77.1%	79.2%	80.8%	82.0%	83.0%	2.2%
Total Monthly ARPU (\$)	61.57	60.23	60.05	59.65	59.63	59.50	-0.7%
Total Service Revenue (\$ Millions)	66,928	66,885	68,968	69,875	74,079	77,713	3.0%
Data Users (Thousands)	73,791	80,196	84,651	89,672	92,921	96,888	5.6%
Monthly ARPU on Data per Data User (\$)	20.61	20.87	20.18	20.39	20.60	20.41	-0.2%
Total Handset Sales (Thousands)	50,636	52,322	52,563	51,854	50,799	49,873	-0.3%
Handset Sales by Technology (Thousands)							
<i>1G Migration Path</i>							
PHS Handset Sales	811	678	536	384	223	51	-42.5%
<i>GSM Migration Path</i>							
WCDMA Handset Sale	14,572	20,513	25,200	28,631	31,006	32,574	17.5%
<i>CDMA Migration Path</i>							
CDMA2000 1xRTT Handset Sales	7,660	5,419	3,566	2,347	1,710	1,490	-27.9%
CDMA2000 1xEV-DO Handset Sales	4,086	7,414	10,671	13,064	13,939	12,950	25.9%
<i>Other</i>							
PDC Handset Sales	22,859	17,580	12,459	7,822	3,809	450	-54.4%

Source: IEMR

1. Executive Summary

*Japan Opens Up
Operator Market,
Just a Bit*

For the first time in 12 years, the Japanese government opened up the country's cellular operator market to new entrants in November 2005. Japan enters 2006 with three new competitors in its wireless operator space. BB Mobile of Softbank and eMobile, operated by eAccess, are scheduled to begin WCDMA services by the end of 2006. While both Softbank and eAccess carried out trials of other TDD systems, they opted for the well-established FDD technology, leaving IP Mobile with the license to launch Japan's first TD-CDMA service.

The new entrants will likely see growing pains. We feel the roll-out plans announced by Softbank and IP Mobile are overly ambitious and do not take into account the types of problems that can be encountered in network roll-outs. On the other hand, eMobile's plan is too cautious, with partial network roll-outs and partial coverage which will likely fail to create significant churn among incumbent operators. Existing Japanese operators and the demanding Japanese consumer will ensure these new operators are kept on their toes, with greater price competition and bundled service offerings.

*DoCoMo and KDDI Will
Continue to Dominate,
While Vodafone KK's
Position Is Tenuous*

Despite the new entrants, DoCoMo and KDDI will continue to remain dominant players in Japan's wireless space. DoCoMo's strategy is simple - continue to defend its market share, with a focus on Japan's demanding consumer. To do this, the company is working on a number of fronts, including the introduction of multimode PDC/FOMA (Freedom of Mobile Multi-Media Access) handsets, large investments in FOMA handset manufacturers, and adoption of HSDPA for its WCDMA service. DoCoMo is also capitalizing on its brand recognition by introducing innovative cell phones, such as the two-screen prototype developed jointly with Mitsubishi Electric, and applications, such as its offering of internet auction services with Rakuten Inc.

On the other hand, KDDI's strategy has been to consolidate its operations, with a view to create a national "au" brand. In November 2005, KDDI completed its acquisition of PoweredCom from Tokyo Electric Power Co., in a \$1.1 billion deal. KDDI has also completed integration of the TU-KA Group, with a plan to leverage and integrate TU-KA's retail presence.

Of the three incumbent operators, we view Vodafone KK's position as tenuous. Despite its ambitious target of unseating KDDI from the #2 rank, Vodafone KK saw negative subscriber growth for three straight quarters in 2005. All said, Vodafone KK lost 871,500 subscribers in the January - September 2005 period, which represented 5.7% of its subscriber base. We do not believe Vodafone KK's plan of emphasizing its 3G services, together with price competition with other incumbents and new entrants, is robust enough to overthrow KDDI from its #2 spot during our forecast period (2006 - 2010).

*Japanese Operators will
Continue to Lead
Innovation and
Application Cycles*

Japan is the most sophisticated, demand-driven mobile market in the world, and Japanese operators are two to three years ahead of the curve in terms of network implementation and technology applications. All three incumbent operators have offered 3G wireless services for three or four years now, and are in the process of network upgrades of various types, with the broad aim of ironing out network kinks and

increasing data transfer rates. With new operators on the horizon, Japan will also be a test ground for so-called “triple-play” network roll-outs, demonstrating the ability to deliver simultaneous broadband, video, and data services.

On handset designs as well, we expect the Japanese market to be an important barometer of success for global handset vendors and technologies. Prototype clamshells with two screens, memory cards for space conscious cell phones, contactless integrated circuits, contactless wallets, and ‘hybrid’ phones have all made an appearance in Japan in 2005. Success of these technologies in Japan will determine global take-up during the forecast period.

True to form, Japanese operators have also been on the leading edge of applications. For example, DoCoMo has teamed up with Rakuten Inc. to provide internet auction services over its network, while eAccess and Vodafone KK are likely to focus on MVNO development as part of their business models going forward. Cellular technology, from Mobile TV to SMS and E-mail messaging, to MP3 and GPS-enabled phones, is going to become faster and more practical, with Japanese operators leading the way.

Operator Strategic Outlook

Operator competition is set to rise in Japan, with 3G licenses awarded to BB Mobile, eMobile, and IP Mobile.

Response by incumbent operators will be to consolidate existing installed base, reduce churn through enhanced customer service, reduce prices, and provide bundled services.

KDDI and DoCoMo will continue network consolidation and upgrades while venturing into foreign markets.

Vodafone KK will likely be the first casualty of the coming wireless war in Japan. As our Brand Image and Strategy Surveys suggest, Vodafone KK suffers from weaknesses on many fronts, such as low brand strength and a perception of weak management, branding, and content strategies by its own suppliers and channel partners. We believe Vodafone KK’s 3G gambit and pricing strategy will face tough challenges from existing operators and new entrants, especially BB Mobile and eAccess. Vodafone KK may ultimately exit the space altogether, or enter the MVNO space.

IEMR's Brand Image Survey Results: Operators

As part of our CONSUMEREADY™ suite, we conducted random telephone surveys in Q4 2005 and Q1 2006 of representative samples of cellular users in five of the largest markets in the Asia-Pacific: Japan, Korea, China, Indonesia, and India. We asked cellular users a series of questions, to capture their “Share of Mind” of operators’ and handset manufacturers’ brands. We also asked cellular users to rank firms on seven characteristics that determine their choice of operators and manufacturers. These are: “cool”, “creative”, “reliable”, “good value”, “cheap”, “technically advanced”, and “good service”. With 408 respondents for Japan, overall survey results are valid at the ±5% level 19 times out of 20. Following are some key survey findings:

- DoCoMo, KDDI, and Vodafone KK have top “Share of Mind,” with 83% - 90% of users able to recall names of these operators unaided. With recall rates in the 3% - 16% range, new entrants such as BB Mobile and eMobile have some way to go to establish their brands in the Japanese wireless space.

- In terms of brand essence, DoCoMo came out on top in a number of categories, reflecting its #1 position in Japan. DoCoMo’s brand was most associated with the words “cool”, “creative”, “reliable”, “technically advanced”, and “good service”. On the other hand, KDDI’s brand was most commonly associated with “good value” and “cheap” - likely reflecting its recent innovative pricing plans.

- In terms of brand strengths, DoCoMo is the clear leader in marketing its brand. Relative to its market share, DoCoMo owns words such as “cool”, “creative”, and “technically advanced”, which is reflected in the large positive differences between its actual market share and the number of respondents who associated DoCoMo with these terms.

- On the other hand, DoCoMo’s major weakness is pricing, with large negative differences between its actual market share and the number of respondents who associated DoCoMo with words such as “good value” or “cheap”. This weakness is already being exploited by the other players, including the new entrants. Our Brand Image Survey shows both BB Mobile and eMobile have positive brand strength when it comes to words such as “good value” and “cheap”, and both are on record in their strategy to create customer churn by reducing ARPU’s from their current levels.

- Our view is that Vodafone KK has the weakest brand strength among the incumbent operators. Relative to its market share, five out of seven criteria we used to measure brand strength showed a negative or insignificant outcome for Vodafone KK. That is, less mobile users associated Vodafone KK with words such as “cool”, “creative”, “reliable”, “technically advanced”, and “good value” than is reflected by its market share.

In October 2005, we also sent surveys to senior executives at over 100 suppliers and channel partners, asking them to evaluate Japanese operators based on five criteria: management strength, price strategy, content strategy, branding and marketing strategy, and financial strength. Survey results were ranked on a scale of 1 – 7, with 1 being “not competitive” and 7 being “very competitive”. Following are some key survey findings from the 21 responses received:

- DoCoMo received the highest overall ranking with a score of 6.3, followed closely by KDDI. DoCoMo’s clear strengths include its management, content strategy, and marketing strategy. This likely reflects the appointment of Mr. Masao Nakamura as CEO in June 2004. Mr. Nakamura has a marketing and multimedia background, and has made his mark on DoCoMo’s marketing and branding strategy in the last 1½ years.

- While KDDI did not get #1 billing in any of the five criteria, executives ranked KDDI a close #2 in areas such as management strength, content strategy, branding and marketing strategy, and financial strength.

- As in our Brand Image Survey, executives ranked Vodafone KK a distant third. In areas such as content, branding, and management strength, Vodafone KK was perceived more like a new entrant than an incumbent operator.

Some analysts speculate 2006 or 2007 will see smaller Japanese handset manufacturers exit, leaving the door open for foreign suppliers such as Nokia, Motorola, Samsung, and LG Electronics.

We believe the most likely entry point by foreign suppliers will be through new operators, particularly BB Mobile and eMobile. Therefore, we do not expect any massive breakthrough by foreign manufacturers in the relatively closed Japanese market, despite top “Share of Mind” billing received by foreign manufacturers in our Brand Image Survey in Japan.

As far as the shakedown among Japanese handset manufacturers is concerned, this has already occurred, with the weakest players announcing restructuring plans. For example, Kyocera has outsourced its handset manufacturing operations to Flextronics, and Casio-Hitachi have announced a handset design and manufacturing joint venture.

Handset manufacturers have entrenched relationships with operators, which ensures them market share in a relatively closed market. Our view is that smaller players, such as Kyocera and Fujitsu, actually have a lot of financial staying-power in the handset domain in Japan, and are not exactly hurting from an overall business perspective. In fact, Kyocera and Fujitsu have stronger measures of liquidity, asset coverage, and profitability compared to market leaders, such as NEC and Panasonic.

IEMR's 2005 Brand Image Survey found that Nokia, Samsung, and LG Electronics have strong “Share of Mind” of Japanese handset consumers, with 51% - 59% of Japanese mobile users able to recall the names of these manufacturers unaided. This was 1.5x to 3x higher than the “Share of Mind” data for market leaders, such as NEC, Matsushita, Sony, and Sharp.

In our view, this top billing is a reflection of the global branding by Nokia, Samsung, and LG Electronics which has filtered into the minds of Japanese consumers. This can be viewed as an opportunity for the global players, as they have already overcome the first hurdle in selling to the demanding Japanese consumer.

On the other hand, none of the global players received a ranking on any of our brand essence questions, reflecting their almost total absence from the competitive Japanese wireless space. These results indicate the need by foreign players to undertake significantly more branding and marketing if and when they do enter the Japanese space in a significant way. Should they enter the Japanese market, Nokia, Samsung, and LG Electronics will need to invest not only in branding and marketing, but also in maintaining the after-sales service standards the Japanese consumer is used to. At the same time, Japanese competitors, such as NEC, Panasonic, Sony, and Sharp, need to invest more in brand ownership, as is reflected by low levels of brand awareness by Japanese mobile users.

Our 2005 Strategy Survey found some interesting results in the competitiveness of handset manufacturers in Japan. Again, a scale of 1 – 7 was used, with 1 being “not competitive” and 7 being “very competitive”. Some key findings are as follows:

- Among manufacturers and channel partners, foreign manufacturers and domestic leaders get high overall rankings. Nokia received top overall ranking, followed by Motorola and Samsung, achieving scores of 6.3, 6.1, and 5.9 respectively. Domestic players Sony, Fujitsu, NEC, and Panasonic also received consistently high marks on various strategy elements important to handset manufacturers, with average scores of 5.8, 5.7, 5.6, and 5.3 respectively. From the perspective of industry players, Japanese manufacturers such as NEC, Panasonic, Sony, and Fujitsu are not far behind their foreign competitors when it comes to various elements of business strategy as viewed by channel partners.
- Nokia receives top billing on two elements of business strategy: Intellectual Property Licensing Practices (6.4) and Marketing Strategy (6.7). Motorola receives top ranking for its Platform Strategy (6.5). Reflecting its recent market share rise in the Japanese handset space, Sharp receives the highest score among channel partners for its pricing strategy (6.7). Again, it should be noted that these #1 slots are only a fraction higher than the #2 and #3 slots, reflecting the high degree of competition among players in this space.
- We also asked channel partners to rate various elements of technological innovation of various handset manufacturers. Here again, Nokia gets the highest scores for the “Quality of IP Portfolio in Handset Domain” (6.4) and “Quality & Innovativeness of Existing Platforms” (6.9). When it comes to “Quality of Design of Existing Handsets” and “Quality of Engineering in Existing Handsets”, channel partners ranked Japanese manufacturers much higher than foreign players, like Nokia and Motorola. These results on engineering and design point to well-known weaknesses of foreign manufacturers that have caused incumbent operators to avoid players like Nokia and Samsung, and instead choose Japanese manufacturers.

2. Forecasts of Japan Wireless Sector, 2005 – 2010

2.1. Headline Market Forecasts

2.1.1. Installed Base, Monthly ARPU, and Service Revenue

We expect Japan's installed base to increase by a Compound Annual Growth Rate (CAGR) of 2.0% for the 2005 - 2010 period. Unlike most other Asian markets, share of pre-paid users in Japan is low, at about 3% of the installed base. Vodafone KK has made great strides in tapping the pre-paid market, and, based on Vodafone's recent figures, we expect the pre-paid installed base in Japan will increase at a CAGR of 17.5% over the 2005 - 2010 period - the highest level in Asia. On the other hand, Japan's post-paid installed base will continue to see modest growth rates of 1.4% CAGR for the 2005 - 2010 period (see Table 1).

Japan's blended monthly Average Revenue Per Unit (ARPU) is the highest amongst Asian economies, at around \$62 in 2005. The range is tight between operators, with KDDI reporting an ARPU on the high end at \$68, and Vodafone KK reporting ARPU on the low end at \$56. We expect blended monthly ARPU to see only marginal declines (CAGR of -0.7%) during the forecast period, despite the entry of new players (see Figure 1).

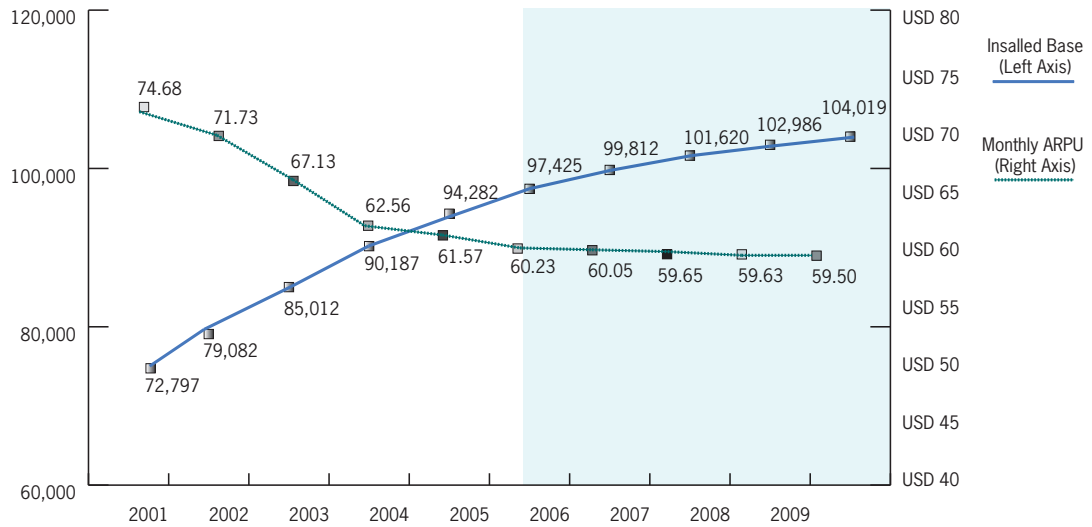
It is significant to note that Japan will continue to be Asia's most lucrative wireless market by service revenue until at least 2015, when China will likely overtake Japan on a revenue basis. Total service revenue in 2005 is expected to be \$ 67 billion, and will likely grow at a rate of 3.0% CAGR over the forecast period. Given our projections on ARPU, we are, therefore, making a bet that most of the service revenue growth will be driven by net additions to the installed base and by the ability of carriers to bundle services.

Table 1: Headline Market Forecasts: Japan, 2005 - 2010

IEMR FORECAST							
	2005	2006	2007	2008	2009	2010	CAGR 05 - 10
Total Installed Base (Thousands)	94,282	97,425	99,812	101,620	102,986	104,019	2.0%
Penetration Rate %	74.5%	77.1%	79.2%	80.8%	82.0%	83.0%	2.2%
Pre-Paid Installed Base (Thousands)	2,609	3,130	3,692	4,316	5,025	5,845	17.5%
Post-Paid Installed Base (Thousands)	91,673	94,295	96,121	97,304	97,961	98,174	1.4%
Total Monthly ARPU (\$)	61.57	60.23	60.05	59.65	59.63	59.50	-0.7%
Total Service Revenue (\$ Millions)	66,928	66,885	68,968	69,875	74,079	77,713	3.0%

Source: IEMR

Figure 1: Japan Installed Base and ARPU Forecast, 2001 - 2010



Source: IEMR. Shaded region represents Forecast Period.

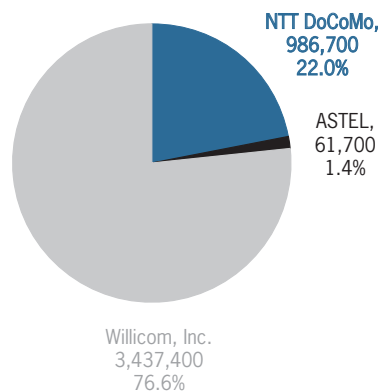
2.2. Technology Forecasts: Installed Base

2.2.1. 1G Migration Path: PHS

There are three operators currently providing PHS in Japan. Willcom, Inc., a part of the U.S.-based Carlyle Group, has 76.6% of this market, with 3,437,000 subscribers as of September 2005. DoCoMo has 22% (986,700 subscribers) of the PHS subscriber base with the remaining 1.4% currently registered with the ASTEL group. PHS installed base represents 4.8% of Japan's wireless market as of September 2005. Our long-term forecast calls for the PHS installed base in Japan to decline by -23.7% CAGR during the 2005 - 2010 period.

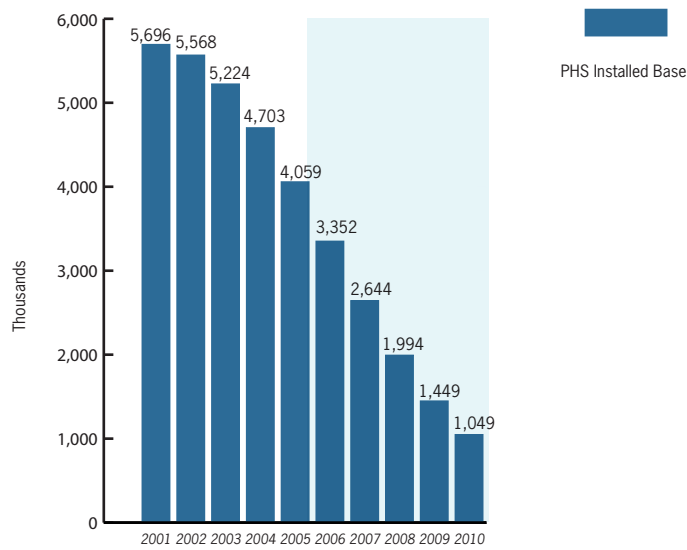
The number of PHS subscribers stabilized in the second and third quarters (Q2 and Q3) of 2005, with Willcom acquiring some DoCoMo subscribers. Our long-term forecast, however, continues to show that the 1G migration path is on its way out of Japan. DoCoMo is stopping development of new PHS handsets. In September 2003, DoCoMo informed Sharp (a manufacturer of its PHS *Paladio* series handsets) that the operator would not be developing new PHS handsets. DoCoMo is also no longer developing new handsets for its *Dotchimo* series- which supports both PHS and PDC protocols. (see Figure 2a and 2b).

Figure 2a: Japan PHS Market Share, 2005



Source: Telecommunications Carriers Association

Figure 2b: Japan PHS Installed Base, 2001 - 2010

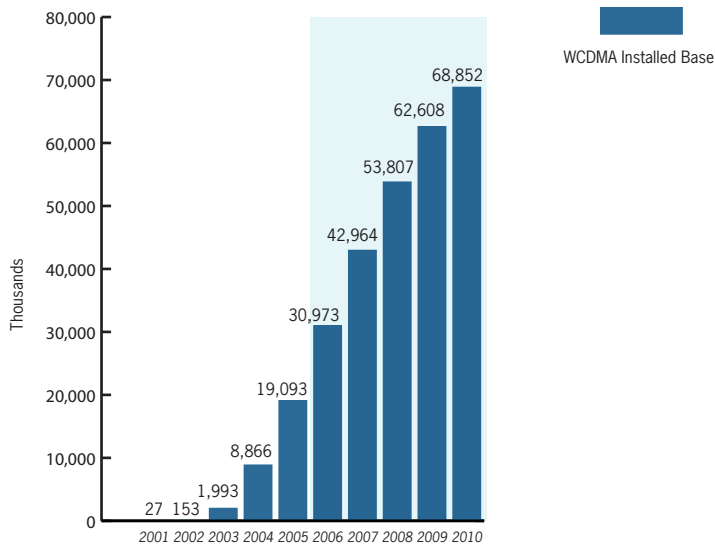


Source: IEMR. Shaded region represents Forecast Period.

2.2.2. GSM Migration Path: WCDMA

With DoCoMo, Vodafone KK, and now Softbank and eMobile developing WCDMA capability, we expect rapid growth in both subscriber base and handset sales will occur in the WCDMA space. We expect Japan's WCDMA installed base to experience 29.2% CAGR for the 2005 - 2010 period (see Figure 3). We also anticipate WCDMA installed base in Japan will reach 31 million subscribers by the end of 2006.

Figure 3: WCDMA Installed Base, 2001-2010



Source: IEMR. Shaded region represents Forecast Period.

Our positive outlook on WCDMA in Japan is due to several drivers. First, although DoCoMo was the first to roll-out 3G in Japan with its FOMA offering in October 2001, it initially struggled to expand its WCDMA subscriber base. Factors which contributed to this include expensive single-mode handsets that could not revert back to DoCoMo's PDC-based 2G infrastructure, short handset battery life, limited coverage area, and software problems. It appears these problems are behind DoCoMo. FOMA subscriber

base has increased by 158% year-on-year (y-o-y) in October 2005, with close to one million subscribers being switched each month to FOMA in Q1 and Q2 of 2005. As of September 2005, DoCoMo reported 16.77 million FOMA subscribers.

Second, the entry of BB Mobile and eMobile into the WCDMA space, expected in early 2007, will result in changed competitor dynamics, with Japanese consumers benefitting from increased competition. The technological strategy adopted by BB Mobile and eMobile are similar. True to their broadband backgrounds, both have completed HSDPA field trials. In 2005, BB Mobile achieved two milestones:

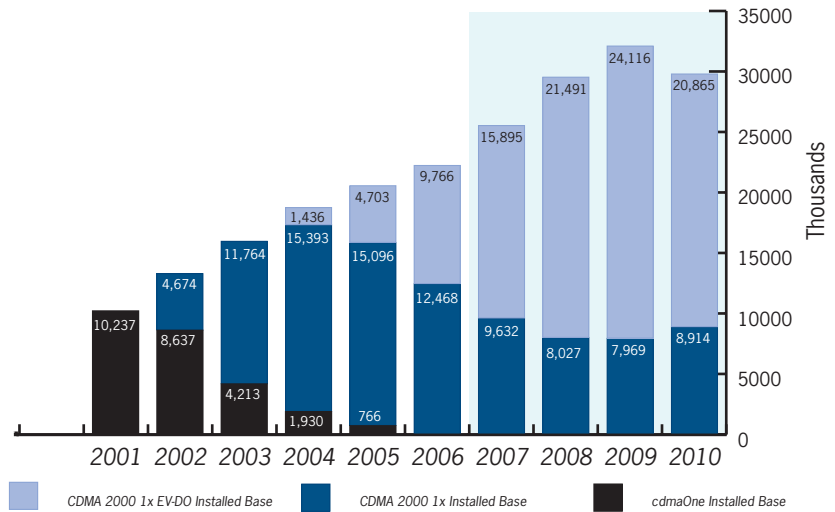
- In June 2005 BB Mobile completed the world's first "seamless" hand-off of voice and data services between a 3G network, operating on the 1.7 GHz band and a wireless local area network (WLAN); and Japan's first 14.4 Mbps wireless data transmission, using Nortel's HSDPA technology on the 1.7 GHz band.
- In October 2005, BB Mobile, Nortel and LG Electronics demonstrated so-called wireless "triple play" capability - signifying the potential of wireless operators to provide uninterrupted communications to subscribers using one device that roams among 3G cellular, WiMAX and WLAN networks. eMobile completed similar HSDPA trials using Lucent technology in May - July 2005.

The objective, of course, is to offer a range of multimedia services currently available to Japanese consumers at lower speeds. These include so-called 'blended lifestyle' services such as streaming video, mobile TV, mobile internet browsing, and bundled services, such as portable travel agents and home security. Therefore, all four GSM operators, including Vodafone KK, are likely to develop MVNO relationships with various media and entertainment partners in Japan, playing to the tastes of the demanding, media-savvy Japanese consumer.

2.2.3. CDMA Migration Path: CDMA2000 1x and CDMA2000 1xEV-DO

Following DoCoMo's entry into 3G, KDDI began offering its 3G service, based on CDMA 2000 1x, in April 2002. KDDI was wildly successful at migrating its installed base to 3G, partly because CDMA 2000 1x was upwardly compatible with its existing cdmaOne network. KDDI's strategy of leaping ahead - of Vodafone at least - with its CDMA 2000 1x EV-DO offering appears to have paid off, with 93% of its installed base currently migrated to this path. Partly because of KDDI's success and the robust nature of the technology, we expect the CDMA 2000 1x EV-DO installed base will rise by 34.7% CAGR for the 2005 - 2010 period (see Figure 4).

Figure 4: Japan CDMA Migration Path Installed Base, 2001-2010



Source: IEMR. Shaded Region represents Forecast Period.

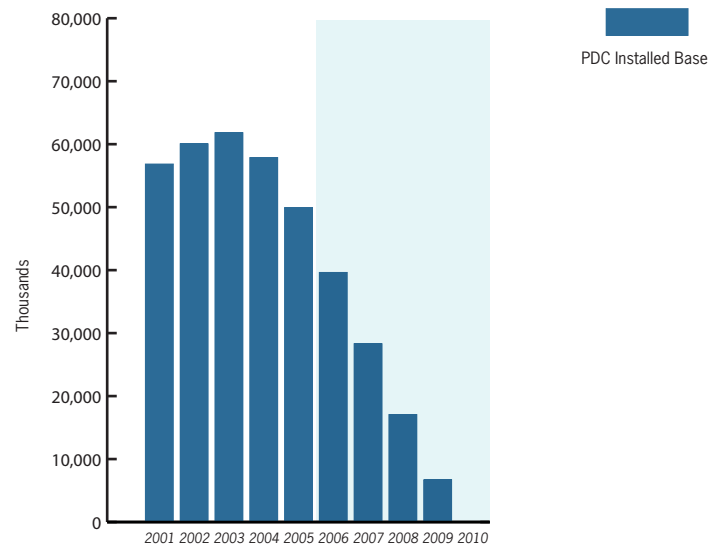
The higher subscriber uptake growth figures for KDDI in the short-term of the forecast period (2006 and 2007) essentially boils down to the fact KDDI will be able to focus more on marketing and sales, based on what is currently a more robust technology. DoCoMo, BB Mobile and eMobile will all have to deal with on-going technical difficulties faced by HSDPA technology, at least into the middle of 2006 for DoCoMo, and well into 2007 for BB Mobile and eMobile. As mentioned above, all three GSM operators have committed to HSDPA.

DoCoMo has delayed adoption of HSDPA until at least March 2006, partly because it has learned important lessons from its slow 3G launch in 2001, and wants to ensure kinks are solved before commercial offering in the tough Japanese market. As of November 2005, these kinks are still significant. Field trials of HSDPA, conducted by Motorola in Europe, have shown that data transmission speeds are subject to significant degradation. Video performance in the Motorola trials froze when only a modest number of users were active. State-switching also caused significant latency. The most significant problem, however, is power usage. The Motorola study found that mobile devices need sufficient power to receive signals, particularly when the user is on the move. Built-in functions are available that can increase data rates when devices are on the move, by as much as 40%, but few devices currently have this capability. Another reason cited for DoCoMo's delayed HSDPA roll-out has been a lack of suitable content - a key ingredient to marketing higher speeds to consumers in Japan.

2.2.4. Other Migration Paths: PDC

PDC is a 2G technology that has been the backbone of Japan's cellular industry since 1991, and is used nowhere else in the world. All three incumbent operators use PDC networks. As of October 2005, there were 48.9 million PDC subscribers in Japan. By 2010, with all of the operators in Japan offering 3G enabled services, our forecast is that all PDC subscribers will be migrated to other paths. On a monthly basis, about a million subscribers are being migrated out of the PDC migration path (see Figure 5).

Figure 5: PDC Installed Base, 2001 - 2010



Source: IEMR. Shaded Region represents Forecast Period.

Our view that PDC is here to stay until at least 2010 is due to several factors, which speak to the robustness of this technology. PDC uses TDMA technology, which is very similar to the US TDMA or IS54/IS136 system, except that it operates on the 800 MHz and 1500 MHz bands, and uses 25 kHz channel spacing, instead of 30 kHz. Japanese operators have proven that the spectral efficiency of PDC is capable of supporting features such as text messaging and caller identification. PDC networks in Japan have also been shown to support everything one needs in a cell phone, such as pre-paid calling features and universal access numbers. All of these features will cause Japanese consumers, especially those in the older age category to continue to prefer standard voice services to the innovative data services carriers are currently gearing up to provide.

Furthermore, the experience of DoCoMo and Vodafone with 3G will cause the incumbent operators to cautiously migrate their subscriber base from PDC, rather than rushing headstrong into a situation where their networks may not be able to support the migrated subscribers.

2.3. Japan Voice and Data Services Forecasts, 2005 – 2010

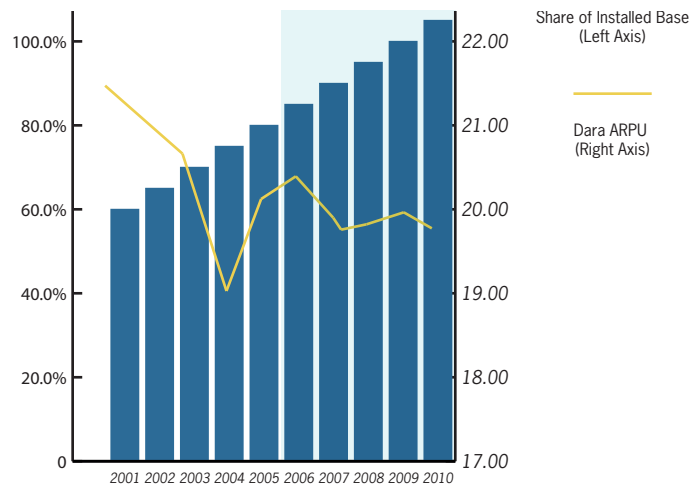
2.3.1. Voice and Data Services Installed Base, Monthly ARPU, and Service Revenue

Outside of South Korea, Japan has the highest share of the installed base using data services in the world. By the end of 2005, we expect 78% of Japan's installed base (73.8 million subscribers) will be using data services. We also expect this share of data users to rise to 93% by 2010 (see Figure 6).

Our estimated monthly ARPU on voice services is \$45. This makes Japan the most lucrative market in Asia. On average, operators are able to charge 5x and 6x what carriers in China and India charge for voice services. On the data side, our estimated monthly ARPU on data services for 2005 is \$21, making Japan also the most expensive data market in Asia. On both the voice and data, the entry of new players, together with a demanding Japanese consumer, will ensure all operators innovate on services,

while keeping plan charges low. Therefore, we expect data ARPU will remain flat over the forecast period, with a CAGR of -0.2%.

Figure 6: Japan Data Users and Data ARPU, 2001 - 2010



Source: IEMR. Shaded Region represents Forecast Period.

Japan is a mobile society, with cell phones playing an important role in people’s lives. On the data side, text messaging, originally provided for Japanese business, was reinvented by Japanese schoolgirls (commonly referred to as *Ko-guyaru*). E-mail is also big in Japan, and is going to change in a big way, with the evolution to 3G technology. All three of the incumbent carriers also provide special characters, such as emoticons and animated images. Japanese cell phones also come with different types of built-in and Java-application games. The Java application games are delivered via the operator’s network, and there is a charge for these downloads.

With the imminent entry of BB Mobile and eMobile, the next battle in the Japanese wireless telecom space is clearly going to be in the area of data services. DoCoMo reports that for data services, access percentage by content category is evenly distributed between ring tones/screen savers (23%), games and horoscopes (21%), and entertainment information (27%). What is significant about DoCoMo’s latest numbers is the fact information downloads account for 14% of access, while database and transaction downloads account for 5% and 10% of access, respectively. These latter shares on transactions and database downloads are likely to increase, given DoCoMo’s success with *Osaiifu Keitai* (wallet phones). Web packets transmitted accounted for 96% of DoCoMo’s transmission, while email only accounted for 4% of packet transmission. KDDI’s figures suggest 85% of its installed base is subscribed to its EZweb service, with 4,398 official websites available to its users.

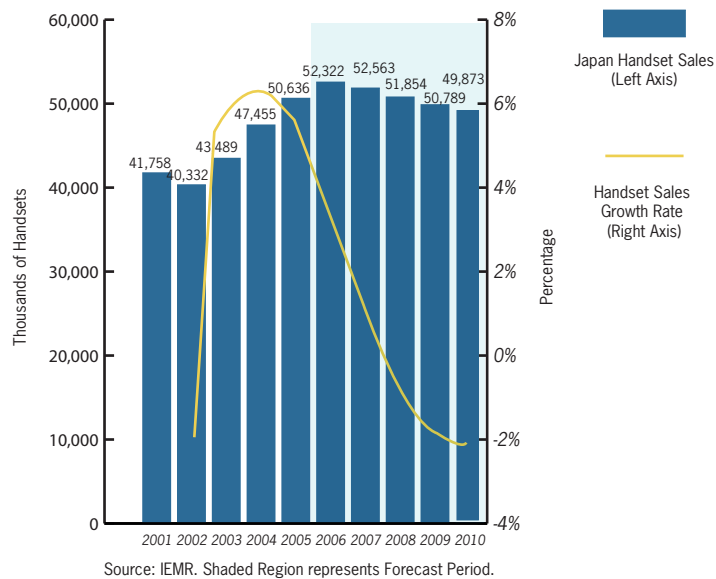
3. Japan Mobile Handset Sales Forecasts and Market Shares, 2006 – 2010

3.1. Japanese Handset Shipments

Japan's mobile culture has always defied the laws of economic gravity. The maturity of the market, however, cannot be denied. We expect the installed base to grow by 2.0% (CAGR 2005-2010). The level of marginal growth in handset sales in Japan, therefore, is expected to be minimal. Our forecast for handset sales growth in Japan is for a CAGR of -0.3% for the 2005 - 2010 period (see Figure 7).

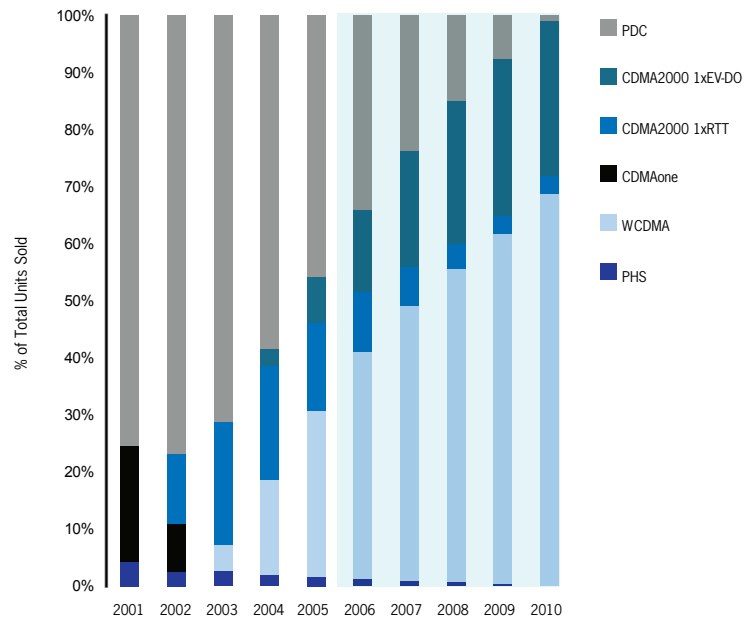
The overall outlook for handset sales growth in Japan, as outlined above, is not to say there is no significant opportunity in the Japanese handset market, especially given that major global players like Nokia, Motorola, Samsung, and LG Electronics are effectively shut out of the Japanese market. For 2005, we expect total handset shipments to Japan to come in at 50.6 million handsets, keeping in line with past replacement rates of around 50%. This still makes Japan an important market for handset manufacturers and the second-largest market in Asia after China, during the forecast period.

Figure 7: Japan Handset Sales Forecasts (2001-2010)



Of course, the greatest growth in handset shipments is going to happen in WCDMA and CDMA2000 1xEV-DO handsets. We expect WCDMA handset sales will increase by a CAGR of 17.5% over the forecast period, and CDMA2000 1xEV-DO handset sales will rise by a CAGR of 25.9% (see Figure 8).

Figure 8: Japan Handset Sales by Technology (2001 - 2010)



Source: IEMR. Shaded Region represents Forecast Period.

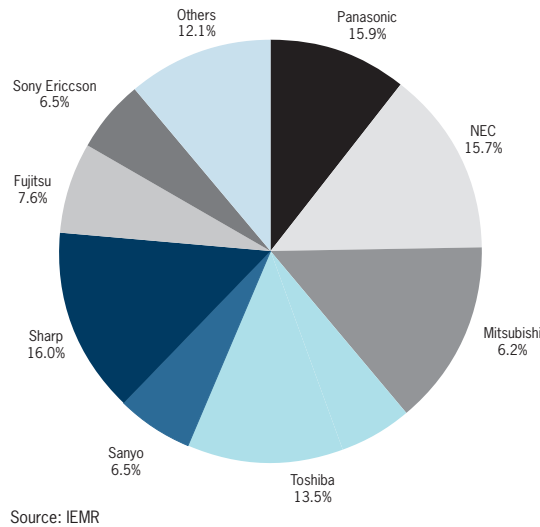
3.2 Japanese Handset Manufacturers: Market Shares

The level of competition in handset sales, however, is going to increase slightly in the domestic Japanese market. There has also been speculation that smaller handset manufacturers, such as Casio, Hitachi, Fujitsu, and Mitsubishi might exit handset manufacturing in Japan altogether, although we do not subscribe to this view. There are several reasons why we expect increased competition in the domestic Japanese market:

- First, in November 2005, DoCoMo announced it will buy handsets from NEC which are manufactured in China, to cut costs and compete with other incumbent and new operators. This willingness to buy handsets cheaply from manufacturing facilities outside Japan is a new phenomenon, and will squeeze margins at handset manufacturers that are already some of the lowest in the world.
- Second, Japanese operators, such as DoCoMo, subsidize handset costs for customers, and typically pay about ¥ 50,000 (\$435) to retailers for each 3G handset. If this trend continues, handset manufacturers who are able to support the incumbent operators' 3G plans with subsidies of their own will see the largest success in the Japanese 3G race. The problem, though, is that currently 3G handsets are about 25% more expensive to manufacture than 2G handsets. Again, this will squeeze margins for all Japanese handset manufacturers, and will have a particularly negative effect on smaller manufacturers, such as Fujitsu, Mitsubishi, Hitachi, and Casio, who do not have the scale to absorb the lower margins (see Figure 8).
- Finally, Japanese operators are beginning to offer handsets manufactured by foreign manufacturers. While foreign manufacturers like Nokia and Motorola have failed dismally in meeting the particular needs of the demanding Japanese consumers, even the former

supporter of Japanese handset manufacturers, DoCoMo, has said it will start offering handsets by foreign manufacturers. Vodafone KK already has models by Nokia and Motorola on offer, although these are at the lower end of their offering.

Figure 9: Japan Handset Shipments Market Shares, 2005



All of the above have fuelled speculation that 2006 or 2007 will see some Japanese handset manufacturers exit manufacturing for the domestic Japanese market. We think this is unlikely to happen for several reasons:

- First, our review of the strategies of the smaller Japanese players (Toshiba, Mitsubishi, Sanyo, Fujitsu, Casio, and Hitachi) shows that all of these players have unveiled plans to expand research and development (R&D) and marketing in their mobile handset divisions. For example, in February 2004, Casio and Hitachi announced they would establish Casio Hitachi Mobile Communications Co., Ltd. This joint venture combines Casio's surface mounting and image processing capabilities with Hitachi's high-speed data communications technologies. In May 2005, Kyoto-based Kyocera Corporation outsourced its handset manufacturing to Flextronics, allowing it to focus on R&D and marketing of its handsets. These and other plans indicate to us that the expected shake-down has already taken place, and any other restructuring by the smaller players will likely take the shape of joint ventures, to strengthen existing business models or contract manufacturing.
- Second, we disagree with the notion that companies like Casio and Hitachi have little financial heft or scale to back up their mobile handset strategies in the medium- to long-term. For example, Hitachi has an asset base of \$ 90.9 billion, which is 2.5x larger than NEC's total assets (for year ended March 31, 2005). Moreover, our analysis of handset model availability in Japan suggests players like Casio, Kyocera, and Fujitsu generally tend to unveil approximately the same number of handset models per year compared to players such as NEC or Panasonic (see Table 2).
- Finally, on the issue of technological capability, we do not believe smaller Japanese players such as Fujitsu, Mitsubishi, and Hitachi are straggling compared to NEC or

Panasonic. For example, Fujitsu has 307 patents in the handset domain, while NEC, the industry leader, has only 245. In 2005, Sharp unveiled as many new handset models for the Japanese market as NEC and Panasonic put together, and was rewarded with a significant increase in its market share in the first half of 2005.

Table 2: Model Offering by Japanese Handset Manufacturers, 2005

Company	DoCoMo	KDDI	Vodafone KK	Willcom	Total # of Model Offerings
NEC	6	0	2		8
Panasonic	5	0	0		5
Mitsubishi Electric Co.	4	0	0		4
Toshiba	0	4	5		9
Sanyo	0	6		1	7
Sharp	3		10		13
Fujitsu	6				6
Sony Ericsson	3	3	1	1	8
Kyocera	0	4		2	6
Casio	0	5			5
Hitachi	0				0

Source: IEMR

4. Japanese Handset Manufacturers Competitive Landscape

To get a better sense of the competitive landscape in the Japanese handset manufacturing space, we undertook two surveys in Japan, as part of our CONSUMEREADY™ and EXPORTREADY™ suites. Our Brand Image Survey was a telephone survey of 408 Japanese mobile handset users, conducted from November 15 - 20, 2005. For the Brand Image Survey, we asked consumers standard evocative word association questions, to establish “share of mind” and qualities “owned” by various brands of handsets. Overall results of the Japan survey are valid at the $\pm 5\%$ level 19 times out of 20 (see Annex A for details).

For IEMR's 2005 Wireless Strategy Survey, we sent surveys to executives in 100 manufacturers, suppliers, and channel partners active in Japan. We received responses back from 21 suppliers/channel partners. In this survey, we asked executives to rank operators and manufacturers, based on their competitiveness in five elements of business strategy, using a scale of 1 – 7, with 1 being “not competitive at all” and 7 being “very competitive”. For operators, these elements were: management strength, price strategy, content strategy, branding and marketing strategy, and financial strength. For manufacturers, these elements were: intellectual property licensing practices, price strategy, platform strategy, marketing strategy, and systems integration strategy. In addition, for manufacturers, we asked executives to rank manufacturers on five elements of technological innovation crucial to success in the wireless telecommunications space. These technology elements were: quality of IP portfolio in handset domain, quality and innovativeness of existing platforms, quality of design of existing handsets, quality of engineering in existing handsets, and ability to integrate R&D, design, and manufacturing functions.

When combined, the Brand Image Survey and Wireless Strategy Survey represent the most comprehensive survey of the competitive landscape in the Japanese wireless telecommunication space. Data and analysis tools from the Brand Image Survey can be accessed at www.iemarketresearch.com Our website also contains various reports, which outline results and methodologies of these surveys.

4.1. Results from the 2005 Brand Image and Wireless Strategy Survey

Figures 10 and 11 provide summary results of our Brand Image and Wireless Strategy Surveys. Should Nokia, Samsung, and LG Electronics choose to enter the Japanese market in a big way, our Brand Image Survey indicates they have significant “share of mind” advantage over major incumbent players, such as NEC and Panasonic (see Figure 10). This means Japanese consumers are at least aware of these brands, and may be willing to try their products.

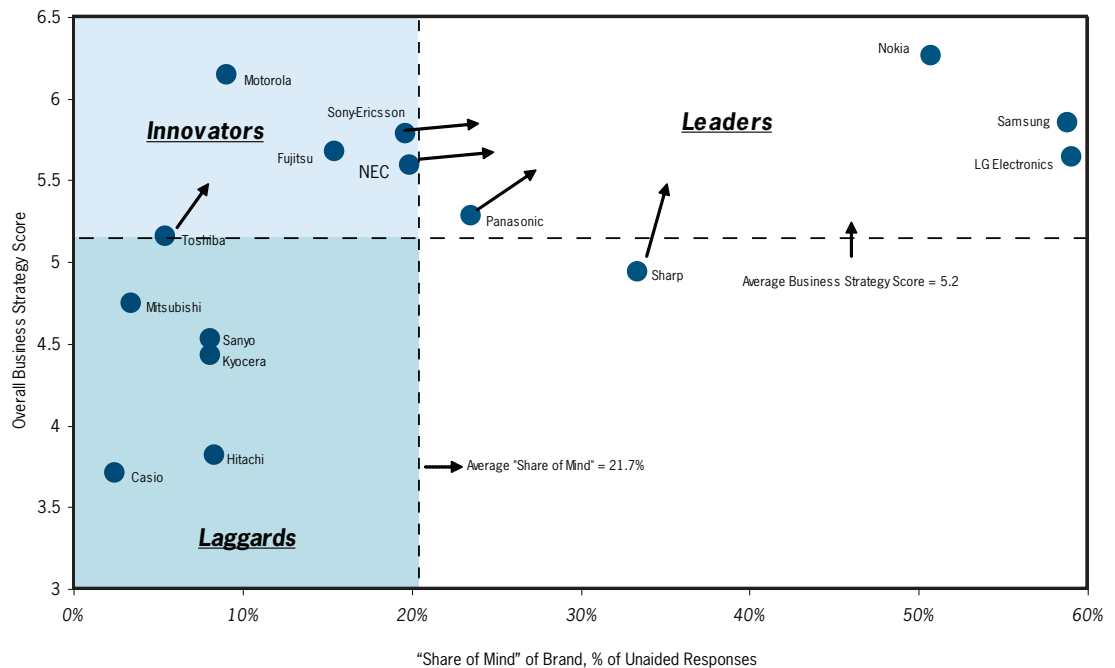
To translate this into real advantage, foreign manufacturers face two major hurdles:

- First, they must convince the incumbent operators of their technological innovation - something they have been unable to do in the past. The technology innovation portion of our Wireless Strategy Survey shows that this is the biggest hurdle to overcome,

since incumbent players like Sony, NEC, Panasonic, Fujitsu, Toshiba, and Sharp are all perceived by industry executives as being virtually as innovative as international players (see Figure 11).

- Second, foreign players must invest heavily in brand awareness with consumers, to instill the qualities they are known for outside Japan. Our 2005 Brand Image Survey indicates that developing brand ownership may be difficult for international players, because, while Nokia, Samsung, and LG Electronics all have strong share of mind, they are almost non-existent on various brand ownership criteria such as “cool”, “creative”, and “cheap” (see Figure 12). This is partly due to their current lack of market share in Japan. While awareness-building can occur through association with new operators, the real key is to target incumbent carriers with innovative design, functionality and heavy marketing subsidies, in order to gain market share. Any gains in market share will be at the cost of the existing weaker players, while competition with the innovative and leading players will solidify.

Figure 10: Japan 2005
Brand Image and Wireless
Strategy Survey Results



Source: IEMR

Figure 11: Japan 2005 Brand Image and Wireless Strategy Survey Results

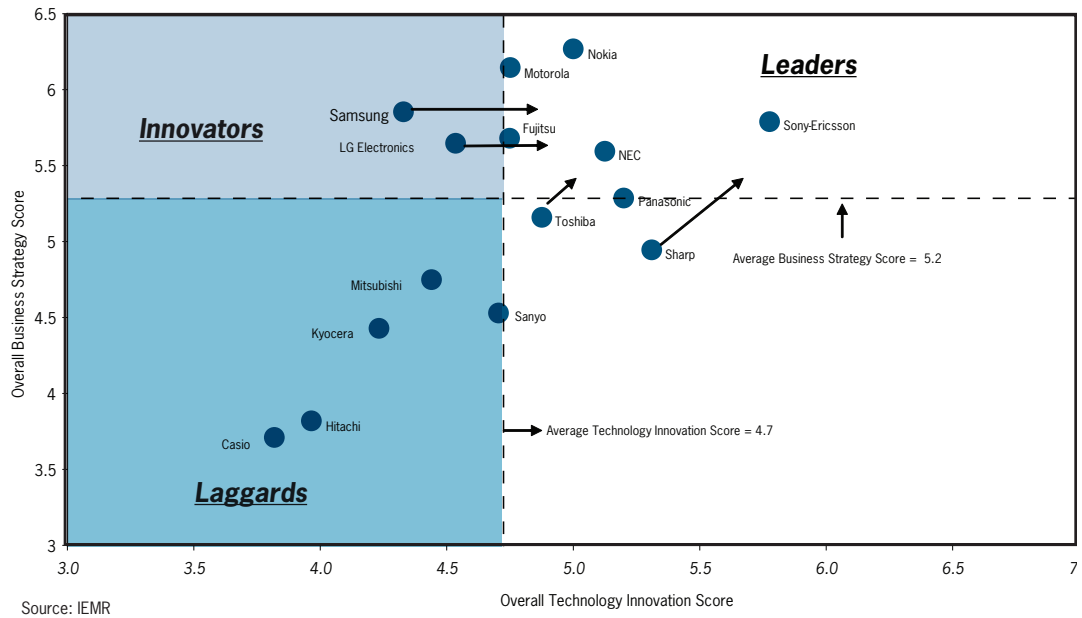
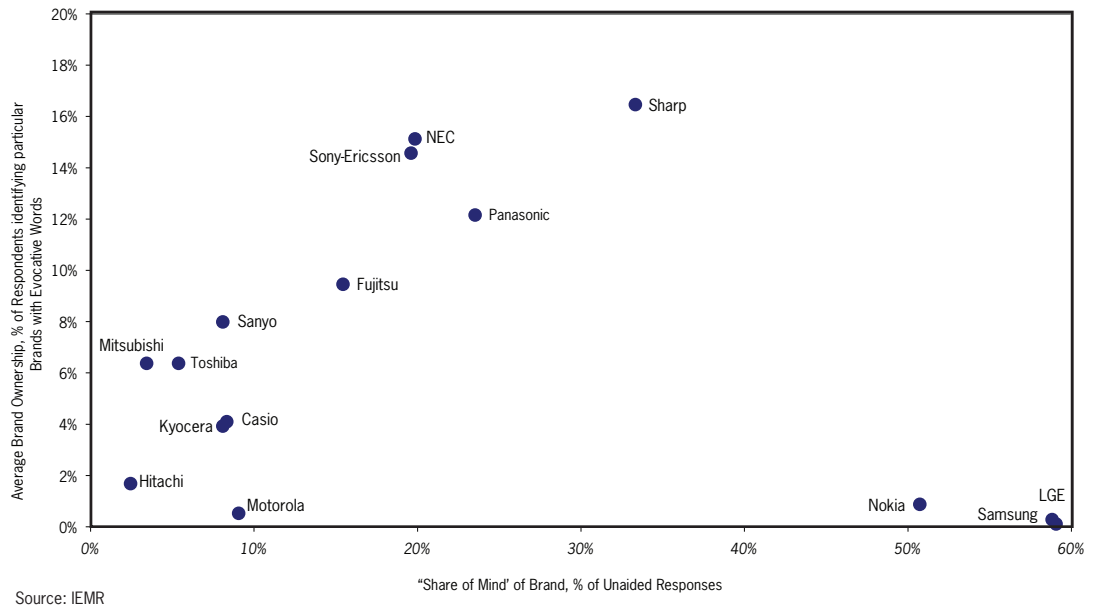
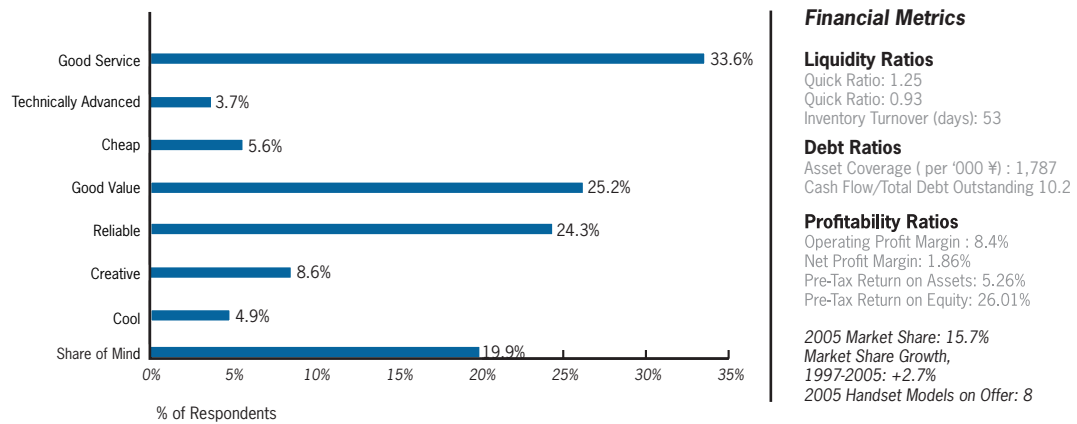


Figure 12: Top of Mind but no Brand Ownership for International handset Manufacturers





2005 Brand Image Survey

Source: IEMR

Strategic Outlook:

With a market share of 15.7% in the first half (H1) of 2005, we believe NEC is still a leading Japanese handset manufacturer. However, we question the company's recent announcements to again restructure its overseas mobile handset business, with an emphasis on solutions and software, rather than on handset shipments. In our opinion, this is part of an overall strategy which has been in the making for over five years, and need not occur at the cost of handset shipments. This restructuring also effectively deprives NEC from reaching the type of economies it needs, in order to compete in the domestic Japanese market.

Operational Summary:

At their investor meeting in November 2005, management acknowledged that NEC failed to meet domestic Japan shipment targets, due to a lack of product line-up (they had only eight on offer in 2005, compared to 13 by Sharp). In overseas markets, NEC also supplies both GSM and WCDMA handsets, mainly to China and Europe. There, operators have been deferring 3G roll-outs to H2 2005, resulting in large decreases in shipments. Furthermore, management's response to strengthen domestic operations through alliances, and downsize NEC's overseas mobile terminal business by reorganizing and restructuring business operations in China, will likely cost them more market share, in the very markets that will see growth in the GSM and WCDMA space in the long-term.

NEC has long stressed the need to move away from a business model that relies on handset manufacturing, to a model that develops platforms, content, and software. We have reservations about this strategy for three reasons. First, we think NEC's focus on content for the Chinese market will have a long gestation period, and may not result in the types of sales NEC anticipates, in the price-sensitive Chinese market. In June 2003, NEC tied up with Beijing-based SINA, a portal site, and COTA, a mobile contents provider. NEC hopes Japanese content providers wanting to enter the Chinese market will do so through NEC. NEC will then be able to leverage these contracts with content providers, in order to negotiate better handset terms with Chinese operators. As shown in our China report, however, the largest increases in handset shipments in the medium-

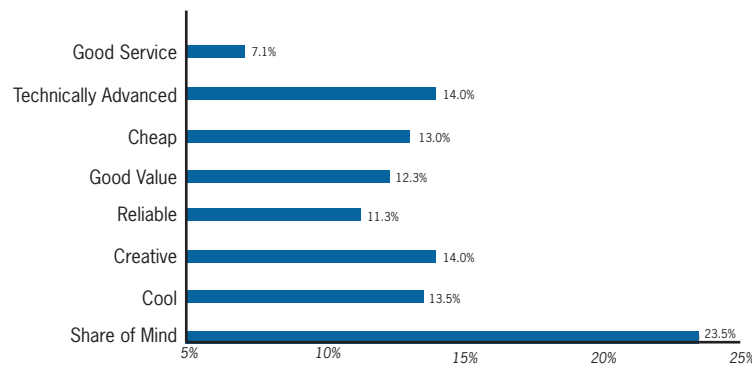
term will likely be for low-cost PHS handsets, which is not the focus of most Japanese content providers (see China Wireless Telecom Market Forecasts: 2005 - 2010).

Second, price is a significant determinant of consumer take-up in China. With monthly ARPU for Chinese operators hovering at \$10.70 and monthly data ARPU hovering at \$2.20, we do not think content will be the focus of Chinese operators, at least in the short - medium terms. It is worth noting that Chinese monthly ARPU is one-fifth of Japan's ARPU, where the average consumer can afford to pay for content.

Finally, NEC's approach to implementing its strategy has been rather haphazard. For example, in 2000 NEC sold its Telford, UK plant to Toronto-based Celestica, and closed its handset manufacturing facility in Mexico. As GPRS networks came on-line in Europe and China, NEC then began shipping handsets again to those markets in 2001, from its high-cost Japanese manufacturing facilities and contract manufacturers in Taiwan.

In the WCDMA space, NEC's earlier UMTS handsets included the e313, e606, and e616, and captured large market shares, with over one million handsets sold to Hutchison. In 2003 and 2004, management saw large opportunities in the WCDMA space, and wanted to achieve a global market share of 15% in two years. Those plans now appear to be shelved. Finally, in November 2005, DoCoMo, NEC's largest customer in Japan, announced it would buy cheaper handsets manufactured by NEC in China. How the November 2005 announcement of "downsizing overseas mobile terminal business" plays with its most important customer's need for cheaper handsets is anybody's guess.

4.1.2. Matsushita Electric Industrial Co., Ltd. (Panasonic)



Financial Metrics

Liquidity Ratios

Current Ratio: 1.42
Quick Ratio: 0.93
Inventory Turnover (days): 53

Debt Ratios

Asset Coverage (per '000 ¥) : 2,864
Cash Flow/Total Debt Outstanding 42.8

Profitability Ratios

Operating Profit Margin : 3.5%
Net Profit Margin: 3.24%
Pre-Tax Return on Assets: 5.25%
Pre-Tax Return on Equity: 11.42%

2005 Market Share: 15.9%
Market Share Growth,
1997-2005: -10.1%
2005 Handset Models on Offer: 5

2005 Brand Image Survey

Source: IEMR

Strategic Outlook:

Panasonic's handsets have experienced a long-term decline in market share in the domestic Japanese market. For example, in 1997 Panasonic had 26% of mobile phone shipments going into the hands of Japanese consumers. In H1 2005, its share of the Japanese market had declined to 15.9%. Despite this significant decline in market share, we think the firm's "Value Creation 21" Strategy, which resulted in the launch of "V-products*", and its more recent midterm "Leap Ahead 21" plan, are based on strong value propositions, which will distinguish the Panasonic brand in the mobile handset domain.

Operational Summary:

For years, Panasonic has released mediocre handsets that seemed to be one or two years behind the industry leaders. One of the defining moments in Panasonic's recent history was when its President, Mr. Kunio Nakamura, gave internet-equipped mobile phones to 400 of his top executives, and insisted all reports be sent to him by mobile email. This emphasis on mobile data communication followed an expensive, value-destroying recall of 100,000 of Panasonic's internet-ready Digital Mova P503i handsets in July 2001.

Since his takeover as CEO in 2000, Mr. Nakamura's overall operational strategy has been clear. First, he has integrated operations of Matsushita's various divisions. On the R&D side, in 2001 Nakamura reorganized 30 divisions into four groups with shared R&D facilities. In October 2002, Nakamura merged five separately-listed companies, including the cell-phone unit, into the parent company, to integrate R&D, manufacturing, and marketing. Second, Matsushita has consolidated much of its brand equity into the Panasonic brand. Internally, this has meant the creation of the Corporate Marketing Division for Panasonic Brands, which has responsibility for placing orders with and making purchases from manufacturing divisions, in addition to sales responsibilities. This emphasis on marketing means the engineering and manufacturing units within Matsushita must respond to market demands, and are driven to continuously innovate.

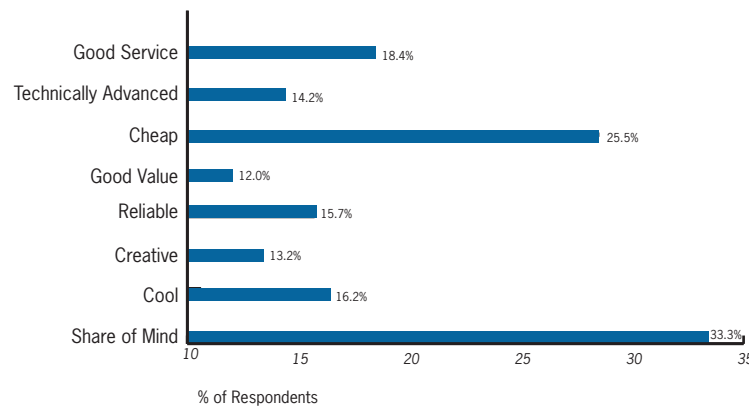
On the wireless front, unlike NEC's focus on content, Matsushita's focus has been on

engineering quality. Its mobile networking strategy hopes to integrate cellular phones with PC's, email terminals, SD audio players, car navigation systems, ETC terminals, and fixed-line telephony. Matsushita has also become less averse to joint ventures and licensing best of breed technologies. For example, Matsushita has licensed the Nokia Series 60 software, and selected the CPU/DSP OMAP architecture from Texas Instruments. Matsushita is also using the Agere-based GSM/GPRS baseband chip sets for its tri-band GSM phones, introduced in 2003.

Panasonic's new culture of market-driven engineering excellence is embodied in its latest P902i and FOMA 3G prosolid® II announcements in Japan. The P902i includes an extra camera for video-conferencing, a WCDMA chip and antenna, miniSD slot, and FeliCa electronic money antenna. The FOMA 3G prosolid II is equipped with a wide-diameter speaker and QVGA LCD, providing enriched functions such as TV phone, i-Channel, i-Appli®, and infrared data communications. With features such as these, Panasonic's offering is very competitive compared to players such as Nokia and Motorola, and certainly more advanced than some of the major Japanese players.

4.1.3. Sharp Corporation

*V-products are those which can attain top market shares in mass markets and in which Matsushita has patented technologies.



Financial Metrics

Liquidity Ratios

Current Ratio: 1.12
Quick Ratio: 0.84
Inventory Turnover (days): 60.7

Debt Ratios

Asset Coverage (per '000 ¥): 2,885
Cash Flow/Total Debt Outstanding: 37.6

Profitability Ratios

Operating Profit Margin: 2.60%
Net Profit Margin: 2.04%
Pre-Tax Return on Assets: 4.12%
Pre-Tax Return on Equity: 23.09%

2005 Brand Image Survey

Source: IEMR

Strategic Outlook:

Sharp has quietly and consistently deployed its so-called “spiral strategy,” to gain market share and respect in both the Japanese and global space for its camera phones. At the heart of this spiral strategy is the use of its in-house devices and technical expertise to gain a competitive edge in various handset domains: displays, cameras, LEDs, flash memory, CCD camera modules, image processing LSIs, and ICs. Closely related to this spiral strategy has been Sharp’s marketing strategy. This marketing strategy has three key elements. First, integrate in-house technologies with consumer demand, to quickly achieve “first-to-market” status. Second, implement these technologies in higher-tier offerings, and then transfer these to mid and lower-tier models. Using this method, Sharp has captured margins at each step of the value chain. Third, offer time-limited exclusivity to operators within their territories, while at the same time customizing handsets to operator’s specifications. The latter has worked well for Sharp in the Japanese market, where DoCoMo has played an important role in leading its suppliers in handset design and development. It has also enabled Sharp to leverage its investment in international markets.

In our opinion, Sharp’s strategy has made it a leading innovator in the camera phone domain, both in Japan and internationally; however, its next market move is unclear to us. Sharp was very late in arriving to the handset scene in Japan, and was not even a DoCoMo partner until 2002. The defining moment in Sharp’s handset business came when Sharp presented DoCoMo with its prototype camera phone, which was roundly rejected by DoCoMo. Sharp then pitched its concept to Vodafone, which pounced on the camera phone idea, and as a result, increased its subscriber base significantly. In 2002, Sharp became a DoCoMo partner!

Operational Summary:

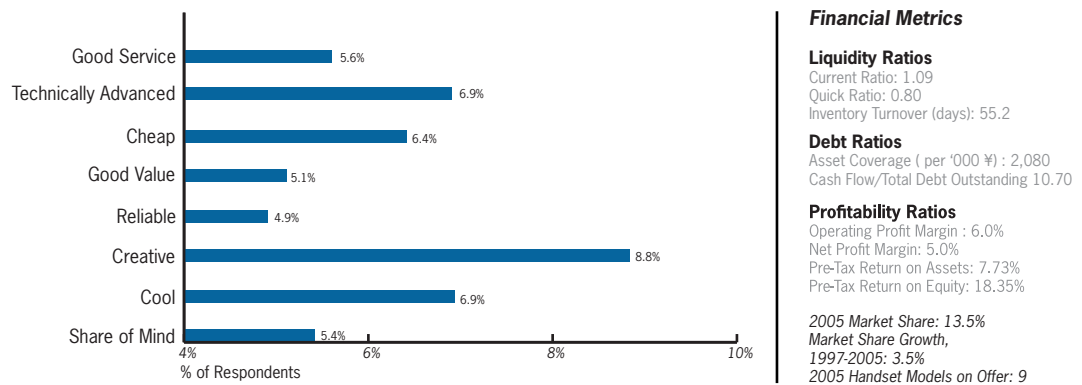
Sharp has become a major competitor in camera phones, for both GSM and WCDMA, and has done well in a short time, with its camera phones leveraging off of its strength in LCD color displays, and CCD/CMOS camera sensor modules. Sharp began supplying the first video-capable camera handset, the J-SH51 to J-Phone, in December 2001, and the GX10, which supports the “Vodafone Live!” service, in September 2002. It

began supplying the SH251i to DoCoMo, an i-shot capable camera handset, in May 2002. In April 2004, Vodafone KK began shipping a WCDMA handset from Sharp, the V801SH, which supports 3GPP-based WCDMA network in Japan and roaming on GSM networks worldwide. In addition to voice roaming customers enjoy live contents like Sha-mail picture messaging, Movie Sha-mail video messaging, and web browsing. High-end camera phones will likely use two sensors, a high-resolution CCD for still shots, and a lower resolution CMOS sensor for auxiliary display functions. With these handsets and others, such as the Vodafone 902SH and the FOMA SH901iS, Sharp has become a key partner in the strategies of the #1 and #3 players in the Japanese handset domain.

Sharp is also designing a cost effective GSM/GPRS/EDGE handset with a mega-pixel camera and display, based on the Analog Devices' Blackfin/ARM chipset. Because the application software is optimized to execute from the onboard ARM processor (also handling the GSM protocol stack), this offering is expected to be one of the more cost-effective GSM/GPRS handsets.

One final operational note. Besides m-commerce, Sharp's next move will be in enhanced audiovisual and camera capability in its cell phones. We think the next trend in 3G cell phones will be streaming video. Sharp seems well positioned, because it continues to offer CMOS as well as CCD sensor modules, both of which will co-exist for awhile. We believe Sharp is fully capable of meeting the complex graphics capability needed to make streaming video work. Sharp offers a complete line of full-color GF/PF and TFT custom displays, and their full color transfective TFT technology provides exceptionally bright vibrant colors in all environments.

4.1.4. Toshiba Corporation



2005 Brand Image Survey

Source: IEMR

Strategic Outlook:

Toshiba is Japan's largest provider of CDMA handsets, with KDDI as its traditional partner. Outside of Japan, Toshiba is better known for its handset parts and chips than for its branded handsets. Our review of Toshiba's strategies suggests Toshiba will continue to innovate for the Japanese high-end market, and focus its international attention on high-end handsets. In 2005, the large increase in KDDI's subscriber base pushed Toshiba's market share higher, to 13.5%. We believe, as KDDI continues to move customers to its 3G network, sales of Toshiba handsets will tag along for the ride. Internationally, without significant moves, we do not expect Toshiba to be a player in its traditional CDMA space. Toshiba's activities will likely be limited to providing quality parts and chips to other handset manufacturers.

A confirmation of the above strategic outlook came in April 2005. Toshiba announced it was going to withdraw from the cellular handset business in China, because of sluggish sales of its video email-equipped phones and other high-end products. This came only a year after Toshiba launched the T618X for use on China Unicom's CDMA 1x network. The T618X integrated a 310,000-pixel CCD camera, and could record up to 15 seconds of motion picture, as well as still pictures. Toshiba's MPEG-4 technology was used to compress movie images that are transmitted through "U-Mail" to mobile phones and PCs. Toshiba sold its 33% stake in a joint venture and a mobile phone production facility to local partner Nanjing Putian Telecommunications Co. earlier in 2005. Nanjing Postel Wong Zhi Telecommunications Co.– the joint venture sold by Toshiba– began marketing high-end cell phones in 2002, but sales lagged as consumers preferred cheaper handsets.

The decision by Toshiba to exit what has been a stated long-term commitment to increase its production capacity in China is an indication it will focus on its Japan market and high-end handset production. This also follows its decision in mid-2004 to sell its 25% stake in Audiovox Corporation to UTStarcom, reducing its ability to brand CDMA handsets in North American markets.

Operational Summary:

In addition to the above, Toshiba has made a number of operational investments over the years in the parts, content, and chip set domain, that should see its mobile operations focused on high-end handsets and parts. In March 2000, Toshiba America Electronic

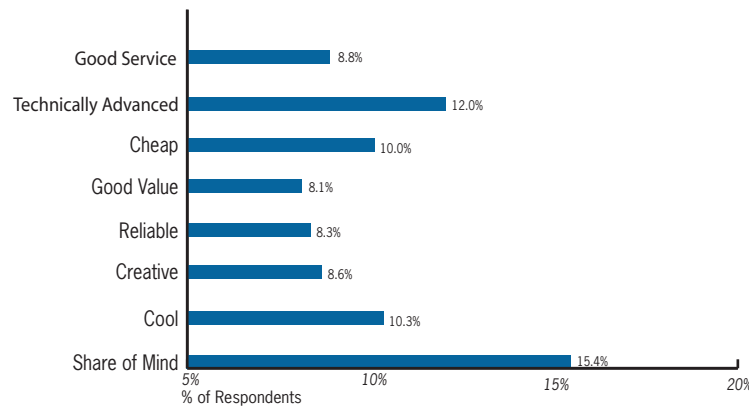
Components, Inc. announced its first CMOS image sensor, which incorporated an analog-to-digital (A/D) converter, said to achieve the industry's lowest power consumption in this class of device. Available in both color (TCM5033T) and black and white (TCM5030T) versions, the sensor's small size and high level of performance was designed to meet growing demand for cellular phones and other portable devices with built-in cameras. Along with the CMOS image sensor, Toshiba can also supply a companion digital signal processor (TC90A70F), allowing simple construction of a color digital camera system.

Toshiba's newest sensor offers the highest level of performance in the 330,000-pixel class of device, including support for 10-bit digital output and a signal-to-noise ratio of 57dB. This high level of contrast and reduced noise produces a higher quality picture, fully compatible with the Video Graphics Array (VGA) standard for video-conferencing. The sensor is fully VGA - compatible, meeting the format's specification for a 640 x 480 pixel frame, with an effective pixel count of about 330,000. The new sensor also incorporates a signal generator, and black and white versions require no peripheral devices to configure a digital camera system.

In March 2003, Toshiba unveiled a fuel cell prototype that has the potential to replace rechargeable batteries with clean-energy technology. While issues such as water management, volumetric energy density, and complete packaging still need to be resolved, the first applications of these micro fuel cells will be in the high-end handset domain and niche markets, such as industrial mobile computing.

In February 2005, Toshiba, together with IBM and Sony Corporation, unveiled key technical details of their advanced microprocessor, code-named Cell. Cell is a multi-core chip, comprising a 64-bit power processor core, and multiple synergistic processor cores capable of massive floating point processing. Cell is optimized for compute-intensive workloads and broadband rich media applications, including computer entertainment, movies, and other forms of digital content. Other highlights of the Cell processor design include: multi-thread, multi-core architecture; support for multiple operating systems simultaneously; substantial bus bandwidth to/from main memory, companion chips; flexible on-chip I/O (input/output) interface; and on-chip hardware, in support of security systems for intellectual property protection.

Toshiba's investment in Cell, together with its continued investments in Mobile Broadcasting Corp. of Japan (25% stake) and micro fuel cells, demonstrates it will continue to maintain its focus on high-end mobile applications, such as multi-channel HD broadcasting programs and mega-pixel digital still/movie images, captured by high-resolution CCD/CMOS imagers.



2005 Brand Image Survey

Source: IEMR

Financial Metrics**Liquidity Ratios**

Current Ratio: 1.33
 Quick Ratio: 1.01
 Inventory Turnover (days): 49.7

Debt Ratios

Asset Coverage (per '000 ¥) : 1,673
 Cash Flow/Total Debt Outstanding 27.84

Profitability Ratios

Operating Profit Margin : 3.4%
 Net Profit Margin: 4.5%
 Pre-Tax Return on Assets: 11.7%
 Pre-Tax Return on Equity: 49.9%

2005 Market Share: 7.6%
 Market Share Growth,
 1997-2005: -1.4%
 2005 Handset Models on Offer: 6

Strategic Outlook:

Fujitsu occupies 6th place in the Japanese handset domain. While our CONSUMEREADY™ suite Brand Image Survey found that Fujitsu needs to improve its brand within Japan, our view is that Fujitsu is probably technologically the best placed Japanese handset manufacturer. Unlike any of the other Japanese players, Fujitsu has a strong pipeline of innovative (and probably disruptive) technologies that will see it grow its handset business in Japan and overseas in the medium- to long-term. These include Fujitsu's various IP plays, its ability to leverage its systems integrator functions, and its emphasis on WIMAX chips. As mentioned above, the key strategic issue facing Fujitsu both in Japan and overseas is its lack of "cool" in the handset domain. Among customers, Fujitsu is better known for its engineering excellence and technology leadership than marketing.

Operational Summary:

At Broadband Wireless World in Las Vegas in April 2005, Fujitsu Microelectronics America, Inc. introduced its WiMAX system-on-chip, the MB87M3400. The chip complies with the IEEE802.16-2004 standard, and is designed for development of a new generation of WiMAX-compliant broadband wireless access equipment. The launch of the MB87M3400, together with subsequent announcements by customers (MiTAC Technology and Aperto Networks), is an illustration of why we think Fujitsu is well ahead of its Japanese competitors in the development of next generation mobile communications.

Fujitsu's WiMAX system-on-chip play is the first part of a 1-2-3 punch that should see it become an increasingly important player in the wireless telecom space. The second punch is the consulting arm of Fujitsu Ltd., which announced a comprehensive wireless services package for corporate customers in North America, building upon its expertise in the Japanese and European markets. Fujitsu's Enterprise Mobility includes both consulting services and technology, including middleware, network equipment, and client-side devices. This systems integrator capacity has made Fujitsu the leading systems integrator in Japan. Testament to this, is the December 2004 decision by Cisco to establish a strategic alliance with Fujitsu, which will focus on adapting Cisco's networking equipment to the Japanese market. The effort will focus on tailoring Cisco's high-end router IOS XR operating system to the needs of Japanese operators. Cisco and Fujitsu will also create and market product lines featuring

Cisco's CRS-1, 12000 Series routers and Catalyst 6000 and 4000 Series switches. Fujitsu is competing - and winning - with the likes of IBM and Hewlett Packard, mainly because of its experience in deploying networks.

Finally, Fujitsu is a leader in open standard handsets. In December 2002, Fujitsu shipped the world's first Symbian-based, 3G phone to DoCoMo. The FOMA F2051 featured a digital camera, as well as full email and Web access, photo editing capability, and 170 hours of battery stand-by time. In Q3 2005, Fujitsu began shipping its FOMA Raku-Raku PHONE II, also based on Symbian, targeting older subscribers with features, such as the ability to slow speech received on the phone and improved audio quality, to help users hear easily, clearly, and at their own speed. Fujitsu's FOMA F700iS, also for DoCoMo, is designed to connect to the "FOMA plus area," which uses the 800 MHz band in areas where regular FOMA coverage is not available. In August 2004, Fujitsu began shipping the F900iC, the first 3G smart-card handset compatible with i-mode FeliCa Service, for mobile wallet applications. The handset included a fingerprint sweep sensor for security. These firsts for Fujitsu, combined with engineering excellence, have made it an important partner for DoCoMo in the Japanese handset space.

5. Japan Mobile Operator Outlook

5.1. Industry Strategic Scenario

In November 2005, new frequency bands at 1.7 and 2 GHz were made available to three operators, and licensed for a period of 12 years, by the Radio Regulatory Council of the Japanese Ministry of Internal Affairs and Communications (MIC). BB Mobile of Softbank Corp. and eMobile, operated by eAccess Ltd. (part of the U.S.-based Carlyle Group), plan to begin WCDMA services, and IP Mobile Inc. plans to begin Japan's first TD-CDMA service in 2006.

While this regulatory change may seem to significantly affect the market dynamics for mobile operators in Japan, our view is that both DoCoMo and KDDI - the two dominant players - will maintain their market shares. On the other hand, Vodafone KK is likely the most vulnerable to losing subscribers to both the incumbents and new WCDMA plays of BB Mobile and eMobile.

The business strategies to be adopted by Softbank and eMobile are clear: use their broadband base to provide new services at lower prices, to create churn among customers of incumbent operators. eMobile, in particular, cannot be discounted. Its founder and CEO, Dr. Sachio Semmoto, is on record with his strategy of reducing mobile tariffs in Japan and bringing Japanese mobile ARPU in line with ARPU in the ADSL market. Currently mobile ARPU is nearly 3x that of the ADSL market in Japan. Dr. Semmoto is also on record with his projections that eMobile can capture 10% of Japan's mobile market within seven years of launching operations.

Despite these high expectations by new entrants, we think that incumbent carriers, particularly DoCoMo and KDDI, are not about to give up without a fight. DoCoMo and Vodafone have taken steps to match the new entrants' technology plans. All three incumbents also have greater management, marketing, and technical capabilities, to effectively compete for subscriber adds, and keep churn rates low.

Our view is the new entrants face three strategic issues in significantly changing the market dynamics at the operator level:

1. New Entrants' Network Roll-out Plans Miss the Mark: Both BB Mobile and eMobile have staked their business strategies on successful HSDPA roll-outs in 2006. We believe BB Mobile's plan is too ambitious, and eMobile's plan is too slow. For example, DoCoMo has delayed adoption of HSDPA until at least March 2006, partly because it has learned important lessons from its slow 3G launch in 2001, and wants to ensure any kinks are solved before commercial offering in the tough Japanese market. As of November 2005, these kinks are still significant. Field trials of HSDPA, conducted by Motorola in Europe, indicate data transmission speeds are subject to significant degradation. Video performance in the Motorola trials froze when a modest number of users were active. State-switching also caused significant latency. The most significant problem, however, is power usage. The Motorola study found that mobile devices need sufficient power to receive signals, particularly when the user is on the move. Built-in functions are available which can increase data rates when devices are on the move by as much as 40%, but few devices currently have this capability. Strategically, we expect

both BB Mobile and eMobile to delay roll-outs until at least the first half of 2007, partly to ensure they do not repeat the same mistakes the incumbents made in the past.

2. Content Constraints and Ageing Population Dynamics in Japan May Result in Slower Take-Up of BB Mobile and eMobile Services:

Another reason cited for DoCoMo's delayed HSDPA roll-out was a lack of suitable content - a key ingredient to marketing higher speeds to consumers in Japan. Here, it is instructive to note that DoCoMo's i-mode success was partly based on the ability of DoCoMo to provide exclusive, simple, and cheap content to Japanese consumers. Unlike i-mode, however, 3G content requires significant partnerships with major content providers, such as TV networks and branded media outlets. These are more expensive propositions, which neither BB Mobile nor eMobile may be able to absorb over the medium- to long-term.

An important factor many analysts have not focused on is Japan's ageing population dynamics, and how it impacts the price-speed strategies of players like BB Mobile and eMobile. It is a well-known fact Japan's home internet penetration rates are among the lowest in the developed world. A number of factors have contributed to this. Small apartments in urban centers lack sufficient space for desktop computers; and extensive commuting times to and from work minimize the amount of time spent at home. The response by Japanese operators was to provide practical applications, unique to the Japanese market, which allow consumers to use the internet to effectively communicate with each other and access information relevant to their lives.

Research on the use of telephony by older Japanese citizens suggests Japanese aged 55+ tend to demand the basic voice and practical data applications. They are also relatively price inelastic, choosing reliability of service over price. They also do not tend to shift service providers easily. In our view, these tendencies of an ageing Japanese population do not bode well for either BB Mobile or eAccess, as both will rely on speed and price to create churn, something the mass (i.e., older) Japanese market may not appreciate over the medium- to long-term.

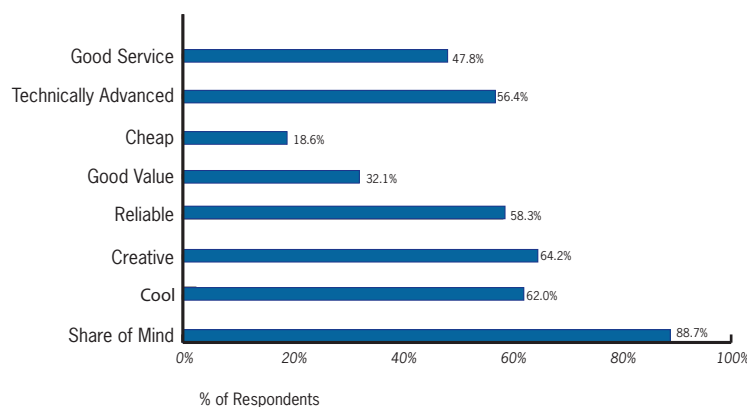
Here, KDDI's technology and management strategy is instructive. In many ways, KDDI has made a brilliant play on Japan's aging population by putting its eggs in the Fixed-Mobile Convergence (FMC) basket, and unveiling plans to integrate fixed-line and mobile offerings in a single package. Its strategy of consolidating fixed-mobile billing and cross-selling, bundled fixed-mobile charges, as well as development of FMC handsets and services, will create market barriers the new entrants will find hard to break.

3. Uphill Battle for Brand Recognition by SoftBank and eAccess:

In our 2005 Japan Brand Image Survey, we found the two strongest brands in the Japanese mobile space are DoCoMo and KDDI. This brand recognition of DoCoMo and KDDI is rock-solid among Japanese 55+ years of age. In contrast, BB Mobile and eMobile are only recognized by 2% -3% of the Japanese population, with even lower numbers for Japanese over age 55. With a lack of brand recognition and an ageing population, our view is both BB Mobile and eMobile have a long grind ahead, to capture significant market share.

5.2. Mobile Operator Competition Analysis

5.2.1. NTT DoCoMo



2005 Brand Image Survey

Source: IEMR

Financial Metrics

Liquidity Ratios

Current Ratio: 1.96
Quick Ratio: 1.81
Inventory Turnover (days): 31

Debt Ratios

Asset Coverage (per '000 ¥): 4,116
Cash Flow/Total Debt Outstanding: 215.6%

Profitability Ratios

Operating Profit Margin: 33.2%
Net Profit Margin: 26.0%
Pre-Tax Return on Assets: 20.9%
Pre-Tax Return on Equity: 32.8%
Debt Adjusted Dupont ROE: 20.7%

2005 Market Share: 54.4%

Net Subscriber Growth,

2004-2005: 4.24%

Customer Churn Rate: 0.81%

Blended ARPU (¥): 7,000

Blended ARPU Growth: -4.63%

Management Background:

DoCoMo's management consists of the icons of the Japanese wireless telecommunication space. An indication of the direction that will be taken by DoCoMo in the coming years is the pedigree of its President and CEO, Mr. Masao Nakamura, who has a marketing and multimedia background. Prior to becoming CEO in June 2004, Mr. Nakamura was DoCoMo's Marketing Division Managing Director. Before that, he was Executive Vice-President of DoCoMo's Mobile Multimedia Division.

Mr. Nakamura has provided a strong vision, with a focus on the DoCoMo brand, revenue growth through content and multimedia innovation, and an emphasis on DoCoMo's international operations. Running DoCoMo's international strategy is Mr. Masayuki Hirata, who is the Managing Director of its Global Business Division. Mr. Hirata's strong finance background (he oversaw the listing of DoCoMo on the New York and London stock exchanges in 2002) should help DoCoMo avoid some of the financial difficulties it had with its previous wave of international expansions.

To support DoCoMo's content and multimedia innovation, Mr. Takeshi Natsuno has stayed on as Managing Director of DoCoMo's crucial Multimedia Services Department, Products & Services Division. Previously, Mr. Natsuno was their Media Director from 1997 – 2001, and part of the trio credited for DoCoMo's success with i-mode. Also still associated with DoCoMo are Mr. Kei-ichi Enoki, now President of DoCoMo Tokai, Inc., and Ms. Mari Matsunaga, who continues to consult with DoCoMo on design and content issues.

2005 Brand Image Survey Results and Analysis:

In the recent past, many analysts have tended to dismiss DoCoMo's ability to compete effectively with aggressive new entrants, such as BB Mobile and eMobile, or erstwhile competitors such as KDDI. Anyone who has read Mr. Natsuno's *i-mode Strategy* and Ms. Matsunaga's *The Birth of i-mode* should not be too quick to discount either DoCoMo's ability to protect its brand or to innovate technically to dominate the Japanese content space.

Our 2005 Brand Image Survey confirms this. Of the 408 Japanese mobile users surveyed, 89% had DoCoMo at "top of mind" when asked to name a Japanese mobile

service provider. More importantly, 62% of respondents associated DoCoMo with “cool”, 64% with “creative”, 58% with “reliable”, and 56% with “technically advanced”. In distant second and third, we have players like KDDI and Vodafone, while the new entrants do not even register on the radar screen. These results point to the tremendous brand equity possessed by DoCoMo going forward. With numbers like these, both incumbents and new entrants into the Japanese wireless space will have a tough time breaking the DoCoMo brand.

There are areas in which DoCoMo is relatively weak compared to KDDI, and provides opportunities for its competitors to exploit. For example, 32.6% of respondents associated KDDI with “good value”, compared to 32.1% for DoCoMo, while 39.5% of respondents associated KDDI with “cheap”, compared to only 18.6% for DoCoMo. For its market position, Vodafone KK also ranks high on qualities such as “good value”, “cheap”, and “good service”. We view this as a signal that, while the DoCoMo brand is associated with “cool”, “creative”, and “reliable”; consumers are willing to switch to other carriers, based on price and service quality.

Clearly, the coming brand wars in Japan will determine the winner of the Japanese wireless telecommunication race. Here, our Brand Image Survey shows that DoCoMo has a leg up against its key competitors and new entrants. DoCoMo’s brand-enhancing strategy revolves around three key components:

1. Differentiate and enhance handset design and functionality: In response to its customers’ diverse needs, DoCoMo has been at the forefront of demanding better handsets of its manufacturing partners. Our view, however, is that DoCoMo is still focused on the “premium” market, clearly with a view to enhancing ARPU. Whether this comes at the cost of losing customers at the lower end of the market is anybody’s guess, although our survey shows that “good value” and “cheap” are clearly not associated with DoCoMo. To offset the lack of initial take-up of its premium FOMA 900i, FOMA 901i, and FOMA 901iS handsets, DoCoMo decided in February 2005 to launch its FOMA 700i series, which is priced lower than the 900i series and offers fewer FOMA functions.

2. Offer Premium after-sales service with a view to preventing churn: In April 2004, DoCoMo launched the DoCoMo Premier Club, which is essentially a retention strategy that provides Premier Club members with several services. These include free handset repairs for three years and free replacement batteries for handsets in use two years or more. Members can also exchange their points for travel coupons, restaurant meals, etc. According to DoCoMo, as of the end of April 2005, there were more than 30 million Premier Club Members, and the company claims that churn rates among Premier Club Members is lower than among non-members.

3. Create new markets that will drive revenue growth: A final element of DoCoMo’s branding strategy is to capture first-mover advantage by creating new markets for wireless services. Here, DoCoMo’s move into the *Osai-fu-Ketai* (wallet phone) market shows it will continue to brand its handsets more along the lines of a “lifestyle” good than a wireless product. Mobile wallet phones, which are equipped with the FeliCa chip,

represent DoCoMo's second attempt into this market. Three years ago, it introduced a service, letting people buy soft drinks from a vending machine. The system uses a barcode scanner and a bar code reader on the screen. First, customers find a machine used to load smart cards with cash, located in some convenience stores and offices in Japan. They then place the phone in a special slot and slip bills into the machine. The phones have a ¥ 50,000 (\$450) limit. To pay for purchases, customers simply wave their cell phones within a few inches of a special display screen found in stores, restaurants, and vending machines around Japan. A tinkling sound indicates the transaction has been completed. In the first year of operations, DoCoMo claims 5 million subscribers, with 22,000 shops in Japan, accepted the *Osafu-Ketai* service.

2005 Wireless Strategy
Survey Results and Analysis:

As part of our research, we asked suppliers and channel partners to rate the six operators in Japan, based on five broad criteria: Management Strength, Price Strategy, Content Strategy, Branding and Marketing Strategy, and Financial Strength. Table 3 presents the results of our 2005 Wireless Strategy Survey. As can be seen, on all criteria except price strategy, DoCoMo comes out on top. On issues such as management strength and financial strength, suppliers feel DoCoMo (and KDDI) are in a different league, compared to BB Mobile and eMobile. It is clear from our Wireless Strategy Survey, however, that DoCoMo's Achilles' heel continues to be its pricing strategy. Here, DoCoMo was ranked below KDDI, Vodafone KK, and eAccess, and ranked similarly to BB Mobile. On Branding & Marketing and Content Strategy, suppliers rated DoCoMo's strategies highly, something echoed in our Brand Image Survey.

Table 3: 2005 Wireless
Strategy Survey Results: Do-
CoMo (Maximum Score: 7)

Business Strategy Element	DoCoMo Average	Overall Average
Management Strength	6.6 (#1)	4.5
Price Strategy	5.4 (#4)	5.7
Content Strategy	6.6 (#1)	4.5
Branding & Marketing Strategy	6.5 (#1)	5.0
Financial Strength	6.3 (#1)	5.0
Overall Strategy Rating	6.3 (#1)	4.9

Source: IEMR. Rank in Parentheses.

Financial Analysis:

From a financial point of view, the key strategic question faced by DoCoMo is what it is going to do with its significant free cash flow going forward. Clearly, the entry of new players in the domestic Japanese market will put pressure on DoCoMo to offer subsidies and spend resources on marketing and content to maintain market share. However, like operators in Korea, Singapore, and other developed markets, DoCoMo management has long realized that markets such as Japan are mature and marginal revenue growth will occur from investments overseas. For now, it seems that DoCoMo will lean towards sticking to its home base with small investments (by past DoCoMo standards, at least) overseas.

Liquidity: DoCoMo enters 2006 with a strong balance sheet and cash position. With a working capital ratio of 1.96 and a Quick Ratio of 1.81, DoCoMo has the highest liquidity rating of the three incumbent operators in the Japanese wireless telecommunication space. Its inventory turn-over rate of 31 days, however, is 29% higher than KDDI, and 13% higher than Vodafone KK. The higher inventory turn-over rates may have been due to slower take-up of the premium FOMA 900i, FOMA 901i, and FOMA 901iS handsets during fiscal 2004-05.

Debt: DoCoMo's strong cash position is reflected in its strong Asset Coverage. At ¥ 4,122, DoCoMo has an asset coverage ratio that is 2.4x KDDI, and 1.5x Vodafone KK.

DoCoMo's ability to maintain a high level of CAPEX and finance its international expansion is reflected in its Cash Flow/Total Debt Outstanding ratio. This ratio stood at a whopping 216%, 4.6x larger than KDDI, and 2.8x larger than Vodafone KK.

Profitability: IEMR's standardized* profitability calculations show that operating profit margins at DoCoMo are in line with its closest competitor, KDDI, at 33.4%, and slightly lower than Vodafone (36.2%). DoCoMo's strong balance sheet, however, means that net profit margins at DoCoMo was 26%, which was 3.5x larger than KDDI, and 2.3x larger than Vodafone KK.

On October 28, 2005, DoCoMo announced Q2 and H1 results for 2005. While H1 operating revenues were down 3.2% compared to the same period last year (at ¥ 2,373.5 billion), operating income was up 2.4% y-o-y (at ¥ 558.4 billion), income before taxes was up 16.1% y-o-y (at ¥ 633.1 billion) and net income was up 14.9% y-o-y (at ¥ 385.3 billion).

Despite these results, the company was cautious regarding its full-year results, guiding market expectations slightly higher compared to its May 10, 2005 guidance. Full-year operating income was forecast by DoCoMo to be ¥ 830 billion (up 5.8% y-o-y) and net income was forecast to fall to ¥ 604 billion (down 19.2% y-o-y).

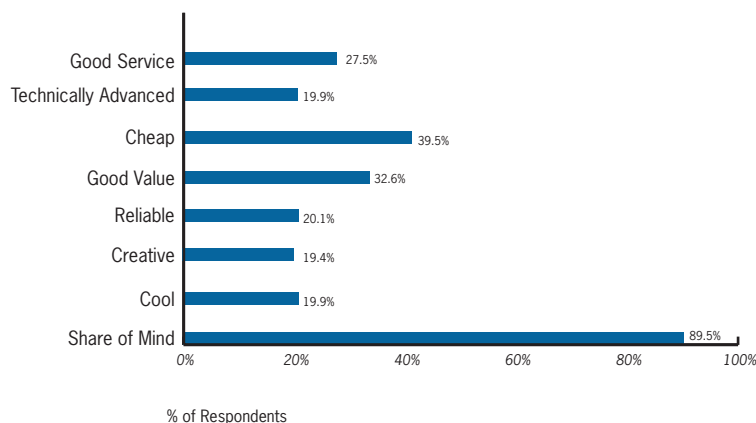
Risks: On December 15, 2005, DoCoMo announced it was taking a 10% equity stake in KT Freetel Co., Ltd. (KTF), South Korea's #2 carrier, in a deal valued at ¥ 65.5 billion. We view this as being accretive to DoCoMo's operations. Both DoCoMo and KTF have adopted WCDMA standards, and the deal will allow greater roaming revenue in the important Tokyo-Seoul corridor.

The KTF deal represents the first time DoCoMo has ventured back into the international domain since 2002. While the deal itself is not large, it represents a perpetual risk undertaken by DoCoMo. DoCoMo's international strategy has always been to promote its standards by investing in partner carriers internationally. This strategy has not always paid off. Readers will note that in 2002, DoCoMo's parent company, DoCoMo Corp., took a \$6.3 billion write-down from its investments in KPN Mobile, AT&T, and Hutchison Telephone Company Ltd.

It is not yet clear to us how DoCoMo is going to run its international strategy any

differently this time. While the KTF deal has synergies, it does represent the old business model of taking minority investment positions, in the hope that DoCoMo's standards and technology will be adopted more widely. The decision to invest in the saturated and competitive Korean market also puts DoCoMo into a similar situation that it finds itself in the Japanese market - limited revenue growth potential, competitive pricing pressures, and limited subscriber growth.

**IEMR's standardized profitability measures include: Operating Profit Margin, Net Profit Margin, Pre-Tax Return on Assets, and Pre-Tax Return on Equity. Net Profit Margin adjusts net earnings to take into account earnings from minority interests of subsidiaries after removing any equity income earned. As such, IEMR's standardized profitability measures are not the same as standard measures such as EBITDA. See Annex B for details.*



2005 Brand Image Survey

Source: IEMR

Financial Metrics**Liquidity Ratios**

Current Ratio: 1.07
 Quick Ratio: 0.98
 Inventory Turnover (days): 24

Debt Ratios

Asset Coverage (per '000 ¥): 1,686
 Cash Flow/Total Debt Outstanding: 46.7

Profitability Ratios

Operating Profit Margin: 33.4%
 Net Profit Margin: 7.4%
 Pre-Tax Return on Assets: 10.9%
 Pre-Tax Return on Equity: 28.6%
 Debt-Adjusted Dupont ROE: 8.0%

Total Subscribers Base: 24,231,200
 2005 Market Share: 25.9%
 Net Subscriber Growth, 2005: 10.8%
 Customer Churn Rate, %: 1.2%
 Blended ARPU (¥): 7,190
 Blended ARPU Growth: -1.51%

Management Background:

At the head of KDDI is Mr. Tadashi Onodera, President and Chairman of the Board. We would characterize Onodera and his management team as the “workhorses” of the Japanese wireless telecommunication space. Since taking over as President in April 2001, Onodera has worked diligently to transform KDDI into the second largest mobile operator in Japan. Unlike DoCoMo’s Nakamura, who has a marketing background, Onodera is an electrical engineer by training. KDDI’s approach to subscriber growth and developing its brand equity has largely been to implement solid backbone networks to provide reliable cellular service at a reasonable price to its customers. We think this approach to increasing subscriber growth reflects the engineering background of the company’s president.

An indication of this strategy is KDDI’s resounding success in implementing its CDMA 2000 1x and CDMA 1xEV-DO services. Before becoming president, Onodera served as DDI Corporation’s Chief Engineer, and was largely responsible for ensuring KDDI’s launch of its CDMA2000 1x services went smoothly in 2000-01. Although DoCoMo was the first to roll out 3G in Japan, with its FOMA offering in October 2001, it struggled to expand the WCDMA subscriber base. KDDI, on the other hand, began offering its 3G service, based on CDMA 2000 1x, in April 2002. Over eight months, KDDI garnered about 4 million subscribers for its 3G offering, exceeding expectations and totally eclipsing the uptake of DoCoMo’s FOMA. Currently, of its total 20.1 million CDMA subscribers, KDDI has successfully converted over 95% of its subscribers to CDMA 1x.

2005 Brand Image Survey Results and Analysis:

Our 2005 Brand Image Survey results show there are certain strengths KDDI can capitalize on to further solidify brand equity. To our surprise, 89.5% of respondents had KDDI’s “au” brand at “top of mind” (larger than DoCoMo, although not significantly so). This was likely because KDDI provides local, domestic long-distance, international fixed-line, Internet, and IP services, as well as mobile telecom services throughout Japan.

Our Brand Image Survey found that while many Japanese did think of KDDI as a provider

of mobile telecommunication services, KDDI's mobile au brand did not get stronger responses than KDDI's market share. For example, only 19.9% of the respondents associated au with "cool", 19.4% associated au with "creative", 20.1% associated au with "reliable", and 19.9% associated au with "technically advanced". On the other hand, the au brand's strength appears to be price and service, as 32.6% of the respondents associated au with "good value", 39.5% associated au with "cheap", and 27.5% associated au with "good service".

For younger consumers, KDDI's results on service and price are strong compared to DoCoMo, which, again, was a surprise to us. Of youth aged 18-24 years, 36% associated au with "good service" (similar to DoCoMo), while 48% associated au with "cheap" (over 3x more than DoCoMo). KDDI has also recently made a brilliant play on Japan's aging population, by unveiling plans to integrate and brand fixed-line and mobile offerings in a single package. Its strategy of consolidating fixed-mobile billing and cross-selling, bundled fixed-mobile charges, and development of FMC handsets and services points to a more sophisticated branding and marketing strategy than in the past. KDDI has also completed integration of the TU-KA Group, with a view to leveraging and integrating TU-KA's retail presence. Our overall view, therefore, is that brand consolidation can only help KDDI increase brand equity in the medium- to long- term.

2005 Wireless
Strategy Survey Results
and Analysis:

In October 2000, DDI CORPORATION, KDD Corporation and IDO CORPORATION merged to form a new company, which in April 2001, began operating as KDDI Corporation. The key strategic roll-out of KDDI occurred in May 2001. The strategic plan and management reforms announced had three main components:

1. Change KDDI's Business Structure and Consolidate to the au brand: The major strategic change was to consolidate operations of its two core business lines - mobile telecommunications and internet protocol (IP) technology - into KDDI's au brand. This involved the integration of seven subsidiary companies, such as Okinawa Cellular, and non-core services, such as TU-KA's PDC service, into the au brand. In addition, non-core business lines, such as DDI Pocket, were eventually phased out. KDDI also drastically trimmed down the number of directors from 53 before the merger to 13 after June 2001, and consolidated its international offices from 31 to 21.

2. Implement CDMA2000 1x Technology: On the operational side, KDDI undertook the brilliant move to quickly implement CDMA2000 1xRTT technology, and optimize this on the existing 800 MHz frequency. Its explicit objective was to gain a market share of over 20% (17 million) by March 2005. KDDI clearly had an advantage over DoCoMo. CDMA 2000 1xRTT was upward compatible with its existing cdmaOne network, which meant voice and 64-kbps data services were available over a large percentage of Japan from the onset. The next milestone was the CDMA2000 1x EV-DO data service, which was offered in the spring of 2003. CDMA2000 1x EV-DO, considered to be true 3G, is characterized by an inexpensive infrastructure equipment upgrade cost, in comparison to the more costly WCDMA transition. An interview given by Mr. Yusai Okuyama, past president of DDI Corp. in September 2000, revealed KDDI's technology strategy. In it, Mr. Okuyama made it clear the decision to adopt CDMA 2000 1x was based not so

much on consumer demand, but on the ability of KDDI to minimize network installation costs and the problems associated with adopting WCDMA that still existed in 2001-02. KDDI, therefore, aimed to leapfrog over both DoCoMo and J-Phone. KDDI was able to surpass its 17 million subscriber target one year ahead of schedule, in April 2004.

3. Debt Reduction and focus CAPEX on Core Business: In our view, the final element of KDDI's strategy was debt reduction and focusing capital expenditures (CAPEX) on its CDMA2000 1x roll-out. Debt reduction involved a total of ¥1 trillion in repayments— ¥600 billion in repayments from free cash flow, and ¥400 billion from property securitization and asset sales, by March 2005. Here, too, KDDI has met its targets. As of March 2005, its interest bearing debt was ¥864.6 billion.

While we do not have a comparative survey, our 2005 Wireless Strategy Survey shows the extent to which KDDI has earned the respect of its suppliers. Overall, KDDI is ranked #2, but our strategy survey shows that #3-ranked Vodafone has a long way to go on several fronts before it can capture the #2 position from KDDI. On management strength, content strategy, and financial strength, KDDI was ranked by its suppliers and channel partners as being well above Vodafone, and closer to DoCoMo.

Table 4: 2005 Wireless Strategy Survey Results: KDDI (Maximum Score: 7)

Business Strategy Element	KDDI Average	Overall Average
Management Strength	5.6 (#2)	4.5
Price Strategy	6.0 (#3)	5.7
Content Strategy	6.0 (#2)	4.5
Branding & Marketing Strategy	5.9 (#2)	5.0
Financial Strength	6.0 (#2)	5.0
Overall Strategy Rating	5.9 (#2)	4.9

Source: IEMR. Rank In Parentheses.

Financial Analysis:

On October 21, 2005, KDDI announced its H1 2006 results. On a consolidated basis, operating revenues came in flat at ¥1468.8 billion (-0.2% y-o-y), although net income rose 30.3% to ¥101.4 billion. Operating revenue growth was driven by KDDI's au business - operating revenues increased by 10.4% y-o-y while operating income rose by 29.0% y-o-y. au now accounts for 76.1% of operating revenue, and 109.8% of consolidated net income. Significantly, KDDI also announced top share of net subscriber adds in the first half, at 54.5%.

Liquidity:

Compared to its rival, Vodafone KK, KDDI enters fiscal 2006 with a relatively strong balance sheet, although DoCoMo and Vodafone come out stronger on some financial indicators. Over the past four years, KDDI has made steady progress in its liquidity position. Its current ratio has increased by 30% to 1.07, while its quick ratio has increased by 46% to 0.98, reflecting its efforts to streamline inventory. As well, of the three incumbent carriers in Japan, KDDI has the lowest inventory turnover rate, at 24 days.

Debt:

As mentioned above, one of the important aspects of KDDI's strategy since the merger was to reduce debt. Nonetheless, it still carries a higher debt load, compared to DoCoMo and Vodafone. At ¥1,710, KDDI's Asset Coverage ratio is still 63% of Vodafone, and its Cash Flow - Total Debt Outstanding ratio is only 47.4% of Vodafone's.

From an operational point of view, we do not have a problem with KDDI's relatively high debt ratios, as the impact on its mobile network operations is marginal. Since 2001, its CAPEX strategy has been quite different from either DoCoMo's or Vodafone's, dictated primarily by the upwardly compatible CDMA2000 1x roll-out. Therefore, lower CAPEX levels were perfectly acceptable. Going forward, we expect more of its CAPEX to go toward content and handset investments on the mobile side, and fixed-line operations. We already saw KDDI's CAPEX for au decelerating in H1 2006, compared to H1 2005. For 2006, KDDI expects CAPEX in its fixed-line operations to account for 34% of its total CAPEX, compared to 25% in 2005.

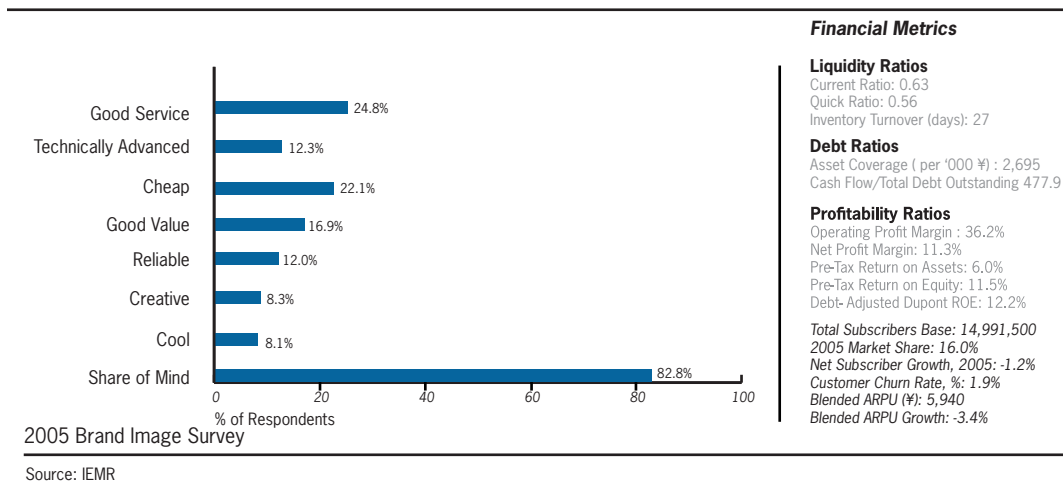
Profitability:

KDDI's higher debt levels have affected the firm's overall profitability. While operating profit margins at KDDI are just as high as at DoCoMo or Vodafone KK, net profit margins are lower, at 7.4% for KDDI in 2005 compared to DoCoMo's 26.0% and Vodafone KK's 11.3%. Again, this reflects the fact that KDDI still has an important fixed-line business which is expected to account for 21% of operating revenues and is still bleeding cash on a segmented basis.

Risks:

In November 2005, KDDI announced its aim to capture 30% market share in the Japanese wireless telecommunication space. To our surprise, Mr. Onodera announced: "We've no plans to pay more subsidies per handset to add users. We do not see a need in giving bigger discounts on handsets if our customers are satisfied with our services." How KDDI proposes to capture 30% market share without offering discounts, which will be offered by its competitors, is a mystery to us.

This announcement is a bit worrying from a business strategy point of view. Our 2005 Wireless Strategy Survey places KDDI at #2 place overall. The only one aspect where KDDI came out ahead of DoCoMo was on its price strategy. Also of note, suppliers in this domain thought the pricing strategy of its biggest competitor, Vodafone KK, was superior to KDDI's. Furthermore, our 2005 Brand Image Survey found a strong association between KDDI and the words "cheap" and "good value". Given that both DoCoMo and Vodafone, as well as new entrants such as BB Mobile and eMobile, are on record as saying they will aggressively move on the pricing front to head off any competition, we feel KDDI will eventually need to match any price changes implemented by its incumbent and new competitors.

**Management Background:**

Our view on Vodafone KK's current top management is that it is made up of turn-around specialists, rather than strategists capable of competing toe-to-toe with DoCoMo or KDDI in the tough Japanese market. It appears management is in a "pretty-up the asset" mode, by either entering the MVNO space and withdrawing from retail, or selling out altogether to other players.

What caught us by surprise was the February 2005 announcement by Vodafone, appointing Bill Morrow as President, and effectively sidelining Mr. Shiro Tsuda, who was "promoted" to the largely ceremonial role of Chairman of the Board. Mr. Tsuda is considered an icon of the Japanese wireless telecommunications industry, and was instrumental in DoCoMo's launch of FOMA in 2001. His defection from DoCoMo to Vodafone, after being passed over for company president, was viewed as a coup for Vodafone KK, and a blow for DoCoMo. His sidelining came as an even greater surprise, since it was Mr. Tsuda who was largely responsible for the bleeding of subscribers occurring at Vodafone, in his capacity at DoCoMo prior to 2004!

In February 2005, Vodafone announced the appointment of Bill Morrow as President of Vodafone KK. Morrow's history as a turn-around specialist is long. He started his career at Pacific Bell, and took over the company's troubled data network group, transforming it quickly into a leading fixed-line data provider in California in 1994. Then, in 1998, Morrow was dispatched to Belgium, to help turn around AirTouch Communications Inc.'s local affiliate, Proximus. In 1999, Morrow joined the Vodafone Group, upon its acquisition of AirTouch Communications. In 2001, Morrow became Vice President and Country Manager of Vodafone in Japan. He was then appointed President of Japan Telecom, where he oversaw the turn-around and sale of Vodafone's stake in its fixed-line business to Ripplewood Holdings LLC in November 2003. It is important to note that Japan Telecom was acquired by Softbank Corp. in July 2004, which, if Softbank's history is any indication, may be in the bidding if Vodafone KK goes on the auction block.

Supporting Morrow is John Durkin, Chief Financial Officer (CFO). Durkin has over 15 years of experience in Japan, which includes a stint as CFO at Nike Japan. Viewed

within Vodafone KK as “Chief Fix-it Officer”, Durkin has introduced a number of far-reaching changes at Vodafone over the years. Perhaps the biggest change Durkin introduced was centralizing financial control. Japanese groups do not tend to have a central finance unit. As a result, CAPEX and inventory levels are high, and procurement is directed by sales or engineering, without oversight by finance. In our view, after trimming down J-Phone’s nine operating companies to three in 2000, and then to one following Vodafone’s takeover, Durkin managed well to control costs at Vodafone KK.

2005 Brand Image Survey Results and Analysis:

Our 2005 Brand Image Survey results show that Vodafone has a long way to go to catch up to KDDI for the #2 slot in Japan. While overall share of mind was quite high at 83%, Vodafone is not identified with terms such as “cool,” “creative,” “reliable,” or “technically advanced”. Where it does stand out, relative to its market share, is in its pricing and service quality. This association with “cheap” may be due to the introduction of various flat-rate plans in 2005, including the *Kozoku Tuwa Teigaku* (Family Plan), the *Meru Teigaku* (Mail Plan), and the *Dual Packet Teigaku* (Packet Plan).

Table 5: 2005 Wireless Strategy Survey Results: Vodafone (Maximum Score: 7)

Business Strategy Element	Vodafone Average	Overall Average
Management Strength	4.1 (#3)	4.5
Price Strategy	6.1 (#2)	5.7
Content Strategy	5.0 (#3)	4.5
Branding & Marketing Strategy	5.2 (#3)	5.0
Financial Strength	5.0 (#3)	5.0
Overall Strategy Rating	5.1 (#3)	4.9

Source: IEMR. Rank in Parentheses.

Financial Analysis:

On November 15, 2005, Vodafone Group announced results for H1 2005 to September. Net revenue of Vodafone KK declined 0.4%, due to a 5% reduction in service revenue, mainly on the voice side (-6.3% decline in voice revenue). On a brighter note, net non-messaging data revenue increased by 12.4%, resulting from higher usage of data products and services, probably due to the additional 816,000 3G devices being registered to the network in the six months prior to September, bringing the total 3G subscriber base to 1,614,000. While Vodafone KK’s financials have stabilized substantially over the past three years, particularly on debt-related measures, it still has a long way to go on issues of liquidity and profitability, to match the heft of its closest competitor, KDDI.

Liquidity:

Vodafone KK’s current ratio of 0.63 and quick ratio of 0.56 are the lowest among Japanese operators, including Softbank and eAccess. We consider a quick ratio of under 0.5 in the wireless telecom domain as being risky, reflecting either excess inventory or high current liabilities. These low levels of liquidity are due to relatively high current liabilities, at 159% of current assets. Most of these liabilities are in the form of bank advances and accounts payable.

Debt:

We are comfortable with Vodafone KK’s debt indicators, primarily because it does not have to deal with legacy line operations, like KDDI. Vodafone has a high asset coverage ratio of ¥2,695 (per ¥1,000 in liabilities) and a 77% Cash Flow - Total Debt Outstanding Ratio.

Profitability:

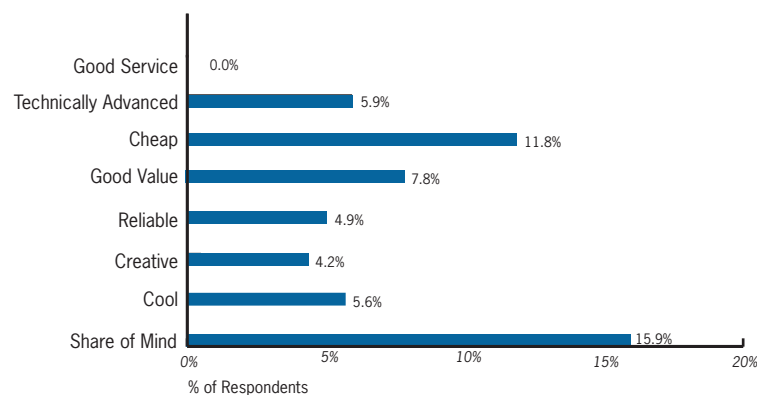
For H1 2005, Vodafone KK reported a 57.1% drop in operating profits. EBITDA margin was 21.7%, down from 27.7% for the same period in 2004. Vodafone KK, however, has historically shown better operating profit margins than both DoCoMo or KDDI. For example, in 2005, operating margins were 36.2%, compared to 33% for both KDDI and DoCoMo.

Our view on Vodafone's profitability, however, is that in the absence of significant network adds; price competition with incumbents and new entrants will continue to be downward pressure on profitability. It is significant to note that both in terms of pre-tax return on assets and pre-tax return on equity, Vodafone's profitability indicators are lower than DoCoMo and KDDI.

Risks:

Among the incumbents, Vodafone KK is the most vulnerable to competition by new entrants. We think being the only operator that is solely mobile is a liability for Vodafone KK going forward, given the Japanese market is increasingly moving toward convergence. Readers will note that Softbank acquired Japan Telecom from Ripplewood Holdings LLC in July 2004 after Vodafone divested itself of the fixed-line carrier only eight months before in November 2003. While introducing new rate plans and a wider selection of handsets has helped stop the bleeding of subscribers at Vodafone KK, it has not stemmed the profitability issues faced by the firm. The introduction of Mobile Number Portability (MNP) and new entrants has caused some speculation that Vodafone KK might withdraw into the MVNO market.

By entering the MVNO market, Vodafone KK risks jeopardizing its retail operations. At the same time, by opening up its network, Vodafone KK may gain a steady income stream and higher profit margins. Nonetheless, in a market where the competition bundles products across voice, data, access, and fixed-line services, we do not see how withdrawal into the MVNO space would enhance the longer-term competitive position of Vodafone in Japan.



Financial Metrics

Liquidity Ratios

Current Ratio: 0.88
Quick Ratio: 0.81
Inventory Turnover (days): 33

Debt Ratios

Asset Coverage (per '000 ¥): 1,609
Cash Flow/Total Debt Outstanding: -5.4%

Profitability Ratios

Operating Profit Margin: -6.1%
Net Profit Margin: -16.8%
Pre-Tax Return on Assets: 1.4%
Pre-Tax Return on Equity: 13.1%
Debt- Adjusted Dupont ROE: -7.5%

Total Subscribers Base: 10,910,000*
Net Subscriber Growth, 2005: +20.2%

*Includes 5,870,000 subscribers with Japan Telecom Co., Ltd., 230,000 subscribers with Japan Telecom IDC Inc., and 4,810,000 subscribers with Soft Bank BB Corp.

2005 Brand Image Survey

Source: IEMR

Management Background:

If anyone has the capability to threaten Vodafone's #3 slot, SoftBank's CEO Mr. Masayoshi Son does. An intrepid entrepreneur, Masayoshi Son has consistently shown his willingness to risk it all in technology ventures that have proven to be unsuccessful. These included billions invested in Asahi TV, Asia Global Crossing, SKY Perfect, Kozmo.com, and More.com. This time, however, we think Masayoshi Son's approach to the Japanese wireless space gives him a more solid footing, especially with his recent acquisitions of Japan Telecom and Cable & Wireless IDC Inc., Japan's #2 international telephone company. In our view, among the new entrants, Softbank has the best mix of broadband, fixed-line, internet, content, and now wireless operations, to establish a foothold in the tough Japanese wireless operator space.

2005 Brand Image Survey Results and Analysis:

Not surprisingly, our 2005 Brand Image Survey results point to an intense branding task ahead for SoftBank and other new entrants. In our survey, 15.9% of mobile users actually recognized SoftBank as a mobile communications operator. This high number was a surprise to us, given that SoftBank was not even in the wireless telecom space at the time of the survey! The result may partly reflect the intense marketing effort and brand image of SoftBank in areas such as broadband, fixed-line, internet, and content. The flamboyant nature of its CEO may also have affected the results. Of the different categories, SoftBank was most associated with the terms "good value" and "cheap," reflecting its broadband credentials.

While our demographic breakdowns are not significant, there are certain areas where SoftBank needs to continue to emphasize in order to keep going forward. Among youth aged 18 - 24, 11.4% associated SoftBank with "creative," and among generation X'ers, aged 24 - 34, 15.9% associated SoftBank with "technically advanced". This type of brand equity is gold, and we can be sure SoftBank will capitalize on this as it begins its entry into the wireless telecom space in Japan.

2005 Wireless Strategy Survey Results and Analysis:

While our Brand Image Survey shows significant brand equity for SoftBank, our survey of informed industry insiders does not paint a good picture. SoftBank's overall average was the second lowest among the six operators, although not significantly different

from the overall ratings given to eAccess. SoftBank received relatively low ratings for its management and financial strength, and content strategy. Its strength clearly lies in its branding strategies, as viewed by industry insiders.

Table 6: 2005 Wireless Strategy Survey Results: BB Mobile (Maximum Score: 7)

Business Strategy Element	BB Mobile Average	Overall Average
Management Strength	3.8 (#4)	4.5
Price Strategy	5.3 (#5)	5.7
Content Strategy	3.0 (#4)	4.5
Branding & Marketing Strategy	5.0 (#4)	5.0
Financial Strength	4.0 (#4)	5.0
Overall Strategy Rating	4.2 (#5)	4.9

Source: IEMR. Rank in Parentheses.

Financial Analysis:

While not strictly comparable to the incumbent players' statistics, we have undertaken a similar financial analysis of SoftBank, since it is increasingly looking like a mainstream telecommunications company, rather than a high-tech Venture Capital firm.

Liquidity:

We are comfortable with SoftBank's liquidity position. With current and quick ratios at 0.88 and 0.81, respectively, SoftBank's liquidity position is better than Vodafone KK's, and should be sufficient to allow it to expand its retail presence, and undertake debt-financed capital expenditures in the short- to medium- terms.

Debt:

Debt has always been the Achilles' heel for SoftBank. Its asset coverage ratio is lower than any of the incumbents at ¥1,609 per ¥1000 in debt, while its adjusted Cash Flow - Total Debt Outstanding ratio is actually at -5.4%. From a bond-holder's perspective, these are worrying figures, and represent a company who has yet to grapple with its high debt load.

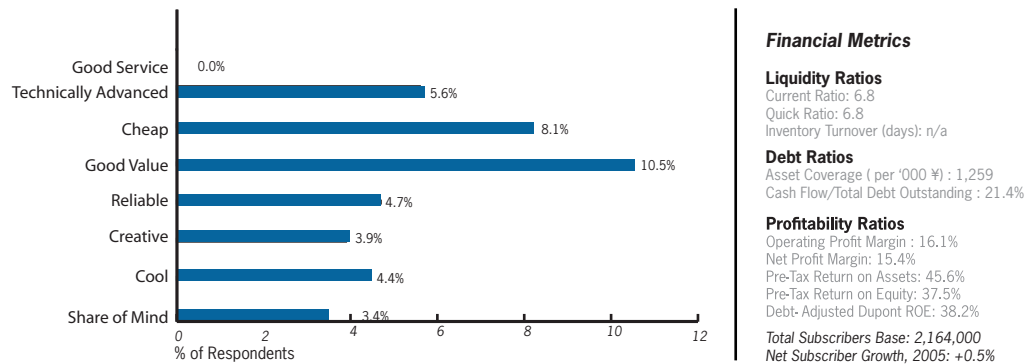
Profitability:

From a profitability perspective as well, SoftBank's wireless operations will likely place the company further into the red, as both CAPEX and marketing burn through cash flow. In 2005, SoftBank had an operating profit margin of -6.1%, a net profit margin of -16.8% (due to high interest payments), and a pre-tax return on equity of 13.1% (which was higher than Vodafone, but less than half that of DoCoMo and KDDI).

Risks:

We view SoftBank as the most serious contender for Vodafone's #3 slot in the medium term. Of the three incumbents, SoftBank has the strongest market position, with its July 2004 acquisition of Japan Telecom Co., Ltd. and its February 2005 acquisition of Cable & Wireless IDC Inc. Because of these acquisitions, the number of SoftBank Group lines jumped to 10.91 million. As well, through these acquisitions, SoftBank is increasingly looking like a mainstream telecommunications company, with opportunities to cross-sell within the group.

As mentioned above, one risk factor that will continue to affect financial results at SoftBank is its relatively high debt load. SoftBank owes \$5.7 billion in long-term debt, and has been bleeding cash for a long time. Its Cash Flow - Total Debt Outstanding ratio is the lowest in the industry. On balance, however, we think Softbank enters the mobile wireless space in Japan poised to challenge Vodafone, and leverage its fixed-line and broadband assets to drive down prices and create customer churn among incumbent carriers.



Financial Metrics

Liquidity Ratios

Current Ratio: 6.8
Quick Ratio: 6.8
Inventory Turnover (days): n/a

Debt Ratios

Asset Coverage (per '000 ¥) : 1,259
Cash Flow/Total Debt Outstanding : 21.4%

Profitability Ratios

Operating Profit Margin : 16.1%
Net Profit Margin: 15.4%
Pre-Tax Return on Assets: 45.6%
Pre-Tax Return on Equity: 37.5%
Debt- Adjusted Dupont ROE: 38.2%

Total Subscribers Base: 2,164,000
Net Subscriber Growth, 2005: +0.5%

2005 Brand Image Survey

Source: IEMR

Management Background:

At the head of eMobile is Dr. Sachio Semmoto, who, in the 1970's, played a pivotal role in developing ISDN at DoCoMo. In 1984, with Kyocera, he planned and implemented the development of Dainiden, which later became KDDI, Japan's first private phone company. Dr. Semmoto is a former professor of entrepreneurial management at Keio University, and has lectured at Harvard, Stanford, and Cambridge Business Schools.

Supporting Dr. Semmoto as CFO is Eric Gan. Mr. Gan was formerly Chief Operating Officer (COO) at eAccess, and also was a former managing director of Goldman Sachs Japan, an investor in eAccess, along with Morgan Stanley Dean Witter. Together, Semmoto and Gan have put together a proven management team, and have demonstrated their ability to spot niches in the Japanese wireless telecommunication space.

2005 Brand Image Survey Results and Analysis:

Our 2005 Brand Image Survey results show that eMobile has a ways to go, in order to build a brand for itself among mobile consumers in Japan. Only 3.4% of the mobile users surveyed had eMobile as top of mind. Like SoftBank, the two areas most associated with eMobile were "good value" (10.5%) and "cheap" (8.1%). These appear to be the right selling points targeted by eMobile's management going forward.

2005 Wireless Strategy Survey Results and Analysis:

When we surveyed executives of leading suppliers in Japan, eMobile comes out at the same level as BB Mobile from an overall strategy perspective. eMobile's greatest advantage is its pricing strategy (6.3), which came out much higher than DoCoMo and BB Mobile, but on par with KDDI and Vodafone. Its weakest link, as perceived by industry insiders, is its content strategy. Also, on management strength, eMobile comes out weak, relative to some of its competitors. We think this is an important issue going forward, particularly because senior management does not tend to jump ship often in Japan.

Table 7: 2005 Wireless Strategy Survey Results: eMobile (Maximum Score: 7)

Business Strategy Element	eMobile Average	Overall Average
Management Strength	3.3 (#5)	4.5
Price Strategy	6.3 (#1)	5.7
Content Strategy	3.1 (#4)	4.5
Branding & Marketing Strategy	4.1 (#5)	5.0
Financial Strength	4.4 (#4)	5.0
Overall Strategy Rating	4.3 (#4)	4.9

Source: IEMR. Rank in Parentheses.

Financial Analysis:

Overall, we think eMobile enters 2006 with a credible financing plan for its network roll-out. With the highest liquidity ratio among the six major operators, we think management is sitting on cash that it will burn quickly on CAPEX and marketing, to get a toe-hold in the mobile operator market.

Liquidity:

eAccess has a very strong liquidity position, with current and quick ratios of 6+. This reflects the recent bond financing. Long-term debt increased from ¥23 billion to ¥83 billion between June 2004 and March 2005.

Debt:

Among the six Japanese operators studied, eAccess has the lowest asset coverage (¥1,259 per ¥1,000 in debt), and the second lowest Cash Flow - Debt Outstanding ratio (21.4%). Given its focused business strategy and relatively credible strategy, we are comfortable with these debt indicators.

Profitability:

In 2004-05, eAccess provided its investors with the highest standardized pre-tax ROE (37.5%) of any of the six Japanese operators analyzed. While we do not expect a repetition of this in the short- to medium-term, management has proven it can manage the ADSL space profitably, and feels there is room for profits to grow in the mobile space going forward.

Risks:

While we feel eMobile is entering the Japanese wireless telecommunication space with a credible capital expenditure plan, we also feel its wireless roll-out plan may be too slow to generate the necessary churn needed to capture consumers from incumbent operators and its closest rival, BB Mobile. eMobile seems to be applying its “stages” philosophy to providing access, which it learned during its broadband years. The formula works something like this: 1) Reach the customers with access, using the most convenient technology available now; 2) provide content compelling enough to keep them loyal; 3) construct a fiber network, to cut down the access fees it pays DoCoMo.

In its mobile business strategy announced in August 2005, eMobile plans 50% nationwide coverage within five years and 50% coverage in the Tokyo, Osaka, and Nagoya areas within three years. We think this time line needs to be accelerated. Both DoCoMo's and Vodafone's experience with their 3G launch shows the Japanese consumer demands quick, comprehensive coverage. eMobile's offer to consumers for 50% national coverage in five years' time will likely ring hollow with consumers, as eMobile's rivals are offering lower prices and better coverage, now.

There are other things absent from the eMobile strategy that we feel need to be addressed. First, there was no mention of content or retail operations. Second, an important part of eMobile's strategy is becoming an MVNO. The problem with this strategy is that it may lose both retail control of the customer (i.e., marketing and branding) and control of content, which is an important feature of the wireless space going forward, and an important driver to profitability and customer loyalty.

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Annex A: Methodology for IEMR's 2005 - 06 Brand Image and Wireless Strategy Surveys

Brand Image Survey Methodology:

Between November 2005 and February 2006, IEMR undertook its 2005 - 06 Brand Image Survey in five of Asia's largest wireless markets: Japan, China, Korea, India, and Indonesia. Together, these economies have an installed base of over 675 million subscribers, and represent perhaps the most important markets for operators, handset manufacturers, and vendors in the wireless space today.

The objective of our 2005 - 06 Brand Image Survey was to provide our clients with intelligence on the specific strengths and weaknesses of both their own and their competitors' brands in these five Asian markets. In order to achieve these objectives, we undertook a random sample survey of 2,459 individuals. All interviews were conducted over the telephone in local languages/dialects. As such, this IEMR 2005 - 06 Brand Image Survey represents the largest multi-country survey of its kind in Asia. Table A1 below presents a summary of sample sizes, response rates, and significance levels of overall results in each of these markets.

Table A1: Sample sizes and Significance Levels in the 2005-06 Brand Image Survey

Market	Date of Survey	Sample Size	Response Rate, %	Significance Level
Japan	Nov. 15 - 20, 2005	408	35.6%	± 5% 19 times out of 20
China	Jan. 25 - 26, 2006	651	25.2%	± 4% 19 times out of 20
Beijing		202		
Shanghai		232		
Guangzhou		217		
Korea	Jan. 29 - 30, 2006	500	32.1%	± 5% 19 times out of 20
Indonesia	Jan. 31 - Feb. 2, 2006	400	40%	± 5% 19 times out of 20
Jakarta		191		
Surabaya		72		
Bandung		74		
Medan		40		
Palembang		23		
India	Feb. 19 - 21, 2006	500	32%	± 5% 19 times out of 20
Delhi		209		
Mumbai		91		
Calcutta		93		
Chennai		59		
Bangalore		48		

Source: IEMR

Clients should note two important caveats when interpreting results of the Survey:

1. While the national-level results are valid at the significance levels indicated above, the levels of error are much higher at the city level. Therefore, we urge clients to interpret the city-level results with caution. At all levels, we have made every effort to present the statistical significance levels of our results.

2. Because the survey was a telephone survey, we had to limit its implementation to cities within these five markets. While there are no statistical issues here, we feel that brand recognition and strength in suburban or rural areas of these economies, particularly China, Indonesia, and India, would look very different. Therefore, we caution clients that the results of this survey are applicable only to urban populations in these economies.

The generally high response rates on our survey was a direct result of both the short length of the survey and the relatively closed-ended questions we asked respondents. Survey interview times varied between 3 – 10 minutes. We used the evocative word association technique to measure the strength of brands. For handset manufacturers, the interview protocol was as follows:

Question 1: Please name every handset manufacturer brand you can think of?

[Interviewer: Repeat back to the respondent all brands identified]

Question 2: Can you think of any others?

[Interviewer: If they can identify others, repeat back entire list, including new names. Repeat Question 2 until respondent replies “no”]

Question 3: I am now going to say a series of words, and, after each word, I would like you to say the name of the first Handset Manufacturer that comes to mind. There are no wrong answers.

“Cool”, “Creative”, “Reliable”, “Good Value”, “Cheap”, “Technically Advanced”, “Good Service”.

For wireless operators, the interview protocol was as follows:

Question 1: Please name every cellular service provider brand you can think of?

[Interviewer: Repeat back to the respondent all brands identified]

Question 2: Can you think of any others?

[Interviewer: If they can identify others, repeat back entire list, including new names. Repeat Question 2 until respondent replies “no”]

Question 3: I am now going to say a series of words, and, after each word, I would like you to say the name of the first cellular service provider that comes to mind. There are no wrong answers.

“Cool”, “Creative”, “Reliable”, “Good Value”, “Cheap”, “Technically Advanced”, “Good Service”.

Asking respondents to volunteer the names of every firm in a specific domain (Questions 1 and 2) provides a particularly good indicator of whether consumers recognize specific brand names. Aggregating these answers across the sample provides a measure of “Share of Mind”, i.e., the percentage of respondents who actually recalled any particular brand.

Question 3 then asks consumers to associate particular qualities with their recalled brands. These seven qualities – “Cool”, “Creative”, “Reliable”, “Good Value”, “Cheap”, “Technically Advanced”, “Good Service”– are important to different demographics, and the weight attached to each will vary in different economies. For example, “cool” and “creative” are more important decision factors for younger individuals (relative to older individuals), while “cheap” is more important in price-sensitive markets like China and India (relative to a market like Japan).

These correlations are important, since they provide the thrust areas for marketing, pricing and engineering efforts by our client organizations. We provide these country and region-wide correlation metrics on a company and country basis in our various CONSUMEREADY™ publications.

*Wireless Strategy
Survey Methodology:*

Given the competitive nature of the Japanese handset manufacturing domain and Japan’s leadership position in this space, we also undertook a strategy survey of suppliers and channel partners of Japanese handset manufacturers and operators. A structured questionnaire was mailed/faxed/mailed to executives at over 100 suppliers and channel partners. We received 21 completed surveys.

The questionnaire asked respondents to rate various characteristics of handset manufacturers and operators. We would classify these characteristics into two broad areas: 1) technology innovation; and 2) business strategy. On technology innovation, channel partners were asked to rate manufacturers on five indicators that we thought would adequately capture technology innovation in the handset domain. These were:

1. The quality of manufacturers’ IP portfolios in the handset domain
2. The quality of engineering in existing handsets
3. The quality of design of existing handsets
4. The quality & innovativeness of existing platforms, and
5. The ability to integrate R&D, design, and manufacturing functions.

Respondents were asked to provide their rating on a scale of 1-7 with 1 being “not innovative at all” and 7 being “very innovative”.

For business strategy, channel partners were asked to rate manufacturers and operators on five indicators that we thought would adequately capture various elements of strategy in this area. In this case, 1 = “not competitive at all” and 7 = “very competitive”. For manufacturers, these characteristics were:

1. Intellectual Property Licensing Practices
2. Price Strategy
3. Platform Capabilities
4. Marketing Strategy, and
5. Systems Integration Strategy.

For operators, these were:

1. Management Strength
2. Price Strategy
3. Content Strategy
4. Branding and Marketing Strategy, and
5. Financial Strength.

Two notes of caution when interpreting the results of our Strategy Survey:

1. While all of the respondents were very knowledgeable about the wireless space in Japan, we think that any given respondent would not have had enough specific information or knowledge to judge *all* 15 characteristics of every handset manufacturer and/or operator in Japan. Respondents, therefore, may have ranked firms appearing at the top of the questionnaire more positively than those appearing at the bottom or may have applied the same ranking to several firms to reduce their time commitment for this questionnaire.

2. In an effort to keep the questionnaire length to a minimum, we asked individuals to rate firms on a scale of 1-7 for characteristics such as “intellectual property licensing practices” or “platform capabilities” or “price strategy”. In all instances, the interpretation of these words was left to the respondent. While this interpretation can be better controlled for in an interview setting, our experience shows that even in interviews, interpretations of what is meant can be affected by the respondent’s or the interviewer’s own biases. Nonetheless, in the case of our questionnaire (as in any questionnaire), different respondents may have opposite opinions on what business strategy is or is not “competitive” or “innovative”. For example, it is possible a respondent may think that a price strategy where a manufacturer drastically *reduces* prices was “very competitive” while another may think that a price strategy in which another manufacturer *raises* prices was “very competitive”. While we think these interpretive anomalies are usually averaged out, clients are advised to use caution when interpreting results.

Annex B: Financial Metrics Methodology

We use nine standardized indicators to analyze the financial status of handset manufacturers and operators in the wireless space. These span three areas: liquidity, debt, and profitability. The indicators we use are calculated as follows:

Liquidity

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Quick Ratio} = \frac{\text{Current Assets} - \text{Inventories}}{\text{Current Liabilities}}$$

$$\text{Inventory Turnover} = \frac{365}{(\text{Cost of Goods Sold}/\text{Inventory})}$$

Debt

$$\text{Asset Coverage} = \frac{\text{Total Assets} - \text{Deferred Charges} - \text{Intangible Assets} - [\text{Current Liabilities} - (\text{short-term debt} + \text{Current Portion of long-term Debt})]}{\text{Total Debt Outstanding}/\text{Currency Unit 1,000}}$$

$$\text{Cash Flow : Debt Outstanding} = \frac{\text{Net earnings (before extraordinary items)} - \text{equity income} + \text{minority interest in earnings of subsidiaries} + \text{deferred income taxes} + \text{depreciation} + \text{Deductions not Paid in Cash}}{\text{Total Debt Outstanding}} \%$$

Profitability

$$\text{Operating Profit Margin} = \frac{\text{Net Sales} - \text{Cost of Goods Sold}}{\text{Net Sales}}$$

$$\text{Net Profit Margin} = \frac{\text{Net Earnings (before extraordinary items)} - \text{equity income} + \text{minority interests}}{\text{Net Sales}} \%$$

$$\text{Pre-Tax ROA} = \frac{\text{Net Earnings (before extraordinary items)} + \text{income taxes} + \text{total interest charges}}{\text{Total Assets}} \%$$

$$\text{Pre-Tax ROE} = \frac{\text{Net Earnings (before extraordinary items)} + \text{income taxes} + \text{total interest charges}}{\text{Value of Common Shares Outstanding} + \text{Contributed Surplus/Paid-In Capital} + \text{Retained Earnings} + \text{Other Adjustments (e.g., Foreign Exchange)}} \%$$

Rather than use “rules of thumb” to judge each of the above measures, we developed normalized indices to rank overall financial strength. For manufacturers, this was the Handset Manufacturer Financial Index (HMFI); for Wireless Operators, we developed the Wireless Operator Financial Index (WOFI). The methodology for calculating HMFI and WOFI was fairly simple:

1. We calculated the average of the liquidity (except inventory turnover), Debt (except Cash Flow: Total Debt Outstanding), and profitability measures separately;
2. We then normalized each of these measures to the minimum in the peer group to get an index number for each of these measures (minimum = 100);
3. The average of the three indices was then used to calculate a “blended index” which was again normalized to the minimum in the peer group.

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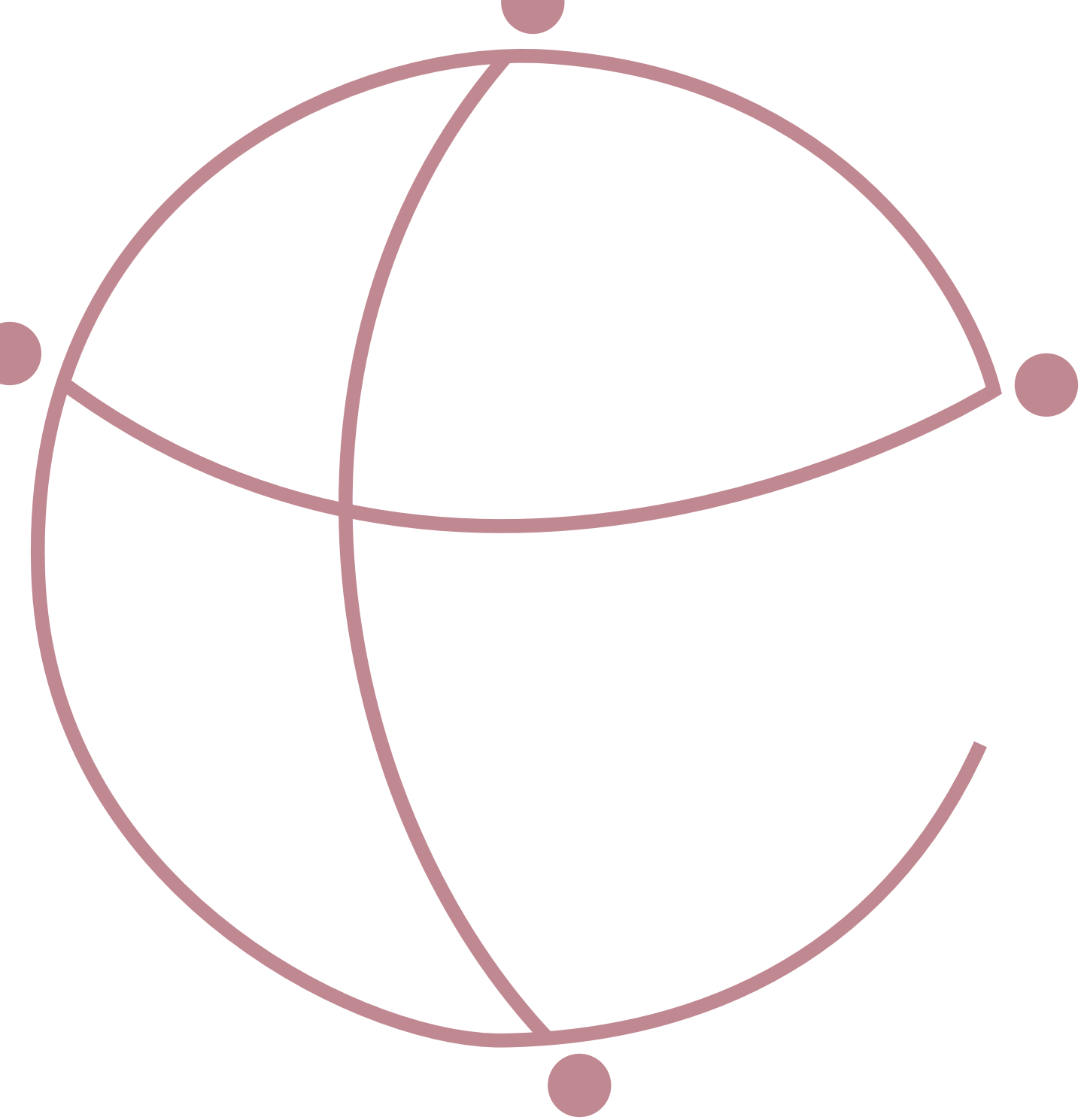
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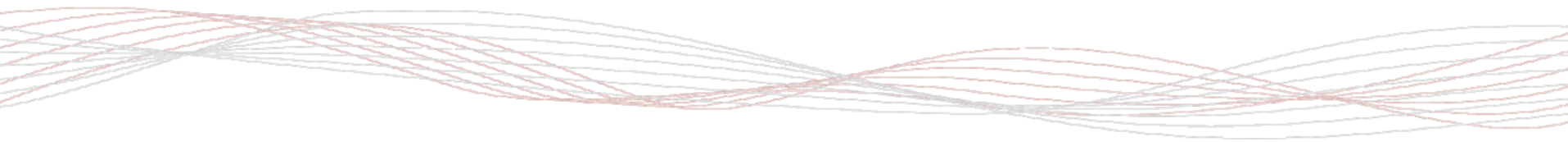
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