

Innovation in Telecom Services -Framework and Analysis Based on the Case of International Pre-paid Calling Cards in Japan

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Summary

Much work on innovation has focused on the manufacturing sector. In this paper, we propose a framework for analyzing innovation in services centred on capability and technology integration. We illustrate the theoretical points made by conducting a case study on an international telephone communications provider Brastel, which introduced significant innovations in international calling services, in the form of rechargeable pre-paid calling card, through effective application of standard IT. Brastel is situated against its main competitors, considering two dimensions of price and service breadth and convenience. A novel technique for measuring competitiveness based on price and service index is introduced. The following competitors were selected: NTT, KDDI, Japan Telecom, Fusion Communications, J-Call / World Link, G-Call, ASP Check, Primus, QuickPhone, and MCI. To create the service index, factors such as ease of use, convenience, number of languages in which the services are available, and additional features were taken into account. The company itself and the rechargeable card innovation were analyzed through in-depth interviews and data collection. It was shown that a competitive advantage was maintained through internal and external integration capabilities.

Key words: service industry, telecom service, innovation, Japan, capability integration

1. Introduction

Over the last decades, services have become more and more important in the world economy, accounting for roughly three quarters of the GDP of most developed countries. Academic studies about service innovations and their significant economic impact, however has not increased at the same pace. At the same time, information technologies have also evolved significantly, and the possibilities of cheap and effective interaction with customers afforded by them are particularly interesting for service companies.

More important than having domain over cutting-edge information technology, however, is to be able to apply it effectively. This paper is based on a study that highlights this argument. The analyzed company, Brastel, an international telecommunication provider in Japan, has introduced a service innovation in the form of a rechargeable pre-paid calling card, which has since been imitated and created a market niche. No particularly new technology was involved in its implementation; it was rather the clever integration of different established technologies that made the innovation possible, and it was effective organizational integration and customer focus that made it successful. Thus, the research is centered on the analysis of capability integration and application of information technologies towards service provision.

First, a theoretical framework is presented and the research methodology, scope, and limitations are described. The market for international calls in Japan is then analyzed with the objective of providing background information on the competitive environment faced by the company analyzed in the case study. The company is situated within this market through a competitor analysis, providing insight into different market niches and competitive strategies.

A novel technique for measuring competitiveness based on price and service index is introduced. Finally, we present relevant discussion points and conclusions.

2. Theoretical Framework

2.1. Innovation in Services

The main purpose of this section is to develop a theoretical framework to structure the research. It revolves around an assessment of current relevant theoretical work regarding services innovation, capability integration, and the application of information technology. The following research questions have guided the research effort:

- 1) How does a company in an user-centred service sector articulate internal competences to innovate and launch new services?
- 2) Does IT facilitate organizational integration? How is IT linked with and aligned to the organization as a whole?

Schumpeter was the first to recognize the importance of innovation and to consider technology not as an exogenous factor, but as an asset that cannot be transferred instantly. This gave rise to a great body of theoretical work aimed at analyzing dynamics of innovation and technological development. Nevertheless, several researchers have identified a bias in innovation studies favoring

manufacturing as opposed to service enterprises (Miles, 2001, and Harvey et al, 2001). This is in contrast with the trend of increasing reliance on services by advanced economies. The U.S. Department of Labor predicts that services will be responsible for roughly 75% of total job growth from 2000 to 2010 in the American economy. As argued by Gallouj (2002), there is widespread consensus on the view of service sectors as technological laggards, which tend to draw on innovations brought by manufacturing as a primary source of technological progress.

Miles in particular has pointed out that more careful research, however, has revealed that service industries do innovate. Advances in telecommunications and banking (e.g. ATMs), due to their technological content, are often cited examples. Sirilli and Evangelista (1998) have analyzed the Italian service sectors through surveys indicating that, between 1993 and 1995, one third of the market services firms studied have introduced technological innovations, a ratio similar to that of manufacturing companies. They also point out the difficulties in mapping organizational and non-technical innovations, which are arguably underestimated by manufacturing studies also.

Another example is the successful history of Benetton, as described by Belussi (1989). After early manufacturing innovations achieved by machinery adaptations, most of their growth was accompanied and afforded by innovations in their retailing system and supply-chain structuring, coupled with sound application of IT, which actually amounts mostly to innovation in the services component of their business.

Some effort has been put in characterizing the specificities of innovation processes within the services environment, and more recently into producing a generalized innovation theory that encompasses not only manufacturing but services as well. Sirilli and Evangelista note that they found more similarities than differences regarding services versus manufacturing innovation processes, but more discriminating characteristics might be found if integration, organizational and non-technical innovations would be studied more deeply.

2.2. Definition of Service

Services represent a very wide range of economic activity, including transportation, communications, retail, banking, gardening and much more. One common characteristic is the intangibility associated with them and the fact that they are produced as they are consumed. By means of a definition, Kotler and Armstrong (2004) define it as: "Any activity or benefit that one party can offer to another that is essentially intangible and does not result in the ownership of anything."

There is great diversity in the services industry. As Miles (2001) points out, it is useful

to provide a tentative classification in order to reduce complexity. Though extremely aggregated, services can be broken down into three classes; 1) Physical Services, 2) Human or Person-Centered Services and 3) Information Services. The last category is sub-divided into *mass media*(businesses which mainly distribute standardized information in a large scale, such as cinema and broadcasting), *infomediaries* (which distribute non-standardized information to specific recipients, such as telecommunication companies, and also financial brokers), and *knowledge services* (companies that produce and interpret specialized information, such as in accountancy, consultancy in general, engineering, and outsourced R&D).

All information services have traditionally been early and heavy users of IT, due to the extensive impact it has on their business. Though the impact of IT is somewhat clearer or more immediate in information services, the other categories benefit significantly from information technology as well. This is especially true in providing customer interaction when a large audience is involved and when analyzing business data to improve operations. Additionally, just as services constitute a highly heterogeneous industry, there are different approaches to innovation. In this paper, we will focus mainly on information services.

2.3. *Organizational Integration*

Whiston (1992) argues that, in terms of organizational integration, technical change, and in particular implementation of information technology, will increasingly require an explicit transfer of encoded data, from what was previously in the “human psyche”, to the computerized data network. This will tend to highlight existing organizational or managerial deficiencies, in the sense that the codification process implies much more explicit and technically defined integration. Despite all the hype and high expectations that frequently surround new information technologies, by their very nature they impose a less flexible way of doing business, as opposed to simple human interaction. Rigid organizational structure, lack of management skills, and workforces lacking confidence and technical experience can compromise not only the introduction of new technologies, but the necessary systems change and subsequent effectiveness.

In addition to this, Tether and Metcalfe (2001) argue that innovation studies in the services environment tend to bring out inter-relationships between businessmodels, organizational forms, technology and outputs, to a greater extent than in manufacturing, where focus tends to be more concentrated on the product and production process. At the same time, studies of services generally highlight the importance of knowledge forms other than, or complementary to, technological knowledge and formally defined R&D, particularly about the market and customer

behavior.

2.4. The Concept of Capability

The research is centered on the key concept of capability. The notion of corecompetence was created, which is firm-specific and closely related to intangible assets, know-how, and accumulated technological resources (Miyazaki, 1995). For the purposes of this paper, the terms competence and capability can be used interchangeably. As the development and improvement of services often requires tight integration of market and technological knowledge, it is important to consider the concept of capability integration. Naturally, this coupling is important in any industry, as technologically great products can still fail due to poor marketing or by failing to meet customer needs.

2.4.1. Capability Building and Integration

In modeling the dynamics of capability building and integration, Iansiti and Clark (1994) provide some interesting insights, focusing on problem-solving activities as the fundamental unit of knowledge creation. The actions taken by a company are derived from its capability base, which in turn depends on its knowledge base. Problem solving is considered to be the dynamic link between them. As problems are tackled, new knowledge is sought to deal with them, and additional knowledge is gained from the solution itself deeper market understanding, for example. As new knowledge is merged into and assimilated by the company, eventually it will improve its capability base, thus broadening the spectrum of potential future actions. This process is somewhat analogous to the double spiral of organizational learning mentioned by Freeman and Soete (1997), where the codification of tacit intelligence into formal systems leads not only to codified knowledge, but also new tacit knowledge, which comes from the analysis of the codified information.

Also, the concept development phase is associated with a significantly higher level of external integration, as new knowledge, both on technical and market issues, is sought after and analyzed. The implementation phase is more geared towards getting things to work, as opposed to thinking about what to do, and the focus shifts to internal integration and how to fit the solution in the company's organizational structure, or even how to adapt the structure itself to a new business situation.

2.5. The Role of IT

As pointed out by Whiston (1992), when the introduction of new technology fails to meet expectations, the technology itself may be blamed, and the crucial role played by the organizational aspects of the implementation is often forgotten. The interaction of human and technical systems in an organization is then more important than the technology merits by themselves. Thus a solid understanding of technical and ultimately business benefits associated with the introduction of information technology requires not only technical knowledge by the systems department, but an understanding of the impact on the whole organization, spread from top management to the workforce.

Once operations are in place and the company is in business, however, organizational integration can go to great lengths in ensuring sound business application of IT. If guidelines for technology integration and services provision are put forward by the workers who intend to benefit from it, in the user areas of the company, the fit between the company business goals and its technological portfolio is surely to improve. Furthermore, the IT department gains significantly important business knowledge by interacting frequently with workers in the rest of the company, then enabling it to take advantage of technological opportunities which are not visible to non-technical people. The high level of organizational integration frequently associated with services' innovation make this kind of coupling all the more important.

2.6. Methodology

The research methodology consists in the illustration of the theoretical concepts put forward here through the case study of Brastel, an international telephone communications provider in Japan. Initially, the market for international telephone calls in Japan is analyzed, highlighting trends and issues important for the case study. This analysis is followed by a study of the competition within this market, with the objective of positioning Brastel against its competitors. A novel approach is put forward for the competition analysis, based on two dimensions: price, and service convenience and breadth. Finally, the company itself and the services provided are analyzed, with emphasis on capability integration aspects. In this paper, we focus on the first 2 steps, analysis of the market and competitive benchmarking.

With fewer than 200 employees, the company can be classified as a small or medium enterprise (SME). The case is interesting for two main reasons. First, the company grew significantly in the last years due to its successful innovation in international calling services by the introduction of a rechargeable pre-paid card, as opposed to traditional, single-use ones. Secondly, there is

the fundamental role of organizational integration and application of IT in the innovation and subsequent evolution of the provided services, as well as the diversification of target customers.

One of the authors has had the experience of interacting with the company both as a customer and more directly through a period of part-time work when this research was conducted. E. Wiggers joined Brastel as full time staff in April 2004 upon graduating from Tokyo Tech. The latter provided invaluable access to the company's internal structure and strategic positioning, as well as the nature of their external integration activities, particularly towards customers. The case study was conducted with a fair amount of observation and interviews, in trying to grasp the articulation of the company in providing and improving its services and answering the research questions. Easy access was available to all organizational levels, from customer service attendants to the company's two CEOs. The good relationship with the company overall also afforded access to data which small telecommunication providers are often secretive about, such as traffic data.

3. Analysis of the Market

3.1. Telecom Licenses

To operate in the Japanese telecommunications industry, a company must obtain a license from the Ministry of Public Management, Home Affairs, Posts and Telecommunications. There are three kinds of licenses: Type I, Special Type II, and General Type II. Basically, a Type I license allows a company to lay physical telecom infrastructure inside Japan, and is given only by explicit government permission. A Special Type II license allows a company to operate using leased circuits on public switched networks, providing services to an undetermined number of people on each end of the connection, i.e., as a traffic carrier. In this case a company can also set up telecom equipment in Japan with the purpose of connecting to facilities abroad. The requirement for entry is registration with the government. Finally, a General Type II license applies to businesses not covered by the other two licenses, and the requirement for entry is notifying the government.

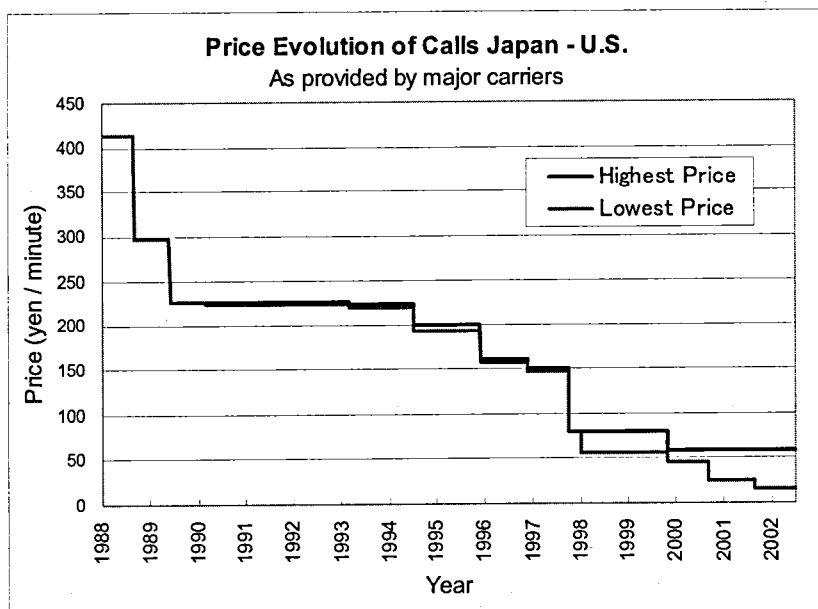
A lot of the cheap providers of international calls in Japan are licensed as General Type II, and so is Brastel. Not having their own physical network infrastructure, for domestic or international connections, they rely on interconnection agreements with domestic phone companies and international carriers. One notable exception to this is Primus, a big global player which has Japanese units licensed both as Type I and Special Type II. As a result, a competitive

market for telecommunications carriers is a key factor in the provision of low cost international calls in Japan.

3.2. Competition at the Carrier Level

For more than a decade, pro-competitive policies issued by the Japanese government have driven down the cost of international communications, as can be seen in Figure 1. Naturally, the cost of domestic telephone calls has also gone down significantly, however we are interested mainly in international costs. Domestic costs will play their role in the final rates one must pay to call abroad, and thus will be dealt with indirectly.

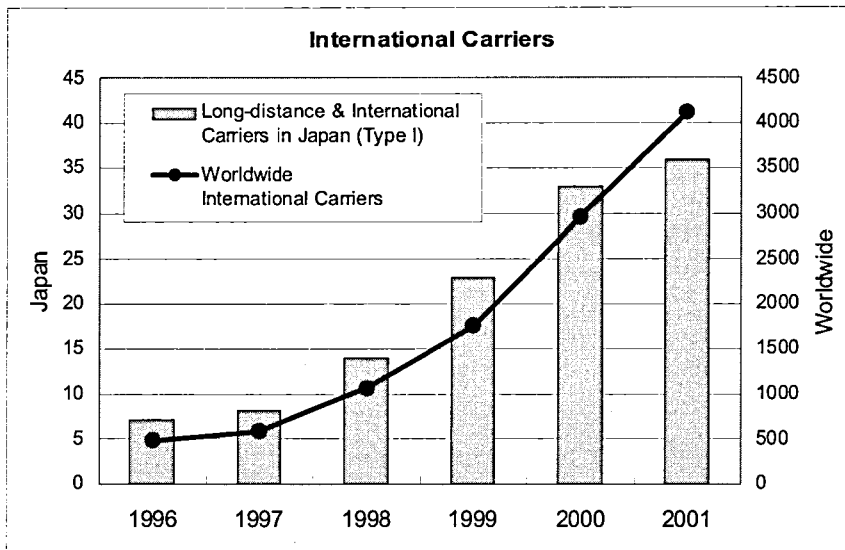
The price reduction process for international calls was started after the monopoly held by KDD on international communications ended, giving birth to KDDI and the New Communication Carriers (NCCs). In the analysis shown in Figure 1 the prices practiced by major carriers in Japan are shown. These are KDDI (former KDD), Japan Telecom (former ITJ), Cable & Wireless (former IDC), DDI, TTNNet, NTT Communications, Deutsche Telekom, and Fusion Communications. Until 1998, the market was dominated by KDDI, Japan Telecom and Cable & Wireless. After that there was another surge of new entrants, resulting in the increased spread between highest and lowest prices.



Source: Telecommunications Carriers Association.

Figure 1: Price Evolution for Calls between Japan and US

Intensified competition is not a phenomenon unique to Japan however. The number of international communication carriers has increased significantly all over the world in the last years. As seen in Figure 2, Japan has mostly kept up with the world in this process. This chart plots the global number of international carriers against the number of Type I carriers in Japan registered as long distance and international operators.



Source: Telecommunications Carriers Association; TeleGeography.

Figure 2: Growth in the number of international carriers

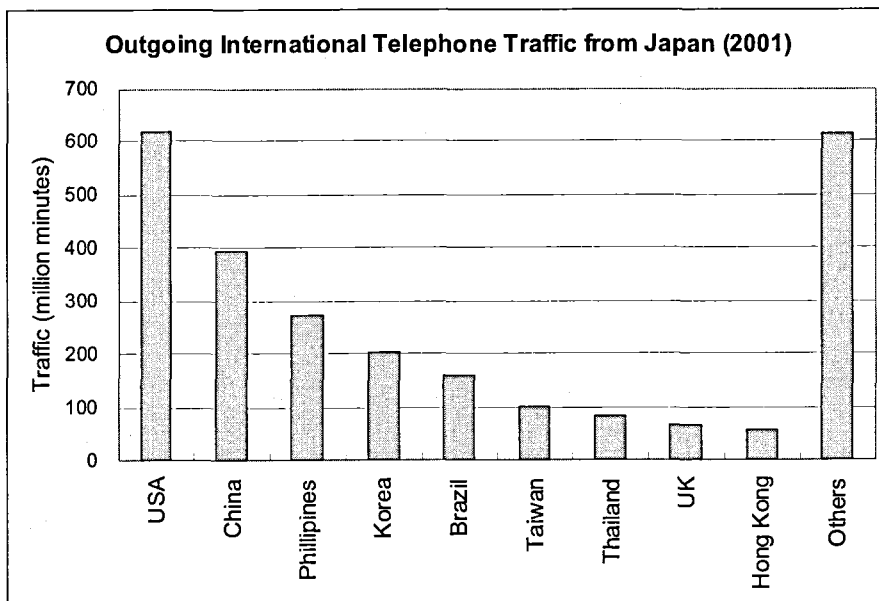
As might be expected in this technology and capital intensive business, it can be said that most of the new entrants in Japan are rather large companies, interested in placing their own telecommunications infrastructure inside the country. Special Type II carriers, also allowed to compete in completing international calls, have not increased in numbers as nearly as Type I carriers interested in international communications.

On the other hand, looking at General Type II telecommunication providers, which are allowed to operate only by interconnecting with other businesses who own telecom infrastructure, we see that competition has increased at a rather constant pace. Naturally, this includes not only international call providers, but any business interested in providing telecommunications by tapping into established public network infrastructure. However, it seems reasonable that General Type II providers who are seeking to provide international communications are capitalizing on the increased competition at the Type I and Special Type II carrier levels.

3.3. Customer Diversity and Language Barriers

Providing services for the international community in Japan poses formidable challenges regarding customer interaction. The more active participation of customers when using services, as opposed to buy manufactured goods, only highlights this problem. Considering the fact that a significant amount of foreign residents in Japan are not fluent in either Japanese or English, providing marketing and customer service in a number of different languages becomes critical.

Figure 3 presents total international telephone traffic outbound from Japan in 2001, according to the destination country. It is evident that the U.S. is a primary target for international call providers, accounting for a full 24% of the market. It is also possible to notice increased price competition towards the American market. This concentration is a likely reason why most post-paid calling companies in Japan focus primarily on the American market, concentrating on offering customer service in Japanese and English.



Source: Telecommunication Carriers Association.

Figure 3 : Outgoing International Telephone Traffic from Japan (2001) by Destination Country

By effectively covering marketing, customer service, and competitive prices for the top nine destinations (U.S.A., China, Philippines, Korea, Brazil, Taiwan, Thailand, U.K., and Hong Kong), a company is able to target 76% of the international calling market in Japan. This effort requires ability to communicate with customers in seven different languages (Japanese, English, Chinese,

Tagalog, Korean, Portuguese, and Thai). Most of the pre-paid competitors analyzed meet this condition, as opposed to the post-paid ones.

Now, by looking at Figure 3, we see that a significant amount of traffic is finely distributed over a much larger set of destination countries, representing a 24% market share of the same magnitude as the US. Of course, people will end up calling those countries whether they can find services offered in their native language or not, looking for the best prices while doing so. The result is that most companies do not worry too much about this share of the market, at most simply making sure they offer reasonable prices. After all, communicating in an increasing number of different languages for increasingly smaller markets does not seem a very tempting business proposition.

However, that is where capability integration comes into play. If a company is able to provide proper customer support for a larger set of target countries, meaning communicating with customers in their native language, while at the same time providing reasonable prices, a significant competitive advantage is achieved. The key is to rely on a lean organizational structure, coupled with a high degree of integration, to keep the language diversification costs low. This strategy is actively pursued by Brastel.

4. Competitor Analysis

Having described the market for international calls as a whole, in this section we intend to assess Brastel, in relation to competition. The players are analyzed from a customer perspective, by looking at retail prices and services offered. It is difficult to compare them directly, because of the complexity of the rate systems various destination countries, and sometimes variable rates according to the time a call is placed and the diversity of services offered various dialing procedures at distinct levels of convenience, pre-paid or post-paid billing, breadth of languages in which the services are offered, and so on.

To overcome this problem, two indexes to measure competitiveness were devised, namely a price index and a service breadth index, and different players were compared based on these. Their composition naturally incurs a fair amount of simplification, though care has been taken to avoid significant biases.

4.1. Post-paid Services

Regarding payments, there are two main ways of providing international telephone calls: pre-paid

or post-paid. With post-paid services, the customer makes calls, receives the bill at the end of the month and pays it. This is arguably the most convenient payment method, except for potential maximum credit limits.

Brastel does offer a post-paid service, however it was not analyzed here because it is more expensive when compared to the rechargeable card and its offering is mostly limited to a rather narrow share of customers, namely Japanese and Latin Americans. Other customers can still subscribe to post-paid services, but generally with severe credit limits.

4.2. Traditional Pre-paid Services

With pre-paid services, the customer shells out the money first, in exchange for a guarantee he or she will be able to make a determined amount of international calling. Traditionally, a calling card will be bought, with a secret access code printed on the back. The customer scratches the code clean, and places the calls by following the printed instructions, dialing the access code at some point. After the afforded credit is used, the card becomes useless and is thrown away.

The guarantee of future service, coupled with the fact that the customer never sees any bill, allows for some marketing plays. Pre-paid cards sometimes have “connection fees” meaning that each time a call is completed a certain amount of credit is consumed, often beyond the equivalent of one minute of conversation at the more clearly advertised rate. Billing granularity can also be more coarse than the standard 6 seconds used in most telephone services, up to one or more minutes. The company pockets the round-off. One additional trick is that most pre-paid cards have a shelf-life after the first use; generally the credit is good for one to six months.

Another issue about traditional pre-paid cards relates to branding and illicit strategies. At the bottom end of the market, there are several traditional calling cards provided by a number of small companies. These were not considered in the competitor analysis because they are often focused in a specific destination. In the case of China for example, the card"@providers appear and disappear quite often, distribution channels are much more limited, and anecdotal evidence suggests that connection quality is terrible. This brings a bad reputation for cheap pre-paid calling cards, and thus branding becomes a significant competitive factor. In Japan, KDDI and MCI for example benefit from this in particular.

A further problem comes in the form of distribution channels. Traditional pre-paid calling cards are distributed and sold as if they were products or manufactured goods, even if the objective

is service provision. This means setting up retail channels, controlling stocks, and setting up a system for retailers to return excess unsold cards. The cards carry monetary value, so lost or stolen shipments are a big concern. As a result, many cheap traditional calling cards are not very easy to find. They are often sold in specialized stores that focus on a specific foreign community in Japan, such as ones that sell imported products from Brazil or China. In this respect, KDDI again has a significant competitive advantage, having automatic vending machines spread throughout the country carrying a well known card, branded with the company name.

In 1999 Brastel started offering its own traditional pre-paid card. Because of the reasons described above, however, managers figured they would have severe difficulties in competing in the pre-paid market. At that time Brastel was a very small provider, only a fraction of what it is today, focused mainly on the Latin American foreign community in Japan.

4.3. Rechargeable Pre-paid Services

This innovation was implemented by Brastel and has been a primary growth driver since its introduction in 2000. Instead of buying a pre-paid calling card, using it, and throwing it away, the customer is able to use the same card over and over again, by making additional payments in convenience stores easily available anywhere in Japan. This simple fact has deeper business ramifications than it might appear at a first glance. The model is not protected by intellectual property rights, and therefore was imitated after its success was noticed.

4.4. Selection of Players

The competitors to be analyzed were selected based on several criteria, including interviews with Brastel market analysts, searching the Internet, and observing media advertisements. Based on this, the following competitors were selected: NTT, KDDI, Japan Telecom, Fusion Communications, J-Call / World Link, G-Call, ASP Check, Primus, QuickPhone, and MCI.

NTT: post-paid services provided by the giant of telecommunications in Japan

KDDI: both post-paid services and the KDDI SuperWorld pre-paid calling card, provided by the company that used to hold a national monopoly on international communications

Japan Telecom: post-paid services by another big company

Fusion Communications: post-paid services provided by a relatively new telecommunications provider in Japan, providing cheaper services than those of big incumbent companies and operating also in the domestic market

J-Call / World Link: post-paid services billed via credit card, provided by a company more focused on foreigners when compared to the companies mentioned above

G-Call: post-paid services provided by a company focused mainly on Japanese people

ASP Check: calling services provided through a rechargeable pre-paid card, an imitation of the one introduced by Brastel, by a company called Alpha Network

Primus: a rather large global telecommunications company, based in the U.S., providing calling services through post-paid billing, another rechargeable pre-paid card (Primus PhoneBank), plus a mix of five different traditional pre-paid cards

QuickPhone: another rechargeable pre-paid calling card

MCI: calling services provided through a traditional pre-paid calling card, by a global giant in the telecommunications industry

4.5. Price Index Composition

Price is arguably the most important competitive aspect in providing international calls, provided reasonable quality is achieved. All of the analyzed prices refer to toll-free calls, meaning that the full cost of the call is included in the rate. Further, prices were analyzed separately for calls originating from fixed phones and from mobile phones, since all players offer quite different rates depending on this factor.

In order to compare prices for the different players, their rates to different countries were summarized in a single value. For this, the top nine destinations of international telephone traffic outbound from Japan were considered, accounting for roughly 75% of the market. The traffic from 1999 to 2001 was averaged to dampen historical biases. The price index for each competitor is obtained by multiplying its rate for each of the destinations by the share presented.

Brastel toll-free rates depend on the cost of the domestic call from the customer's phone to the access point in Tokyo, from where the call is connected abroad. The result is that there are four rate classifications, two for fixed phones and two for mobile phones. To obtain a single price, a simple average is considered between either classification A and B, for fixed phones, or C and D, for mobile phones. It would be better to consider traffic data, but this would require expensive database queries which were not authorized by the company. A further problem had to be overcome for competitors offering variable rates according to the time the call is placed, namely NTT, KDDI, and Japan Telecom. All other players offered flat rates. In this case, a single rate was obtained according the number of hours each varied rate was available during one week. All three competitors using variable rates use this same scheme to determine

discounts. The rate for the first minute is also more expensive, but not by much, so this factor was ignored and the prices for subsequent minutes were considered.

4.6. Price Comparison

Through calculations according to the previous section, price indexes were obtained for each of the players, for calls both from fixed and from mobile phones, and the results are shown in Figure 4. The players plotted to the left of Brastel all offer post-paid services. The ones to the right are pre-paid providers. Of the pre-paid competitors, Primus PhoneBank, QuickPhone, and ASP Check have imitated the rechargeable card business model. The remaining ones offer calling services through traditional single-use cards. The far right column, Primus Mixed Pre-paid, is obtained by considering a mix of five different single-use calling cards sold by Primus. The best rate for each destination was selected from the cards offered. Finally, Fusion does not publish rates for calls from mobile phones, so it wasn't considered for that analysis.

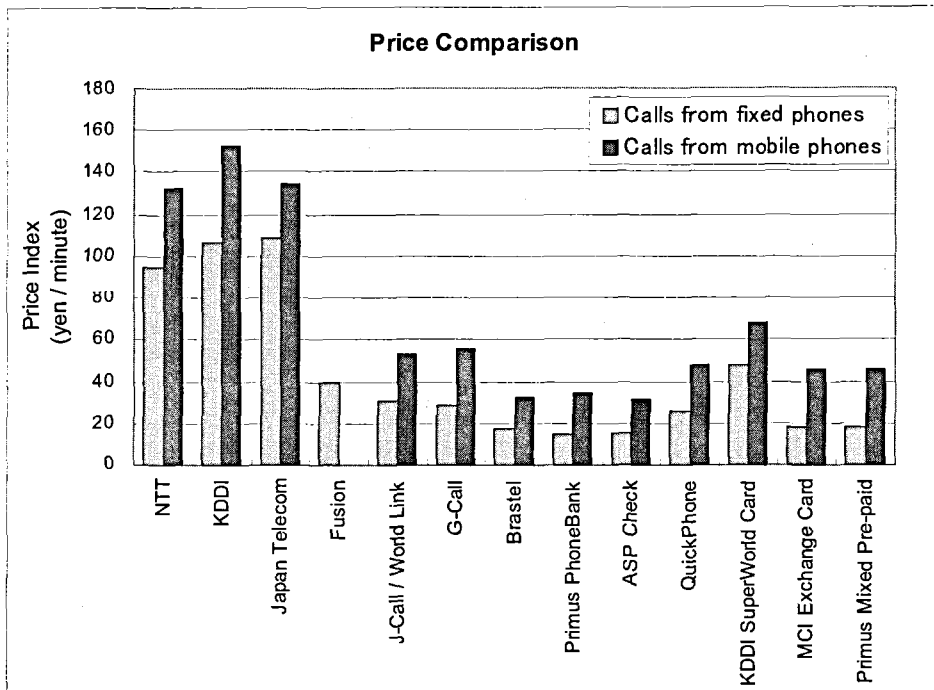


Figure 4 : Price Comparison

The selected incumbent providers NTT, KDDI, and Japan Telecom charge several times more

than Brastel or any other competitor for their calling services. It is possible to get a clearer competitive picture by using Brastel as a reference. For this, a competitiveness index was created by dividing the price index of Brastel by the competitor price index, as shown in Figure 5. Brastel is plotted as a reference, with competitiveness of 100%.

Primus offers the best prices for calls from fixed phones, but is not as competitive regarding mobile ones. It is also interesting to see that they charge significantly higher rates from customers using their traditional calling cards (Primus Mixed Pre-paid), as opposed to ones using the rechargeable card (Primus PhoneBank). ASP Check actually offers the best prices overall. All pre-paid providers, plotted to the right of Brastel, are significantly more competitive than post-paid ones, which are depicted to the left. On the post-paid arena, newcomers are significantly more competitive than NTT, KDDI, and Japan Telecom.

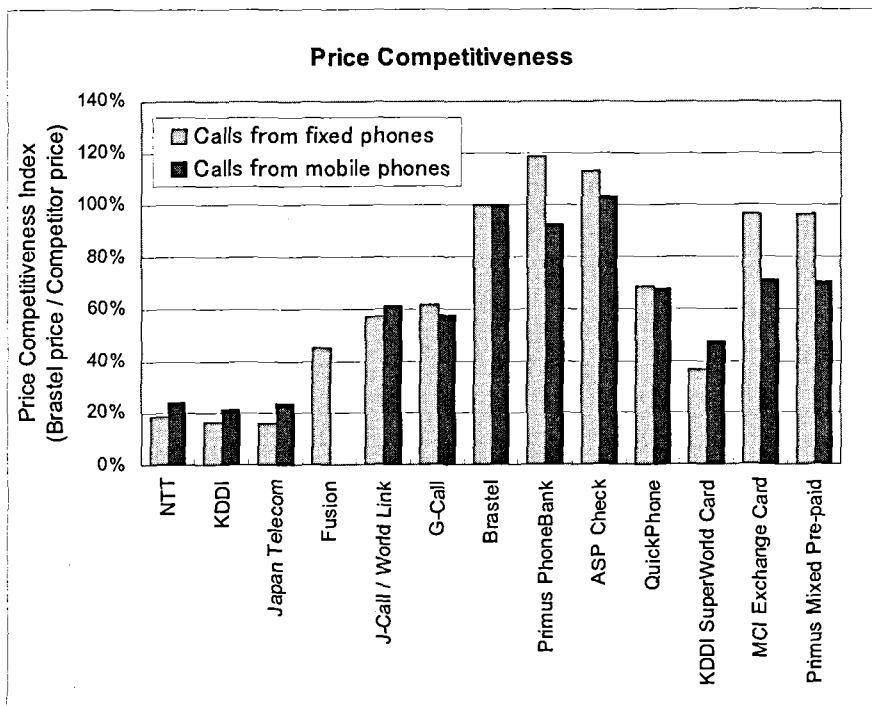


Figure 5 : Price Competitiveness

Due to the large markets for the U.S. and to identify possible differences in relation to the aggregated set of nine destinations, separate price competitiveness analyses was performed considering only rates to the US, as in Figure 6.

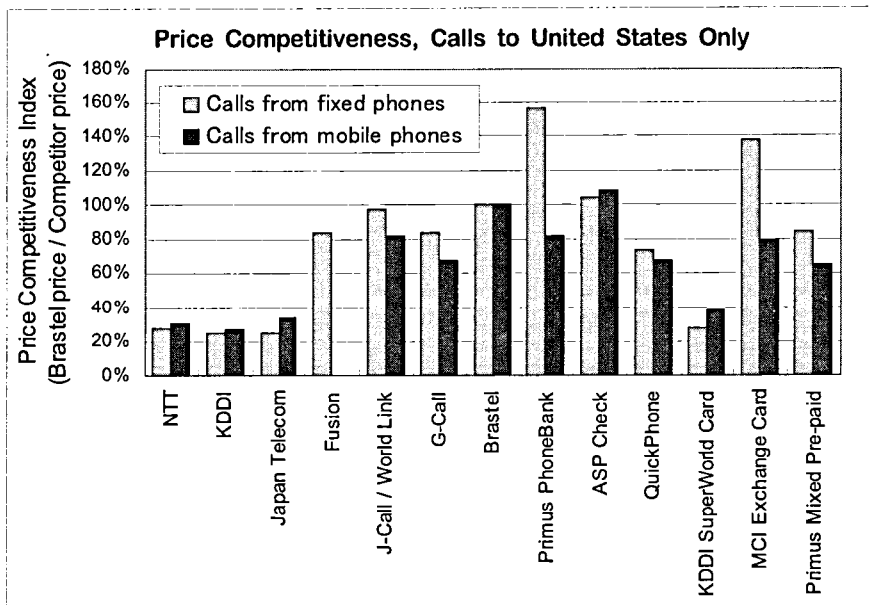


Figure 6: Price Competitiveness, Calls to United States Only

For the U.S. market, it is interesting to see that Primus and MCI offer by far the best prices, but only if the call is placed from a fixed phone. This may reflect the fact that they are able to make use of their own telecom infrastructure all the way to the U.S., thus not having to pay any interconnection fees. It is not clear however why the advantage disappears when the call is made from mobile phones. One possible explanation is that other providers might be able to negotiate better interconnection contracts due to larger traffic volume. Also, post-paid providers Fusion, J-Call / World Link, and G-Call are all much more competitive for calls to the U.S. This suggests that the U.S. pose a more competitive target market, in which post-paid providers are more focused, while other destinations face more competition from pre-paid competitors.

4.7. Competition Interdependence

As described in the previous chapter, not all international call providers own or operate international or domestic telecommunication connections. In fact, to provide calls for the whole world, all of them have to rely on different telecom carriers, since no single company has complete worldwide coverage. In terms of domestic connections, NTT in particular has an advantage over other competitors, due to its massive telecom infrastructure inside Japan.

Brastel currently relies on 13 different international carriers, among these KDDI, Japan Telecom, Primus, and MCI, which are registered as Type I carriers. Furthermore, Brastel has independent contracts with all domestic telecom operators in Japan, including NTT, Japan Telecom, Fusion, and all mobile phone companies.

The relation between competitors at this level is quite different from retail competition. Access and traffic are bought and sold based on interconnection fees, which are scale-dependent. Access to competitors' telecom networks is guaranteed through government regulation, a common trend in the whole world, though this is a hugely complex subject not analyzed here. When dealing with international connections, however, several carriers operating in Japan focus exclusively on providing wholesale traffic, meaning that they do not compete for final customers. This increases price competition for international connections in particular.

4.8. Service Index Composition

It is also interesting to compare the players regarding the qualitative aspects of the services offered. The complexity involved is much greater than when comparing prices, but even then a simple service index can provide some insight into how the players compete. To create the index, factors such as ease of use, convenience, number of languages in which the services are available, and additional features (e.g. ability to check call history, account management through the Internet) were taken into account. Each player is compared against a set of criteria, and scores are added according to the conditions summarized in Table 1.

4.9. Dialing Procedure

The dialing procedure was evaluated mainly from a convenience point of view. Four types of procedures were identified, through conditions A to D. At the bottom of the scale (A), the customer has to go through three or four steps to be able to place a call. First she must dial a toll-free number. The call is answered by the provider, and the customer is directed through the other steps by voice prompts. The next step is often dialing a language selection code. Then the customer must identify herself (or rather the pre-paid card she is using) by dialing an access code. Finally, the destination number is dialed, starting from the country code. This procedure gets 10 points (A).

To increase convenience, some pre-paid providers offer a phoneregistration option. The dialing procedure is similar to above, but if the call is made from a registered phone, the company already knows which language the customer prefers and her access code, based on the phone

Table 1 : Service Index Composition

Criteria	Condition	Score
Dialing Procedure	A Customer has to dial a toll-free number, then an access code, and finally the destination number. Often includes language selection also.	10
	B Customer has to dial a toll-free number, then the destination number. No access code or language selection necessary.	20
	C One-step dialing: international prefix immediately followed by the destination number.	30
	D Customer can choose to use either one-step dialing or a toll-free number with access code, thus enabling calls from any phone.	35
Payment	E Traditional, single-use pre-paid calling card.	10
	F Rechargeable pre-paid calling card.	20
	G Post-paid billing.	30
	H Rates are flat, meaning they do not vary according to the time or location in Japan.	5
Languages	I Services offered in 3 different languages or less.	1
	J Services offered in 4 to 6 different languages.	5
	K Services offered in 7 to 10 different languages.	10
	L Services offered in 11 different languages or more.	14
Additional Features	M Customer is able to check call history.	4
	N Customer can register speed dial numbers at the service provider.	4
	O Customer can use the service to place calls while traveling in other countries.	4
	P Customer can manage his account by logging into the company Internet website.	4
Maximum Score		100

number used to place the call. This reduces the number of steps to two: toll-free dialing, plus dialing the destination number. While more convenient, the customer is unable to register the full number in her mobile phone address book for example. Notice that phone registration is optional the customer retains the ability to borrow a friend's phone to place a call using his own calling card, by dialing his access code. This procedure gets 20 points (B).

Then there is one-step dialing, arguably much more convenient. The customer dials an international prefix (00XX...), immediately followed by the destination number starting from the country code. No other step is required, and the call is completed automatically. It is now

possible to store the full number in a mobile phone address book, and place the call by a single button press. Notice that in this case the customer must use his own phone to place the call. This procedure gets 30 points (C).

Finally, it is possible to offer the convenience of one-step dialing and the flexibility of access code dialing simultaneously, enabling the customer to easily make calls from his own phone, while also being able to use other phones as well, at a cost of additional dialing steps. Brastel does this by offering different international prefixes for each case. This procedure gets 35 points (D), the maximum score in terms of dialing.

4.10. Payment

Similarly, the payment dimension was also rated from a convenience and ease of use point of view. At the bottom are single-use pre-paid calling cards (E). Firstly, since they are pre-paid, the customer must make the payment in advance and obtains a limited amount of calling time available. Naturally, the customer can buy multiple cards, but he can't combine them into a single call. Secondly, for continued use the customer must repeatedly buy them at a retail store, which is often not so easy to find. In this case, a score of 10 points is achieved (E).

For rechargeable cards, even though they are also pre-paid, convenience is significantly greater. The customer has the option of recharging the card multiple times, and often can choose different higher payment amounts if he uses the card frequently. Thus the available calling time, even though still limited, is not as fixed as with traditional calling cards. Also, to recharge the card all the customer has to do is to go to a convenience store, easily available anywhere in Japan, to make another payment. Rechargeable cards earn 15 points (F).

Arguably the most convenient way of paying for calling services is post-paid billing. The customer only has to pay for services he or she already consumed. Further, though sometimes there is a monthly credit limit, it is often quite high, and if the customer calls abroad frequently an extended limit can generally be negotiated. Thus, in practical terms the available calling time is unlimited. Because the convenience is much improved, post-paid billing gets 30 points (G).

Finally, some providers offer flat, simple to understand prices. This is regarded as enhancing the ability of the customer to judge the cost of using the services, and therefore is made part of the payment criterion, affording additional 5 points (H). Most of the providers get these points, except for NTT, KDDI, and Japan Telecom, whose prices differ according to time, and Brastel, because their rates are divided into four classifications according to the phone from

where the call is placed. The maximum score regarding payments is then 35 points, combining post-paid billing and simple prices (G + H). Thus dialing and payment, considered to be the most important criteria, add up to a maximum of 70 points (D + G + H), or 70% of the absolute maximum.

4.11. Language

The language criterion refers to the breadth of support offered by the service provider in terms of idioms in instructions for use and customer service. As specified in Table 1, a company offering services only in Japanese and English gets a score of 1 in this dimension (I). If services are offered in, say, Japanese, English, Chinese, Tagalog (Philippines), Thai, Korean, and Portuguese, this affords 10 points (K). The maximum score for language support is 14 (L), implying that services are offered in 11 or more different languages.

4.12. Additional Features

Some providers offer additional features that enhance the value of the core service provided, international calling. Four different additional features were identified in this sense. For each additional feature offered, the service provider earns additional 4 points, totaling to a maximum of 16 points (M + N + O + P).

First, there is the ability to check call history (M). Naturally, all post-paid providers offer this, even though detailed phone bills listing each call can cost extra, as in the case of the services provided by NTT for example. The pre-paid providers that offer this do so through the company's Internet website, at no additional cost.

Secondly, there is the ability to program speed dial numbers at the service provider, as opposed to the customer's own phone (N). Arguably this is useful mainly to companies that do not offer one-step dialing, or for customers that do not use their own phone to place the calls. They might use a PBX extension from their office, for example, in which case phone registration is not practical. For the service provider, the call originated from one of the central outgoing lines used by the customer's company, making it impossible to automatically identify which customer is placing the call based solely on phone number information.

Thirdly, some companies offer support for calls placed from abroad (O). This means that the client can use the services while traveling overseas. Finally, some providers allow the client to manage his service account by logging into the company's Internet website (P). For some customers, this is arguably more convenient than having to call customer service, which can

mean several minutes on hold and is often not available 24 hours a day. Since it is also cheaper for the provider to use the Internet as a means of interaction, this feature should in fact become more and more common in the future.

4.13. Service Comparison

The results of the service index analysis are presented in Figure 7. Naturally, because different aspects of the provided services are combined, some care has to be taken when evaluating the chart. Even then, there are interesting similarities when considering post-paid (to the left of Brastel), rechargeable pre-paid (Brastel, ASP Check, Primus PhoneBank, QuickPhone), and traditional pre-paid providers (KDDI SuperWorld Card, MCI Exchange Card, Primus Mixed Pre-paid). At a first glance, the services provided by post-paid competitors are very similar. The same is true for traditional pre-paid competitors, though Primus offers wider language support.

In terms of dialing convenience, post-paid competitors and Brastel are better positioned because they offer one-step dialing. In fact, Brastel is the only pre-paid company to provide this, and takes it a step further by also offering customer identification via access code dialing, thus enabling customersto use any phone to place the call. Among other pre-paid providers, Primus PhoneBank and QuickPhone are the only other services allowing phone registration, which eliminates access code and language selection dialing when the customer uses his own phone to place the call.

Regarding payment, post-paid providers are in a significantly better position, as argued in the previous section. Fusion, J-Call / World Link, and G-Call have a higher rating because they use flat-rates, which are arguably more convenientfor the customer. Among the pre-paid providers, ASP Check, Primus PhoneBank, and QuickPhone are the best positioned, combining a rechargeable card with simple prices. Brastel loses a few points, even though it also uses a rechargeable card, because of the different rate classifications.

In terms of language support, post-paid providers are much more limited. This is in accordance to their higher price competitiveness to the U.S., a very big market requiring only English and Japanese. Pre-paid providers are much more diversified, targeting the foreign community in Japan by supporting multiple languages. Additional features are more evenly distributed among the players, even though none offers all four of them simultaneously.Brastel comes close, but it is still not possible to use their rechargeable card in other countries.

Finally, it is interesting to notice the increased variability among the rechargeable pre-paid providers. Brastel comes top because of one-step dialing convenience and wide support for languages

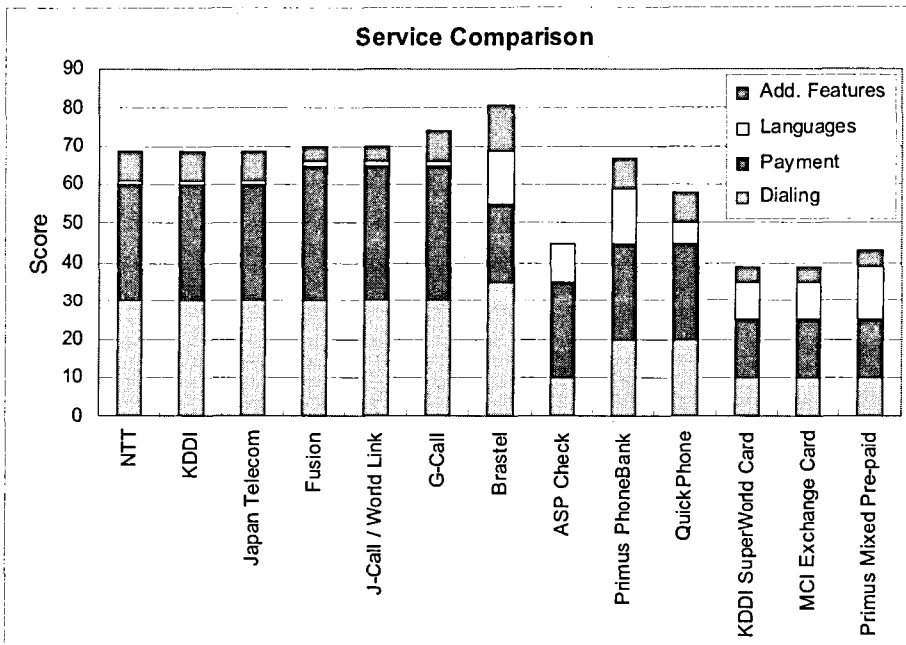


Figure 7: Service Comparison

and additional features, even though the prices are more complicated due to the different rate classifications. Primus PhoneBank comes second. It also offers wide language support, however dialing is less convenient and only two additional features are offered (speed dial programming and use from other countries.) QuickPhone comes third, due to narrower language support (only English, Japanese, Spanish, and Portuguese.) A bit surprisingly, ASP Check comes last, even though it was launched in September 2001, as one of the first imitations of Brastel’s rechargeable card. No additional features are provided, and dialing is as inconvenient as with a traditional pre-paid card no option of phone registration.

5. Summary and Conclusions

It is now possible to position the analyzed players regarding price and service competitiveness, as shown in Figure 8. In terms of price, the rates for calls from fixed phones were considered. Naturally, care has to be taken into reading the service axis in special, because quite different criteria are summarized together.

Brastel is well positioned both from price and service perspectives. Their rates are not absolutely the best, but still are extremely competitive. On the service dimension, one-step dialing coupled with wide language support and additional features put Brastel in a very comfortable situation, at least when considering any other pre-paid competitor.

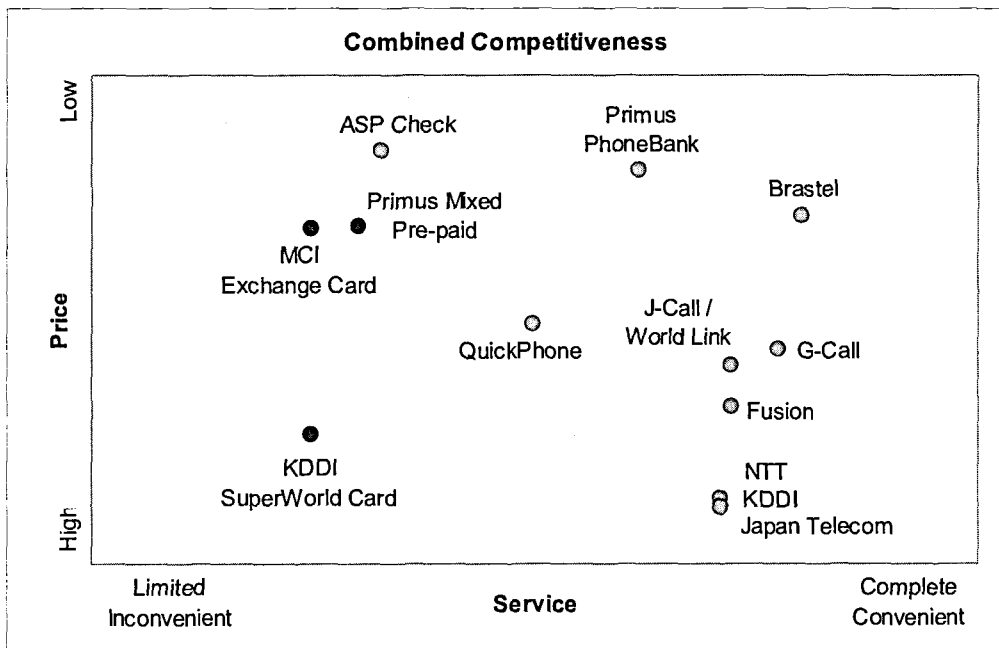


Figure 8 : Combined Competitiveness

Among other rechargeable cards, QuickPhone shows up with average prices and service convenience overall. According to the range of supported languages (Japanese, English, Portuguese, and Spanish) and interviews with Brastel market analysts, they are more focused on the Latin American community in Japan, and in fact used to compete head to head with Brastel, when the latter was also focused on this market a few years ago. ASP Check on the other hand offers great prices, and rather wide language support, a total of 9 different languages. However, even then they fall behind in service convenience when compared to other rechargeable cards, due to the cumbersome dialing procedure and the absence of any additional features despite having been in the market for a longer time than QuickPhone and Primus PhoneBank.

After Brastel, the strongest competitor among rechargeable card providers is Primus PhoneBank, which tends to offer better prices (mainly due to lower rates to the U.S. actually) and good

service convenience, basically lacking only one-step dialing. However, this is a key competitive advantage which is expensive to obtain.

On the traditional pre-paid front, we see the least sophisticated services. Prices offered by MCI and Primus are quite good, but still lag behind rechargeable cards in a general sense. KDDI on the other hand is able to charge premium prices for its SuperWorld calling card, most likely due to its brand name and comprehensive distribution network.

Looking at the post-paid providers, the big incumbent companies NTT, KDDI, and Japan Telecom offer basically the same services, at the same prices. Smaller post-paid competitors Fusion, J-Call / World Link, and G-Cal offer similar services, but at lower prices. Still, post-paid billing means higher prices than almost any other competitor, except for the KDDI SuperWorld Card. Furthermore, it is useful to notice the broad area covered by rechargeable cards, as opposed to traditional ones and post-paid providers, which are more neatly grouped together. This suggests that the market for rechargeable cards is more immature when compared to the other two, perhaps understandably since Brastel created this service only a few years ago, in 2000.

Naturally, it is possible to say that there is a market for each group of competitors, as individual customers pose different needs, price sensitiveness, and brand name valuation. However, rechargeable cards in general constitute a significant threat to traditional calling cards, by offering both better prices and better services. Post-paid providers rely more on brand name and convenient services, and are able to charge more for it. Peter Drucker (1985) would perhaps classify this as “creaming” the market, i.e., concentrating on a lucrative niche, while allowing other competitors to grow more efficient by tackling tougher challenges at smaller profit margins. Brastel managers estimate that post-paid competitors tend to offer better connection quality (NTT, KDDI, and Japan Telecom in particular), and are more focused on business users and native Japanese. They argue that the foreign community in Japan is in general more sensitive to prices and prone to use pre-paid providers, so the goal is to provide good quality at low cost. The study has also confirmed the notion of ‘servuction’, in which the customer plays an integral part in the value provided by the services consumed, being able to customize them for his or her particular needs and preferences.

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