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# Innovation in Services ~ Assessment of Competitiveness based on the Case of International Pre-paid Calling Cards in Japan

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## ABSTRACT

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.

**Keywords:** service industry, telecom service, innovation, Japan, capability integration

## 1. INTRODUCTION

Although services have become more and more important in the world economy, 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 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 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

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 [1, 2]. 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 [3] 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 [4]. 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.

## 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 [5] 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 [1] 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*, *infomediaries*, and *knowledge services*. 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. In this paper, we will focus mainly on information services.

## 2. 3. 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 case is interesting for two main reasons. Firstly, 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<sup>1</sup>. 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.

## 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 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. 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. Types of Services

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

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<sup>1</sup> E. Wiggers joined Brastel as full time staff in April 2004 upon graduating from Tokyo Tech

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. 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. After the afforded credit is used, the card becomes useless and is thrown away. Rechargeable pre-paid services was an innovation 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.

### 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. 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. Most of the pre-paid competitors analyzed meet this condition, as opposed to the post-paid ones. 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. 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. 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

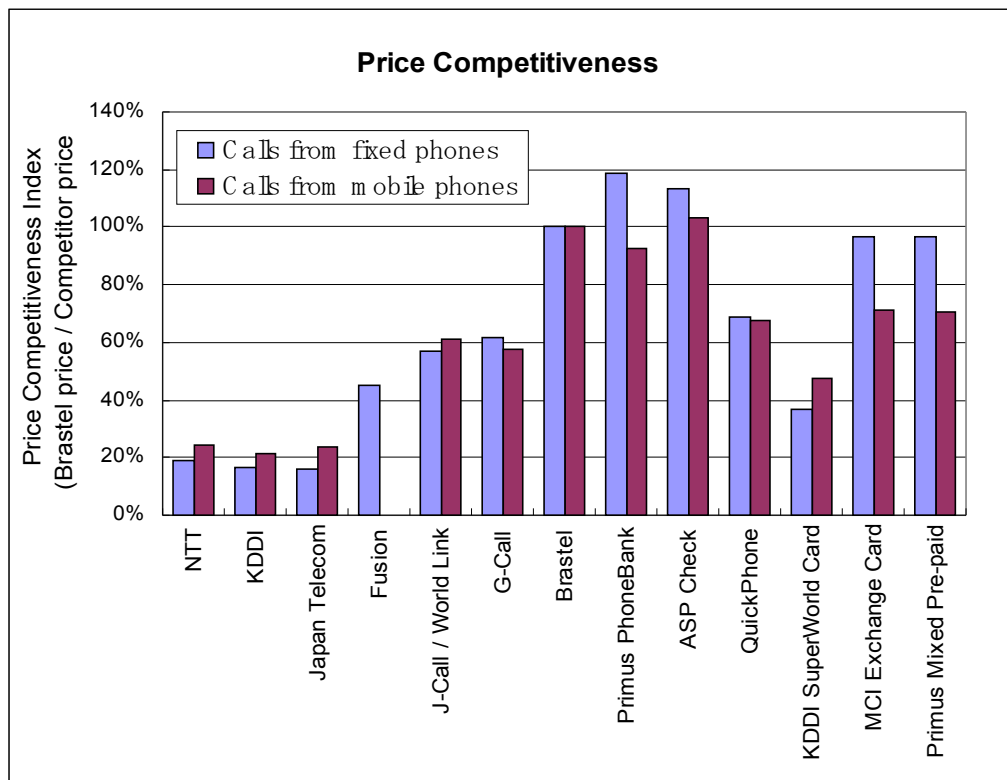
#### 4. 2. Price Index Composition

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.

#### 4. 3. 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. 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. 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. 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 1. 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 1> Price Competitiveness

## 5. 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.

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 also language selection.	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 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

<Table 1> Service Index Composition

### 5. 1. 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. To increase convenience, some pre-paid providers offer a phone registration 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. This reduces the number of steps to two: toll-free dialing, plus dialing the destination number (B). Then there is one-step dialing, arguably much more convenient (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. This procedure gets 35 points (D).

### 5. 2. 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). For rechargeable cards, even though they are also pre-paid, convenience is significantly greater. Arguably the most convenient way of paying for calling services is post-paid billing.

### 5. 3. 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.

### 5. 4. 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).

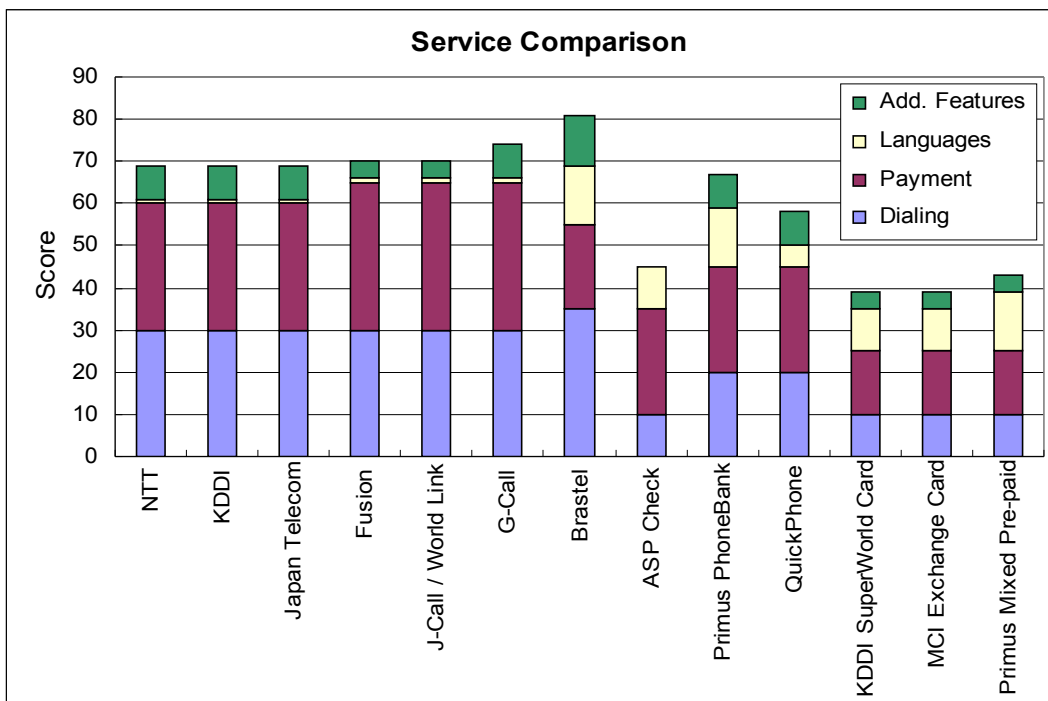
### 5. 5. Service Comparison

The results of the service index analysis are presented in Figure 2. 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 customers to 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 convenient for the customer. Among the pre-paid providers, ASP Check, Primus PhoneBank, and QuickPhone are the best positioned, combining a rechargeable card with simple prices.

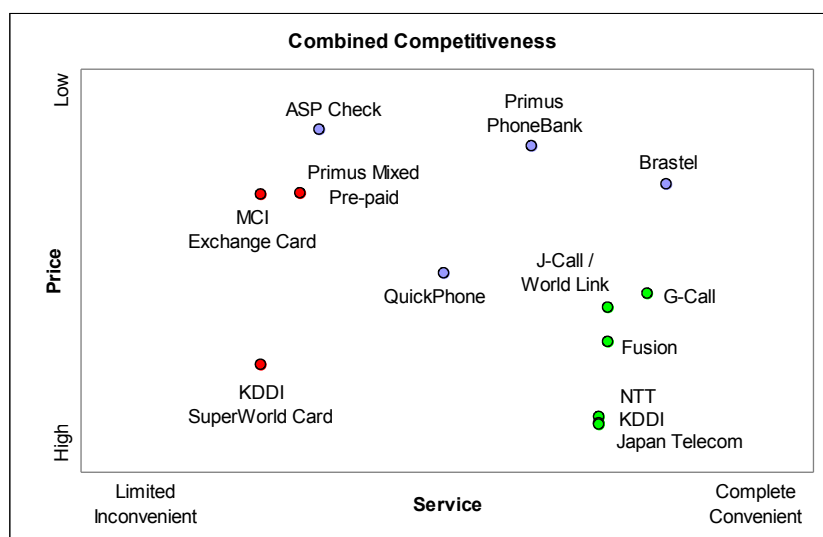
In terms of language support, post-paid providers are much more limited. This is in accordance to their higher price competitiveness to the U.S., a very big market requiring only English and Japanese. Pre-paid providers are much more diversified, targeting the foreign community in Japan by supporting 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 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. 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.



<Figure 2> Service Comparison

## 6. CONCLUSIONS AND SUMMARY OF COMPETITIVENESS OF KEY PLAYERS

It is now possible to position the analyzed players regarding price and service competitiveness, as shown in Figure 3. 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 3> Combined Competitiveness

After Brastel, the strongest competitor among rechargeable card providers is Primus PhoneBank, which tends to offer better prices 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. 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 [6] 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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