Competitive forces in Japanese mobile telephony: the case of NTT DoCoMo and KDDI

Mark M. Lennon

Department of Marketing and Finance,
College of Business,
Frostburg State University,
101 Braddock Road, Frostburg, MD 21532, USA
E-mail: markmlennon@gmail.com

Abstract: Since its inception in 1973, Hofer's strategic challenge-response model has been used to explain the strategic environment, and the resources and capabilities in which firms meet strategic challenges. In this study, resource-based view (RBV) is used to describe the model, which is then applied to two Japanese mobile telecommunication companies, NTT DoCoMo and KDDI, as they face the strategic challenge of new 3rd generation technologies. The contribution to the literature is two-fold: first, to determine whether the model is still applicable, and second, to help fill the gap of the paucity of studies on Asian-Pacific mobile communication firms.

Keywords: mobile phones; mobile commerce; NTT DoCoMo; KDDI; case study Japan.

Biographical notes: Mark M. Lennon holds a Doctorate in Strategy and International Business from the University of Rhode Island, and additional degrees from Williams College, MIT, Northeastern University, and Kyoto University – Japan. He is an expert in Japanese mobile telecommunications from both his academic credentials and over 20 years working in the information technology field in both the USA and Japan.

1 Introduction

In this paper, we apply the Hofer (1973) strategic-challenge response model to the case of two modern Japanese mobile telecommunications companies, NTT DoCoMo and KDDI. In this model, the firms are described using the terms 'resources and capabilities', for which we draw upon RBV literature for our descriptions.

The structure of the paper is as follows: first there is an overview of the Hofer model, wherein the three main hypotheses and a drawn figure of the model are introduced. Following this, there is a brief review of salient RBV literature, which will be cited in succeeding portions of the paper. From there, the methodology section explains how data was collected. Next, in order to examine Hofer's three hypotheses, the findings section

recounts in detail the application of the model to the two Japanese mobile telecommunication companies NTT DoCoMo and KDDI, before and after the development of 3rd generation (3G) technology. Finally, there is a conclusions section that summarises the findings of the article and gives directions for future research.

## 1.1 The Hofer strategic-response model

The 1973 *Academy of Management Proceedings*, published *Some Preliminary Research on Patterns of Strategic Behavior*, an article by Charles W. Hofer. In order to develop a strategic-challenge response model, Hofer examined 12 years worth of articles from *Forbes* magazines about a group of US firms. In this work, regrettably, he did not go into detail about which industries or specific companies were chosen. From this historic analysis, Hofer then developed three major hypotheses and a model for the qualitative analysis of a firm's strategic behaviour. Table 1 summarises these hypotheses.

Table 1 Hofer model hypothesis

Hofer model hypotheses
1   Alterations in a firm's strategy set (objective, strategy, functional policies) result from either actual or forecast changes in external environment and/or its resources and capabilities.
2   Different types of strategic challenges would elicit different strategic responses.
3   The type of strategic response adopted for a specific strategic challenge would, in general, significantly influence the future success or failure of the firm.

    Source: Hofer (1973)

Figure 1 Hofer strategic challenge-response model (see online version for colours)
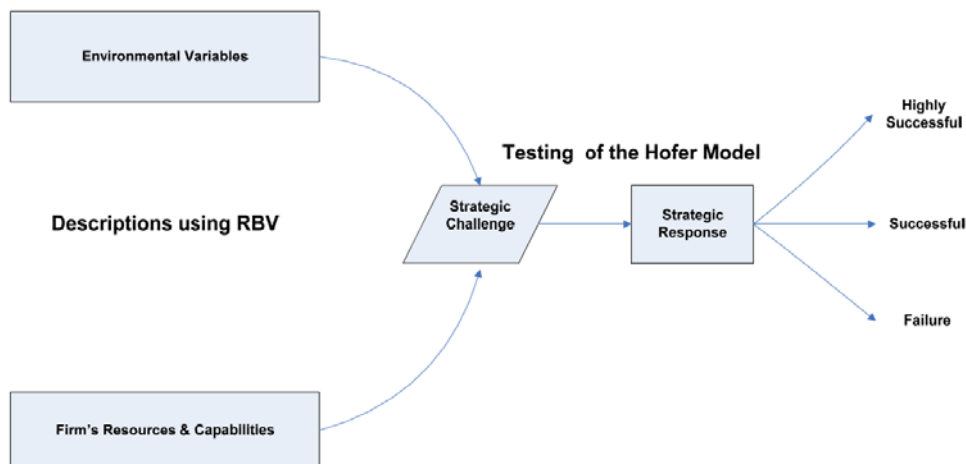
In order to determine their applicability, in the succeeding sections of this paper each hypothesis will be examined in the context of the strategic-challenges and responses faced by the two companies.

Figure 1 illustrates Hofer's strategic-challenge response model. Following along the pathway of the model, the left side identifies the environmental variables in which the

firms operate. Next, the firms' resources and capabilities are described. These two sources then feed into the strategic challenge, which is then processed in the strategic responses. These responses are then deemed to be highly successful, successful, or a failure.

1.2   RBV definitions of resources and capabilities

Table 2 summarises the definitions of resources and capabilities as drawn from salient RBV literature. While there is a plethora of RBV literature to choose from, these six articles were chosen to be a representative sample as they lent themselves to the description of the Hofer model. The articles are then cited in succeeding portions of this paper.

Table 2   Resources and capabilities review

Resources and capabilities described via RBV	
Author(s)	*Resources and capabilities*
Penrose (1959)	Explains the outputs of a firm
Wernerfelt (1984)	Assets, intangible or not, which are semi-permanently linked to a firm
Aaker (1989)	Can be separated into 'assets' and 'skills'
Barney (1991)	Include all assets, capabilities, organisational processes, knowledge and attributes
Grant (1991)	Are the inputs into a production process while the productive processes are capabilities
Amit and Schoemaker (1993)	A set of possessed or all ready controlled factors available to a firm, while capabilities refer to the ability to spread resources to achieve the desired results

Source: Author's research

Penrose (1959) first defined RBV, suggesting that the analysis of a firm's resources explained the output of a firm. Later writings by Wernerfelt (1984) extended this analysis by identifying "resources and products as two signs of the same coin", further defining resources as "the assets, intangible or not, which are semi-permanently linked to a firm".

Barney (1991) uses the term 'resources' interchangeably with 'capabilities', in that a firm's resources include all assets, capabilities, organisational processes, knowledge, and attributes. In this seminal work, Barney also develops a framework for determining whether a resource can cause sustainable competitive advantage (SCA), if the resources meet the four criteria of being valuable, rare, in-imitable, and non-substitutable (VRIS). While analysis of SCA in the context of the two Japanese mobile communication companies being studied in this paper could be quite valuable, the primary aim of this paper is to examine the Hofer strategic challenge-response model. Therefore, the study of Barney's VRIS and SCA is beyond the scope of this work and will be addressed in future research.

Following along the lines of this earlier RBV research, Grant (1991) makes a distinction between resources and capabilities, wherein resources are the inputs into a

production process; these can include not just raw material, but also finance, patents, and technologies. Resources themselves, however, cannot engage in productive processes, which instead require capabilities.

Building upon this work, Amit and Schoemaker (1993) considered resources to be a set of possessed or already controlled factors available to a firm, which can be obtained from the outside, while capabilities refer to the ability to spread resources to achieve the desired results. This is similar to Aaker's (1989) assertion that resources can be separated into 'assets' and 'skills'. Using these explanations, we will now describe our research methodology.

2 Methodology

Factual information about the two companies, NTT DoCoMo and KDDI, is from an assortment of secondary sources. These include texts, newspapers, websites, and magazine articles. Also used were industry and company-specific whitepapers and annual reports of each of the respective firms. For a research strategy, the qualitative case study method was selected because it is both a "process of inquiry and the product of that inquiry" (Kemmis, 1980).

This method lends itself to the use of RBV, as stated by Hoskisson et al. (1999) "the case study methodology may be appropriate for the RBV research because it can provide much richer information about the firm's idiosyncrasies". The case study method also enables both a description (Kidder, 1982) and the ability to test theory (Anderson, 1983; Pinfield, 1986; Eisenhardt, 1989). Earlier case studies illustrate this, including RBV pioneer Penrose's (1960) case study of the Hercules Power Company.

Given that only a limited number of firms could be studied due to time and financial constraints, NTT DoCoMo and KDDI, (the first and second largest mobile operators in Japan), were chosen. They were also selected as they are two opposing firms, in accordance with Pettigrew's (1988) assertion that such a choice of polar opposites better enables the process under scrutiny to be 'transparently observable'. Additionally, the case study method makes possible the asking of 'how' and 'what' questions, which facilitate problem definition and construct (Eisenhardt, 1989), which then lent itself to a better testing of the Hofer strategic-challenge response model.

3 Findings

Mobile telephones are ubiquitous in Japan, with nearly 90 million users, in a country with a population of 120 million people, and a penetration rate of nearly 70%.

In this section, we will now provide a detailed description of the firms under study, NTT DoCoMo and KDDI, through the use of RBV terminology. Subsequently, we will examine the strategic challenges and responses faced by the companies. In doing so, we will compare the results with the three Hofer hypotheses, to determine their applicability or lack thereof. We will now first look at the environmental variables, and resources and capabilities of each firm.

3.1   Environmental variables shared by NTT DoCoMo and KDDI

Figure 2 is the Hofer strategic-challenge response model applied to NTT DoCoMo while Figure 3 is the model's application to KDDI. As can be seen on the left side in both figures, there are environmental variables shared by both firms. Table 3 summarises these shared environmental variables.

Table 3   Environmental variables shared by NTT DoCoMo and KDDI

Environmental variables shared by NTT DoCoMo and KDDI		
Variable name	*Property*	*In Japanese context*
National technology policy	State sponsored division of telecommunication markets	Duopoly of NTT for domestic and KDD for international calling
Telecommunication regulation	Promotion of competition by privatisation of state sponsored telecommunication company	NTT corporation act and the telecommunications business act
Economic	Decade long recession	Willingness to spend on low ticket items
Cultural	Desire by youth to stay connected	'Thumb Tribe' of heavy user

Source: Author's research

Figure 2   Hofer strategic challenge-response model applied to NTT DoCoMo (see online version for colours)
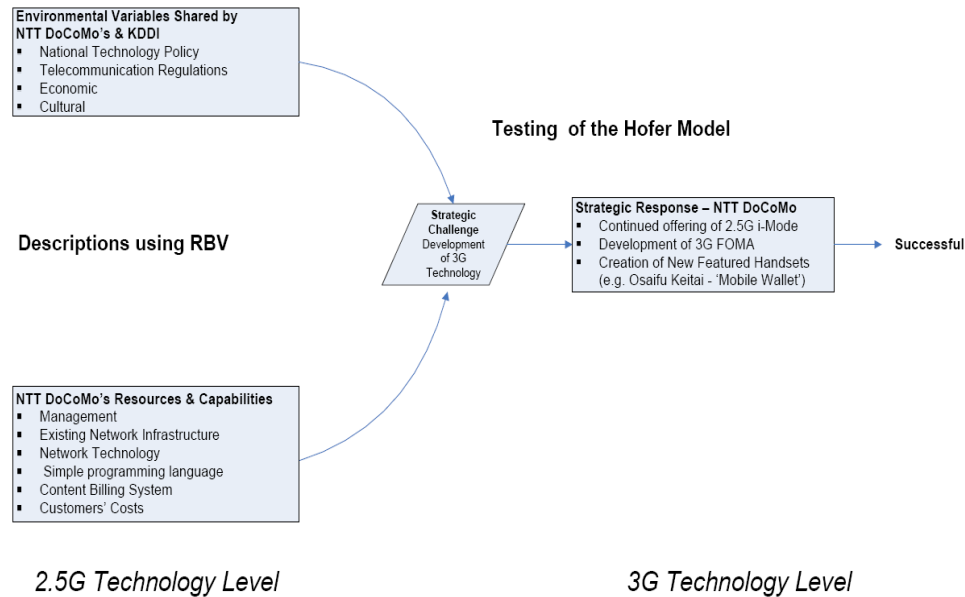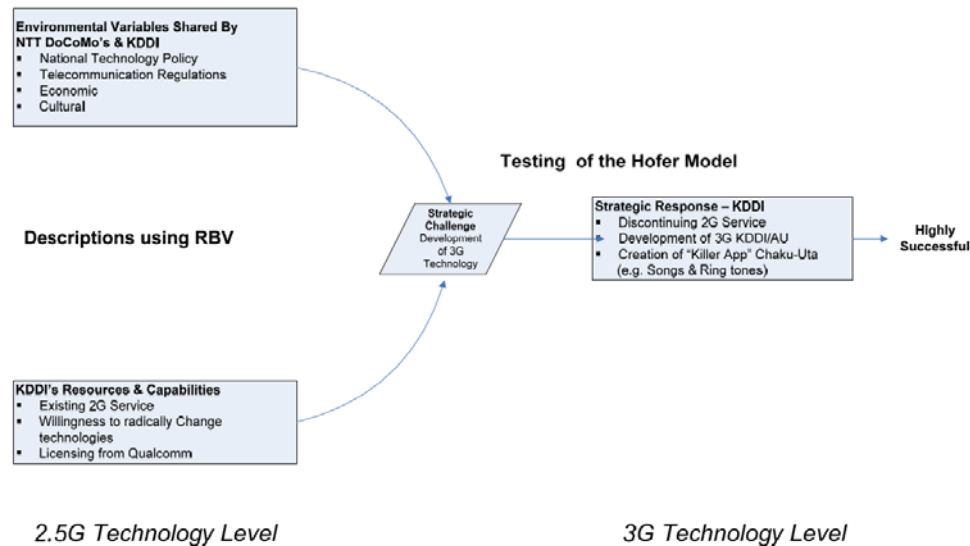
Figure 3 Hofer strategic challenge-response model applied to KDDI (see online version for colours)

3.2 National technology policy

In order to understand the current conditions in the Japanese mobile communications industry, it is necessary to examine the historic antecedents (Steinbock, 2003). RBV supports this assertion, in that Barney (1991) argues that "firms are intrinsically historical and social entities, but that their ability to acquire and exploit some resources depends upon their place in time and space".

In 1944, there was an established base of one million telephones in Japan. Due to the extensive bombing of Japan by the Allies, this number was reduced to 400,000 in the immediate post-World War two-period. In response to this, the supreme commander of allied powers (SCAP, i.e., the occupying forces), sought to remedy the problem by establishing a new public firm Nippon Telephone and Telegraph (NTT), based on the AT&T model of a state-sponsored monopoly.

NTT was charged with the mission to supply the infrastructure, maintenance, and support of domestic telephone calls. At the same time, in 1953, the firm KDD (Kokusai Denshin Denwa-International Telegraph and Telephone) was established to provide international calling service (a market which NTT was forbidden to enter).

In 1979, NTT offered the first mobile service in Japan, a 1st generation (1G) analogue voice system. It was a dismal failure, as by 1989 this service had attracted a mere 200,000 subscribers. This translated into a market penetration of a mere 0.14%. There were several reasons, including high usage costs and the proprietary technology used which eliminated competition. In response to consumer pressures, momentous changes occurred in the Japanese telecommunications industry through changes in governmental regulations.

3.3   Telecommunications regulations

In their study of the Dutch audit industry, Maijoor and van Witteloostuijn (1996) showed that the regulatory environment can be considered when using RBV. In Japan, between 1982 and 1984, through the promulgation of the NTT Corporation Act and the Telecommunications Business Act, NTT was partially privatised in order to promote competition. Another milestone was the ability to purchase handsets, as opposed to the previously leased handsets, which had added greatly to the service costs.

With these changes in regulations, Japan became more hospitable to the development of mobile communications. With the advent of 2nd generation (2G) digital voice technology, in 1991 NTT created a wireless division known as NTT DoCoMo, an abbreviation for 'do communications over the mobile network'. In the Japanese language, the word also means 'everywhere'. As will be shown later in this paper, it was this firm that charged ahead to become the dominant mobile player in the Japanese 2G market.

3.4   Economic environment

Consideration of the economic environment when applying RBV is also found throughout the literature (Wernerfelt, 1984; Barney, 1986; Grant, 1991; De Toni and Tonchia, 2003). In the last decade, Japan has been suffering under a deep recession, accompanied by high unemployment. However, due to the high savings rate of the Japanese, it has been dubbed the 'golden recession', in which middle class purchasing power has remained high. At the same time, economic uncertainty has made Japanese consumers very reluctant to spend these savings on large-ticket consumables (such as housing, automobiles, etc.), which has only prolonged their recession. A notable exception to this is the wholesale adoption of mobile communication, because it is a low-ticket item.

3.5   Cultural environment

Rouse and Daellenbach (1999) in their description of research methods for RBV argue that cultural environment can also be taken into account. In this context, a primary driving force for handset sales and adoption of the newer technologies (e.g., 2G mobile services) is Japanese youth. Due to high unemployment from the bursting of the Japanese speculative real estate market beginning in 1991 and continuing to the present, there is a great deal of free time to enjoy games, music, ring tones, videophones, etc. So common is this phenomenon of usage by the younger generations, that there is even a slang word in Japanese 'oyayubi zoku' (literally 'thumb tribe') to describe them (Davis, 2002).

Having described these environmental variables, however, there is some research that argues that analysing the environment is not the best way to characterise firms. Grant (1991) maintains that in an environment that is in flux, such as that where the technology and customer needs are continually evolving, a better way to characterise a firm is to look at its resources and capabilities. This we will do in the following sections of the paper by first examining the resource and capabilities of NTT DoCoMo, followed by KDDI.

3.6 Resources and capabilities of NTT DoCoMo-2G level

This portion of the paper will now give a detailed analysis of the resources and capabilities held by NTT DoCoMo that enabled the creation of their highly successful 2G mobile commerce technology i-mode. '2G' refers to second generation mobile technology, digital voice and data, whereas, 1G refers to voice only analogue cell phones.

3.7 The rise of i-mode

In 1999, NTT DoCoMo launched the first mobile internet service in Japan. Using 2.5G (digital telephone) service, the new service was dubbed 'i-mode' (internet mode). Given the Japanese love for puns, the pronunciation of 'I' corresponds to the Japanese word 'ai', meaning love. This new service became an instant hit. Within 18 months of its launch, it had attracted more than 10 million subscribers and 20,000 available sites. By October 2001 the number had increased three-fold to more than 30 million users (Steinbock, 2003). In 2005, there were more than 40 million subscribers, making it the market leader in Japan, and one of the largest mobile communications companies in the world (NTT DoCoMo, 2005).

   i-mode's success can be attributed to a variety of resources and capabilities possessed by NTT DoCoMo. These are summarised in Table 4 and analysed in terms of RBV in the succeeding sections.

Table 4   NTT DoCoMo resources and capabilities

NTT DoCoMo 2.5G i-mode resources and capabilities	
Resource	Capability
Management	Innovative leadership by top US MBA graduates is atypical of traditional Japanese firms
Existing network infrastructure	Significant start-up costs savings occur by using a previously built failed pager network
Network technology	Eliminates licensing fees by using home grown W-CDMA wireless standard
Simple programming language	Simple web programming language promoted rapid development of i-mode accessible sites
Content billing system	Centralised the billing system which facilitated the creation of content provider firms. Also provided a continuous revenue stream.
Customers' costs	Encouraged customers to try the new service as no contract required, with payment based on data packet usage, not minutes

   Source: Author's research

3.8 Management

In 1992, under the maverick leadership of Kouji Ohboshi, an NTT executive chosen to serve as president of the NTT DoCoMo subsidiary, major actions were taken in the development of technology (Dvorak, 2003). Initially, he assembled a team of executives who had been trained in the USA. MBA programmes, in order to gain a fresh perspective on the development of NTT DoCoMo as a viable firm.

Reversing the order in which Japanese firms had originally acquired technology as described previously, his paradigm was to be market-driven, embrace competitive pricing, and operate with a deep desire for internationalisation. His chosen product was to create a 2.5G voice and data telecommunications system.

3.9   Existing network infrastructure

Initially, in the early 1990s, a paging system was more popular than the analogue voice services, and was the most profitable endeavour by NTT DoCoMo, with 3 million subscribers. Mr. Ohboshi took then seen as radical move to use for the i-mode system this existing pager, rather than expend the resources necessary to build out a new dedicated network.

Constrained by the limitations of the narrow bandwidth of the existing pager network (9.6 kbps), NTT DoCoMo designed its handsets around this limitation and created a simple menu structure to access the internet within these constraints. The company was able to leverage off of the existing pager network, thereby reducing the required capital investment needed to initiate the i-mode service, hence reducing its risk (Kodama, 2001; Anwar, 2002; Ratliff, 2002).

3.10   Network technology

To protect itself from foreign and domestic challengers, the network was based on the personal digital cellular (PDC) technology, which was incompatible with the technologies deployed by potential competitors. Likewise, instead of adopting worldwide standards, NTT DoCoMo relied on its own home grown wide band code division multiple access (W-CDMA), a derivative of the CDMA standard developed by the US-based firm Qualcomm (Kodama, 2002).

Table 5   Popular 2.5 GM-commerce sites

Popular NTT DoCoMo 2.5G i-mode mobile commerce services
Banking
Stock quotations
Games
Ringtones
Music snippets
Manga (cartoons)
Ticket purchasing
Travel advisory

3.11   Simple programming language

The content for this new i-mode network was produced by using a subset of HTML, compact hypertext markup language (cHTML). This choice of programming language was critical to the success of i-mode, as it facilitated the rapid creation of content. Third party website operators could readily convert their HTML-based websites into cHTML, making it available to i-mode subscribers. In 2005, there were more than 60,000 i-mode

accessible websites (NTT DoCoMo, 2005). With the growth of this network, there is network externality as the network of sites becomes more valuable to the user as more are added (David, 1985; Arthur, 1989; Liebowitz and Margolis, 1994). Table 5 lists some of the more popular applications.

3.12 Content billing system

For the content developers, NTT DoCoMo instituted a billing service that would handle the monetary transactions between user and content provider. This was advantageous for developers because by centralising the billing system, it was unnecessary for content providers to create a billing system and ancillary support structures (e.g., accounting, collections departments, etc.). Instead, content providers could concentrate on deploying their core competencies of rapid i-mode content (Prahalad and Hamel, 1990). This gave them an advantage, as time to market was shortened, enabling them to rapidly gain market share. This creation of market share could then lead to faster profitability (Buzzell and Bradley, 1975). This service became quite valuable and profitable as NTT DoCoMo charged a 9% fee for these transactions.

3.13 Customers' costs

Part of the reason for the impressive success of the i-mode service was financial. Customers were willing to try out the service because the initiation costs were so low. With a monthly fee of about $3.50, usage of the mobile phone was metered by the number of data packets exchanged (be it for voice or data), which can run from free to 10 to 100 Yen for X number of data packets, depending upon the content provider (Ratliff, 2002). This is much more consumer friendly than the pay-by-the-minute plan widely used in the USA. Also unlike the USA, customers need not sign a contract for service.

3.14 Resources and capabilities of KDDI–2G level

Table 6 summarises the resources and capabilities as found in KDDI on the 2G level.

Table 6   KDDI resources and capabilities – 2G level

Resources	Capabilities
Existing network infrastructure	A 2G system that the firm, unlike i-Mode, did not build upon
Licensing	In order to rapidly deploy new network, licensed technology from US-based Qualcomm, obviating need to develop their own platform
Robust technology	Qualcomm's CDMA-2000 (code duplex multiple access) network technology enabled ready conversion of 2G to 3G

   Source: Author's research

3.15 Existing network infrastructure

Through its acquisition of IDO, KDDI inherited a 2G system, with 3 million subscribers. However, as stated in KDDI's (2005) annual report, the firm recognised the downward

spiral of subscribers, so it did not invest any monies into this line of business, and instead treated this 2G service as a cash cow with a limited life span.

3.16 Licensing

KDDI embraced the use of licensing the technology of US-based Qualcomm's CDMA technology. This has enabled KDDI to concentrate its efforts on developing applications instead of an operating platform, as NTT DoCoMo did with its proprietary W-CDMA technology (Gallini, 1984).

3.17 Robust technology

Qualcomm's CDMA-2000 system made conversion from 2G technology to 3G technology relatively easy. This promoted that migration of KDDI 2G customers to 3G services.

In the following sections of the paper, we will first describe the strategic challenge faced by both firms. From this, we will apply the Hofer model's hypotheses to the strategic responses of both firms.

3.18 Strategic challenge: the advent of 3G

The growth of NTT DoCoMo's i-mode system was phenomenal. By May 2001 there were more than 30 million customers using the NTT DoCoMo 2.5G i-mode system (Ratliff, 2002; Steinbock, 2003). This is in a nation of 120 million people. However, NTT DoCoMo realised it could be susceptible to competition, most notably KDDI. Therefore, in the best traditions of Japanese firms, it practiced 'Kaizen', (gradual improvement) and developed and deployed the world's first 3G system (Anwar, 2002; Kodama, 2002).

3.19 Strategic response: KDDI/au service

This section refers to Figure 3, the application of Hofer's strategic-response model to KDDI. We will now apply the Hofer model hypotheses' to KDDI's strategic-responses.

Hofer Hypothesis 1   Alterations in a firm's strategy set (objective, strategy, functional policies) result from either actual or forecast changes in external environment and/or its resources and capabilities.

With the changes in the environment of the Japanese mobile telecommunications field, specifically in the form of NTT DoCoMo's i-mode's formidable lock on the 2G mobile market, KDDI made an early decision not to compete in this market. Rather, in April 2002 it launched its own 3G service. Dubbed the 'AU' service, it offered robust multimedia applications, far more advanced than NTT DoCoMo's 2G i-Mode service. Table 7 lists some of the applications.

Table 7   KDDI/au services and descriptions

Application name	Service
EZ Chaku-Uta Full EZ Chaku-Uta® (ringtones/songs)	These services allow downloads of CD quality songs and music clips. The most popular of all au services, they have boosted au's reputation as a mobile music carrier. The EZ Chaku-Uta Full service enables download and handset playback of single tracks by leading recording artist, and enables users to download 15 to 30-second song clips for use as ringtones.
EZ Channel	With the CDMA 1X WIN service, this feature functions as a broadcasting medium for original programs featuring full audio and video playback, as well as text. Selected programmes can be downloaded automatically overnight for customers to view at their leisure. Movie previews, music chart rankings and quiz programmes are popular selections from the 30 channels available.
EZ Movie	This service allows users to download high-quality short movies onto handsets. The CDMA 1X WIN service permits downloading of movie clips of up to three minutes in length. The service also supplies Flash® animations.
EZ Navi Walk (GPS navigation)	This street-navigation service based on GPS technology turns the phone into the portable equivalent of a car navigation system. The screen image scrolls automatically depending on walking speed.

Source: KDDI corporate website

Hofer Hypothesis 2   Different types of strategic challenges would elicit different strategic responses.

Faced with the need to differentiate itself from the i-mode service, in 2003 KDDI/au changed its pricing plan. Instead of the i-mode model of metered data charges, KDDI/au offered 'all you can use' flat data rates. They were able to offer this because of its foresight in licensing the Qualcomm technology, in that the system could be readily converted into 3G. This 'all you can use' system encouraged the adoption of multimedia applications and content by the Japanese consumer. No longer would there be the 'guess work' of not knowing how much (in data packets) a multimedia application would costs (KDDI, 2005). Due to its popularity, NTT DoCoMo was forced to adopt this plan as well (NTT DoCoMo, 2005).

Hofer Hypothesis 3   The type of strategic response adopted for a specific strategic challenge would, in general, significantly influence the future success or failure of the firm.

As shown in Table 8, another major reason for the adoption by customers of the KDDI/au system was its 'Killer Application', mobile music in the form of ring tones (Chaku-Uta: a 20- to 30-second music clip) and complete songs (Chaku-Uta Full). While NTT DoCoMo was the first to debut with ring tones in 1999, they did not foresee the takeoff of mobile music, and so the company has been relegated to 2nd place.

Table 8   Hofer Model Applied to NTT DoCoMo and KDDI/au

Hofer hypotheses	NTT DoCoMo FOMA	KDDI/au
Alterations in a firm's strategy set (objective, strategy, functional policies) result from either actual or forecast changes in external environment and/or its resources and capabilities	New strategy to emphasise research and development of new 3G FOMA technology in order to migrate customers away from 2.5G i-Mode	Faced with formidable lock on 2.5G market by rival (NTT DoCoMo), KDDI chose to eschew 2G and instead develop 3G
Different types of strategic challenges would elicit different strategic responses	In order to compete with KDDI, development of advanced features such as a 'Osaifu Keitai' – mobile wallet	To promote multimedia adoption and differentiate itself from competitors, established 'all you can use' data rates
The type of strategic response adopted for a specific strategic challenge would, in general, significantly influence the future success or failure of the firm	While 2.5G customers are still main source of revenue, NTT DoCoMo acknowledges that it must get more 3G customers to remain competitive	Creation of 'Killer App' of Chaku-Uta (ring tones and songs) laid pathway for development of other features and services

Source: Author's research; Hofer (1973)

3.20   Strategic response: NTT DoCoMo FOMA

This section refers to Figure 3, the application of Hofer's strategic challenge-response model to NTT DoCoMo. We will now apply the Hofer model hypothesis to NTT DoCoMo's strategic-responses.

Hofer Hypothesis 1   Alterations in a firm's strategy set (objective, strategy, functional policies) result from either actual or forecast changes in external environment and/or its resources and capabilities.

After a rocky start in October 2001, NTT DoCoMo debuted its 3G service, Freedom of Mobile Access (FOMA). In lieu of concentrating its efforts on development of its 2.5G technology, the company's new strategy was to have its customers migrate to 3G as was the case with KDDI. This has not been as successful as the company has hoped, due to consumers' satisfaction with, and reluctance to change from, the 2.5G service.

Hofer Hypothesis 2   Different types of strategic challenges would elicit different strategic responses.

In order to compete with the KDDI/au 3G service, NTT DoCoMo has continued to innovate its mobile phones and make them more useful, in an effort to accelerate the adoption of 3G phones. The most current offerings include 'osaifu keita' (mobile phone wallet) wherein the handset has a built-in infrared scanner enabling consumers to make purchases at supermarkets, from vending machines, in train stations, etc.

Hofer Hypothesis 3   The type of strategic response adopted for a specific strategic challenge would, in general, significantly influence the future success or failure of the firm.

While the 2.5G i-mode customers are still NTT DoCoMo's main source of revenue, NTT DoCoMo realises it must grow its revenues by converting customers to higher-end paying

3G phones. Adoption of this strategy will lead to greater returns in the future (NTT DoCoMo, 2005).

Table 8 summarises the three Hofer hypotheses and their application to NTT DoCoMo FOMA and KDDI/au service. From our analysis, we can see that the Hofer model can still be applied to modern, high technology firms.

4 Conclusions

In this paper, we have analysed two Japanese mobile telecommunications companies, NTT DoCoMo and KDDI, by deploying the Hofer strategic challenge-response model, during which we described components of the model using RBV.

As shown in Figures 2 (NTT DoCoMo) and Figure 3 (KDDI), the model begins on the left with the environmental variables. In our analysis, both NTT DoCoMo and KDDI shared the same environment. Below this is found 'resources' and 'capabilities'. In order to describe them, relevant RBV literature is considered.

In the next part of the model, NTT DoCoMo and KDDI were faced with a strategic challenge – the advent of new 3G technology. In the course of explaining their responses, in order to test the Hofer model, each of the model's three hypotheses were compared with each of the two companies. The results were that the Hofer model was applicable.

This applicability has a number of implications. In the academic world, this model could be further developed by a study of additional subjects (i.e., firms). In order to eliminate potential cultural bias due to Japanese business customs, North American and European companies could also be examined.

For the practitioner, the applicability of the Hofer model engenders more benefits. Using the model as a guide, he or she could identify key elements in a given situation and formulate strategy accordingly. However, this should be taken with a caveat, as there are several shortcomings in this study. First and foremost is the number of firms. To gain a deeper understanding of the usage of the model, more companies could be studied. Likewise, firms in other industries could also be chosen. Another problem may be the time period of the study. Due to the nascent nature of the two mobile communication companies, NTT DoCoMo and KDDI, the data given is from only the last ten years. In Hofer's 1973 study, data is drawn from 12 years worth of business magazines. Therefore, a longer longitudinal study may stimulate further insights that could support or contradict our findings.

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