The i-mode (almost) went global.[1]

A case study in product export failure.

Abstract

The i-mode, the world's first commercial web browser technology for mobile phones was launched in Japan in 1999, encountering immediate success and rapidly dominating the Japanese market. Nevertheless, when the technology was launched in the US and in Europe in the early 2000s it was highly unsuccessful. Ultimately, the technology was abandoned outside Japan, and several manufacturers exited the mobile phone industry following their inability to understand foreign customers' needs and to innovate. This paper reconstructs the history of the i-mode technology and provides a business-oriented analysis of the causes of its debacle.

1. Introduction

In 2004, I bought a Mitsubishi M342i mobile phone in Italy. This mobile phone was manufactured by Mitsubishi Electric.

Picture 1. Mitsubishi M342i. Source: Mitsubishi M342i

Together with the MFUG bank, the Mitsubishi corporation and Mitsubishi Heavy Industries, Mitsubishi Electric is one of the main companies of the Japanese Mitsubishi Group. Other products and services offered by the Mitsubishi group are quite known globally, but you might have never heard of the Mitsubishi phones. In fact, even though Mitsubishi Electric started producing mobile phones in the 1980s, it never became a well-known global brand (Troaca).

I have been using this mobile phone from 2004 to 2009. At the time, it was reliable and resistant, and it contained a nice set of features. Should I have had to make a prediction on the persistence of the brand in business, back in 2004 and only based on the performance of this phone, I would certainly have predicted their success… and the prediction would have proven wrong! Mitsubishi Electric and other Japanese mobile phone manufactures eventually recorded severe losses and exited the cell

[1] Originally written for the course 6030 Global, Prof. C. Mutlu, June 2020

phone business in 2008 (Takenaka). The rest of this paper will focus on understanding the causes of this failure.

2. The advantages of i-mode and its Japanese success

If you have a careful look at picture 1, you will immediately notice one characteristic that should have made the Mitsubishi M342i appealing: the i-mode, represented by the "i" yellow logo on the front and on the back of the device.

The i-mode, launched by the Japanese provider NTT DoCoMo in 1999, was the world's first commercial web browser technology for mobile phones (Kamada). It used a 2G cellular technology called PDC-P, that was able to leverage volume-based pricing (Al-Debei et al.). This technology was based on the Compact HTML (c-HTML) standard and required web content to be written in c-HTML in order to be accessible from the mobile phone (Kamada). Users could use the i-mode to engage in a variety of e-commerce and entertainment activities such as buying and selling stocks, accessing the news, or buying flights and movie theater tickets. With the i-mode technology, mobile phones were constantly connected to the internet (which eliminated dial-up time), and users were charged on-the-go; the consumed media, entertainment and other services generated micro-invoices that were added to the mobile phone invoice by NTT DoCoMo, and the content providers and users did not have to worry about invoicing. This encouraged both users to adhere to the new technology, and content providers to design new content and services for the i-mode technology (Ratliff).

Notwithstanding its start as an interim, low-technology, pilot project for e-commerce targeting the urban and affluent youth segment, the i-mode encountered an extraordinary and unexpected success in Japan (Ratliff). In the first six months after the product launch, 1 million users joined the service; the number grew to 10 million one year after the launch, then to 50 million (that is, almost 100% of all NTT DoCoMo customers) shortly thereafter (Kamada), and finally covered more than 70% of the whole Japanese market within 3 years from launch (Kondo et al.). With the spectacular growth of the i-mode's penetration in the Japanese market, the proposed services continued to grow. For instance, the i-mode technology supported targeted advertisement as soon as in 2002 (Ratliff).

As shown in figure 2, several characteristics of the Japanese market strongly influenced the success of i-mode and enabled the creation of a virtuous loop.

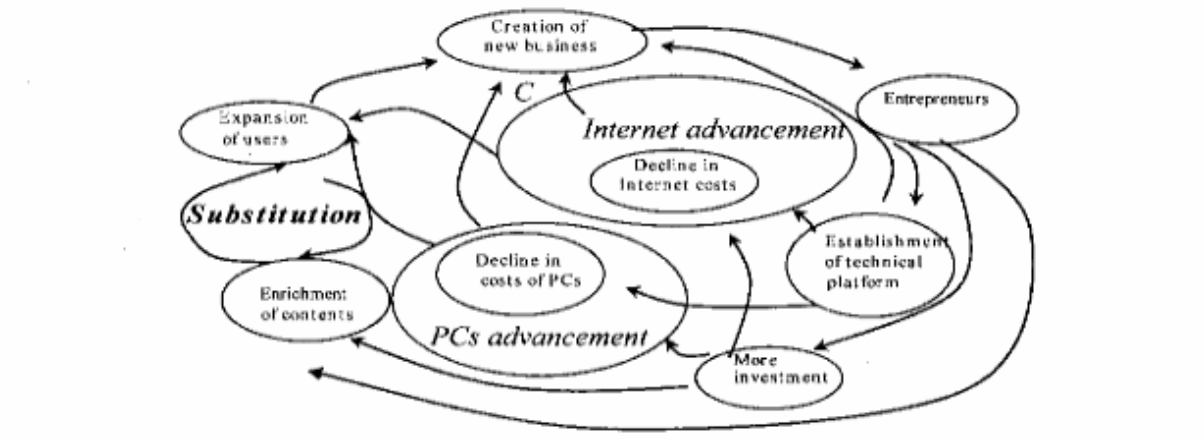

Figure 2. Virtuous cycle between users, content providers and handset makers over the mobile communications network. Source: Kondo et al., 16.

The company that developed the technology, NTT DoCoMo, was also an internet service provider and a portal (Baldi and Thaung), as well as the leader mobile phone service provider in Japan, controlling more than 50% of the market in the country (Hung and Yeh). Thanks to the Japanese conglomerate business culture, NTT DoCoMo had strong ties with mobile phone manufacturers and with content providers (Hung und Yeh). Content was developed together with marketing specialists and targeted the needs of users inside the Japanese society (Al-Debei et al.). This enabled a virtuous circle: the more the technology was developed, the more the available content and the greater the customers' adherence (Ratliff; for a detailed analysis of the i-mode technology and content development, see Peltokorpi et al.).

The familiarity of Japanese users with message exchange services combined with widespread use of portable electronic devices (especially during train commuting) and the related cultural acceptance of pervasive connectivity also contributed to the success of i-mode (Kondo et al.). In addition, desktop computers and wired internet connection were scarcely diffused and very expensive in Japan, partly due to the crisis and the economic recession during the lost decade (Ratliff; Barry) and partly due to the fears of the disruptive economic and social changes IT could bring to Japan (Kondo et al.). The i-mode technology filled the gap and enabled millions of customers to have their first experience with the Internet, emails, websites etc. As these users had never accessed the internet before, the possibility of them suffering from unmet expectations was limited (Al-Debei et al.).

In addition, as Barry explains, the meaning around i-mode in Japan was not associated with "an individual accessing the internet over the phone". Instead, i-mode was seen as an extension of preexisting, structured, point-to-point communication. Considering a strong cultural preference for predictability and order, and a small preference for free information, the very structured internet experience offered by the i-mode was particularly suited for Japanese customers expectations at the time (Ratliff). Therefore, when using i-mode users had the impression of contributing to Japan's technology future while experiencing an unthreatening and safe web environment (Barry). Furthermore, i-mode was perceived as a technology allowing users to be modern without becoming Western and contributing to build the culture of Japan (Barry).

The usage of i-mode also enabled users to express their own identity in the Japanese extremely conformist and etiquette-prone cultural environment, and to engage in informal asynchronous social contacts that reinforced friendships and family relationships while preventing the risk of losing one's face (Barry).

As explained by Hung and Yeh, NTT DoCoMo proactively supported the adoption of the i-mode technology by setting up attractive promotion for data transmission and by subsidizing mobile phone manufacturing vendors by as much as 300 USD per phone, that was 85% of their price. In addition, NTT DoCOMo applied an aggressive licensing policy to manufacturers such as Mitsubishi in order to benefit from scale economies and stimulate competition across manufacturers.

As shown in figure 3, in 2004, the proportion of subscribers to mobile internet access to subscribers to mobile phone in Japan was the highest in the world (Kondo et al.). The success of i-mode was crucial in re-igniting the Japanese economy after the recession and in fostering the dissemination of IT across the Japanese economy (Kondo et al.) The habit of accessing the internet over the phone became so widespread among the youth that a new word was even created to describe them (*oyayubizoku*, namely "thumb-tribe") (Ratliff; Barry).

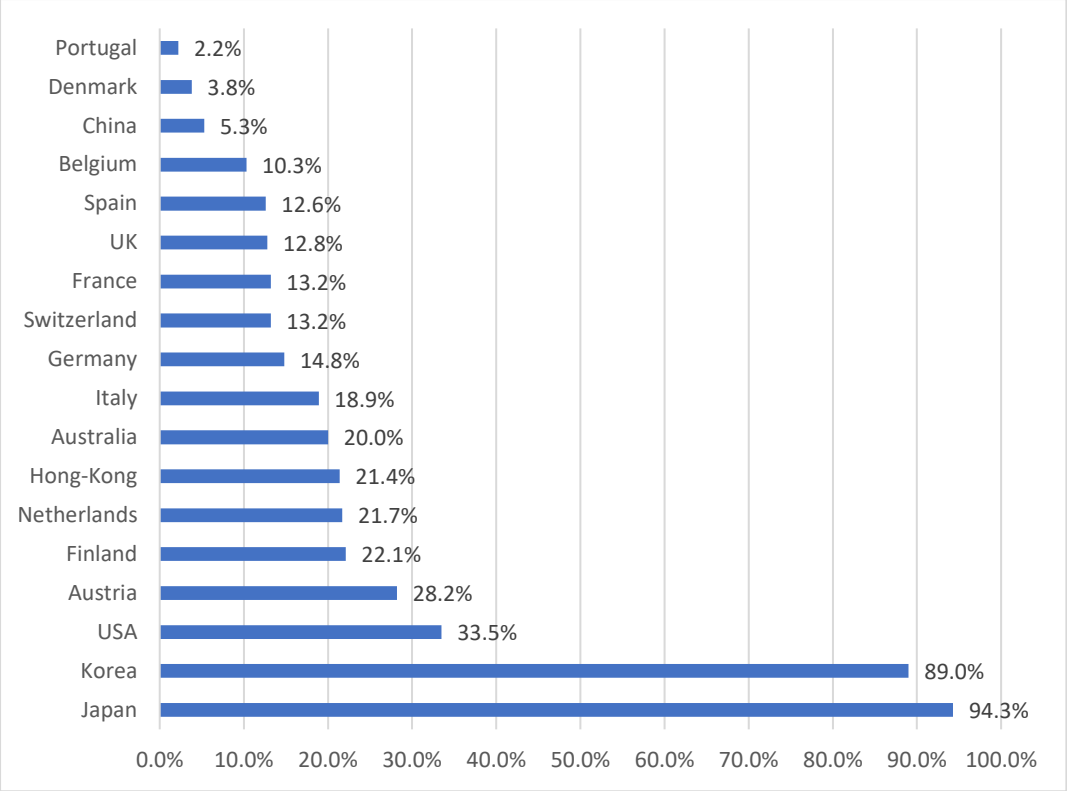

Figure 3. Proportion of subscribers to mobile internet access to subscribers to mobile phone in Japan in 2004. Graph by the author, source of the data: Kondo et al.

3. Bringing i-mode to the rest of the world

Meanwhile in the US and Europe, the mobile phone voice business was saturated, and the industry was slowly embracing the WAP technology.

NTT DocoMo had been a key member of the WAP forum, but it abandoned it to develop and promote its proprietary standard i-mode (Hung and Yeh). WAP was optimized for wireless instead of HTML and the internet standard (Kamada). In fact, WAP mobile phones could access WML content, whereas i-mode mobile phones could access c-HTML content; WML was a new, sophisticated language that content-creators had to learn, whereas the c-HTML used in i-mode was simply a subset of HTML, that is it was much easier for content-creators to manage (Baldi and Thaung). A comparison of i-mode to WAP is provided in figure 4.

i-Mode	*WAP*
Propriatary standard, developed by NTT DoCoMo	Open standard, developed by wireless phone industry
Used mainly in Japan/Hong Kong	Used around the world as de facto standard
No learning curve for content providers due to similarity to HTML	Learning curve for content providers
Colour animated, sophisticated downloads, Java support	Black and white displays
1,300 official sites and 33,000 unofficial sites in Japan	24,000 sites accessible globally
18 million subscribers in Japan (end 2000)	About 15 million WAP-enabled phones, about 7.5 million WAP users (end 2000)
Billing provided by NTT DoCoMo for official sites	Must agree to pay charges by credit card

Figure 4. i-mode vs. WAP. Source : Baldi and Thaung, 9.

European and US users were already accustomed to using desktop computers and seemed to have a strong preference for accessing information in a free-unstructured manner over the internet (Ratliff), and to be less interested in mobile entertainment than Japanese customers (Baldi and Thaung).

Even though some concerns emerged over the i-mode business model being too entrenched in the Japanese culture to be exportable as such (Barry; Ratliff), in the early 2000s it seemed reasonable to forecast that the technology would have conquered a considerable segment of mobile phones communications in the years to come (Ratliff). In fact, the WAP technology was failing to truly take off and it was deceiving customers' expectations, and the deployment of 3G was staggering. NTT DoCoMo was thought to have 1.5 to 3 years of technological advance compared to global competitors in the "internet for mobile phones" arena, i-mode was globally perceived as a success story to admire, and NTT DoCoMo was therefore well-placed to start a global expansion (Ratliff; Kodama; Anwar).

NTT DoCoMo's strategy was to position itself as a technology leader, overcoming other technologies such as WAP or J-Phone and offering i-mode through well-established local mobile-phone providers. In the first half of the 2000s, it established partnerships with mobile phone providers in Western markets, such as Bouygues Télécom in France, KPN in Belgium, Wind in Italy and AT&T in the US (Ratliff).

As mentioned by Peltokorpi and colleagues, NTT DoCoMo invested more than USD 5 billion to promote i-mode in Europe, where the first services were launched in spring 2002. In early 2004, European subscribers were more than 1 million and the total users worldwide were just 2 million, far away from the astonishing success of i-mode in Japan.

4. Failure to go global and market exit

As highlighted by Hung and Yeh, the liberalization of telecommunications markets has lowered the firm's propensity to cooperate and lead to the risk of market balkanization with regards to standards. This implies that a firm would need superior technology, leadership, and coordination capabilities in order to become the technological leader in a given market.

i. Partnerships

NTT DoCoMo enjoyed a leading position in Japan, but it was not a well-known brand in Europe nor in the US (Al-Debei et al.). Even though several partnerships were established with foreign mobile phone service providers, these companies did not have high-brand recognition and were not leaders in their respective markets (Al-Debei et al.); the first five foreigner partner operators occupied a weighted average of 21% of the market (Hung and Yeh). Having a smaller market size compared to Japan, these providers often lacked the economic scale to offer new technologies, especially in the context of domestic competition against WAP or other services (Hung and Yeh), that they often continued to offer aside i-mode (Al-Debei et al.). Even though i-mode had been adapted to 3G, it entered the international market at the same time as major mobile phone providers were still using GSM (2G) and GPRS (2.5G) technologies and just adopting 3G – which made the i-mode technology less appealing because of both the compatibility issues between PDC-P and GSM/GPRS technologies and the high appeal of new 3G local installations (Al-Debei et al.).

In addition, among the already existing mobile internet subscribers, many were locked into long-term service contracts, had non-portable phone numbers and portable sim-cards, so they were unlikely to adhere to i-mode if their provider did not offer it (Hung and Yeh).

Finally, the success of i-mode was strongly related to its pricing method (pay on-the-go). The Western markets were dominated by flat-rates and reluctant to adopt this new price structure, which also reduced the success of i-mode overseas (Al-Debei et al.).

ii. Customer characteristics

Western users were already accustomed to fixed internet connections, and more difficult to attract than Japanese customers (Hung and Yeh; Al-Debei et al.). Contrarily to what was observed in Japan, these customers were looking for free, individual access to the internet via their mobile, and they were not interested in structured, point-to-point communication. In Europe, mobile internet was marketed as an alternative manner of accessing the web indeed (Al-Debei et al.), and that was not coherent with the way the i-mode technology had been marketed so far, nor with the way it functioned for navigating the web.

Furthermore, the i-mode service could initially be accessed only via mobile phones manufactured in Japan, which also slowed down adoption in the rest of the world (Peltokorpi et al.). This issue became even more serious as NTT DoCoMo failed to establish partnerships with foreign mobile phone manufacturers, leading to a limited offer of i-mode mobile phones in the Western markets (Hung and Yeh).

iii. Content

The flexible and collaborative content-production structure between mobile phone providers and business partners that had worked in Japan proved difficult to manage at the international level (Peltokorpi et al.).

Therefore, few official and unofficial contents were available to the i-mode users outside of Japan; for instance, in 2003 there were almost 3,000 official i-mode websites in Japan, but only 60, 130, 60 and 90 in The Netherlands, Taiwan, Belgium and France respectively (Al-Debei et al.). The little content that was available to Western users was essentially a translated version of what was available in Japan, with no cultural adaptation. As much of this content had to do with entertainment and e-commerce, which is considerably different in Japan compared to Western cultures, foreign taste should have been taken into account. Nevertheless, even though marketing studies were conducted for the Japanese market, this dimension was overlooked for the foreign markets (Al-Debei et al.).

iv. Understanding markets

In order to globally maintain and innovate on the product, NTT DoCoMo used the same closed network it had been using to target the Japanese market. The actors in the network lacked knowledge and experience of the international markets, and they had a limited understanding of foreign customers' needs (Al-Debei et al.).

As NTT DoCoMo lacked leadership and coordination abilities at the global level, the technology standard became isolated, and the sales of i-mode mobile phones dropped. A couple of years after launching i-mode, many of the foreigner providers stopped support for i-mode services or reduced it to niche-markets only (Al-Debei et al.). In Japan, Japanese mobile phones started to be identified as the archetype of a "Galapagos ke-tai", that is a technology or service developed in Japan in a way that is unique to this market and that, for this reason, is successful in Japan but unable to penetrate the overseas markets (Akiike and Katsumata).

In the late 2000s, the Japanese mobile phone industry became the victim of its own success. As explained by Kodama, the core-capability of the industry, that was the i-mode, also became its core

rigidity. NTT DoCoMo's managers show resistance towards further innovations on the i-mode (such as the capability to take and send pictures or to connect to a GPS) due to misleading assumption about customers' needs and preferences and about the Japanese market's supposed unicity compared to the rest of the world (Kodama).

The Japanese phone manufacturing industry, which was strongly connected to NTT DoCoMo, followed the provider's vision on the future of i-mode. This implied adapting the hardware to the developments of the i-mode rather than the opposite (Al-Debei et al.). When the iPhone and Android mobile smartphones were released in 2007, Japanese manufacturers underwent a considerable shock to which they were not prepared (Kodama).

v. Market exit

Mitsubishi Electric had to face aggressive competition from global players who offered products best suited for the global markets and who, thanks to their international success, could benefit from considerable economies of scale (Troaca; Reuters).

In addition, domestic operators such as NTT DoCoMo were betting on low-cost monthly rates and cutting subsidies for cell phones acquisitions. For these reasons, similar to other Japanese firms such as Sanyo Electric, Mitsubishi Electric decided to stop its loss-making cell phone unit and exited the business in 2008.

5. Conclusions

In 2009, the battery of my Mitsubishi M342i died. When looking for a new battery, I discovered that Mitsubishi had stopped producing mobile phones… and that finding a new battery would therefore be almost impossible. I resigned myself, did not look any further into Mitsubishi's fate and bought an Android smartphone.

For this post, I have decided to investigate the story and to understand what happened. In this text, I have shown how the success of Japanese mobile phones and mobile internet technology in the early 2000s was rooted in the extraordinary expansion of the i-mode system in Japan. This expansion was connected to Japan's lag in the adoption of IT, particularly desktop computers and fixed internet. The whole technology, including the hardware and content, was thought for the Japanese market. None of these was re-evaluated when expanding to a global market.

In addition, hardware manufacturers were dependent on the i-mode provider's decisions, which were biased by a success trap when it came to new technological developments. Mitsubishi's failure to expand in the global markets and its decision to exit the mobile phone market are ultimately a consequence of the firm's tight relationships with NTT DoCoMo – and of NTT DoCoMo's lack of leadership in and knowledge of foreign markets. In fact, due to the characteristics of the involved stakeholders, the decisions were poorly informed when it came to international markets and foreign customers. This state of things let manufacturers unprepared to the emergence of new mobile phone technologies, particularly smartphones.

The technology has evolved so much since then, that considering this topic in 2020 feels like writing about an archeological discovery. In our interconnected and technologically intense world, changes can happen in sudden and dramatic ways. Research using primary and secondary sources can help businesses to anticipate change, prevent it, cope with it and overcome its consequences. Appropriate research could have prevented the disaster for the i-mode technology and for Mitsubishi as well. Even

though research is costly, especially when involving primary sources, a small portion of the 5 USD billion that NTT DoCoMo invested trying to penetrate Western markets would have been enough for them to answer a few crucial questions.

For NTT DoCoMo, research should have focused on all the aspects that seem to have been ignored, namely:

- Western consumer preferences on mobile internet, for instance regarding user experience and content
- Potential sources of content in the Western markets
- Market position of potential partners
- Pricing strategies of potential partners
- Feasibility of acquisition of foreign mobile phone providers
- Trends in IT relative to mobile phones.

For Mitsubishi, research should have focused on all the elements that seem to have been underestimated, namely:

- Foreign technologies (GMS/GPRS) – R&D on products compatible with these technologies
- Global mobile phones manufacturers and partnership opportunities
- Trends in IT relative to mobile phones.

Among the primary research methods that should have been used are surveys, interviews, focus groups, ethnographic field studies, and usability testing with Western users. Primary research should also have included surveys and interviews with industry leaders and KOLs in the Western markets.

Among the secondary research methods that should have been used are benchmarking against competitors and competitors' technologies, literature reviews, SWOT analysis, Use Case Modelling, and User Stories.

The researchers' group should have included members with awareness of and experience in foreign markets.

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