

i-mode pricing

15.04.2003

SANDRO GRECH
Helsinki University of Technology

sandro@cc.hut.fi

Abstract

To date, the growth of mobile communications has been fuelled almost exclusively by voice calls. However, voice is becoming a saturated market, and with increasing competition forcing lower prices, leading to a trend of declining average revenue per user, mobile operators are seeking to introduce new services in order to maintain growth. Japan's NTT DoCoMo has successfully managed to balance out the decrease in voice revenue with revenue fuelled by its data service known as i-mode. Understanding i-mode's success is critically important for all those who have placed multi-billion euro bets on the success of third generation cellular (3G).

One of the important characteristics of DoCoMo's i-mode service is the pricing model. Owing to the early phase of mobile data, pricing and charging models for these services across the globe are still in their evolutionary stage. This paper gives an analysis of the pricing strategy adopted by NTT DoCoMo for its i-mode service. The pricing model is analyzed particularly from the end-user and content provider perspective. The applicability of the i-mode pricing model to GPRS and the Internet is also discussed.

Keywords: i-mode, pricing, charging, ARPU, mobile data, NTT DoCoMo.

1 Introduction

Launched by NTT DoCoMo in 1999, i-mode is one of the very few successful mobile services to-date, apart from voice and short messaging. Reaching a subscriber base of over 30 million (Figure 1), i-mode accounted for almost 20% of the total ARPU by year-end 2002 (Figure 1). Equally important for DoCoMo, i-mode reduces subscriber churn rate through service differentiation when compared to other competing mobile operators.

i-mode runs over a packet switched mobile network based on NTT's proprietary PDC-P packet technology.

This property has been fundamental for i-mode's success since it leverages volume-based charging, as opposed to time-based charging.

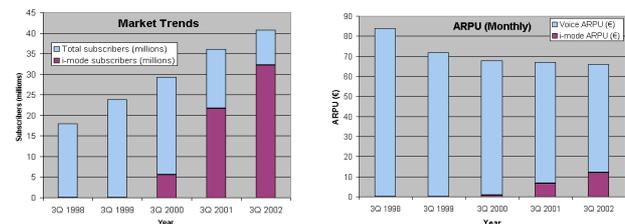


Figure 1: DoCoMo subscriber growth and ARPU

In defining its business model, DoCoMo has chosen to place itself as an access provider, mobile Internet service provider and content aggregator, through its i-mode portal. Unlike many other mobile operators, however, DoCoMo has chosen not to act as a content provider itself. This has ensured a rich diversity of content and services for the i-mode customers, particularly when compared to the traditional walled-garden approach adopted by many mobile operators.



Figure 2: DoCoMo in the mobile Internet value chain [1]

Instead of simply purchasing content and re-selling it, NTT DoCoMo has chosen to act as a portal to a number of "official sites". These sites enjoy an entry in the i-mode startup menu, giving them a competitive advantage in terms of exposure to customers. At the same time, DoCoMo leaves the possibility for "unofficial sites" to offer their services via i-mode.

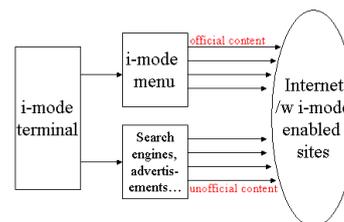


Figure 3: i-mode service hierarchy

There are a number of pros and cons to consider for a content provider thinking of applying for official status. The most important advantages of being official are [2]:

- The site will be easy to find and access
- It is possible to bill the user on their phone bill
- Direct exposure to more than 30 million subscribers
- Presence on the i-mode portal is seen as an indication of quality.

The primary drawbacks are:

- Limited freedom on the content that can be offered
- Several requirements have to be fulfilled (which turns into costs)
- Limited business models (section 4.2).

This section has briefly introduced DoCoMo's i-mode service. The rest of the paper is organized as follows. Chapter 2 explores the characteristics of typical i-mode users and their usage patterns. This serves as a background for understanding the subscriber's "willingness to pay" and thus, the philosophy behind the i-mode pricing model. Chapter 3 introduces the details of the i-mode pricing structure and revenue flow. This is followed by an analysis of the i-mode pricing model from the end-users' perspective and content providers' perspective, in chapter 4. Chapter 4 also investigates the applicability of the i-mode pricing model to other data services, namely GPRS and Internet services. Finally, chapter 5 takes a look at the future of i-mode pricing, followed by some conclusions.

2 Users and usage patterns

Before embarking on any discussion about i-mode's pricing model one must understand who uses the service and for what purposes. Both of these characteristics undoubtedly have a critical role in defining the pricing model of any service.

Initially, NTT DoCoMo assumed that mobile data would appeal most to business customers. This has not been the case, and NTT's DoPa packet switched service introduced in 1997 did not enjoy much success till i-mode was overlaid on top of DoPa. As a result, the large majority (>80%) of i-mode subscribers are consumers paying their own bill (Figure 4).

As shown in Figure 4, i-mode subscribers are distributed across all age groups. In interpreting these figures, one should remember, however, that a significant portion of the over 40's are parents who pay for their children's

bills. Judging from this, there is no doubt that i-mode usage is most popular among young people.

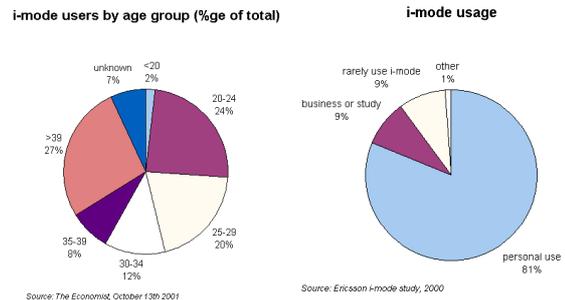


Figure 4: i-mode users and usage patterns

Over 40% of all i-mode usage is e-mail related, making it the most popular service, by far. Entertainment sites are most popular for content, representing over 70% of all accesses to the official sites. In general, the most popular content is very closely related to the terminal itself, such as ring-tones and picture downloads. Transaction services, such as banking, have not proved as popular (Figure 5).

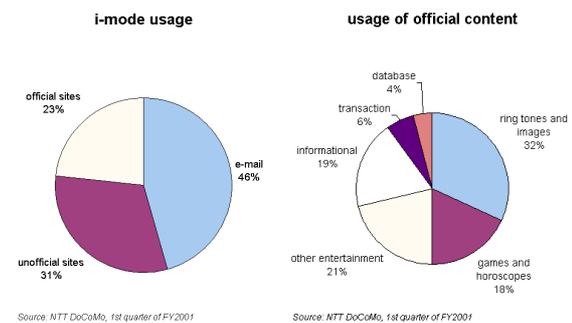


Figure 5: i-mode users and usage patterns

These observations tightly govern the pricing cap above which the subscribers' willingness to pay will fall drastically. The pricing model adopted by DoCoMo will be introduced next.

3 i-mode pricing structure

i-mode is an add-on service to the regular mobile phone service. Therefore, all i-mode charges are in addition to the subscriber's regular monthly mobile phone bill.

The i-mode charges consist of the following components: monthly subscription fee, packet transaction charges and optional premium content charge. These will be discussed in more detail in the following sections.

3.1 Monthly subscription fee 2.3€

In order to use i-mode, the user has to pay a monthly fee of approximately 2.3€. The choice of such a relatively

low value (less than 4% when compared to the subscriber ARPU, in Japan), is not incidental. Monthly subscription fees typically inhibit users from experimenting with new services, and thus limiting the potential generation of traffic, which as will be discussed shortly, is DoCoMo's main source of revenue from i-mode.

3.2 Packet transmission charge (€0.003 per packet)

The packet transmission charge is applicable for all packets sent and received during the month. However, browsing across the i-mode menu is free of charge.

Table 1 shows the approximate transmission charges for some typical i-mode services.

Table 1: Approximate transmission charges

Service	Transmission charge (€)
i-appli (download)	0.2
i-melody (45sec long, 16 chord melody)	0.14
Mail (100 characters)	0.016 to send, 0.009 to receive
Picture download (still picture)	0.05
Mobile banking (transfer of funds)	0.46
News	0.13

Source: NTT DoCoMo

To counteract the problem of e-mail spamming, NTT DoCoMo has decided not to charge for the first 400 packets per month, so that the users do not feel they have to pay to receive unsolicited e-mails.

3.3 Optional premium content charges

i-mode subscribers can sign up for premium content services on the i-mode portal. NTT DoCoMo takes care of the billing and control how the content is charged. Until recently, NTT DoCoMo only allowed the content providers to charge 0.78€, 1.56€ or 2.34€ per site per month. This has now changed, and the content providers are now allowed to charge different amounts. However, the maximum limit is still 2.34€ per site per month. There are two primary reasons why the content provider can charge only fixed monthly fees with an upper limit. Firstly, NTT DoCoMo's billing system implementation is not flexible enough to handle more advanced forms of billing. Secondly, NTT DoCoMo wants to keep the content charges low to stimulate i-mode usage. Flat-rate pricing is also a very efficient tool to stimulate usage. Furthermore, a simple pricing structure means easier billing, less operations and management costs and is also easier to communicate to the market.

NTT DoCoMo controls access to charged sites, activates new subscriptions (to sites) and keeps track of billing records. On a regular basis, it transfers information and content fees to the content providers. In return for administrating the billing, NTT DoCoMo takes 9% of the content fees in commission.

Unofficial content providers can also charge their customers, but not with the help from NTT DoCoMo and not through the mobile phone bill. There are third party companies that provide billing services to unofficial content providers. These solutions can, for instance, be based on credit card payments. Even so, most unofficial content providers do not charge for their content.

The flow of revenue between content providers, NTT DoCoMo and the subscribers is illustrated in Figure 6.

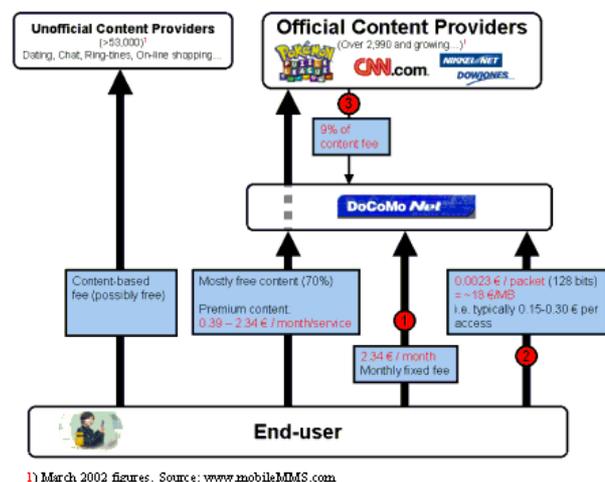


Figure 6: i-mode revenue flow

Most sites, however, do not charge for their content and thus do not pay anything to DoCoMo. This does not matter as long as these sites increase the value of i-mode.

4 Analysis

4.1 i-mode pricing from the end-user's perspective

One of the main advantages of the i-mode pricing and billing model from the end-user's perspective is that much of the content and/or services used via i-mode (i.e. content and/or services coming from official sites) can be paid directly via i-mode and will be shown and paid in a single bill, instead of paying to each supplier. This helps to ease the way they pay and encourage them to use m-commerce. Equally important, the presence of the i-mode portal provides some level of quality assurance to the users.

4.2 i-mode pricing from the content provider's perspective

The maximum amount that NTT DoCoMo allows the content providers to charge is 2.34€ per month. This puts an upper limit on the revenue per user and the only way to increase the profit margin is to reduce the costs. The most straightforward way to reduce the business costs is to take advantage of the economies of scale. Thus, the volume in terms of number of subscribers should be the number one goal for content providers selling online content. However, this makes it harder for small content providers to succeed than for larger companies.

According to NTT DoCoMo, only half of the fee-carrying sites have more than 10,000 subscribers. Thus, more than half of the charged sites generate less than 23,430€ per month. For an i-mode-only content provider to generate profit on this kind of revenue, it has to be very small. However, with relatively little effort, most content can be offered through the other operators' mobile Internet services, thus increasing revenues.

NTT DoCoMo offers no facility to charge per transaction. However many content providers put a limit on the number of downloads per month.

Several companies sell goods and services using i-mode. However, most companies in the shopping category promote traditional shopping rather than actually selling through i-mode. Products that can be ordered directly using i-mode include books, CDs, games and tickets for shows and events. NTT DoCoMo does not offer billing solutions for this kind of commerce. Instead the content providers have to rely on traditional payment solutions, such as credit card payments or cash-on-delivery.

Many content providers are asking for more advanced billing solutions so that they can price their services in a more suitable way. Furthermore, many content providers are finding the upper limit of 2.34€ too constraining. So far, NTT DoCoMo has not revealed any plans for changing its billing solution. Also, it may not be in NTT DoCoMo's interest to do that; it makes its money on the generated traffic and therefore wants the i-mode content to be cheap and easy-to-use in order to drive traffic. There is also a benefit in NTT DoCoMo only offering the content providers the facility to charge a monthly fee; if the users were to pay per transaction they might think more about their usage than they do with a flat monthly fee.

These disadvantages for the individual content provider are offset by the high quality of the i-mode menu that is ensured by NTT DoCoMo's control. The high quality is

of great value to all official content providers, since the users are more likely to return to the i-mode menu.

4.3 i-mode pricing compared to GPRS pricing

The equivalent of i-mode sites, on Europe's GSM networks, are the WAP sites. The success of WAP has undeniably not followed that of i-mode, however. Much of this lack of success is clearly also attributed to the fact that before the launch of GPRS, WAP services were charged in time units.

The introduction of GPRS as an extension to GSM networks, has leveraged the possibility of charging on a per-packet basis. The most widely used GPRS pricing model to date is in effect very similar to the i-mode pricing, with a relatively low fixed monthly fee, low per packet fee, and the possibility to pay for premium content/services (e.g. notably ring tones and pictures) via the mobile phone bill.

The most notable difference between the pricing of i-mode and GPRS services is that i-mode content/service providers are able to make only monthly service charges, whereas many GPRS content/service providers charge per transaction. For example the Finnish map service provider *Genimap* charges 0.4€ per map search, whereas, using the NTT model, *Genimap* would only have the possibility to charge for at maximum 2.34€ per month.

4.4 i-mode pricing model and the Internet

It is often said that people in Europe and the US will not pay for content, since they are used to get it free from the Internet. This is true and will have an impact on how much users are willing to pay for content. There are reasons why content is free on the Internet today:

- there is no convenient micro-payment solution
- there are other business models, primarily advertising.
- lack of proper copyright protection

Currently, not many companies are making profit providing Internet content. This will not go on forever. Even Yahoo! has started to charge for some services and AOL has been charging for a long time. There is a reason why many potential content providers, such as music distributors, are not offering content over the Internet to a large extent, and that is because they cannot charge for it easily.

This seems to advocate that a micro-payment solution, similar to the one adopted by i-mode, may be a good feature for Internet portals that have a billing relationship with the customer (ISPs). This model could, in theory, be

used for content that is not easily subject to copyright infringement, and would replace the advertising model, in some specific cases such as premium news content via the ISP portal, for example. In practice, however, it remains to be seen how robust such a business model would be for the ISP, since on the fixed Internet side it would be hard to replicate DoCoMo's success by deriving the main revenue from traffic generated from services accessed through the portal. As highlighted in Section 2, the most successful content in the i-mode portal is content related to the terminal itself, and products/services that are purchased on impulse but not needed immediately. The PC is not as suitable as the mobile phone for either of these contents/services. Applying DoCoMo's model to the fixed Internet side would thus need a considerable tailoring.

5 Evolution to 3G: The future of i-mode pricing

The Economist (March 2000) mentions that Keiji Tachikawa, NTT DoCoMo's president, is cautious about the future. Although he expects that voice and data traffic will be equally split by 2005, he thinks it may not be until 2010 that data is responsible for more than half of NTT DoCoMo's revenues. For Tachikawa, low pricing is the key to building demand for the service, mainly because i-mode has so far been a consumer product.

In October 2001, NTT DoCoMo launched its 3G service FOMA (Freedom Of mobile Multimedia Access) in the Tokyo area. NTT DoCoMo's strategy is to migrate slowly towards 3G, increasing i-mode's speed from 9.6kbps to a maximum of 64kbps uplink and a maximum of 384kbps downlink. The increase in speed will enable richer i-mode content and also enable totally new services such as multi-media streaming.

There are four different pricing schemes for FOMA, shown in Table 2, for packet data (these charges apply also for i-mode traffic)¹.

Table 2: FOMA packet data plans

Plan	Monthly fee (€)	Fee per packet (€) (1 packet = 128bytes)
Packet Pack 20	18	0.001
Packet Pack 40	36	0.0005
Packet Pack 80	72	0.0002
No packet pack	Free	0.002

Source: NTT DoCoMo

¹ During the introductory phase, NTT DoCoMo priced packets at 0.0005€/per packet

FOMA's price is lower compared to a similar monthly packet usage over PDC-P. However, with the high available data speeds carrying much larger amounts of data in the same time, total fees for packet transmission could easily become extremely high. This can be alleviated by subscribing to one of the three packet packs (Table 2). Due to the high monthly fee of these packet packs compared to the basic i-mode monthly fee of 2.34€ it is believed that many consumers will, at least initially, prefer not to pay any monthly fee. Consequently, they will be reluctant to use multimedia services and other services that require large volumes of data to be sent. Augmented with the high prices of FOMA terminals, one may conclude that NTT DoCoMo is at this initial stage targeting business users rather commercial users.

6 Conclusions

Flat rate pricing appeals to traditional Internet users and service providers because of its simplicity and predictability. However, congestion is the inevitable consequence of flat-rate pricing, and consequently per-packet pricing is essential for cellular packet data where radio capacity is a scarce resource.

Pricing per transmission has been of utmost importance for the success of i-mode. Radio capacity is expensive and must be used effectively in order to offer a reasonable price to the consumers. i-mode operates on the packet-switched network PDC-P and transmission is charged per packet. Another important aspect of transmission charging is its relatively low price which stimulates usage and solicits users to experiment with new services.

Figures show that the commission on content is less than 1% of the current i-mode ARPU [2]. Clearly DoCoMo's approach is to make money on traffic and not on the content or commission, and thus, so far there are no known plans for NTT DoCoMo to provide more flexible billing features to content and service providers over i-mode.

The business model adopted by the prevailing amount of GPRS operators is increasingly similar to that of i-mode, with relatively low monthly fees, packet charges, and possibility to pay for content related to the mobile terminal (ring tones, logos) and/or generates traffic revenue to the mobile operator (streaming content), via the phone bill.

The applicability of the i-mode pricing model to the fixed Internet is not completely self-evident, and would require considerable tailoring, particularly for those operators charging a fixed monthly rate.

References

- [1] Kakkori, Matti: Comparing mobile Internet services: i-mode and WAP, Helsinki University of Technology, May 2001.
- [2] Bakersville strategic research: Lessons from i-mode II, Northstream research and publications, 2001, ISBN: 1 8431 115 00.
- [3] Graduate school of business – Stanford University: i-mode: NTT DoCoMo's Wireless Data Service, 2001
- [4] Graduate school of business – Stanford University: i-mode: Weaving an “analog” web, 2002
- [5] EMC World Cellular Database: i-mode- The convergence of content and mobility in Japan, EMC, 2000
- [6] Vincent Geoff: Learning from i-mode, IEE review, 2001