Micropayments and Microprofits

Can banks extend their payments franchise to the Net?

by
Dave Birch <mailto:daveb@hyperion.co.uk>
Hyperion <http://www.hyperion.co.uk>

The micropayment sector is attracting a lot of attention of the Net right now. This is because it is, in a sense, ‘up for grabs’. Banks’ existing payment offerings—credit and debit cards, cheques and bank transfers—stop being useful (i.e. convenient and cost-effective) as the size of transactions falls below around £5. In the ‘real world’ we can use notes and coins in this sector. On the Net, new solutions are required. Will bank-led electronic purses extend their reach from the real to virtual worlds or can alternative Net-based technologies assume the payments franchise in the 5p to £5 range.

Macro, Mini, Micro, Nano

For the sake of a simple classification, let’s break the online payments sector down into four subsectors. There are:

- **Macropayments.** These are payments that can only be made convenient and cost-effective using electronic funds transfer (EFT), much as they are now. Payments in excess of £5000, for sake of argument.

- **Minipayments.** These are payments that can be made using a wide variety of means, ranging from credit cards to electronic cheques, where the choice of payment mechanism depends on cost and convenience factors but not on technology. Payments from £5 to £5000.

- **Micropayments.** These are payments that cannot be made convenient and cost-effective using existing payment means (that’s why we still use notes and coins instead). Payments from 5p to £5.

- **Nanopayments.** These are payments that cannot be made using any existing payment means whether cost-effective and convenient or not. I cannot use my Visa card to make a payment of 0.5p no matter how much I am prepared to pay for the privilege and no matter how much inconvenience I would put up with.

In the world of the Net, it’s the micropayments sector that is currently attracting the most attention¹. This isn’t really because of the value of the marketplace itself: the ‘cut’ on micropayments transactions will remain a tiny fraction of the total electronic commerce market, but because micropayments are seen as being a key enabler to new forms of electronic commerce in the mass market.

¹ Brown, E. *The Net’s One Cent Future in NewMedia.* 7(8) (23rd June 1997).
There is a definite chicken-and-egg touch to this. There are a great many organisations that have information (articles from back issues of the FTVFR, for example) with some commercial value. If this information could be put on the web and sold for 10p per article (with no subscriptions, pre-arrangement or any other complicating factor) then it could stop being ‘dead’ and start earning some revenue. Until there is a means of collecting and processing the pennies, however, publishers will not make the investment needed to switch business models.

Those publishers that have taken the plunge have generally gone for the password and flat-fee model. One or two have been successful, with the Wall Street Journal being the often-quoted example. Personally, I don’t subscribe to any of these services: if I click on a URL and am then presented with a form asking me to subscribe, then I just click off and go somewhere else instead because I can’t be bothered (whether the subscription is free or paid). I simply can’t remember enough user names and passwords to make this a workable model: it seems as if every time I do go to The Electronic Telegraph or The Times on the web I have to re-subscribe because I can’t remember the user name and/or password that I used before. One novel solution to this probably is being tested by Lucent: a web proxy that generates user names and passwords for you so that when you visit a site and are asked for a user name, you just type “\u” and the proxy generates the appropriate user name on the fly. Password-based subscriptions aren’t just unwieldy but also particularly prone to fraud, as the ‘adult’ web industry has discovered. I’m reliably informed that newsgroups such as “alt.sex.passwords” are thriving. Some passwords are posted by people who have actually paid for flat-fee access, others have been obtained using counterfeit or stolen credit card numbers. According to a Hustler executive, their sites have seven times the paid membership logging on every day. I recall a similar situation with an online newspaper site, where the user name “cypherpunks” and password “cypherpunks” were widely posted. Problems of this kind are bound to spread as the mass market moves on to the web, increasing the demand for a micropayment solution.

There’s another factor to bring in here as well: who is going to want to buy things online? The overall market for children’s online services will capture a significant percentage of online revenues. Jupiter Communications estimate that almost 100 million individuals will make use of online services from the home in the US in 2002 and that around 20% will be children under the age of 18. On a gross basis, if the kids’ market simply reflected the percentage of users, then total revenues would be $4.5 billion. It is possible that kids’ use could surpass adult use, so a decent micropayments infrastructure must be good for playing Doom online as well as for reading the Electric Telegraph.

### Making a Living

Having identified the broad demand for a micropayments scheme, we need to look at what kind of revenues such a scheme might generate. Suppose during the course of a day at work I visit 50 pages that cost 1p each to view: that’s 50p and no big deal. If there are a million people like me, that’s £10K per day or £200K per month. Now,

---

Micropayments and Microprofits

that may sound like a lot of money but card payments run at more than £200K every couple of seconds. By the time you take the running costs out of the £200K worldwide, there’s not much left over. Visa, Mastercard and Amex handled more than $1.5 trillion last year: key Net payments players such as Cybercash, First Virtual and Wave Systems have taken less than $3 million in their entire histories.

My assumption, therefore, is that it’s not going to be easy to make money by creating a micropayments infrastructure from scratch: an assumption verified by Netscape’s decision to drop its LivePayment scheme after less than 2 months in operation. This line of thinking would suggest that micropayment schemes can only be viable as an adjunct to some other existing infrastructure by exploiting either economies of scope (e.g. complementing some other financial services products) or economies of scale (e.g. using a telecommunications operator’s billing engine to support a microbilling scheme).

But How?

There are two principal categories of micropayments implementation: software-only schemes and smartcard-based schemes. In the long run, I would have thought it likely that smartcard-based schemes (electronic purses) will come to dominate this sector by value. Consumers don’t really want to have to deal with multiple schemes and in time it will become simpler to put a Visacash card in a PC rather than wrestle with unfamiliar schemes. What’s more, the marginal costs of using electronic purses as a micropayment (or, more accurately, micro-prepayment) scheme over the Net are low since the Net isn’t the core of the electronic purse business. Software-only schemes may come to dominate by volume, I would have thought, because microbilling and even nanobilling schemes will become widespread. Both the ‘micro-prepayments’ and ‘micro/nanobilling’ sectors are evolving rapidly and will be discussed in more detail in a future article.

The software versus hardware and pre-payment versus billing discussions shouldn’t be the basis for forming banking strategies towards micropayments. It’s very hard to predict the vagaries of the hi tech marketplace and no-one wants to invest in an uncertain technological implementation. The banks’ focus should probably be on developing their micropayments business model in order to decide whether to participate: since the transaction cut is going to be quite small for some time, this business model should be about partnerships, markets and leverage rather than volumes.

Getting Started

Is there some way that a reasonably efficient micro-prepayment system could get off the ground in advance of the widespread deployment of smartcards and microbilling so that banks, merchants and customers could get going? Actually, there are a couple of ways to do this: in both cases, they get the micropayments business model jump

started in such a way as to build experience and market share ready for the next generation of micropayment schemes.

One alternative to wholly online schemes is to use offline tokens to establish online entitlement. The ‘scratch card’ model, for example, has already been implemented in the mobile telephony sector. France Telecom Mobiles sell “mobicartes” in stores: the mobicarte goes in a mobile phone. Once inserted, the user dials a service number to register the phone number. Customers have two months to recharge the mobicarte before the number becomes invalid. The cards can be recharged by buying a lottery-type scratch card in one of France’s 35,000 tobacconists. The card contains a 14 digit number that the user types into the handset after calling the service number. The move is the latest innovation among mobile phone operators to get control over their bad customer debt problem and the Net analogue is obvious: I want to play online Fantasy Soccer Manager so I buy a scratch card at a games retailer, scratch it to reveal a number and then type this number into a web site: this gives me (or more likely, my specific PC or IP address) a certain number of moves or whatever. The advantage of this kind of scheme is that it is a pre-paid scheme and so long as the integrity of the cards is maintained there are no opportunities for bad debt to reduce revenues. In the UK right now, the economies of scale in this sector make it economically attractive. After all, millions of scratch cards are printed every week and the technology to both create and distribute the cards is well understood as are the attendant business models. Eventually, as more and more PCs are shipped with smartcard interfaces the time will come when it becomes sensible to dump the scratch cards and let people use their electronic purses instead. Another way of moving forwards, where user authentication rather than payment is the main application, is to use a simple form of “one time pad”. Thus, my bank sends me a piece a paper with a list of random numbers on it. Each time I send an e-mail to my bank manager, I start the message with the next number and then cross it off of my piece of paper. The bank, on receipt of the message, check that the number matches with their (electronic) copy of the list and then mark the number as used. This means that no-one can send an e-mail message to the bank manager pretending to be me unless they get a copy of the list that was sent to me. Now, if the CIA decide to frame me then I’m in trouble, but for day-to-day authentication in these early days it should be fine. As more customers get comfortable using e-mail and as it starts to save the bank money dealing with customers this way, so the bank can watch developments in the world of public key infrastructure and eventually cut over to secure e-mail (e.g. PGP) when appropriate.

There are ways to begin experimenting with micropayments right now without making huge investments in hardware or software infrastructure: If banks can get the micropayments business model working for them now—and build market share—then they can more easily apply that business model across various future technology models.

[2038 words]

\(^6\) France Telecom Mobiles offers the Mobicarte pre-paid phone card to customers to avoid bad debt problems in Computergram International. 3(125): p.4 (21st March 1997)