

Payment Mechanisms and Internet Commerce: or, the promise of micro-charging

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In the summer of 1995, I asked the head of a major Internet software company the following question:

Q: "how long will it be before we have reliable online charging mechanisms, so I can buy (for example) a single journal article direct from an online journal's website?"

A: "Eighteen months," was his confident reply.

Five years later, and we are still waiting for the ability to visit a website with which we have no prior relationship as a subscriber, pay a fee of equal or less than the cost of xeroxing an article, and download a piece of information. [As an aside, what I learned from the 1995 exchange above and from subsequent discussions is that when experts or insiders say "eighteen months" as the period of time before a major change takes place, they really have no firm idea, but want to sound well-informed.]

The need to be able to exchange highly granular snippets of information at very low cost is clear, as are the benefits to the user, the vendor, and to whoever wins the battle for operating the billing mechanisms (Microsoft? Mastercard? IBM? The phone or cable TV companies?) Several factors make this form of "eCommerce" an exciting prospect for publishers in particular, if the following assumptions are correct:

- 1) customers routinely want elements of information that are part of a larger published entity which they have no intention of purchasing — they want a single article, a piece of a book, a photograph, a map, or a single search from a journal, a monograph, an encyclopedia, or a web-accessible database. They may be prepared to pay for a particular journal article, but they are not going to buy the entire journal to get it; they may want to use an online information service for an hour, or a day, but they are not going to subscribe for a month in order to do it.
- 2) publishers of material on physical media such as paper have no economically compelling way to sell a single page, or article, or a scattered set of images from a book.
- 3) for several decades, the xerox machine has bridged this gap, revolutionizing the ability of the data consumer to pay a small sum and walk off with a paper copy of a part of a printed volume, newspaper, or journal.
- 4) the Internet finally offers a way of taking those many millions of dollars that get pumped into photocopying machines — at my university the somewhat subsidized rate is five cents per page — and re-directing them to the owners of the information (the publishers) rather than to the owners of the xerox machines (often the libraries).

The importance of the Internet in this regard is not to be underestimated, precisely because the money is already in circulation — it is a matter of diverting the flow and not of persuading people to pay for something that they are not already purchasing. As a graduate student, I spent hundreds of dollars a year on photocopies of scholarly articles and sections of books for personal study. In my local public library, as in my academic library, it is rare that there is not a queue at the photocopying machine. Users do not expect to get these photocopies for free — they understand that the process has a cost that needs to be absorbed by the user. By now too, I suspect, users of information services on the Internet — such as my Electronic Text Center — understand that not everything on a site will be free to all — some data costs money and has limits on its use because it is produced by a commercial publisher who has costs in the creation of the data that need to be recouped with interest.

Ever since the whole notion of charging for on-line information emerged, the nay-sayers in our midst have feared that this will mean that online information now freely available will have a charge placed on it, or that charges will have a deleterious effect on the use of the web. Possibly, in some cases, but I do not share this fear to any great degree, and am perfectly happy to pay a few pennies to access — for example — an online newspaper on the day of issue from another country, especially during cricket season — gone are the fairly recent summers when if I missed the report of a Test Match on the BBC World Service I would have to make either an international phone call to learn the score or wait days for the paper to show up via air mail. The power of the online advertising dollar will keep subsidizing the use of great online information providers just as it underwrites part of the true cost of newspapers, or of radio and television (in the United States at least). The ability to charge users and the willingness or necessity to do so are clearly not linked inextricably: libraries do not charge admission although they could put up turnstiles as easily as the football stadium or the opera does, or institute “donation boxes” like some museums and cathedrals.

However, to assume that excellence, convenience, and luxury costs nothing is a child-like response, and we are now firmly into a phase of “web adolescence.” So, it is time to act grown-up about the emerging situation. When I walk into my local tea house or coffee bar or pub I don’t expect to be charged for the chatter and socialization I engage in there any more than I expect to be charged to contribute to (or eavesdrop on) a newsgroup; however, I do expect to pay for high-quality merchandise or service when I go into my local Barnes and Noble bookshop or Blockbuster video rental store, or when I pull my telephone from my jacket pocket.

There is a large compensating force to offset the irritation of sites that were free but which will develop a charge: once there are charging mechanisms that allow one to undercut the xerox machine — “micro-charging,” as it is sometimes called — then we will see on the Internet large bodies of material that will never be available for free, and which may never generate enough advertising dollars to underwrite the service. In somewhat narrow terms I am thinking in particular of academic journals that cannot generate compensatory web advertising dollars and need subscribers to cover the editorial, dissemination, and peer-review costs. Recently we have put two scholarly journals on the web in a subsidized fashion: both fifty years of *Studies in Bibliography* (1949-1999) and *Essays in History* (1990-1998) and available free of charge, despite the cost of making them available. Traffic is very brisk, and comments are positive. Free is good, but it is hard to argue widely that you can invest in the keyboarding and SGML markup, the online web site design and provision of a search engine, and then simply give the results away. It is even harder to argue this with current issues of a journal, when subscribers cancel paper subscriptions because the journal is “free on the web.”

The many journals not presently available through the web have a sudden and irresistible

reason to embrace the technology when customers can pay a few cents or a dollar or two directly to them for use of current or back-issue articles. In a slightly wider sense, publishers not now publishing electronically have an added incentive to do so if they can see a revenue not only from customers who want to own the entire book, but also from those who would pay to download a portion of it, or pay to search it once.

After we get used to being able to charge or pay a nickel or a dime for a page of text, the next step is to be able to charge or pay a cent, or a tenth of a cent. For many of us at this conference, this is where the real eCommerce revolution lies. A search for micro-charging on www.google.com (the web search tool of choice at present) delivers www.cybercash.com, www.mondex.com, www.multos.com, and players as small as an on-line art gallery (in 1995) and as large as British Telecom (last month) all making excited predictions about software, smart cards and hardware readers that will deliver what we all so clearly want. Recent changes in the computing hardware clearly point in the same direction: the benign side to the somewhat threatening "unique ID number" embedded in every Pentium III chip is that users who choose to turn on this identifier have a reasonably good mechanism for making themselves known as customers in a commercial exchange. While personal anonymity is one of the great cultural forces of the web, an ID of some sort is a clear necessity for the sort of personal commerce that will harness much of the unused potential of this medium.

Assuming that micro-charging develops as it appears that it will, by 2001 the ability to charge cents for a single transaction will be with us, and we'll be actively thinking about charging fractions of a cent for a single transaction. I currently pay \$20 a month for unlimited Internet access; unlimited local phone calls cost \$15 per month; cable TV costs another \$20 per month; I fully expect to have a consolidated Internet data usage charge on about the same scale in a few years.

The impact on a digital library service such as mine will be significant. At present, we have thousands of texts out of our 45,000 text collection that are freely available. On these, we see an average daily usage of 150,000 hits — or 50,000 accesses — from about 10,000 unique host machines, and use is growing rapidly (our daily usage figures now are equal to our monthly usage figures three years ago). A crude micro-charging mechanism that simply charged one cent per access (a third of a cent per hit) would today yield us \$500 per day, or about \$15,000 per month, or \$182,500 per year. We could pay for a lot of digitizing, or many student assistants, with an extra \$15,000 per month. Assuming a more sophisticated reality, one would want a system that charges nothing to users from certain communities and parts of the world, and a small surcharge to others, or nothing for some types of documents (abstracts, teaching guides) and a premium for others. A mechanism that could charge a cent per unique host per day would still yield \$36,500 annually, and would mean that only the first user from a given Internet host machine in a day would pay anything at all.

Would users revolt at a one-cent tariff per electronic text downloaded? Maybe. But what if they understood that this tariff guaranteed a higher rate of increase in the amount of material available, and in the online tools to mine that data for information? \$182,500 per year would go a long way toward digitizing our raremanuscripts collections, for example, or to providing mass digitizing of brittle books. We are, after all, a library and not a publisher, and look for revenues of this sort to increase our holdings. And it is cumulative — the more you have, the more usage you get; the more usage you get the more capital you have to build more material, which increases your usage still further.

There are dangers of an equal scale to the benefits to this scenario. Nonetheless, I am optimistic

about the future of micro-charging mechanisms, and I confidently predict that in 2001 — eighteen months from now — we will have a massively increased ability to conduct this type of purchase and sale over the web, and this will be greatly to our benefit as scholars, students, casual users, and publishers. Initially the mechanisms will be of limited utility to us, except for individual projects, allowing for transactions costing tens of cents each; at this point they compete attractively with photocopying charges, where the average article photocopied also costs tens of cents. But at some point after that, the promise of true micro-charging becomes a reality, and it is time to start thinking of the positive side to this potential.