What do users think of mobile payment?

Steinar Kristoffersen **Anders Synstad** **Kristian Sørli**
University of Oslo, Norway
steinar.kristoffersen@ifi.uio.no

Abstract

This paper reports from an empirical investigation of usage aspects surrounding mobile payment solutions, e-cash and micro payments. This is a particularly imperative aspect of mobile services development, since cumbersome payment allegedly is a significant barrier to the adoption of mobile commerce. Moreover, it is often seen as a mobile "killer application" in itself, which is expected to have great ramifications for the industry. This paper questions this assumption based on one fairly large (n=462) questionnaire. It concludes that the current view of m-payment as a stand-alone 'product' has not been very successful. We believe instead that users want tighter integration of 'trying with buying' and it seems that the co-located relation of paying and buying when it takes place in the same medium might be important. Surprisingly, mobility as such is not a particularly interesting determinant for mobile services adoption.

Keywords: *Mobile content, micro-payment, e-cash*

Introduction

This paper is motivated by the modest development rate of mobile content services. Lack of adoption underutilizes the highly advanced mobile infrastructure that is already deployed, which is a problem since a tremendous amount of capital has gone into this deployment, much of it originating from when the telecom operators were publicly held utilities, often in a strongly governed monopoly situation. This is the case in the Scandinavian markets, from which the empirical platform of this paper is taken, and in many other European markets. The challenges associated with developing new mobiles services adoption are universal, however (Gilbert and Han, 2005, Grantham and Tsekouras, 2005, Sarker and Wells, 2003). Even in more non-governmental settings elsewhere, the findings of this paper are relevant; the role of billing and safe and user-friendly payment is central in the argument about which new services could and should be developed everywhere. Therefore, this paper looks at what users think of implementations, experiences, emotions and models related to exactly these factors, and reasons about how they relate to actual adoption.

Background

Innovation is necessary in the sector of mobile services and application. Particularly, this is the case since large investments in next generation networks, partly motivated by the 'dot.com'-expansion, are sunk costs. These costs need to be recovered in order for this part of the industry to develop further.

The mobile operators today control access as well as billing. They typically provide a framework so that third-parties can offer fairly simple services (e.g., (Nielsen and Hanseth, 2003, Podnar et al., 2002)) and low-value content (Minges, 2005, Davie et al., 2004) to mobile phones, and for that they charge the content providers, in Europe, e.g., between 30-70%. This is a business model that works, somehow, in some countries and not in others (Nielsen and Hanseth, 2003), but it does not seem to offer room for all kinds of actors. Representatives of companies[1] who invest in developing innovative technologies for 3G often point to the "unresolved question of a fair split of revenues in the mobile network[2]."

In most of today's networks, the operators are in a very strong position, controlling as they do the access to the network as well as the billing systems. It should surprise no-one that they see billing as a strategic tool that enables them to stay on top of the value chain (Crookes, 1997, Sabat, 2002).

Problem

Content providers and developers often blame operators for not being "willing to share", of course. In addition, they fear that users might actually not want to pay for new services and content via alternative billing or payment systems, because these alternatives in themselves are not perceived as very user-friendly or trustworthy.

"On the mobile internet there is a need to enable a simple payment system that neither necessitates quitting your browser to send a premium rate SMS, nor requires entering credit card details - indeed, the majority of the content is too low value for credit card details to be worthwhile[3]."

Therefore, content providers, developers and vendors are forming alliances which aim to develop mobile payment schemes that can help these actors fight their way back into the mobile value chain. Especially, the 'crux' is believed to be the lack of a suitable, open regime for mobile small payments, which is how this paper will define m-payment and anonymous peer-to-peer transactions, i.e., e-cash. In this paper, 'mobile' is taken to mean initiated using the mobile phone (cf. (Henkel, 2001)).

However, although the need for mobile payment technologies appears real, perhaps the popularity of conventional payment devices such as credit cards prevents "smarter" alternatives from emerging. How much simpler can it get, after all? Is there anything in the way that this phenomenon is rhetorically dealt with, implemented and actually used, that would indicate that it is a potentially "revolutionary" innovation process going on in this part of the industry?

Our objective, thus, is to investigate in a quantitative manner how people look at and actually use mobile payment solutions today, in order to inform the design of improved mechanisms for m-payment and e-cash.

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[1] *Trolltech* (http://www.trolltech.no) and *Colibria* (http://www.colibria.com), e.g.

[2] http://telecom.no/showArticle.php?articleId=11871

[3] http://www.nccmembership.co.uk/pooled/articles/BF_WEBART/view.asp?Q=BF_WEBART_131164

Related work

Telenor, which is the biggest operator in Norway, reports having 40 000 users per week on their mobile payment system ”MobilHandel” (which translates into something like ”mobile purchase”). That certainly sounds like a lot, but, one should bear in mind that every day, 1.3 million Norwegians use their access/switch-cards, generating annually 460 million transactions. ”Mobile purchase” makes up less than half a percent of this.

There is little empirical evidence of “cumbersome payment” standing in the way of m-commerce. “Easy m-payment” is not usually reported as a determinant of adoption of mobile services, either. On the contrary, although personal experiences for a lot of people might indicate that the current technology for making payments on the web or their mobiles are far from optimal (in terms of its user-friendliness), studies show that it is the usability and usefulness and speed and convenience of the service itself that counts (Pagani, 2004).

Actually, previous findings indicate limited interest in “transactional applications”:

“However, the actual transactional m-commerce applications (transaction mode), such as issuing electronic payment, buying products from physical shops, or transferring money from a preconfigured bank account, did not rank as high as we had predicted they would (Mahatanankoon et al., 2005, p. 353).”

Credit cards dominate electronic payment world-wide (Chakravorti, 2003), even for internet-based transactions today (Asokan et al., 1997). Our studies point towards ‘bookkeeping’ as less important and anonymity as very different from one might intuitively believe based on previous experiences of credit cards transactions, when it comes to m-payment. Moreover, improved m-payment clearly can offer a modern instrument of electronic payment to groups of people who do not have them yet. One example could be users in their early teens who otherwise could, due to their occupational or financial status, acquire one (Szmigin and Foxall, 1998). This is also indicated by the important role of prepaid subscription cards, and they are coming into play as a component in mobile payment solutions as well[4]. Therefore, further research into the requirements to- and properties of e-cash seems warranted.

Finally, with the rapidly developing business scenarios of web- and mobile commerce, we ought to expect from ”disruptive technologies” in this domain that they eventually catch up with requirements that they fall short of today (Christensen, 1997). So it seems relevant to ask if mobile payments in the guise of m-payments and e-cash are, indeed, the start of a disruptive technology.

Method

We have carried out a substantial quantitative study in a population consisting mainly of visitors to the site http://digi.no. Digi.no has 265 000 monthly visitors. As the table below shows, it is skewed towards a younger, male population:

[4] Telenor has made the observation themselves, that *Mobilhandel* is mainly used for renewing pre-paid subscription cards

Sex and age	Male	Female	< 20 yrs	20 - 29 yrs	30 - 39 yrs	40 - 49 yrs	> 50 yrs
Digi.no	93%	7%	4%	35%	38%	15%	9%

Table 1: Demographics of the population

We realize that this makes the sample less representative of the population in general, and that we will not be able to generalize towards the entire group of potential users of mobile payment services. However, since this is one group regularly targeted for early adoption of exactly this type of services[5], their attitudes and usage patterns are particularly pertaining to how the industry develops. Therefore, the focus of this investigation could be seen as exactly its vantage point, rather than a disadvantage.

It is important to know that this population is very experienced with regard to electronic commerce. 97% of digi.no's readers have bought services or merchandise over the Internet, 65% within the last month. The population of digi.no is quite evenly distributed across "white-collar" professions, however, and unfortunately, around 60% of them work in computer and information systems related firms[6]. This needs to be kept in mind when our results are interpreted.

The questionnaire was implemented in phpESP[7] and published by digi.no[8] in late April 2005 and closed one month later. From a population of 265 000, a sample of 462 people responded to the questionnaire. This would indicate that our findings are representative and statistically valid within a confidence interval of 4.6, with $p = 0.05$. However, we are still in the process of carrying out a systematic and quantitative analysis on the results from this study, since it is so recent, and this paper therefore reports mainly on the descriptive statistics of the investigation only. Further work will present more analytical results.

Mobile payment technology

It certainly would have been nice in a paper like this to be able to discuss in detail a lot of exiting, broadly implemented examples of electronic cash, micro payments, digital peer2peer transactions, etc. Unfortunately, however, most of these projects in the telecommunications' realm never took it beyond the piloting stage. Mobile payment has been "hot stuff" for much too long already, as we can see from the sidebar below.

- Mpay in Norway (2005)
- C-mode in Japan (2004)
- Easypark and Telenor (2003)
- Telstra's "dial-a-Coke" (2001)
- Sonera's "Virtual Parking System" (2000)

Many times the possibility of purchasing soft-drinks drinks from a Coke machine and have the drinks charged on the mobile phone bill, have been publicized. Although most people never see any such vending machines around in locations that they themselves frequent, this rhetoric seems to feed itself, nevertheless. Some implementations do exist, however. One can, for instance, in the C-Mode network in Japan use the mobile phone to buy soft drinks. The payment transaction as such is done either by a 2D bar code coupon

[5] http://ikt.hia.no/perep/parking.pdf

[6] The user study of digi.no (http://www.allerinternett.no/annonseweb/lesere/2003/digi.ppt)

[7] http://www.phpesp.org/

[8] http://www.digi.no/php/art.php?id=212571

displayed on your mobile phone screen, or via an infrared connection. The cost of the coke is charged to a prepaid C-mode Club account, which you must fill with cash before you can use it to purchase anything. There are about 1000 C-mode Coke machines in Japan now and one can find some around the main train stations in Tokyo.
In many big cities there's m-payment for parking as well. The company mPay in Oslo is responsible for implementing one solution (Kristoffersen et al., 2005), not to be confused with the Finnish MPAY-project[9]. mPay's system is Internet-based, and requires users to register in advance for the service. They have to enter their personal data including credit card information for payment, which is managed by mPay. The service is activated by SMS[10]; however, payment is not actually implemented by mPay or by the operator. It is carried out by the major credit card banking institutions including Visa Norway, Eurocard and Nordea. mPay deducts billing information from the SMS and then transfers it to the credit card banking regularly for them to do the actual invoicing according to ordinary credit card membership procedures.

Near-field communication

It could also be beneficial to look briefly at some "pure" RFID projects; even though there are still no hybrid RFID (Radio Frequency Identification) mobile phones around in the marketplace. Many operators' R&D departments are experimenting with such devices.
Octopus is an electronic payment system using contact-less smartcards trademarked as "Octopus Card". It offers an easy (it is claimed) and hassle-free way to travel, shop and dine around Hong Kong. Each Octopus card has a built-in microchip which stores money electronically. It also has other applications. Users simply wave their Octopus cards over an Octopus reader which will automatically deduct the correct amount from the card.



Octopus is used widely in different domains, such as public transport, parking and retail. It is based on a proprietary 13.56 MHz technology similar to, but not compliant with the ISO/IEC 14443 standard technology, which is the one used by the Prestige project's Oyster cards, which will give London Underground and London Bus Services Limited a new, integrated ticketing and revenue collection service.
There are now 2.2 million Oyster cards in circulation, which will in the future eliminate cash London buses in order to speed boarding times and thus reduce congestion on the roads. Prestige is well underway, although there have been a few small glitches in the early stages, e.g., including a rush hour failure (in the morning rush hour of Thursday march 10 2005) where the Oyster card system failed in the London Underground, which left barriers open. There have also been accusations of overcharging, but by and large thus project is progressing as well as one might expect.

[9] http://www.vtt.fi/tte/tte5/pdf/EPAArticle.pdf

[10] Short Messaging Service

Tickets



Another existing example (from Oslo) is the system based on Telenor's Mobilhandel[11], system. Via a portal called *Filmweb*, which is also available in a very limited version on WAP, one can read notices and reviews about the films, and order tickets. Payment, in the end of the day, comes either from the subscribers' VISA-cards, their bank-accounts via a third-party system called SmartPay, or a separate mobile account managed by the operator. There is not much service enrollment to speak of except entering the account details and one can even do that over SMS.

Content provider Access

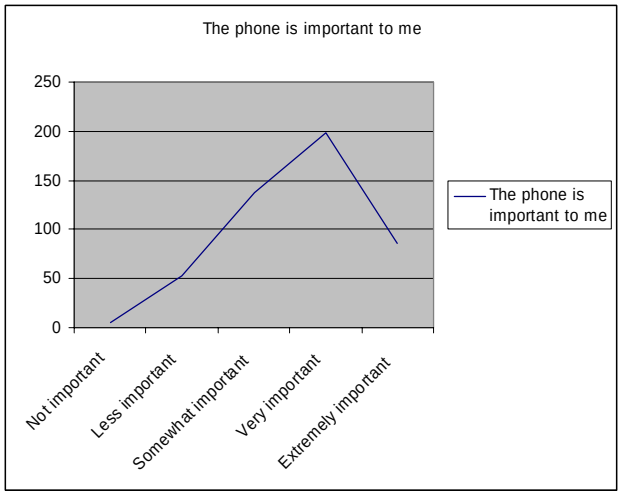
The final example, which is from a successfully implemented platform for billing and a business model developed by the two operators Netcom and Telenor in Norway, is the Content Providers Access Agreement (Kristoffersen et al., 2005, Nielsen and Hanseth, 2003). The CPA gives content providers the possibility to develop and offer simple services to mobile users within the network, and to do so in an operator-independent way. So, this is a billing API, not a mobile service directive towards the end-user as such.
However, one of its important implications is that it gives the end users an operator-independent interface, commonly based on a four-digit access number and (usually, but not technically an implication of the CPA) the same set of messages to memorize for each service. So, the interface is standardized and the marketing thus made easier. The message is routed from the operator to the content providers, which return a pointer to the content and input to the CDR which is then processed by the operators billing system.
With CPA the content provider can distribute both "pull" services, meaning that the end user initiates the service every time he sends a message requesting a service, and "push" services, which the mobile user has initiated at one time with a request message. An example of a pull service is downloading ring tones for the mobile while an example of a push service could be sending messages to the user with football results from ongoing matches.
The operators have chosen not to compete on differentiation with services exclusively provided in one of the networks, and this strategy is basis for a reasonable successful enterprise offering 'infotainment' services by and for the mobile phone, with revenues currently around 250 million €.
It seems, to summarize, that although a few of the projects we have mentioned, such as the CPA platform and contact-less ticketing systems, are impressive and no doubt useful, phone bill charging is the predominant form of mobile payment today and it is used mainly for logos and ring tones. Mobile banking, e-cash and micro payment solutions exist, but they are rarely used. Although people quite clearly have a great deal of confidence in the big operators, a study carried out by tns.gallup in 2004 tells us that they

[11] 'Mobile Purchase'

seem to put less trust their mobile "wallet", although the trend is improving. In this study, 39% say that they would trust their phone to be used as a vehicle for mobile payments, vs. 34%, saying that they would not, and the trend in favor of "trust". 27% are undecided, and this is a reverse trend from previously.
So, to summarize, "E-cash" remains esoteric and mobile payments are only used to a very limited extent. Content providers think it might help them get a fairer share of the revenue stream, and users want simpler, better ways of paying for mobile services, for which heavy service enrollment or other transaction costs are not warranted due to their limited value. Or is this simply not the case?

Results

Summarizing the descriptive statistics of questionnaire, we have to say that it did not confirm our expectations about this particular population in terms of their mobile telephone ownership. They were much less advanced and enthusiastic consumers of mobile content than perhaps we would have been led to believe (Townsend, 2000). This sample consisted of relatively young people; 20% of them were in their early twenties and younger, and a total of 45% fell into the next 10-year tier between 25-and 35. Still we did not really find any usage patterns matching the usual picture of the (predominantly male) young user in complete and clever control of novel services (cf. (Carroll et al., 2002), taking into account that they were looking an even young population). The "subjective importance" of technology, in this case their mobile phone, was distributed along an unexpectedly "normal" pattern:



Graphics 1: Distribution of device importance to owner

In our sample, people did not see themselves as being particularly mobile. More than 55% traveled only occasionally, and 6% traveled very often.
The general trend was that few of the respondents saw the usage of mobile payment as very troublesome at all, although 11.9% did see it as relatively or very problematic. However; as many as 42.4% reported that they would not trust their mobile phone at all as a means of carrying out a payment. This is similar to the findings from tns.gallup.

56.3% trusted credit cards more. Only 4.3% saw the technological support of a mobile phone as something that would make m-payment safer than a credit card. And we must not forget that this is a population of which the majority carries out internet-based transactions and m-commerce on a regular basis. This is therefore a crucial finding, and one certainly with implications for the service providers, since at the same time as many as 61.5% of the respondents believed that this was a technology that would make their lives easier. So, summarizing thus far; our investigations characterizes a population that is used to using technology to do business- as well as personal transactions, they know the technology and do not consider it highly problematic (as such), but they do not trust their mobile phone to be used as an instrument of making the payments, although they think that it would be effective.
The actual usage of mobile and electronic payments was reported to be as shown in the following table:

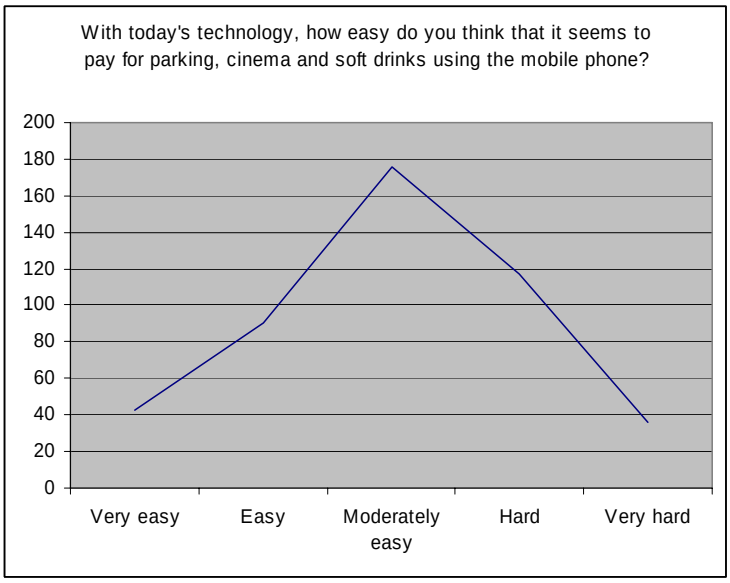
Do you use electronic payments today, such as Payex, ContoPronto (Luup), Buypass (Norsk Tipping), Smartpay (Telenor Mobilhandel), Paypal?

No, I do not use any such means of payment	55.8%	(258)
Payex	19.9%	(92)
ContoPronto (Luup)	1.5%	(7)
Smartpay (Telenor Mobilhandel)	10.4%	(48)
Buypass (Norsk Tipping)	16.0%	(74)
Paypal	27.7%	(128)
Other: Anonym Digital Cash	0.2%	(1)
Other: in Great Britain	0.2%	(1)
Other: Moneybookers, Neteller	0.2%	(1)
Other: mPay	0.2%	(1)
Other: MPAY (infogate.no)	0.2%	(1)
Other: Neteller	0.2%	(1)

Table 2: Do you use e-payment?

Although in one of our pilot studies (n=27) 75% have purchased mobile content and paid for it using their mobile phone, we see that in the larger sample 55.8% do not use any of the common means of electronic payment. Those that are used, indeed, are (with literally one exception) for the Internet mainly. This supports our interpretation for the pilot that users are willing to try (maybe) a mobile content service once, and then they abandon it. There is nothing wrong with using the mobile phone to purchase content for the mobile phone, but there is nothing special about it either, according to our subjects. Relating briefly this discussion to TAM[12] (Technology Acceptance Model), one can perhaps say that our users were slightly positive when it comes to the perceived usefulness of m-payments, bearing in mind that 61.5% thought that it would make life easier and that ca. 50% thought that it was a solution that appealed to them. Perceived user-friendliness, on the other hand, which can be seen as close to normally distributed, could perhaps be interpreted as neutral (graphics on next page):

[12] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.



Graphics 2: How easy is m-payment?

The majority of our sample were people with more than 5 years of mobile phone ownership, dating that "back and through" a period when premium SMS already had become widely available, so either they never did use it a lot, or they discontinued using it, quite recently. We believe that our sample never did make any massive commitments to mobile content provisioning at all, and that they additionally they are only moderately interested in this technology per se. This does not contradict their predicted usage of SMS and phone calls for interpersonal communication, however, even at a highly advanced level (Taylor and Harper, 2002). It is, quite simply, something else in terms of perceived usefulness and easy-of-use.
Perhaps interestingly also, on the basis of the experience that they have had, respondents in our sample had the following recommendations for how mobile payment services could be improved:

What do you think would make mobile payment services easier to use?

Improved user interfaces (easier to use)	53.7%	(248)
Separate e-cash currency (rather than paying on the phone bill)	36.1%	(167)
Anonymity in transactions (similar to cash)	45.5%	(210)
Better feedback, in terms of getting a better receipt	56.5%	(261)
Omnipresence, it must be accepted by many points of service	69.9%	(323)

Table 3: How should m-payment be improved?

From our study it also seems that people grow increasingly aware of how much they depend on their mobile phone, but it is not clear from the data if that is because they grow

older and get more serious commitments, e.g., with children in nurseries and proper jobs, or, if they simply have had the phone longer by then and have become even more adapted to it.
The correlations in this material seem reasonably good and we are currently looking further into issues such as trust of the technology as a determinant of a positive evaluation. It thus complements results presented elsewhere that point to usefulness, user friendliness, price and speed as important determinants of adoption of third generation mobile services (Pagani, 2004).
Also, the requirement of pervasive use (another way of looking at critical mass?) seems to correlate with many other "positive" factors, such as how positively m-payments are evaluated and the weight attributed to usability. A little bit more surprising, perhaps, it is that in another one of our pilots (n=62) we found that people who have had their phones longer, generally to a higher degree want m-payment to be anonymous, in which case they also wanted better receipts of each transaction. Males were significantly less concerned with anonymity then women.
In our pilot study, age correlates positively with seeing the need for a dedicated "e-currency", which is interesting seen in relationship to the next item, namely that they seem to trust their phones even more than long people, when it comes to using it as a mobile wallet. Is this a prerequisite to trust the mobile wallet, that it is perhaps "sandboxed" in a currency of its own? This is something to look into for further research.

Discussion

There seems to be some agreement between analysts and our findings that billing is not really a detached back-office function that can be easily outsourced, or looked at as a "killer application" in its own right (Henkel, 2001). Matter-of-factly and quite practically, respondents in our sample simply do not seem to be particularly "moved" by technology and their lack of trust in the mobile phone must be looked more closely at. There is of course a need for new services, and there is a need to make those services billable in an easy, safe efficient manner, but there is not really an indication in our data that this is a "catch 22".
People prefer to pay using their credit cards or other familiar payment schemes, even though such schemes also have transaction costs. On the other hand, we don't know exactly what users need, and the threshold for people to try new services is high. So, services have to be lightweight and modestly priced.
A better solution is needed. What, then, exactly stands between that solution and the community of project managers, designers and programmers? We think that we need to look back at the data and try to elicit a design framework from the perceptions and experiences that users report having had with this technology. At the same time we need to be open about non-adoption possibly (and trivially) being a result simply of the poor value of most of the services, at the same time as we look to the future and hypothesize more appealing services and try to imagine ways in which buying and paying for those services could be (even) more convenient than what they are already.
We hypothesize, then, that payment and paying should be seen as more tightly coupled with the buying experience, which is exactly and characteristically what happens with the arguably successful CPA. In future research we shall model these concepts more

precisely, but within the descriptive scope of this paper it is only room to say that we want to introduce the notion of "dis-ambience" of paying and buying when the action of settling the bill is detached in space or time from that of buying, as a way of explaining why some solution work whilst others fail. In addition, we shall distinguish between confirmations or receipts of a purchase that happens immediately, vs. one that is postponed. This extends the notion of a receipt conceptually, with technical as well as practical consequences, from confirmation of payment to confirmation of a bona-fide purchase. Postponed confirmations implicate that receipts are seen as a way of being able to keep (reasonably) accurate accounts of spending, plus the possibility of returning goods it after a while they turned out to be faulty. We assert that in the virtual, mobile world of m-buying, confirmation is required immediately of the actual receipt of the goods themselves, something that is taken-for-granted in the physical world, plus that it has to be inextricably linked to the product or service actually working as promised, right away.

Implications

We think that we can see, even if this work is still in its very early stages, some indications from the work presented here in the direction of mobile IS research in general. Firstly, mobility (as such) does not seem to be a particularly interesting determinant of the adoption of mobile technologies. This might seem surprising, but really it is not. Highly mobile people often travel to do their work elsewhere using predominantly stationary technologies and often no IT at all. We have seen this elsewhere in case studies of auditors working to classify ships, consultants, etc (cf. (Kristoffersen and Ljungberg, 1999)). On the other hand, demographic groups with very limited mobility, such as children down towards the age of eight are starting to use mobile phones a lot, to coordinate their everyday lives at school and with friends. Technology can be good enough without that resulting in adoption. Moreover, although people may use a technology extensively for a while, they suddenly stop using it. We believe it is the user and the user's subjective experience with technology that constitutes the main factor and that rhetorical strategies of marketing organizations as well as users themselves are part a of shaping that subjective experience (Phillips, 1998).

This research have to some extent used terminology borrowed from literature about disruptive innovation (Christensen, 1997), which it seems, when we look at companies that work in mobile content provision and m-payment i Norway, to be a notion that sometimes fit when we look back at the product coming out of industrial processes that have been going on for a long time. It is much harder to see how it could have been applied normatively (Christensen and Overdorf, 2000).

Successful m-payment revolves around credit cards, which is the big payment technology. It is managed by the big companies, the banks and the operators, but at the same time it allows smaller companies to make a little from many small opportunities in an economy that is largely sustained rather than disruptive. Which may, in the long run, turn out be quite sufficient. But this is perhaps exactly what makes it not a disruptive technology right now.

Summarizing core findings from our work, then, we arrive at a set of relevant and interesting hypothesis for further research:

Mobility is not a particularly interesting predictor of mobile services adoption: Services and applications for mobile terminals that are on offer in the marketplace today are not, as such, mobile-aware. By that we mean that there is only a weak, or no association at all between the adoption of services and users' physical (or otherwise) mobility.

There is an uninteresting contrast between the "indifference" and low value of mobile content and the "heavy" enrolment needed for (alternative) payment schemes: A lot of the content that is available, and to some extent quite popular for mobile terminals are lightweight entertainment. We are usually concerned with simple java games, logos, ring tones, and only a handful of more advanced multimedia services, but still, hardly services that one would expect people to be willing to enroll in a credit card based services for. However, this is what people do, in these and similar circumstances and they claim to trust these alternatives (and use them) a lot more than they would their mobile phones.

There is a much more intriguing ambient relationship between the "inspiredness" of buying such content and the "immediateness" of trying it: From our research there seems to be an indication of the need to implement buying, trying and paying in an ambient triad with each other, which represents a much more interesting reflection of the job that money does for us, then alternative conceptualizations of electronic money as "another" representation of value. Money sets up the shop, creates the customer (as a role), makes buying and paying possible at the same time and for physical money, makes sure that the product or service can be confirmed in a practical fashion. M-payment needs to strive for the same in the media where the product itself "lives". A ring-tone paid for with CPA is a good example. It is bough with the phone, for the phone, and the user finds out immediately if its works or not. The matter of paying for it is already settled "matter-of-factly" since the operator handles the billing as part of the "deal" of using the phone, for instance for this purpose.

Anonymity, transparency, and pervasiveness are important aspects of m-payment: Looking at what a sample of users in a population of youngish, web-savvy and (in their own eyes) trendy enough people though about using their mobile as a wallet, we found that a lot less people than expected, perhaps, wanted anonymity, but that it correlated with being concerned about the number of places and the familiar confirmation of a receipt. In future research we have to find out more about exactly what this correlation signifies.

Users are not impressed by the services they have been offered by the industry, so far: Most users have tried buying and paying mobile content (even logos, ring tones and games) with their phones, but those who have, have only tried it once. Alas, the discussion in this paper has taken the topic of m-payment to stages that most ordinary users would consider futuristic and irrelevant. It cannot stay that way. The lack of innovation in today's mobile networks is an indication of the relevance and need of research in that direction, not the opposite. Future developments in the telecommunications industry depends on a sustainable value chain, in which well-thought out payment mechanisms will be an integral part.

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