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WAP and Accountability: Shortcomings of the Mobile Internet as an Interactional Problem

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Abstract

Wireless Application Protocol (WAP) is designed to allow access to the Internet on a mobile phone. Attempts to explain its limited success have focused on attitudinal and cognitive reasons for non-use, finding that although people recognize the benefits of WAP, issues like lack of content, privacy concerns, and reference group behavior account for non-use. Such explanations have also been incomplete in that they have not addressed problems related to actual use and interaction with the technology. Our article studies the use of WAP as situated action. We focus on how users make sense of WAP pages and how they disambiguate *in situ* the responses from the service, i.e., new pages and new menus. Our method of transcribing videos of WAP use following the conventions of conversation analysis offers a cost-effective tool for understanding user interaction with technology and provides useful implications for design.

Keywords

Usability data analysis, experiment, video methodology, ethnographic study, heuristic evaluation, Wireless Application Protocol (WAP), accountability, acceptance of technology

Introduction

Mobile telephony and the Internet were the two great telecommunications successes of the 1990s. These were to be united through technological convergence, thus providing a mobile Internet (International Telecommunications Union, 2002). Wireless Application Protocol (WAP) was designed as a central building block of the mobile Internet. WAP is a standardized protocol that enables an application to be set up between a cell phone and a server (Vos and Klein, 2002). Launched with great expectations in 1998, WAP turned out to be an equally great disappointment. WAP-enabled handsets were at first not available, content was scarce, and use was cumbersome and expensive. The launch of this first mobile Internet technology was a flop, and WAP has still not recovered as a consumer technology (although technically it has survived and is becoming widely adopted). Its supply of content is much more limited than of the World Wide Web (WWW) and its browsing experience is inferior (Mylonopoulos and Doukidis, 2003).

This article argues that mobile services are essentially a social technology. How smoothly they are integrated with age-old social practices is crucial to their success (see Taylor and Harper, 2002). Based on a small usability study with five subjects, conducted in Helsinki in 2001-2002, our article describes the kinds of problems these subjects faced when using WAP and the kinds of practical actions they took in trying to solve those problems while interacting with WAP. To be adopted, interactive mobile technology has to be more than just useful and needed by users; it has to be intuitive, stimulating, and supportive of users' interactional practices (Koskinen and Repo, 2006; Repo et al., 2006). Our empirical data illustrate the kinds of irredeemable problems that emerge when this simple fact is forgotten. A secondary aim of this article is to show that, even though conversation analysis is generally thought of as a time-consuming framework, it is possible to conduct quick usability studies with it. Note that the argument developed in this article applies specifically to consumer technologies, not to professional technologies.

Explaining WAP Shortcomings

WAP resembles an extension of the menu structure of a mobile device and has similar features, strengths, and weaknesses (Huang et al., 2006). WAP users can access content on information networks by selecting and clicking hyperlinks on the screen. These hyperlinks are represented as (usually underlined) text or as graphics. The most obvious limiting factor of WAP is the small user interface of a mobile phone, which allows only a few links to be seen at a time. Therefore, content that has any degree of complexity is arranged into a hierarchy in which browsing starts from abstract, higher-level menus and then grows increasingly specific.

Compared with conventional Internet use, WAP offers several advantages (Teo and Pok, 2003; Barnes, 2003). Mobile technology is portable and practically ubiquitous. Users have access to mobile services in any place at any time without needing to search for a hotspot on a wireless network, or a physical computer in a café, library, or some other place of access. The mobile phone also provides a familiar interface. Moreover, the i-mode developed by NTT DoCoMo shows that the mobile Internet itself can be a success. WAP, on the other hand, has not yet become a routine technology; by using it, one can still acquire a

reputation of being technologically savvy. Reports indicate that those with WAP-enabled or more advanced phones use services only slightly more than others (Carlsson et al., 2004).

Despite its advantages, WAP has proved a commercial failure for several reasons. With Japan and South Korea as possible exceptions (Ishii, 2004), only a small percentage of consumers owning a cell phone use it to connect to the Internet. The most typical reasons for not connecting are high costs, slow access speed, and hard-to-read screens that make use awkward and uncomfortable. Low bandwidth in the mobile domain also explains why service interfaces are typically text-based and, thus, difficult to use. Also, although users who have tried out WAP-based services generally have a more positive attitude towards them and are willing to put up with small inconveniences, privacy concerns and lack of content are still seen as unacceptable obstacles for wider use of the technology (Anil et al., 2003).

Few attempts to explain theoretically the failure of WAP have focused on this paradox of high expectations and inferior user experience. Users feel cognitive dissonance between their expectations and practical reality. This dissonance fuels criticism against the technology and the industry alike. Also, promises that new “next generation” technologies will soon be commercially available has led to a wait-and-see stance among consumers. Teo and Pok (2003) have explained the failure of WAP with what they call the “decomposed theory of planned behavior,” claiming that people’s behavior results from behavioral intention, which in turn is explained by their attitude, subjective user norms, and perceived behavioral control. Attitudes are explained by factors like perceived usefulness of the technology, ease of use, and compatibility with the user’s existing values. Subjective norms are due to reference group influence, while perceived behavioral control refers to a belief of possessing the resources and opportunities necessary to adopt a WAP phone. Structural equations showed that the intention to use a WAP-enabled phone was associated with attitudinal and normative factors, but not with perceived behavioral control (see also Cheong and Park, 2005; Pagani, 2004; Kim et al., 2003).

In essence, this body of research explains the intention to use WAP. It assumes that once such intention exists, the likelihood of use increases. The problem with the model is that it does not explain why even those who have used WAP have not continued its use for long. Some other explanation is needed to understand why users give up.

In this article, we assume that users initially see value in WAP, and offer an empirically grounded interpretation of why they stop using it. Methodologically, this premise requires a new approach. Earlier studies focus mainly on the adoption and acceptance of technology rather than its actual use. Moreover, they are based on users’ own reports about their own behavioral intention rather than on the practical grounds of such reports. Our article addresses these problems by studying WAP use in situated action. Accordingly, the argument developed in next section aims to complement previous acceptance studies.

WAP in situated action

In her seminal book “Plans and Situated Actions,” Suchman (1987) proposed a study of interactive technology from a situated perspective. In examining how copy machines communicate with users, she showed that users reasoned their way through the instructions provided by the machine as information came along, rather than by constructing a plan of action to guide the use process. Her study is based on conversation analysis (see Sacks et al., 1974; ten Have, 1999). She compares interaction with technical devices to such institutional activities as doctor-patient interactions in which the expert leads the discussion and provides its basic structure. What the doctor has to do, however, is interpret the patients’ actions anew in every encounter (Drew and Heritage, 1992).

Applied to interaction with WAP services, this approach understands user choices and system responses as an inseparable pair (Suchman, 1987: p. 107). When a WAP page appears on the phone screen, the user has to read it, locate candidate selections from its menu, construct a relevance order between candidates, and select the best candidate or return to the previous menu. Suchman (1987: p. 132) calls such actions “situated inquiries.” The page that appears in response to the selection either confirms or challenges this reasoning. If the user concludes that her initial choice was correct, she will continue to the next screen. She may also return to the previous screen to select another path if she concludes that the selection was wrong. Two types of errors are possible in this process (Suchman, 1987: pp. 163-169). When the selection is correct but the user thinks it is incorrect, it is a question of a “false alarm”. When the user proceeds down the wrong trail to a third page, not knowing that her previous selection was incorrect, she is on a “garden path”. It is the user’s task to realize these errors from information that appears on the screen.

To give an example, finding the daily index of the Helsinki Stock Exchange (HEX) from the Helsinki-based mobile phone operator Radiolinja’s WAP site requires going through a menu system that is formally organized into a tree structure. The user can easily understand that HEX is under STOCK EXCHANGE and even that this is under MONEY, but not as easily reason that MONEY must be under UTILITY. The assumption is that the stock exchange is “useful” and related to money rather than, say, financial markets. Only after performing these three steps correctly can the user find the stock exchange. The problem is that users cannot know the path to their desired destination until they get there. If they head down a garden path, they have to return and reason their way through the system all over again.

At stake is the user’s trust in his/her ordinary methods of reasoning rather than the completion of a simple task like finding a bus schedule or reserving a movie ticket. In one of his “breaching experiments,” Garfinkel (1967: pp. 41-44) instructed students to insist that their co-locutors clarify what they meant by ordinary terms. Typical responses were angry attempts to restore the original state of affairs, indicating that deviations from ordinary methods were sanctioned. Technology is treated similarly. For example, if users repeatedly go off course in using WAP, they feel embarrassed and annoyed, and sometimes even angry at the system. This effectively leads to a total rejection of the technology and to the accompanying service opportunities, no matter how useful the service might

initially have felt: user experience turns negative. Users often have no means of knowing why their search fails. For instance, how could they possibly be aware that the Helsinki Opera still today has no WAP pages? It is natural for users to hold the system accountable for being intelligible and logical from the standpoint of their mundane methods of reasoning. WAP cannot escape being accountable in terms of ordinary society; users see it as a moral statement rather than just a neutral technological and business tool.

Data and methods

Our data consist of five, videotaped, test sessions of WAP use, each lasting approximately 30 minutes. Pairs of university students were given several tasks on the portal supplied by the Helsinki-based mobile operator Radiolinja. The setup followed Suchman's procedure (1987). One subject in each pair was using the mobile phone, while the other one assisted by giving advice and suggestions as they navigated through the menus. The videotaped sessions were transcribed using standard international conventions of conversation analysis. (Tables 1 and 2).

Table 1. Transcription symbols (Jefferson, 1984)

Symbol	Description
(.)	Micropause of 0.1 second in talk.
(0.4)	An interval of 0.4 seconds.
'n [she sa]id	Overlap begins and ends.
[But th-] = [[I'm saying	Utterances start simultaneously.
[[But no:: Wha:t	An extension of the sound.
. ,	A stopping fall and a slight fall in tone
? ?,	A rising and a slightly rising intonation.
/ \	Rise and fall in intonation
Wh<u>a:</u>t	Underlining indicates emphasis.
WHAT	Loud.
what	Quietly, or in whisper.
hhh .hhh	Outbreath and inbreath.
(what)( ) say	Transcriber's doubt or best guess.
((door slams))	Transcriber's comments.
W(h)hat	Within words, (h) is a laughter token.
he HEH hah	Laughter tokens.
wh-	Cutoff of a word.
And th( )<	The speaker halts some unit in progress.
>she said<	Quickly.

Table 2. Transcription of WAP use on the mobile phone

Symbol	Description
<SELECTS OPENING PAGE>	The user performs an activity with the device.
{SYDNEY 2000	Menu opens.
@Connecting to@	System messages to the user.

Each subject pair was given five tasks and had seven minutes to perform each task. Our article describes how the subjects reasoned their way through the WAP service to find the Helsinki Stock Exchange general index (HEX). This case provides an acid test for WAP technology; a stock index is semantically simpler than, say, "traveling" or "culture" that are fun for one, business for another, work for a third, and an investment opportunity for a fourth. There ought to be

few difficulties in finding a key institution in a semantically simple domain. Should this prove to be a problem for users, problems are bound to escalate in semantically more complex domains.

The 10 subjects (three men and seven women) were university students with no expertise in information technology or user interface design. None of them had a phone supporting WAP and only two of them had ever tried one, whereas everyone owned or at least was familiar with a mobile phone. The screen of the Nokia 7100 used in the test shows only five lines of text (Figure 1). The first line at the top is a fixed heading line, and the content of the WAP page can be scrolled down and viewed so that four lines are visible at a time. In addition to the roller wheel used for browsing the text and click hyperlinks, there are two buttons below the screen. The functions of these keys are shown at the bottom of the screen. Usually, the left-hand button is used to access the mobile phone's internal menus, such as bookmarks and preferences, while the right-hand button is used to return to the previous menu or to select or cancel an operation. The original design of basic WAP browsing has not changed much since its launch in the late 1990s. Still today, WAP is very much a novelty for ordinary users, which makes our data, collected in 2001, as relevant as ever.

We recognize that the context in which the data were produced was an unnatural laboratory-like situation with characteristics that do not apply to real use. Nevertheless, we trust that layers of naturally occurring reasoning and methods were indeed revealed in this setup (Kaikkonen et al., 2005). Our analysis describes ordinary methods used by people to solve whatever problems they face in action. The analysis proceeds inductively (ten Have, 1999). We quickly realized that the most crucial difficulties in WAP use occurred in the first two minutes after the service was opened, so we focus specifically on these two minutes.

Our set of data is small for the social sciences, but follows the conventions of industrial usability studies (Nielsen, 1993: pp. 173-174). However, the data are sufficient for our purposes because they enable us to observe and study what people do when faced with WAP for the first time in their lives, and how they make judgments about this technology based on their experiences. Our analysis shows that it is possible to combine conversation analytic accuracy with usability practices in the context of usability studies. The validity of the analysis does not depend on statistical generalization but, as is generally the case with “thick description” (Geertz, 1973), on how richly we are able to capture what users do when faced with certain situations and what features of a situation drive their action. Detailed transcripts of the video sessions enable readers to form an independent judgment about the analysis. If found plausible, its contribution lies in the fresh perspective it provides on WAP navigation.

Findings

Three distinct kinds of findings emerged in our study. The first findings relate to disambiguation in the opening menu of the WAP service. The second findings deal with the problematic response of the next menu. Third, we observed moral dimensions in the interactional confusion created by the menus.

Situated Inquiries in the Opening Menu

In trying to find the daily index of the Helsinki Stock Exchange (HEX), users start from the RADIOLINJA

main menu (Figure 1) and have to decide which alternative on the menu is the most likely candidate for selection. None of the links is directly related to HEX or to financial markets. Still, with only one exception, our users selected UTILITY as their candidate of choice. What kinds of situated inquiries (Suchman, 1987: pp. 132-134, 143) were involved here?

Figure 1. The main page of the Radiolinja WAP service.

Example 1 gives us a cue of how users worked their way through the menu to selection. In lines 5-6, the subjects are browsing the menu to find out what is in it. After about 1.4 seconds, the user locates a candidate for selection (line 8). She sees other available choices, but selects UTILITY after a thinking pause of 1.3 seconds (lines 10-11). It is during this pause that she constructs a relevance order between possible candidates and makes her decision almost immediately. There is a brief thinking token – "mm-m" – before she voices her selection (line 11).

Example 1. Initially on the RADIOLINJA main page

01 s1	{RADIOLINJA}
02 s2	Ehm (1.0) we::ll about the
03	first tas(kh)=
04 f1	=YEA (0.5) the hex[index*
05 s1	[stoc- the hex index ((puts
06	her thumb to the phone's roller))
07	(1.4)
08	{cursor on item UTILITY, which is chosen}
09	(1.3)
10 s1	mm-m uti[lity
11	[the UTILITY page appears

It is important to see that the user's reasoning is situated and specific to what she is doing at the moment. In talk, the user only indicates the selection of the most likely candidate. Still, many things are going on outside talk. In essence, the task consists of reviewing the main page and locating the best candidate for selection.

To go deeper into what was going on in this selection, we can look at Examples 2 and 3. These examples show how the main page prompts uncertainty, even sarcasm. In Example 2, we can see that users are viewing the menu (line 2), and then locate a candidate for selection by eliminating unlikely candidates. In line 3, N suggests that the right choice is UTILITY, which K soon confirms (line 4). However, note how N formulates her candidate. She says that it is "probably" UTILITY, showing that her choice is a suggestion rather than necessarily the right choice. Also, this item is comparative: in saying that something is "probably" the right choice, a range of choice is assumed.

Example 2. On the RADIOLINJA main page

1 N	So >the first< Sto:ck Exchange the Hex index
2	(0.8)
3 -> N	Is >is< probably (.) u<u>ti</u>li:ty
4 K	Ut<u>i</u>lity.

A similar but more pointed version of this logic is presented in the next example. Here, the users are evaluating the menu with what they know and eliminating other possibilities. First, P formulates one of the candidates with certainty (line 11). W, however, continues to browse, which P takes as an indication that W is not convinced and so softens her formulation both in words and in terms of laughter tokens (line 14).

Example 3. On the RADIOLINJA main page

```
01 W     {RADIOLINJA}
02       (0.4)
03       ((W scrolls down the page))
04 P     Eh is [it-
05 W           [is it<? ((scrolls back and forth))
06 W     Is it<?
07       (.)
08 P     =[Ehm:::hh?
09 W      [Util:'ty.
10       (.)
11 ->P   Uhm it's got to be utility then.
12       (.)
13 W     ((scrolls))
14 P     It(h)'s a bit far fetched idea bu[th<
15 W                                      [.hhh
16 W     Oh should we go'n check [that  nobody] ha[s
17 P                             [let's go*::*]    [
18 W                                               [{se-19-lects
         OWN LINKS}
20       put it there=
```

A close analysis of the action taken in the first menu shows varying orientations, although everyone got it right. Also, these orientations were made available to others variously. However, there is "relational work" (Schegloff, 1986) involved throughout the examples. Candidate choices are suggested cautiously, and often the suggestion is softened with laughter tokens or uncertainty markers of the type "probably." Simultaneously, these markers show that users' alternatives were there before their eyes: they made no references to common-sense knowledge outside the service. A good deal of their inquiry into the menu took place through bodily action, i.e., browsing, rather than in words.

Problematic Response of the Second Page

The next phase in the process starts when the user gets a response from the service. The response is another WAP page, which typically contains hyperlinks and sometimes non-interactive text, images, and animations. The service assumes that this response is a relevant reply to the user's request. The uncertainty evident in ordinary users' hesitations is deemed insignificant. From the point of view of the WAP service, the second page specifies the more generic term used on the previous, upper-level page; i.e., the meanings of upper-level pages are specified at lower levels. Still, there is no escape from situated inquiries: users have to analyze the response page in any case to see if it is what they wanted. Only then can they continue to the next selection.

To see how this is done, let us continue on the route to the HEX index. In response to selecting UTILITY from the RADIOLINJA main page, users get the menu shown in Figure 2. This is the designers' interpretation of utility, of what is "useful." The meaning of some of the items on the list is ambiguous: for instance, why should TRAVEL be useful? Also, the scope of the category UTILITY is fairly extensive, ranging from WEATHER to ECONOMY to YAHOO!

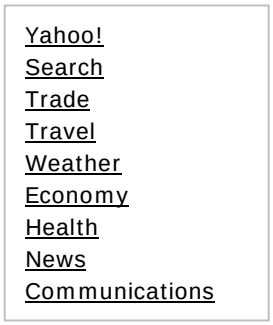

Figure 2. The UTILITY menu.

This menu did not raise serious doubts among our subjects. They stuck to it without considering going back to the main page. The reason was that several candidates on the UTILITY page imply that the user is on the right track. The menu contains two particular items that are easy to take as validation that the first selection was right. TRADE and ECONOMY suggest that if one continues the current line of action, the HEX stock exchange will appear sooner or later. Of course, there are incongruent items as well in the menu (e.g. YAHOO!, SEARCH, NEWS). Still, the match is good enough to suggest that HEX is placed under this page in the menu hierarchy.

Thus, when users received this page, they always stayed there for a moment and continued deeper down the path towards HEX (lines 1-6, Example 4). Even without words, a quick retreat would have shown that something on the page did not correspond to the conjecture formulated on the first page, namely that the HEX index belongs under UTILITY, i.e., useful things.

Example 4. Initially on the UTILITY page, a step below the RADIOLINJA main page

```
01 S   This is a system for learning ((browses down))
02     (1.0)
03 S   =[↑(He:re we go:)
04       [{selects ECONOMY on the screen}
05     (0.6)
06 S   {S gets to the ECO[NOMY page link}
07                       [{S presses ECONOMIC TRENDS}
08     (1.5)
09 S   *Economic trend[s*
10 P                    [Oh you're a real guru:
11     (1.6)
12 S   ((browses the menu down))
13     (7.0)
14     {S goes to the TALOUSSANOMAT link}
15     (0.8)
16 S   Could it be in [economic news?
17                     [((browses up))
18 P   mm-m
19     (5.0)
20 S   {cursor stops at the ECONOMIC TRENDS link}
21     (1.9)
```

However, although this page validated the reasoning, it also led to a selection problem between potential candidates: users had to disambiguate the referents in the menu. In Example 4, S selects ECONOMY from the page. In contrast, some users went for TRADE instead. Example 4 also shows that the ECONOMY page contained several ambiguous elements such as ECONOMIC TRENDS and ECONOMIC NEWS. Although the page was the correct one, subjects were unable to choose between its links with confidence. The same problem emerged when a user opted for the TRADE link. The key ambiguity had to do with the term

"economy." Once an incorrect selection had taken the user down a garden path (Suchman, 1987: 165-169), the only way to proceed was to try out the alternatives in the upcoming menu before concluding that she had to return to a higher-level page. TALOUSSANOMAT in the example refers to an economic daily.

To see how users concluded that they had gone astray, we can take a look at the next example. In Example 5, users have entered the ECONOMY menu. This time, they are scrolling it further than in the previous example. From ECONOMY, they select BANKS and go on to OSUUSPANKKI (the second largest bank in the country). The choice is rational in terms of common-sense knowledge about economics: banks are at the epicenter of financial markets with institutions like the stock exchange. However, notice that the original conjecture is still upheld in action: BANKS belong under ECONOMY, a subset of UTILITY.

Example 5. Initially on the ECONOMY page, a third-level page

```
01 A    No (  [     )]
02 K          [To Osuu]spankki
03 A    Eh: let's check there (2.4) stocks (.)
04      ↑stocks ↑stocks
05 K    (4.0) {the STO[CKS page}
06                [{STOCKS: BRACKETS on the screen}
07 A    Eh: (0.7)[g- lo:wer
08      (2.4)     [((scrolls down [and up))
09                                  [{cursor to STOCKS
10      BY INDUSTRY item}
11 A    *Sto:cks by industry* (.) Take it f'rther up
12      (0.7)
13 K    =[*Should we go to Merita Nordbanken*
14        [((scr[olls))
15 A          [*Would that be better*
16              [{gets to the first BRACKETS}
17      (1.0)
18 K    *How do I get (0.3) back to
19      where I [was *
20 A            [Try that- What
21        it (.)  [What does that say
22 K            [{presses BRACKETS}
23      (0.4)
24 A    No you write [the name there (.) eh. (1.2)
25                   [{page says: WRITE STOCK NAME
        ABC
26      write the stock's name
27      so get [back
28 K           [get back,
29             [{presses the RE[TURN item}
30                             [{new BRACKETS appe
31 K    should I [return]
32 A             [returns]
```

Now we see what users did when they got confused; they stuck to the semantically best candidates, such as STOCKS without thinking that these words can have varying meanings in different contexts. When they cannot decide which bank to choose, they randomly choose one of them (in lines 13-15, they are thinking about going to another bank). On that page, they then opt for STOCKS BY INDUSTRY and study it before inferring that they were off course. Once they get to the search function (BRACKETS, lines 6 and 16), they try it (lines 22, 25 and 30), but without success. Only at this point do they start looking for a way out. The example illustrates the process by which users finally ruled out the OSUUSPANKKI alternative. A garden path like this one is certainly not a mistake that a user can realize quickly. It takes time and effort to conclude that

she is on an incorrect page, and more importantly, pursuing the wrong path.

The examples in this section describe how the task of finding the stock exchange, which appeared relatively straightforward on the opening page, turned into a process that required not just thinking but also browsing through various subpages in Radiolinja's WAP service. On the second page, users found enough items to ratify the selection made on the main page and to stay on the UTILITY page. However, they did not know what to do next because the UTILITY page contained ambiguous items. The only way to disambiguate the UTILITY menu was to select the best candidates and to open new pages to see what the candidates stood for. The problem with WAP in our study was that a similar problem arose on every page. The problem was ubiquitous; there was no evident solution to any selection problem.

Moral Dimensions of Interaction

As users got deeper into the system they headed for pivotal situations in which they came to conclude that they were wasting time on a garden path. Delays, false alarms (Suchman, 1987: pp. 163-165), and incorrect choices tend to create side activities such as criticism of the qualities of the system (Arminen, 2001). At stake are a number of moral dimensions as people's trust in their ability to proceed in a rational and predictable fashion is challenged. Accordingly, they grow anxious, bewildered, humiliated, and even angry at a service that fails to respect the rules of ordinary society (Garfinkel, 1990; Garfinkel, 1967). The only way people can sanction an unintelligible system is to quit use it.

In our study, it took only a few seconds before users were feeling confused, insecure, and embarrassed. For instance, in Example 3, line 14, there is a laughter token that shows insecurity about the system. Elsewhere in the data, there are several instances of laughter and joking about the service's logic. For example, when users mistakenly accessed a taxi service, there was talk about calling a taxi to find the HEX index. More commonly, we have instances where subjects speak out their insecurity (Example 2, line 3; Example 3, lines 11 and 14). In Example 6, K and A are browsing the ECONOMY menu and its objects out loud (lines 1-18). Following a suggestion by A in line 18, K tries out one alternative, NEWS, in line 19, but gets an error message. In line 22, K makes her judgment about the response available with an expletive that leaves little doubt about what she is feeling. KAUPPALEHTI in line 24 refers to an economic daily.

Example 6. On a garden path: scrolling a subpage of the ECONOMY page

```
01 K    It's [not here
02           [((scrolls))
03 A    myeah  ( . ) it's not there
04      (0.7)
05      ((scrolls))
06 K    I don't really (     )
07 A    =[ (    ) (     ) (   [  )]
08 K    [her]e is         [n'th'ng]
09 A                        [stocks
10 A    Return, return ( . ) com-=
11 K    [{selects RETURN}]
12      [{the KAUPPALEHTI page appears}]
13 K    ((scrolls down the page))
14 A    Investment funds
15 A    Currencies
```

```
16 A      News
17 K      ((scrolls))
18 A      Take News
19 K      {g[ets to CHOOSE}]
20           [{selects CHOOSE}]
21        [{system message: NO REPLY RECEIVED}]
22 ->K    *Oh shit* ((finger on the scrollbar))
23        [{presses RETU[RN}]
24                  [{the KAUPPALEHTI page appears}
25        (0.7)
26        ((scrolls))
```

WAP pages are complex and often ambiguous responses to guesses users make when browsing previous pages. Once a response is on the screen, there is still much to do. Users have to figure whether the response is relevant for them and how it can help their search for information. Often, the only way to proceed is to go on to the next page. As the user interface of a service turns into a Kafkaesque labyrinth, frustration mounts, as reflected in users' fleeting judgments of the technology—even when they are using it for the first time and initially consider it beneficial.

Such moments of frustration and anger are crucial situations in user experience. We have no knowledge what happened to our study subjects afterward and what kind of afterlife their judgments and attributions may have. However, we can make a conjecture based on reports showing that many mobile phone users who have tried WAP have discontinued using it on any remarkable scale. Many judgments are more evident in ongoing actions and reasoning rather than in succeeding assessments, and thus, they form the basis for users' experiences with WAP (Garfinkel, 1967: pp. 70-71). For instance, people who are faced with incomprehensible user interface elements cannot even realize they have gone astray. They will not see this as an isolated instance, but rather as further evidence of problems in the technology. As unsuccessful attempts to make sense of such experiences mount, successes with WAP come to be treated as exceptions. Such judgments, then, also act as a contexture for still more sweeping judgments of this technology. We believe that these negative judgments have social dimensions as well. They move into the realm of horror stories about failures or "war stories" about how insurmountable difficulties can be overcome (Orr, 1996). Even with limited data, we can cautiously propose that negative experiences tend to color stories and conversations about WAP. It is clear, though, that our data contain evidence about users' orientations, not just to individual items in the WAP service, but to its overall functioning and ultimately to the technology as a whole.

Discussion

Along with early attempts to build a video phone (Schnaars, 1989), WAP is arguably one of the greatest failures of telephony and a contributing factor for technological conservatism in the mobile phone industry. Just as the success of text messaging came as a pleasant surprise to the industry at the end of the 1990s, WAP proved a failure on a similar scale. It continues to exist as a technical solution and is gaining a prominent status at an infrastructural level. As a consumer technology, however, its period of glory was short-lived, even more so in advertising and industry publicity than among users.

The literature on the shortcomings of WAP as a consumer technology has focused on user intentions rather than on practical experiences in its use. Shortcomings have been linked to attitudinal and normative factors (Teo and Pok, 2003a, b), lack of content, and concerns about privacy (Anil et al., 2003). At a more practical level, product development has relied on a simplistic, intentional model of users. They have been regarded as objective-oriented technicians who decide to do something, create a plan to achieve it, and then follow the plan until they succeed in accomplishing the task they originally set out to do. Traditional usability tests have been conducted in simplified situations instead of in the midst of the situational exigencies of ordinary life—even though such exigencies are at the very heart of the mobile life.

Less attention has been paid to the actual practice of technology use and how it sets limits to thought models. Following Suchman's seminal "Plans and Situated Actions" (1987), this article has focused on users' first experiences with WAP, aiming to find out how initial acceptance so quickly transforms into a perception of uselessness. From a situated perspective, the problem with WAP boils down to what happens when users interact with the service. If they do not understand the system and fail to grasp the reasoning behind it, they get confused, embarrassed, and even angry. Although they sometimes attribute this failure to their own powers, they can just as well come to treat the experience as an indication of unrecoverable technological problems. Judging by the fate of WAP, this is what happened: users found it so cumbersome to use that they quickly scaled down their initial hopes for it. A medical examination is not an enjoyable experience, but it is easy to see good in it, whereas this is not the case if ordering movie tickets or checking bus schedules proves unpleasant. The routine understandings of ordinary society may destroy technologies that do not respect the basic rules of interaction.

A second aim of this article was to illustrate that conversation analysis techniques can be applied for systematic description of usability problems. The size of our data is too small to theorize about users, but large enough to identify and describe usability problems (cf. Nielsen, 1993). Nonetheless, it is important to remember that the problems studied here are not unique to WAP, but are typical of many, if not most, small interfaces that have a hierarchical structure. For us, WAP provided a perspicuous setting for analyzing the difficulties people have to overcome when they are faced with abstract interface items that can only be disambiguated by browsing submenus. Here, we have shown that it is possible to produce a rich description of such difficulties by conducting a test with only a handful of subjects. The findings suggest that conversation analysis can indeed provide new techniques for usability researchers.

Our analysis is based on data describing users' initial encounters with WAP. First, its relevance stems from the fact that WAP continues to be a novelty for the overwhelming majority of mobile phone users (Carlsson et al., 2004), who have yet to try it out for the first time, like our study subjects did. Second, the key characteristics of WAP remain the same: a small screen and a hierarchical navigational structure. Certainly, it would also be interesting to study established, regular use of WAP with similar methods.

The terminology in the user interface of WAP and other similar technologies is dense by necessity. The small screen of the mobile phone means that only a few items are visible at the same time. If content has any complexity, it needs to be organized into a hierarchical, tree-like menu. Consequently, items at the top are packed with meaning, which makes them abstract and difficult to understand. The target content is typically accessible only after four or five additional selections. Such a system demands a lot from users. Users will keep making wrong inferences and selections that lead them down garden paths, even finding find it hard to recognize when they are mistaken. What follows is a perception of a useless technology; users lose trust in their ability to make sense of the service and use it. Studying users and their methods of reasoning is crucial to the success of interactive designs, not only in terms of usability, but also because of the moral attributions that people will make about the technology. Accordingly, a good understanding of users is critical.

Users' moral attributions have inevitable implications for WAP design. The navigation structure can be made broad instead of deep (Parush and Yuviler-Gavish, 2004) and specialized search engines can be introduced (Jones et al., 2003). It is advantageous to test the success of such solutions in actual use, as they may contain similar moral dimensions as the typical implementations of WAP.

We propose the ethnomethodological perspective (Garfinkel, 1967; Suchman, 1987) developed in this article as an addition to the acceptance literature (Teo and Pok, 2003a, b; Anil et al., 2003; Cheong and Park, 2005), not as a falsification of previous findings. By investigating what people do with technology, we can gain a better understanding of the practical grounds for their attitudes, and see how quickly these attitudes develop if technology fails to match expectations. A sharp look at the shortcomings of technologies that were deemed successes before they arrived opens up a window into the social embedding of technology in lived experience.

Practitioner's Take Away

- We offer a video methodology that provides new insights into the usability of a standard technology. We encourage practitioners to try out this methodology in cases where human interaction with machines and automated services is essential. The obtained situated information provides cues for further product development.
- Transcription of videos of actual use reveals how users reason their way when dealing with a complex small-screen device. It pinpoints their potential sources of satisfaction and dissatisfaction, and exposes the underlying reasons. Extracts from videos and internationally standardized transcriptions are illustrative, and can be shared with and understood by different product development teams.
- The study indicates that testing a service on a small number of users can reveal deep insights and complement large-scale surveys. Such cost-effective testing can provide useful implications for redesign.
- The study offers an ethnomethodological perspective to complement the acceptance perspective. In essence, we claim that people's intentions are not necessarily a good predictor of future use of a service, and that it is better to try the service in practice, even on a limited scale in a controlled

environment. Interactional issues and moral attributions are best revealed in actual use.

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