

SHM pilot evaluation report



An evaluation of using mobile terminals to access culture historical information.

Executive summary

The "SHM pilot" project was initiated by TeliaSonera together with the Swedish Museum of National Antiquities (Statens Historiska Museum, SHM). The purpose was to develop, test and evaluate how to deliver and present content (cultural history information) in different context to people with different needs using mobile terminals based on the users geographic position (outside the museum buildings). To achieve these results, the project performed three pilots in different areas in Sweden. The pilots were executed during Q3 2005.

The perceived main advantage from the pilots is that it creates an independence where you can start, pause and stop the tour at your own discretion. You can also walk in your own pace and decide whether you want additional information to deepen your understanding.

This indicates that individualisation is an important area to explore and implies that these services are best consumed on an individual basis. In combination with the use of earphones/headset during the tour, this could impair the social interaction between group members.

The people who are more familiar with modern communication and terminals tend to appreciate the introduction of this new technology to access historical content and are willing to pay for the service. None of the three pilot studies have fully exploited new media to enhance presentation of the content by using virtual reality techniques such as graphical rendering and sound formats.

For audio only services it appears that people are not willing to pay extra, at least not in the context of historical information.

The most innovative pilot, the interactive adventure, which tried to engage the visitors more by active participation, did not give any clear cut results. This is probably due to the game not being sufficiently developed to enable a proper evaluation. Those visitors who participated in the pilot found the adventure rather intriguing and interesting once understanding the task, but further developments are needed.

The pilots had limited implementation of context awareness functions, e.g., the location had to be manually entered by the visitor to get access to context specific information. In a commercial service this should automatically be obtained.

The willingness to pay for different services by different population groups needs to be further investigated by using more comparative studies.

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1 Purpose

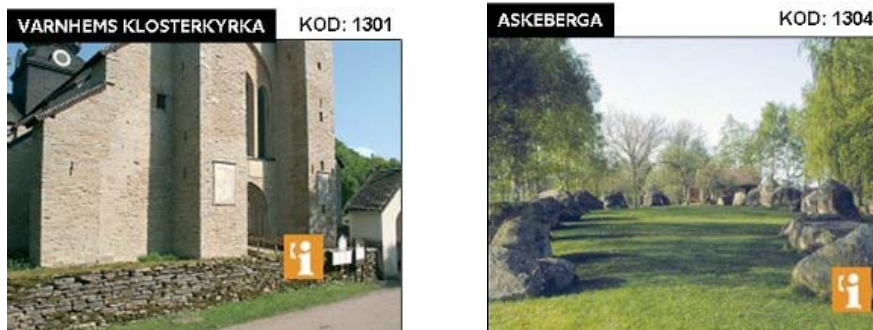
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The pilots are part of a project financed from the Nordic Council of Ministers called “Nordic Handscape”, where SHM is managing the pilots in Sweden as well as the overall project on a Nordic level.

2 Description of pilots

The SHM pilot project consists of one pilot in Västergötland and two pilots in Gamla Stan, the Old Town of Stockholm.

2.1 ”I Arns fotspår”, Västergötland



Picture 1: Examples of visiting sites in Västergötland.

Arn is a fictive person created by Jan Guillou, one of Sweden’s most well-known authors. The stories of Arn take place in Västergötland, a region in the southwest part of Sweden, and are partially based on historical facts. This pilot offered the visitors to follow “I Arns fotspår” (“In Arn’s footsteps”) to learn more about 11 historical places in the region.

The pilot is based on an IVR (Interactive Voice Response) solution to reach a large target group, since all visitors with a mobile phone could participate in the pilot. A brochure was provided to inform about phone number and codes to enter to receive the correct and more elaborative information for the specific position. The visitor could then receive information about the historical place and optionally also hear Jan Guillou read from his novels about Arn.

The practical issues were managed locally by museums and tourist offices in the region. The visitors were asked to fill out a questionnaire to send to TeliaSonera for evaluation after finishing the tour. As an appreciation of their efforts, all who posted a filled-in questionnaire received a lottery ticket.

2.2 "Vandra genom Gamla Stan", traditional digital guide in Gamla Stan, Stockholm

The Stockholm City Museum is organizing guided tours in Gamla Stan for visitors and other interested. The purpose of this pilot was to investigate how a digital guide should be designed to make it interesting, instructive and easy to use.

The content consisted of pictures, maps, sound effects and narrated historic material that was stored in PDAs. The guide offered the possibility to select whether or not you want to obtain additional information. No radio communication was used, but in a future service the content could be transferred over a radio interface to offer this service to the user's own terminal and to always receive updated material. The visitors were asked to fill out a questionnaire after finishing the tour.

2.3 "Döda barn", interactive game in Gamla Stan, Stockholm



Picture 2: Some of the participants were equipped with a portable video solution for more detailed evaluation.

This pilot consisted of an interactive adventure, where the story was based on ordinary citizens instead of kings and other famous persons appearing in the traditional history books. The purpose of this adventure was to create an understanding of how the situation was for an ordinary family living in Gamla Stan during the 16th century, in the tragic times around "Stockholm's blood bath". The visitors had to find "emotional

memories" still existing on some physical locations to interact with them to try and get them to rest.

The pilot was executed on focused occasions, where a mobile phone was borrowed by the visitors to participate in the pilot. Some visitors were equipped with a portable video solution to record the course of events during the pilot (see picture 2). These videos could then be qualitatively analysed afterwards for the evaluation. All visitors were interviewed after finishing the tour.

3 Evaluation of pilots

In the evaluation plan for the joint project, the aim for these studies were to study users' (visitors) experiences from three different aspects, namely historical content, presentation and the technical solution. The main bulk of data have been collected using questionnaires with semi-structured questions and different rating scales, and in some cases direct interviews. There has been no random selection of subjects, rather those visitors whom showed interest in participating were chosen as subjects for the studies.

Basic analyses were made using traditional measures such as age, sex, educational status as independent variables. Correlation analyses were made to study higher order interactions between variables.

3.1 "I Arns fotspår", Västergötland

A brochure was available at the local tourist offices and museums, but also at the 11 historical places of which the pilot described. This made it possible for everyone with a phone to participate in the pilot if interested. This is some statistics extracted from the log files of the IVR server:

Number of calls			
Month	Fixed phone	Mobile phone	Total
July	152	1 562	1 843
August	64	879	1 000
September	20	315	358
Total	236	2 756	3 201

Table 1: Total number of calls during three months for the "I Arns fotspår" pilot.

Number of calls					
Site	July	August	September	Total	Total percentage
Varnhems klosterkyrka	282	203	80	565	18%
Kungslena	99	52	16	167	5%
Eriksberg	50	22	12	84	3%
Askeberga	86	55	22	163	5%
Gestilren	153	80	35	268	8%
Husaby kyrka	294	107	40	441	14%
Axevalla hus	50	23	7	80	2%
Skara domkyrka	197	138	52	387	12%
Husaby S:t Siegfriids källa	206	104	41	351	11%
Gudhem	233	123	30	386	12%
Forshems kyrka	192	93	23	308	10%

Table 2: Total number of calls made for each site.

Some observations for table 1 and 2:

- The 3201 calls were made by 1588 unique phone numbers.
- 1264 of these 1588 phone numbers was only registered making only one call.
- The remaining 324 unique phone numbers visited more than one site and generated on average 6 calls each.
- The average listening time was 168 seconds. This figure depends of course on the length of the recorded content.
- There was no difference in listening time between using fixed and mobile phones.
- There was no difference in listening time between persons visiting more than one site and those attending only one, thus indicating that when starting to listen most people listened through the whole message rather than hanging up due to lack of interest.

As seen in the tables above the sites have been visited by many people, but due to different reasons the questionnaires were not available for the visitors until the later part of the pilot. This, together with the fact that few visitors took the opportunity to return a filled out questionnaire to receive their lottery ticket, has resulted in that the study only is based on 10 returned questionnaires and therefore the results cannot be considered statistically significant.

Background of the sample

- 70% of the visitors are female.
- The average age of the sample is approx. 49 years for males and 48 years for females.
- 50% have completed their university education.
- The average age of the handsets is approx. four years.
- Only one in five in the sample has mobiles purchased as recently as last year (2004) or this year (2005).
- 50% have Nokia phones; 30% Ericsson or Sony Ericsson handsets; and 20% mobiles from Samsung.
- Only 20% have handsets paid for by their employer and 80% have personal phones paid for by themselves.
- 20% of the sample attends museums, exhibitions, and/or live concerts once or several times a month. 30% attend such events about four times a year, while the remaining 50% attend these events more rarely (once a year or almost never).
- 60% say their interest in history is somewhat or much larger than that of the average person (Medel-Svensson).
- 70% learned about the mobile guides from tourist offices and museums, and the remaining 30% first found out about the pilot when visiting one of the 11 sites.
- When asked about how many persons there were in the visiting group, the mean number is slightly over two persons
- Half the sample says they have used similar technologies, such as recorded narrations, for traversing other museums or exhibitions.

Using the mobile guide

REPORT**Public**

Date
2005-11-25
Identity

Page No.
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Version
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- 70% of the visitors made the tour by car. This pilot is covering sites over a large area making it necessary to use some kind of transportation if you want to visit more than one site.
- The average number of places visited by each person is slightly over four.
- None of the persons had high or low expectations before using the mobile guide. This is likely due to the fact that they did not know about the guide before arriving to the museum or historical location.
- 60% say that their expectations were (rather or very much) surpassed by the experience of using the mobile guide, i.e. the experience was better than they had anticipated.
- 90%, in the sample seem pleased with the amount of information served by the mobile guide; they say the amount is "enough" (or "lagom"). The remaining 10% feel there was too little information.
- Nobody feels that the mobile guide content was difficult or hard to comprehend; all reported that it was easy to understand.
- All but one was very satisfied with the tone of the narrator's voice and the narration speed.

Did it work?

Three questions measure whether or not respondents approved of using the mobile guide.

- Almost all of the respondents, 90%, reported that the pilot technically worked good or very good. None of the respondents experienced technical problems during the pilot.
- 70% gave a positive reply to the question "Should this technique be used in exhibitions?"
- A related question asks whether or not the mobile guide "works" in serving information and guidance. 90% find that the mobile guides "absolutely" can convey information and guidance. Only one person says "No", commenting that the technology tend to isolate the visiting persons in a group from each other.
- Finally, a perhaps equally crucial issue is, Will they pay for receiving information to a mobile guide about the sights they are seeing? Only 20% would "perhaps" be willing to pay; 80% of the persons would not ("perhaps" or "absolutely" not) consider paying for such a service.
- Those who reported that they perhaps would pay for the service (20%) on average say that they would pay approx. 10 SEK (€1).

Due to the low number of questionnaires returned no further cross tabulation has been performed.

Summary

The most common response to this pilot is that the visitors appreciated that the information was made always available by using new technology. Other positive responses were that the guide was considered to be simple to use, easy to listen to and it also offers the possibility to listen before and after the tour. However, some reacted negatively to the possible competition with traditionally guided tours by an expert, which gives the possibility to ask questions and create a more social context. Another apparent negative reaction was the lack of information signs at the sites and the risk of isolating the individuals losing contact with each other in a group when

listening to the guide. The results also indicate that the visitors are not very interested to pay for receiving this kind of information.

3.2 "Vandra genom Gamla Stan", traditional digital guide in Gamla Stan, Stockholm

The selection of subjects in this study is visitors who reported an interest in participating in the investigation. A total of 41 questionnaires were returned to the museum and this is the result from the study.

Background of the sample

- 30 of 41, or 73%, are female.
- The average age of the sample is approx. 44 years for both males and females, and almost one in three (29%) is in their fifties, the most common age group.
- 80% have completed their university education, which is quite high compared to the general population.
- The average age of the handsets is approx. two years.
- More than one in three in the sample, 15 persons (37%), has mobiles purchased as recently as last year (2004) or this year (2005).
- 19, or 46%, have Nokia phones; 7 (17%) Ericsson handsets; and 8 (20%) mobiles from Sony Ericsson.
- Six have a mobile paid for by their employer as well as a privately paid mobile; 18 have phones paid for by their employer; and 16% have personal phones paid for by themselves.
- 13 persons in the sample (32%) attend museums, exhibitions, and/or live concerts once or several times a month. 22 persons (54%) attend such events about four times a year, while the remaining 5 persons attend these events more rarely (once a year or, 1 person, almost never).
- Perhaps not surprisingly, 32 persons (a whopping 78%) say their interest in history is somewhat or much larger than that of the average person (Medel-Svensson).
- 18 persons (44%) learned about the mobile guides from "other people". 5 persons (%) first learned about the mobile guides at this or another museum. 17 persons (41%) got their information from "other sources", the most common of which is through their work; in their comments, 11 -- 27% -- refer to their work within this realm (that of museums).
- At least in the sample, it seems that couples, or two persons, are the most common museum-goers. When asked about how many persons there were in the visiting group, the mean number is slightly over two persons. Furthermore, 63% (26 persons) of the replies stem from respondents who visited the museum with one other person.
- Slightly more than half the sample -- 23 persons, or 56% -- say they have used similar technologies, such as recorded narrations, for traversing other museums or exhibitions.

Using the mobile guide

- Half of the sample (49%, 20 persons) had rather or very high expectations before using the mobile guide. For 22 persons (54%), their expectations were

(rather or very much) surpassed by the experience of using the mobile guide, i.e. the experience was better than they had anticipated.

- However, when one cross tabulates these two questions, interesting patterns emerge that indicate that the mobile guide is a success where one least might have expected it:
- 67% of those with low expectations were greatly pleased with the mobile guides, but only 40% of those with high hopes saw their expectations exceeded by the mobile guide experience. A tentative explanation is that mobile guides don't work as well for those who are most interested and most knowledgeable.
- 32 persons, 78%, in the sample seem pleased with the breadth of information served by the mobile guide; they say the amount is "enough" (or "lagom"). 7 persons (17%) feel there was too little information, while only one respondent (2%) say there was too much.
- Nobody feels that the mobile guide content was difficult or hard to comprehend. 34 persons (83%) say it was easy to understand, while 7 (17%) find the content "lagom" (easy enough).

Did it work?

Three questions measure whether or not respondents approved of using the mobile guide.

- Most of the respondents, 33 persons (80%), reported that the pilot technically worked good or very good. Only 5 persons, or 12%, reported technical problems during the pilot.
- Almost everybody, 36 persons or 88%, reply in the affirmative to the question Should this technique be used in exhibitions? Only one person says "No", commenting that the technology used is "too tricky".
- A related question asks whether or not the mobile guide "works" in serving information and guidance. 27 persons (68%) find that the mobile guides "absolutely" can convey information and guidance.
- Finally, a perhaps equally crucial issue is, Will museum-goers pay for receiving information to a mobile guide about the sights they are seeing? A minority, 15 persons (38%), feel that they "absolutely" would be willing to pay for such a service; another 16 (or 40%) would "perhaps" be willing to pay; and only 9 persons (23%) would not ("perhaps" or "absolutely" not) consider paying for such a service.
- Those who reported that the absolutely or perhaps would pay for the service (78%) on average say that they would pay approx. 50-60 SEK (€6-7).

For whom does it work?

We have cross tabulated a number of answers against two of the questions that measure how well respondents feel that mobile guides would work in "real life". There are some correlations but the co variation is limited by the sample size and hence, on the whole, not significantly high enough to be reported here. However, a few of the variables do tend to correlate to quite some extent in the sample we have researched.

- While 68% of all find that mobile guides work in providing information, only 50% think so among the heaviest museum- and exhibition-goers. It would seem that this technology doesn't appeal to those who are most experienced and most in the know; and that these might know more than the system can deliver.

- Heavy consumers of cultural events are also less likely to say they would absolutely want to pay for using mobile guides. Overall, 38% say so, while among heavy museum-goers a mere 8% are absolutely willing to pay.
- People who have learned about the mobile guides from acquaintances and people they know are more willing to pay for using mobile guides than others. 56% of those who first got to know about mobile guides from talking to others are absolutely willing to pay; overall the percentage is only 38%.
- Finally, and not surprisingly, among those who absolutely would want to pay for using mobile guides, 87% find that mobile guides absolutely succeed in relaying information and guidance.

Summary

The major finding is that people appreciated the possibility to walk the tour in their own pace without having to adapt to the traditional guide time table. Another positive aspect was that the duration of the tour could be adapted based on how much additional information they requested. The guide was considered easy to use and understand, and contained valuable and interesting historic information. The respondents disliked that the tour was not a round tour, i.e., not starting and ending at the same place. The display was sometimes hard to read due to sun light and the directions and maps could have been improved. The interface also had some ambiguities where one button had multiple meanings. Another wanted feature was the possibility to repeat parts of the chapters and not having to start the whole chapter over again.

In the present study we found an astonishingly high willingness to pay for this additional service. This could be due to a high degree of respondents used to visiting museums and cannot be extrapolated to the population in general.

3.3 "Döda barn", interactive game in Gamla Stan, Stockholm

Since the evaluation of this pilot mainly is based on interviews and observations with limited number of visitors, it is more of a qualitative nature rather than based on statistical measures.

The game to be investigated was an early beta version, and early interviews indicated the need for modifications due to contextual and technical reasons. This happened during the course of the evaluation period, which besides resulting in negative comments also created some difficulties in the interpretations of the results. When understanding the task of the interactive adventure the subjects found the game quite intriguing and interesting.

- As the game was based on reliving and acting upon "emotional memories" that happened 500 years ago, it was found to be hard to re-enact these emotional memories for people of today. Some people had no prior knowledge of these historic phases and therefore had few expectations of the adventure.
- The subjects had considerable difficulties in really understanding how they should perform their task properly. This implies that the introduction needed to be revised and to separate the introductory background story and the more direct instructions how to play the game. The original introduction, which was 5 min long, was intermingled creating unnecessary hesitations on what to do.

- The creators of the game had included some unconventional rules not usually found in ordinary adventure games, thus the games did not behave according to expectations. This can be considered both as a positive or negative feature.
- In the present form there are no interactions with other players. This could have been an additional thrill to collaborate with others in the pursuit to finalize the game.
- The players reacted to the very vague feedback they receive as a consequence of their actions. This created uncertainty whether they have understood the situation properly and thus affecting the motivations for the game.
- The rather low tempo, caused by many alternatives and details, made the tour rather slow where you typically would spend 20 minutes at each site.
- Too much focus was required to handle the terminal.
- The duration of the adventure, approx. 1 hour, was considered to be appropriate.

Summary

The pilot was viewed as rather intriguing and interesting once the players understood the task of the adventure. There is large potential for improvements to make the adventure easier to understand and to play, by providing a better introduction to the game. Since the time needed for each site was around 20 minutes the players need to be well motivated to continue the game. Further analyses are needed to find out how to make the adventure more self explanatory.

From a historical viewpoint the connection between the adventure and the reality may need to be strengthened.

4 Conclusions

The main advantage of the technical realisation in the pilots is that it creates an independence where you can start, pause and stop the tour at your own discretion. You can also walk in your own pace and decide whether you want additional information to deepen your understanding.

This indicates that individualisation is an important area to explore and implies that these services are best consumed on an individual basis. In combination with the use of earphones/headset during the tour, this could impair the social interaction between group members.

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visitors who participated in the pilot found the adventure rather intriguing and interesting once understanding the task, but further developments are needed.

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The willingness to pay for different services by different population groups needs to be further investigated by using more comparative studies.

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