

The Potential of In-train Crowdsourcing

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Abstract

Nowadays railway operators are improving their services by offering IT-services within their trains. This paper reports on a design study we performed at Dutch Railways (Nederlandse Spoorwegen, NS) in order to research whether or not NS can crowdsource activities utilizing the novel in-train IT infrastructure it is currently rolling out, and provide their passengers a better journey experience at the same time. We specifically focused the potential of future services on the users intention to use the service over time. The study followed a design cycle, in which we created artefacts, and analysed adoption of these artefacts utilizing an in-train survey. Despite the limited scope of the study we can conclude that there is potential for in-train crowdsourcing. Passengers do show interest in the applications we designed, and the more general concept of in-train interaction. Adoption is more likely to occur when serious applications are used, as opposed to entertainment applications.

Keywords: Crowdsourcing, trains, transportation industry, onboard information systems, Dutch Railways, NS, digital customer interaction.

1 Introduction

Trains play an important role in the public transportation system in many countries (CBS et al., 2009; CBS, 2010). Dutch Railways (Nederlandse Spoorwegen, NS) is the principal passenger railway operating company in the Netherlands, with every day more than one-point-two million people (out of a population of 16 million) travelling their trains. NS operates the core railway network in The Netherlands, including parts with a night service, and some of the secondary lines (Wikipedia, 2011). The Dutch railway network is the highest utilized network in Europe, little surprising in a country where 75% of all inhabitants live within 5 kilometres distance of a railway station. 62% of the Dutch utilizes the train at least once a year. In numbers: in 2005, 14.73 billion passenger kilometres were made, which makes up 30% of the seat kilometres (Treinreiziger.nl, 2010). This thus means that NS on average transports 70% empty seats. Central in NS's strategy is making the train a better alternative to the car. Better services are key herein (NS, 2007; NS, 2010); for example the provisioning of good journey information, but also deploying capacities where needed – which also can have direct financial impact through the reduction of cost.

With the introduction of a new IT-infrastructure in trains, named OBIS (OnBoard Information Services) which is currently being rolled out over the largest part of the NS (intercity) fleet, new possibilities arise. At the moment OBIS offers passengers two services: (automated) passenger information on screens and through loudspeakers, and WiFi-based internet access. Having Wi-Fi aboard trains means that (digital) interaction with (individual) passengers can become a reality. How can NS benefit from interaction with passengers in trains, and tap their minds? How can passengers benefit in terms of service by interacting with NS using their mobile phone, tablet or laptop in the train? In fact, this means we are considering the potential of (in-train) crowdsourcing for NS.

This paper started off with the ambition to explore the potential crowdsourcing offers both to/for NS and its customers. Crowdsourcing was first coined by Howe (2006a), when he described a new web-based business model that harnesses the creative solutions of a distributed network of individuals. Crucial to crowdsourcing are the use of an open call format and a large network of potential labourers (Borst, 2010).

It is a new approach for companies to involve large groups of customers feeding information in their operations (Brabham, 2008). To our best knowledge, little research has been done on the particular setting of moving trains and traveling customers.

In order to research the potential of in-train customer interaction we follow a design research approach, as we expected novel and useful insights for practice and science.

2 Literature Background

2.1 Literature scan

To understand the state-of-art in in-train crowdsourcing we reviewed literature on crowdsourcing and in-train internet application. We soon concluded that not many railroads or other large infrastructure providers are currently deploying crowdsourcing techniques.

2.2 Crowdsourcing

The word *crowdsourcing* was born from the two contributing words *outsourcing* and *crowd*. Crowdsourcing represents, as defined by Howe (2006b): “*the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call*”. Examples of crowdsourcing include Wikipedia, or news communities with active user participation (such as in The Netherlands NUfoto and Tweakers.net (Borst, 2010)), challenges to locate red balloons (Tang *et al.*, 2011), but also companies outsourcing their product design, ranging from t-shirts at Threadless (Brabham, 2008) to skis at Dynastar (Dynastar, 2011).

Generally speaking we see applications of crowdsourcing either in domains in which these services used to be performed by employees, as opposed to totally new business services. Crowdsourcing can therefore be seen as a contribution to the conduct of business by the customer, using IT-infrastructure offered by the business, with or without the direct intention to do so, of which at least part of the task could have been conducted, is or has been conducted by an employee. Business wise, this means a customer will commit a task for free, if the infrastructure is offered.

When making use of crowdsourcing, new difficulties arise. One has to create an environment, both technically and socially, in which users are likely to adopt the system. Creating an environment does not necessarily mean one has to create something entirely new, it can also mean combing already existing datasources. In fact Doan *et al.* (2011) strongly suggest establishing crowdsourcing applications on top of existing platforms. Walter (2010) found that monetary reward is not always the best incentive to participate, incentives that matter as well are getting mentioned by name, being part of an expert-community or collecting knowledge. Recently Borst (2010) came to similar conclusions. Doan *et al.* (2011) derived to four key challenges in relation to crowdsourcing: recruiting contributors, defining what these contributors can do, how to combine their contributions and last how to manage abuse.

Although some tasks are performed better by other persons than a company's own personnel (Whitla, 2009) it should be noted that “*sometimes a crowd can return a vast amount of noise that may be of little relevance*” (Keen, 2007) (Doan *et al.*, 2011). However, as Tang *et al.* (2011) describe, filtering correct from uncorrect data is something which can be done through crowdsourcing techniques as well. “*Clearly, crowdsourcing is here to stay. It is changing the way government, corporations, and others tackle complex issues and problems*” (Greengard, 2011).

2.3 In-train Services

Little scientific literature can be found on value-added digital services offered in passenger transport. Websites from different railroads and airliners do however mention some services offered. The French railway SNCF has a free on-board dating service in their newest TGV-trains (Lomas, 2008) and Virgin Atlantic Airlines has chat functionality in their onboard multimedia portal (Jardin, 2007). No direct examples of crowdsourcing, as these can better be described as additional (digital) services to passengers.

Better documented is the state-of-art of internet implementation and actual usage in trains. An extensive survey reports on a series of large(r) scale implementations in Sweden (SJ), the UK (Great North Eastern Railway (GNER) and Southern Trains), Germany (ICE service of Deutsche Bahn), and EU-wide at Thalys (Fokum and Frost, 2010). In addition pilot implementations are taking place in other countries. At most railways the internet is a paid add-on service, sometimes offered for free in first class coaches. Lannoo *et al.* (2007) studied business models for paid in-train internet access, and recommend making internet freely available, as it makes train journeys more attractive, eventually having a positive result on the amount of travellers. Indeed, Fokum and Frost (2010) point at a study dating back to 2004 that found that 72% of business travellers were more likely to use trains than cars or airplanes if Wi-Fi access would be available on trains. However, railways have to be aware that “passengers are beginning to use 3G-capable hardware to connect to the cellular infrastructure directly from within trains” (Sauter, 2007).

A large difference between time spent in trains and other modes of transportation is that many people in the train convert their travel time into activity time (Lyons, 2005). This is less the case for people utilizing the car, and far less for people travelling by bus. People perceive time in the train as time well spent – this concept is referred to as the *value of time*. This is increasing with modern IT introduced.

Large differences exist in the digitalization of (groups of) train passengers (Lyons, 2007). Looking at the adoption of mobile phones they report on an 85% percentage of usage for people between the age of 16-25, and only 26% for people 65+. An interesting observation is that 65% of passengers carrying a laptop are not using them while enroute. A similar percentage was found for people not using their mobile phones or paperwork in train. They report an important difference between 1st and 2nd class passengers: 1st class passengers are much more likely to use their phones and laptops.

The study reports on 40% of the work related passengers working in train (10% always, for the entire trip, 30% for part of the trip). Increasingly this work takes place with a laptop. However, also passengers that do not work in the train increasingly carry electronic means (such as laptops and smartphones) for leisure purposes, such as playing games, chatting, or typing e-mails or other messages.

3 Problem Statement

3.1 Vision and ambition of NS

Central in NS’ vision is the ambition to transform their passengers’ travel time into valuable time. Providing maximum comfort is core in this ambition: train passengers should find an environment that offers them everything to work, communicate and relax (NS, 2010).

3.2 Understanding

NS’ ambition is to generate a growth in passengers by 40-60% between 2010 and 2020 (NS, 2007). Better and more modern trains, improved information provisioning and services are elements to help achieve this goal (NS, 2007). However, for NS it is necessary to better understand what is taking place in its operations and how their

passengers behave. The application of digital customer interaction techniques and crowdsourcing concepts might be a possible approach herein. This provides a basis for improved customer service and savings in operations. NS' customers, the train passengers, can be expected to adopt new technology if it provides them an added value in one way or another.

Currently NS is spending several millions each year on customer research. By applying crowdsourcing in their train, they might be able to reduce direct costs, and gain more information at the same time.

3.3 Relevance

There are ample opportunities for the use of new information technology in and around trains. Passengers increasingly get access to better information about their journey. Reverse, for public transport companies it would be useful to know more about their customers, their behaviour and travel plans, for example by getting information from the crowd of passengers. NS could consider responding to gathered information, by feeding back information, or through incentives such as a loyalty program or reduction coupons for consumptions. Reduction coupons are not necessarily costing money, as these tend to lead to extra consumption generating more profit for NS. Furthermore, NS want to provide better customer experience over the entire journey, from door to door and attaining more customers overtime (NS, 2010). One of the ways to accomplish this is to provide relevant information throughout the whole journey.

3.4 Main Research Question

Discussing the topic and having gone through the first literature we formulated our main research question as following:

RQ: How can we extend the current in-train information systems offered by NS in such a manner that NS gets access to a stream of (valuable) information provided by its passengers, and the passengers experience better customer service from NS?

To help answer this question, a couple of sub research questions are deduced. Each sub question is covered by a part of the research. The sub research questions are:

SQ1: What information does NS want from its customers?

SQ2: How can we get customers to interact on a regular basis with NS?

SQ3: What information, application or service does the customer want from NS?

4 Research Approach

4.1 Design research

To investigate this set of research questions, we followed a design research approach, utilizing the framework provided by The Information Systems Research Framework from Hevner *et al.* (2004).

4.2 Interviews

In the first stage, seven semi-structured expert interviews were used based on Yin (2008). These were used to gather knowledge about the technical and social

environment in which the research was conducted, and as input for artefact creation. We chose a judgment sample of experts, in contrast to random sampling, as this provided a maximum utilization of available knowledge in minimal time (Marshall, 1996). The interviews led to a long list of potential crowdsourcing applications. Each item was assessed by the number of times it was mentioned, expected adoption potential and relevance. Out of this list the top three were chosen to examine further using artefacts.

4.3 Artefacts

Based on the results of the expert interviews and the literature review performed, three artefacts were created for a feasibility study. The artefacts are presented in the form of artificial screenshots, following the look&feel of NS' other applications, containing the information needed to interpret the application, not offering any real functionality. The artefacts will be presented in more detail in Section 6.

4.4 Evaluation by Survey

In the last phase, we evaluated the artefacts utilizing a structured user survey. The survey was executed in trains equipped with OBIS systems, as passengers have the time (while travelling) to consider the three artefacts and answer our questions. As Yin (2008) suggest, we made a careful selection of interviewees. Frequent as well as less-frequent travellers of different profiles were questioned about the artefacts and about their intentions to adopt these.

After the user surveys no redesign was conducted, as this was not the primary purpose of this explorative study. Results were used to derive conclusions about potential adoption and to answer the main research question.

5 Expert Interviews

5.1 Interviews

Interviews were conducted with a couple of NS employees in the last week of October 2010 at the headquarters of NS in Utrecht, the normal working environment for the interviewees. The interviewees first received a short vocal briefing on the subject and the main objective of the research. The information gathered over the interviews resulted in a list of possible in-train crowdsourcing/passenger-interaction applications.

The interviewees were explained that the prospected artefacts should be usable in the Dutch Intercity trains with OBIS systems. This was done to identify limitations of the implemented systems as well as to answer sub question one, concerning what information NS would like to get from their passengers.

Another goal of the interviews was to retrieve ideas for crowdsourcing solutions in this particular context that could be offered to customers. To gather these, an open form of interviewing was used to stimulate creativity and prevent blocking of ideas.

Seven interviews were held with a total of ten interviewees; three interviews were held with two people at the same time. In the interviews the following people were interviewed:

1. Head of the business information development, together with a business information consultant
2. Lead architect OBIS project, together with an operational manager of the IT-operations department
3. Lead developer of the OBIS project group
4. Manager from the Customer Insight department
5. R&D manager Logistics Information
6. OBIS program manager
7. Product manager passenger information trains, together with the delivery manager OBIS

5.2 Technical Feasibility

As we believe we should only design artefacts that are technically feasible we had to better understand the feasibility's offered by the train's OBIS system. As one of the interviewees mentions, there is enough capacity for additional applications on the trains: "The system is currently set up for just two applications, but it was ground up designed for far more. If we look at the CPU, there is plenty room for additional applications." Another interviewee mentions specifically that setting a platform for a series of applications was the driver behind the project: "The project started off with the ambition to make it cost-covering. We thought about value-added services back then."

In-train location-discovery of passengers using the onboard information systems is one example of a technical possibility used in the artefacts designed. This is a functionality currently not in use, but something that should be relatively easy to add by automatically determining the exact Wi-Fi hotspot/antenna to which a customer is connected, as we found out through the interviews.

5.3 Chosen Ideas

In order to make a choice for three artefacts to narrow down our further examination we followed the following procedure. We grouped and ranked ideas by the frequency mentioned by the interviewees. This list gave ground to choose three ideas for further development as (research) artefacts, based on their expected added value, uniqueness and their differentiation.

All users are in the same environment when using the applications, the act of crowdsourcing is limited by some factors of this environment: limited space and a moving environment make some (creative) solutions unrealistic. Concluded from the interviews, information however is a valuable good for NS. The chosen artefacts represent the retrieval of information by letting the crowd deliver it, instead of having to invest otherwise into acquiring it, for example by sending people into the train (as is currently the situation) or conducting customer research otherwise. Following Doan *et al.* (2011) we did not solely focus on the question what contributors can do, but also on the aspect how to recruit contributors and on the question how to combine their contributions.

The choice was made for three artefacts, which are *Train chat*, *Train meeting service* and *Sentiment measurement*, which will be explained in more detail hereafter.

6 Studied Artefacts

6.1 Creating of artefacts

The artefacts we created were designed for the purpose of validation through a survey. Each artefact consists of one or more screenshots of mockups showing the proposed application and an in advance defined oral explanation by the researcher of the concept. All artefacts were designed for in-train usage, building on top of the existing OBIS platform.

6.2 Three Artefacts

The first artefact is a *chat-application* with in-train location-based chat. Passengers can chat with people in the entire train, or only within their own carriage. Also personal chat functionality is offered. One of the images made of this artefact is shown in Figure 1.

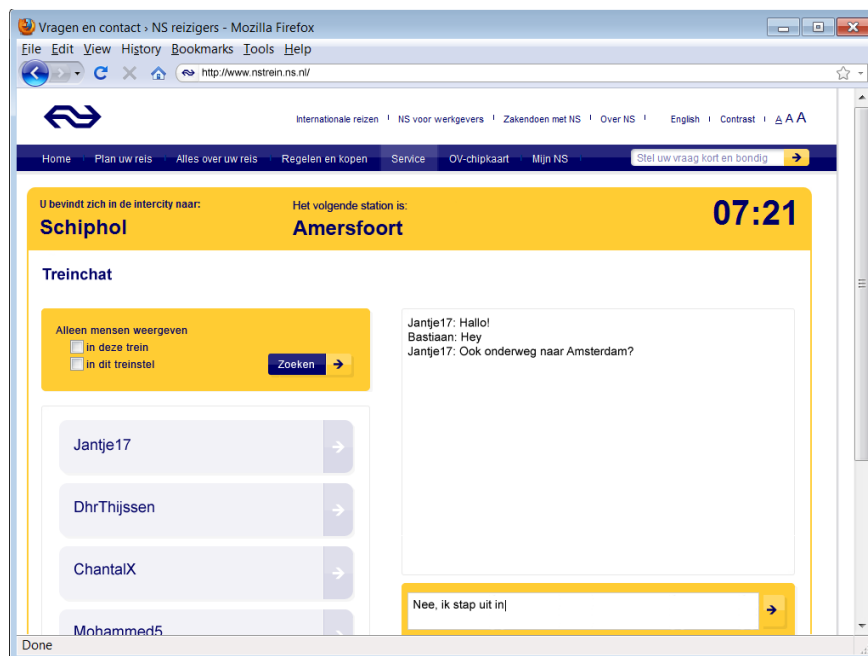


Figure 1: The train chat artefact screenshot

The second artefact consists of a *meeting service*, offering more specific selection methods than the chat application, as a user can apply filters such as age and gender. Furthermore, an option is available to let someone reveal his location in the train. One of the images made of this artefact is shown in Figure 2.

The third artefact is a *sentiment measurement*. Three buttons presenting a feeling (positive, neutral, negative) are available at the portal and, optionally, people can explain why they are feeling this way.

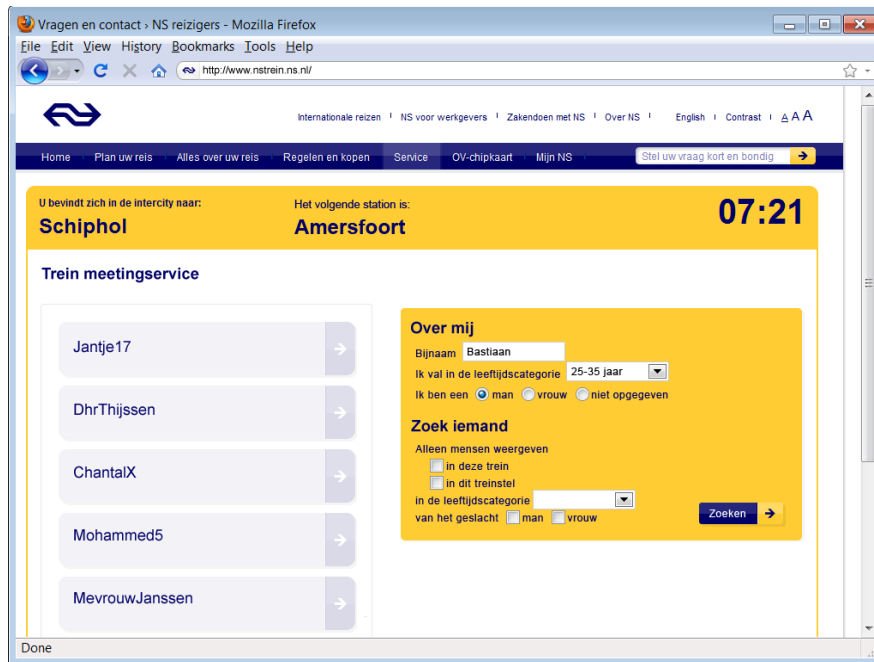


Figure 2: One of the meeting service artefact screenshots

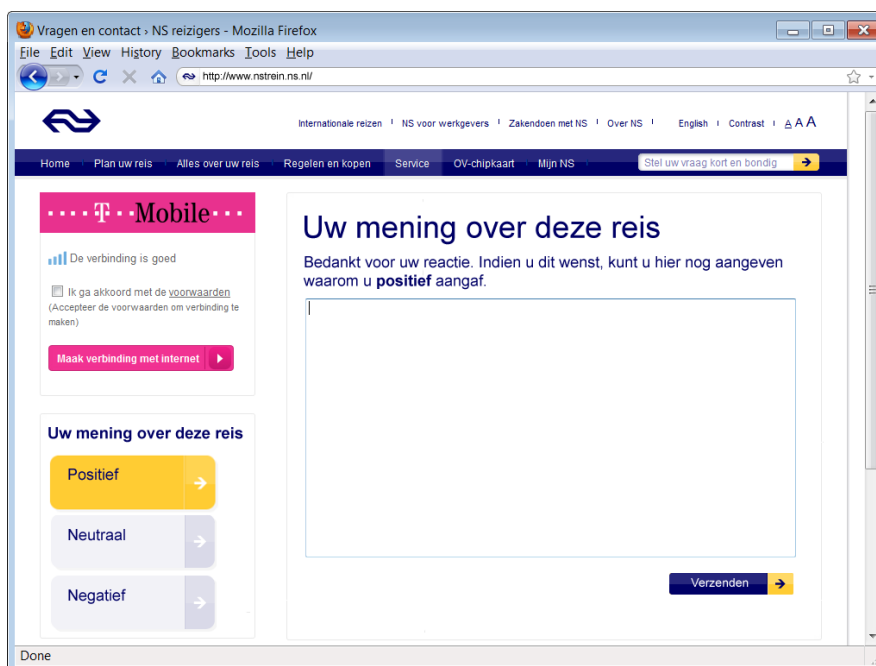


Figure 3: One of the sentiment measurement artefact screenshots

6.3 Privacy

To omit difficult privacy issues, it was chosen to only create artefacts not asking for a login or otherwise storing private data. A login would be difficult to offer in this environment within the complex Dutch privacy regulations. All data used in the intended applications can be made anonymous easily by not storing personal information that could make the user traceable. For the first two applications users can decide what they would like to reveal about themselves..

6.4 Crowdsourcing

Each artefact delivers a different data-stream to NS. This information can be added to currently used information streams, or contains information not yet available to NS, or perhaps not in real time. NS can retrieve information and crowdsource activities to their travellers by delivering these applications. The expected information streams are as follows.

6.4.1 Chat Application

The chat-application delivers a valuable stream of text-data on what people are up to during their journey. By counting words and making statistics out of it, NS can get insight in the sentiment and subjects of current interest to their customers. Discussions might for example take topics such as the quality of the service given by NS, the state of maintenance of the train, the friendliness of the conductor, the quality of the information provided to the passengers, et cetera. However, gathering knowledge from these chat lines requires smart technology to signalize discussion topics, and to construct patterns from raw textual data.

6.4.2 Meeting Service

The meeting service offers the customer the ability to file his age, sex and other personal characteristics. This information can be used in an anonymous form for getting a better picture of customers in the train (at specific times and specific trajectories). One should be aware that such a meeting service would not be of interest to all passengers – however, referring back to the research performed in the UK by Lyons *et al.* (2005; 2007) it might still be of interest to a relatively large group of travellers.

6.4.3 Sentiment Measurement

As mentioned before, NS nowadays conducts surveys for getting knowledge about their customers' satisfaction. With a sentiment measurement artefact this effort be changed by crowdsourcing this. It gives real-time and aggregated insight in the sentiment of people in particular trains at particular trajectories. Enroute, it could be used as a source for information provisioning to this train or these passengers. Aggregated data provides valuable insights about patterns on particular trajectories or in particular trains, what can be a source for targeted improvement programs. Over time, it provides insight in developments in customer satisfaction, also capturing the effects of improvement programs.

7 Adoption Survey

7.1 In-train study

For testing possible customer adoption, formulated in sub research questions two (durable adoption) and three (desired services), a survey was used (Marshall, 1996). The survey gathers both quantitative and qualitative aspects. Most important results are shown in Section 8. The mixed study was conducted in the future intended application domain: moving trains. Passengers in the train were approached with the question whether they would like to cooperate in a research exercise. Around two out of three were willing to cooperate. In total we approached 46 people, and 30 of them cooperated.

Approaching someone was restricted by the availability of a free seat near the person. The surveys have been held spread over four different days, including weekend days. Both people in first and second class were approached.

7.2 Responders

Of the responders, 57% were in the age of 18-24 (student-age), 27% in the age of 25-40, 10% in the age of 40-60 and 7% was over 60. The large number of young-respondents is logical, as students do account for one-fourth of the kilometres on the Dutch railways (NS, 2011) due to the free public transport students get in The Netherlands.

The sexes of the respondents were split 57% man and 43% female. Most of the respondents have been or are currently studying higher (20%) or academic (57%) education. These high numbers are influenced as well by the free public transport for Dutch students but also by the fact that higher educated people tend to live further away from work. Most respondents rated their selves as average to good technical skills.

No distinction can be made on first and second class travellers, as the number of responders in the first class (a total of 8 people) is too low for that use.

8 Results

8.1 Handling the results

Thirty people cooperated in the survey. We show the results regarding the expected user adoption from this survey here. Combining the results found before with the interviews, we can later answer our sub research questions, and by doing so, answer our main research question.

8.2 Chat Application

The expected customer adoption of the chat-application is low. Most people (20 out of 30) mentioned that they like the idea to some extent, but most are not intending to use it. The others didn't like the idea at all. For further details see Figure 4. Also the expected use of the application is not very high, as Figure 5 illustrates. 15 people mentioned they would not use it at all.

In the open questions, 8 people mentioned that although they didn't see any added value in the service, they remarked in case they would be bored, they still might be using it.

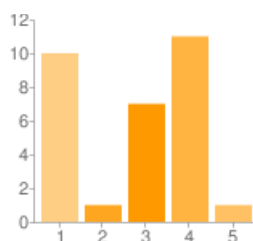


Figure 4: Do you like the idea of a chat application
[From not at all (1) to very much (5)]

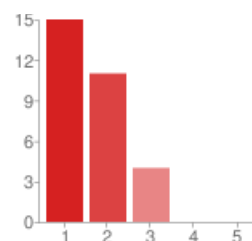


Figure 5: Would you use the application?
[From never (1) to daily (5)]

8.3 Meeting Service

The expected customer adoption of the meeting service is medium. Most people noted that they do like the idea (see Figure 6), but only a few are willing to use it (Figure 7). Even less are willing to use it on a somewhat regular basis. A lot of people liked the idea, but said it would better suit others. This makes adoption questionable.

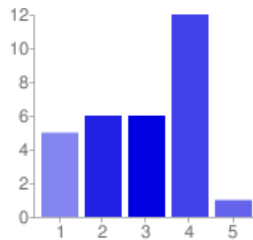


Figure 6: Do you like the idea of a meeting service?
[From not at all (1) to very much (5)]

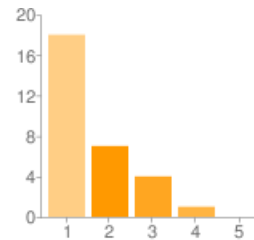


Figure 7: Would you use the application?
[From never (1) to daily (5)]

8.4 Sentiment Measurement

The expected customer adoption of the sentiment measurement is high (Figure 8 and 9). A lot of people are willing to participate and give their opinion (Figure 9) as long as they get a certain amount of feedback on their responses. Three people noted that they would only use it to express negative emotions, but others mentioned they would use it whenever possible.

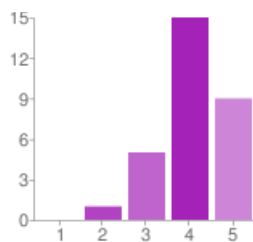


Figure 8: Do you like the idea of a sentiment measurement application?
[From not at all (1) to very much (5)]

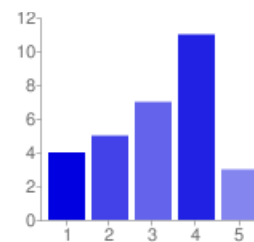


Figure 9: Would you use the application?
[From never (1) to daily (5)]

Interesting observations regarding the sentiment measurement are the answers given to the questions on the sustainability of the adoption expected. Most people mentioned they would be likely to keep using the application (Figure 10) as long as they get the feeling it is useful to do so and get feedback from NS on their input provided (Figure 11). This is notably higher than the scores on the other artefacts.

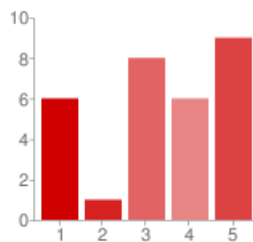


Figure 10: Will you keep using the application?
[From not at all (1) to very much (5)]

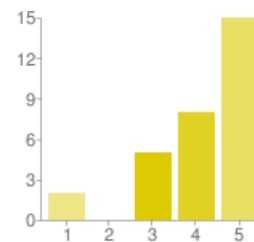


Figure 11: Do you expect information or a message from the NS after using the application?
[From not at all (1) to very much (5)]

9 Discussion

9.1 Answers to the research questions

Revisiting our initial list of research questions, we derived to the following answers:

SQ1: What information does NS want from its customers?

The interviews let us conclude that the most valuable data for NS is a better understanding of who is travelling their trains and at what trajectories. Within the train environment, feedback on the sentiment of the journey, the attractiveness of the train environment, and the feeling of safety are most sought for. This is in fact qualitative data about the sentiment and feelings of its customers the passengers.

SQ2: How can we get customers to interact on a regular basis with NS?

The highest ratings on the sustainability-questions were answered for the sentiment-measurement. Most people also clarified that if they felt that it was useful, they would likely keep using the application. For the entertainment applications (chat & meeting service) the survey did not provide proof that a durable and stable adoption can be expected.

SQ3: What information, application or service does the customer want from NS?

Customers are most likely to adopt applications that give them the feeling they contribute to something worthwhile. Also, as discussed before, applications closer to the core business are more likely to get adopted. Nevertheless, there seems to be a group of customers who want entertainment services. These customers have little overlap with the ones stating to adopt more serious applications.

9.2 Conclusions and discussion

Combining the results of our research as listed above, we can conclude that crowdsourcing in the train has potential. The research revealed that a precondition for successful adoption of any application is feedback to the customer on the use (or not) of the data. NS can retrieve real-time information, currently not available, to detect a social or technical problem in specific trains. Furthermore they can enrich their current information streams with the information from these systems.

However, several things have to be taken in mind before deciding on large scale implementation. First, getting real qualitative and clean data out of the three artefacts chosen and researched seems hard. Only the sentiment measurement service has real potential for qualitative data gathering, although further insight is needed to understand how passengers in fact would utilize such a service in real practice. Do they only provide feedback, as some people mentioned, in case they are dissatisfied?

Furthermore the results (shown in Section 8) suggest that the adoption of applications with more serious characteristics, or closer to the core rail-transport process – such as the third artefact – seem to have a better chance of adoption as applications with a more recreational ground – like the artefacts one and two. Nevertheless, beware that people might not want to tell that they intend to use an application aimed at entertainment or dating. Ergo they give a *socially desirable* answer. Interpreting the work Doan *et al.* (2011) published, one starts wondering whether offering entertainment style

applications could not be a key instrument in recruiting contributors to the in-train crowdsourcing platform, therewith assuring a large user base for crowdsourced input. Our interviews at NS hinted in this direction, although none of the interviewees is a crowdsource expert.

As we are working with $n=30$, we could normally assume by the central limit theorem that our data is normal distributed and that we can derive to a set of coherent conclusions (Marshall, 1996). It is however doubtful if this is really true: young people and higher educated people were over represented in our sample, even considering the student card. Follow up work might therefore be needed in this direction as well.

9.3 Future applied research

Future research can be performed in a couple of ways. As this research explored the feasibility and likeliness of adoption of just three artefacts an easy recommendation for further research is an extension to consider more artefacts/ideas, the longlist we collected might serve here as a basis.

However, if we had to give just one recommendation it would be to create a working test-environment, a living lab, in which novel concepts can be tried out. Our research clearly revealed that people are interested in such developments, and would be willing to try new services. Another motivator for a living lab experimental environment is the important observation brought up by Doan *et al.* (2011), who clearly pinpoint at the importance of easy user interfaces, something they mention which is highly non-trivial. This pleads for short development cycles with the end-users strongly involved.

In a neighbouring domain NS has recently opened up its internal information systems to the crowd: the passenger information is now freely accessible through an open API. Still in beta, NS hopes that developers will pick up the data and start creating (mobile) apps and internet applications. Perhaps it can do something similar for passenger interaction.

Lastly, this research might be of help to NS in further designing services for the double-decker trains which will go shortly in renovation. These trains are going to get a novelty: the opposite of a silence compartment, a relax compartment for people willing to meet and talk. In-train digital services are a logical extension to that, opening up a natural door for applications as researched in this paper. Perhaps design and build by the crowd, for the crowd.

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