Social Acceptance of Negotiation Support Systems

Alina Pommeranz, Pascal Wiggers, Willem-Paul Brinkman, and Catholijn M. Jonker

Section Man-Machine Interaction, Delft University of Technology,
Mekelweg 4, 2628 CD Delft, The Netherlands
a.pommeranz@tudelt.nl

Abstract. We investigate people's attitudes towards the possible use of mobile negotiation support systems (NSS) in different social contexts and the consequences for their design. For that purpose we developed an online survey based on existing models of technology acceptance. In the questionnaire we showed five filmed scenarios of NSS use contexts. The data collected from 120 respondents, showed (a) that subjective norm is an important factor influencing the intention to use the system and (b) that the acceptance of NSS depends on the use context. Therefore, we argue that NSS should be designed not merely as tools being used in the actual negotiation but as social devices harnessing social networks to provide support in all negotiation phases.

Keywords: Negotiation Support Systems, Social Settings, Technology Acceptance, User Study.

1 Introduction

A skillful negotiator has to carefully balance the issues at stake, have a good understanding of his own and the opponent's needs and since negotiation is a social activity, manage relationships and handle emotions [22]. Often negotiating involves overlooking a vast amount of options, deciding on strategies and evaluating bids with multiple attributes. Computational power can facilitate these processes. Within different research areas, e.g. management science, e-commerce and artificial intelligence [11,18,19,23], researchers have been dealing with supporting people electronically in negotiations. Existing negotiation support systems (NSS) can significantly improve the human performance in negotiations and increase the number of win-win outcomes if the negotiation space is well-understood [7,10].

Most existing NSS have been developed either as stand-alone applications [11] or Web-based applications [10] and are currently used for training and research rather than in real-life negotiations. The advance of mobile technology, however, opens up a whole new range of possibilities for NSS. Since negotiation is an activity that can take place in almost any setting instead of being tied to, e.g., an office, mobile technology enables people to have their NSS at hand at any time they are involved in a negotiation. Current mobile devices such as mobile phones, PDAs, handheld computers etc., offer among other things the opportunities to store and compute large amounts of data, access online sources and show graphical data on color screens. In addition, the number of people using portable Internet devices is rapidly growing [8]. We would like to take advantage

G. Leitner, M. Hitz, and A. Holzinger (Eds.): USAB 2010, LNCS 6389, pp. 55–70, 2010.

of these trends and develop a new kind of NSS for mobile use, a so-called Pocket Negotiator (PN) as described by [7]. Our vision is to develop a mobile system that is able to collaborate with its users in order to reach win-win outcomes in negotiations. The PN will enhance the negotiation skills and performance of the user by increasing the user's capacity for exploration of the negotiation space, i.e. possible bids and deals, reducing cognitive task load and preventing mental errors. The functionality of the device will be focused on handling computational complexity issues and providing bidding- and interaction advice. Our idea is to cover all negotiation phases (preparation, joint exploration, bidding and closure) [22] with the support from the system.

The mobile nature of the system will allow users to refer to this support not only when they prepare themselves at home, but also when they are on the move or even during the face-to-face situation with the other negotiation partner. This entails several advantages. The users can, e.g., collect relevant information for the negotiation and enter it immediately into the NSS or update information about their preferences in case they change due to new information. They can practice the different negotiation steps and review tips and strategies at any time. In a face-to-face situation it might also be useful to enter information, e.g., revealed by the opponent (i.e. spoken words or information about the opponent's behavior, emotions etc.). Based on this input the NSS will be able to give context-relevant advice or it could just serve as a reminder for information entered by the user during earlier preparation. Also the possibility of connecting to a wireless network enriches the functionality of the NSS, e.g. by providing online market information. With this new freedom mobile NSS offer, new questions and problems occur. Besides technical restrictions like the small screen size or short battery times the question of social implications arises. When putting NSS into the social setting of a face-to-face negotiation or using it in public spaces, we have to consider appropriateness and acceptance regarding the user, the opponent or bystanders. Entering information or consulting the NSS during a negotiation might interrupt the flow of the communication or bother the opponent for other reasons. Furthermore, the user might be concerned about his or her image when using a mobile NSS in public. These are issues worthwhile investigating.

Therefore, we conducted an online survey (a) to find out in which situations people consider a mobile NSS socially acceptable, (b) to find the factors and relationships that influence this acceptance in the different situations and social contexts and (c) to investigate the consequences of people's attitudes towards NSS for their design.

We would like to stress at this point that the system has not been implemented yet. Before designing the concrete functionality of a Pocket Negotiator and implementing it we would like to investigate the social acceptance of mobile NSS in different situations. This will enable us on the one hand to inform the further design process and on the other hand find answers to why current NSS are not used in real negotiations.

2 Related Work

The majority of existing NSS has been used for training and research purposes, but has not been applied to real life negotiations [9]. A recent study on user acceptance of Web-based NSS [23] predicts that 80 percent of the users would use the system to prepare

and train for negotiations but only 61 percent would use it in the negotiation. Why is the acceptance for real cases so low? One possible answer is that NSS development is too focused on the technical aspects and disregards human concerns. Bui [3] points out that research on NSS concentrates on technological solutions, while the social problems they intend to solve are secondary or completely neglected. Swaab and colleagues [21] argue for a careful analysis of social and psychological processes in order to design good NSS and claim that the success of an NSS depends on the understanding of the activity that the system will support.

Negotiation is inherently a social activity, since it involves communication between at least two parties and is influenced by the social setting in which it takes place. Literature on business science [6] has, e.g., emphasized the influence of relationships on negotiation processes. Moreover, based on results from expert focus groups [17] we know that people's attitudes towards NSS differ widely and that social contexts might play a role when choosing to use a system or not. Therefore, we believe that in order to design NSS that will be successfully used we first need to investigate whether people are willing to accept the use of NSS in different social settings.

Researchers focusing on the adoption of mobile technology in general have recently included social context into their models. Social impacts of mobile technology have been widely studied [12,13,14,15], especially the pervasive nature of mobile phones in public places. Most of the literature in this area focuses on the distraction of bystanders by people talking loudly on the phone or by the mix-up of geographic spaces (current physical space the mobile phone user is in and the space created by a phone conversation) [12,13,20]. In the case of using a mobile NSS, distraction is, of course, especially an issue when the NSS user is in an active, ongoing communication with the other negotiation party (face-to-face or on the phone). The interaction with the device might disrupt this communication and therefore be less socially acceptable. Furthermore, the other party might not accept the interaction with the NSS because it allows the user to have an advantage and other party might feel excluded. In other situations where the NSS is used for preparation, social acceptance might be less of an issue.

3 Research Questions

We looked at several detailed research questions. **RQ 1**: Is there a relationship between the user characteristics and (perceived) usefulness, attitude towards negotiation, behavioral control and social acceptance? The user characteristics include demographic data and experience in computer usage and with negotiations. We expect that age and possibly gender influence the acceptance of a mobile NSS in different situations. In focus groups with negotiation experts we conducted [17] it was anticipated that younger people are more open to technology use in public places and social situations than older people because younger generations grow up with technology around them. This is reflected in **RQ 1a**: Is there a negative impact of the user's age on the acceptance of a NSS in a face-to-face situation?

Based on the results of focus groups we did with end-users (5 groups with 3 high school students each, aged 15 to 18 ($M = 16.73$, $SD = 0.88$), 6 groups with 6 highly-educated women each, aged between 31 and 70 ($M = 49.86$, $SD = 9.16$)), we expect

that people with low negotiation skills and a negative attitude towards negotiation are more likely to use an NSS. Due to their own lack of knowledge about negotiations or insecurity they might find an NSS more useful than people, who enjoy negotiating and consider themselves good at it. This leads to the questions: **RQ 2**: Is there a negative relation between a person's attitude towards negotiations and the attitude towards NSS? **RQ 2a**: Is there a relationship between on the one side negotiation skills and experience and on the other side the attitude towards negotiations?

We believe that the acceptance of a NSS in a social context has an impact on the intention to use it. The social acceptance is measured by two variables, one describing how acceptable people find it to use an NSS in a situation (SN1) and the other describing in how far they believe that the opponent would find it acceptable (SN2). Whereas in a face-to-face situation it might play a big role what the opponent thinks, it might become less influential in a phone scenario. Therefore, our last research questions are: **RQ 3**: Is there a relationship between the social acceptance of an NSS and the intention to use it? **RQ 3b**: Does the negotiation situation determine the social acceptance?

4 The Model

The relations between usefulness, attitude towards a system and intention to use as well as the influence of subjective norm and behavioral control that we are interested in are well-studied for information systems within the scope of the Technology Acceptance Model (TAM) [5] and the Theory of Planned Behavior (TPB) [1]. Both models are extensions to the Theory of Reasoned Action introduced by Martin Fishbein and Icek Ajzen [2].

Based on our research questions we created a model to explain possible factors influencing the social acceptance and use intention of an NSS in different situations that combines both models and extends them with a number of factors that we think are influential specifically for mobile NSS.

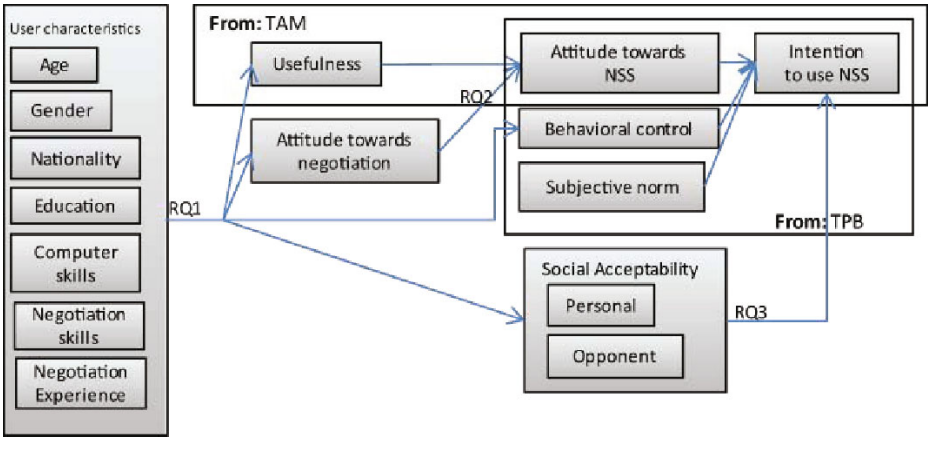

Fig. 1. NSS Social Acceptance Model

4.1 TPB and TAM Model

The TPB is a well known model in social psychology to explain the link between attitudes and behavior. It identifies the attitude towards a behavior, subjective norm (an individual's perception of others' beliefs whether he or she should perform the behavior) and perceived behavioral control (an individual's perceived ease or difficulty of performing the particular behavior) as indicators for the intention to use. The perceived behavioral control and the intention to use determine together the actual behavior regarding the use of a system.

The TAM has been widely used to explain people's attitude towards the use of technological systems. It identifies perceived usefulness and perceived ease of use as two independent factors that influence the intention to use a system and its actual use.

Since our study takes place before the implementation of the system, we are not able to measure the actual use of a system or the ease of use. To be able to measure usefulness and behavioral control we showed either videos or storyboards of NSS use cases. We kept the attitude towards NSS influencing the intention to use, but added the general attitude towards negotiations as an influential factor of attitude towards NSS. As mentioned earlier the use of such systems might depend on different situations and how socially acceptable it is to use a system in that situation. Therefore, we added social acceptance as an extra factor influencing the intention to use. Last, we added a number of user characteristics including: age, gender, nationality, education, computer and negotiation skills and experience.

5 The Survey

To give respondents an idea about the contexts and type of functionality that an NSS could perform we identified, together with a negotiation coach, five distinct situations for NSS use: face-to-face with the boss with concealed use of the NSS, face-to-face with open use at a car dealer, distant negotiation on the phone, collaborative preparation of a couple and short preparation being mobile on a train (Figure 2). For each situation we wrote and filmed a scenario (see e.g. http://mmi.tudelft.nl/video/scenario1/, Dutch voiceover, for other scenarios change the 1 to a number between 1 and 5) to be shown in the questionnaire.

5.1 Scenarios

Scenarios are useful in the design process since they capture the consequences and trade-offs of designs [4]. The narrative nature of scenarios enables users to imagine the use situations and contexts of new or existing technology. For each of the five use contexts we wrote a scenario presented in the following in summary. Italic text is taken from the original texts of the scenarios. In the project we currently focus on two example domains for NSS use: job contract and real estate negotiations. We chose to write two scenarios illustrating a job negotiation, two with real estate content and one about buying a car. All scenarios were checked by a professional negotiation coach to make sure that they were sufficiently realistic. Each scenario is briefly discussed below.

Fig. 2. Scenarios (Screenshots from videos) from left to right, top row: open use at car dealer, collaborative preparation before buying a house, on the phone with real estate agent, ; bottom row: evaluation talk with boss, preparation for job interview on the train

Mobile Preparation with Time Constraints (train). Preparation is one of the negotiation phases stressed in the literature, e.g. [6]. In this scenario we describe a preparation situation with special constraints. The job applicant Martin is already on his way to the interview. Therefore, he has limited time to prepare himself. In addition, the mobile setting constitutes another constraint, namely limited resources. Both constraints require special regard when it comes to the functionality of the device. Just before getting on the train Martin has received a mobile NSS from a friend. He uses the device's speed preparation function to prepare himself in the short time he has left. Among other functions the device allows him to receive knowledge about the job negotiation domain.

He wonders how much money he could ask for. He chooses 'expert opinion' on the interface and types in 'salary'. The PN *suggests a website that has a forum where you can discuss current average salaries for IT consultants with an expert in the field. After reading through the forum Martin has a quite good idea what he can ask for with his kind of educational background and experience. With that knowledge he feels more secure and relieved.*

Later in the scenario Martin makes use of the training module of the NSS which enables him to go through a simulated interview with a virtual agent. He receives on-the-fly advice about his and the opponent's actions. The scenario ends with Martin being more relaxed, knowing what to expect in the upcoming negotiation.

Face-to-Face Negotiation, Secret Use (F-2-F). The situation described in this scenario is a negotiation between an employee, Bianca, and her boss. Bianca is using a mobile NSS. The emphasis in this scenario is the concealed use of the NSS. Bianca is hiding the fact that she has support from an NSS by telling her boss she is using her device only to take notes.

Bianca has been working for a big telecommunication company in The Hague for 2 years now. Today her annual evaluation with her boss is due. Bianca wants to take this meeting as an opportunity to re-negotiate some parts of her contract. Since her husband

got a new job in another city, they decided to move further away. Therefore, she wants to discuss opportunities with her boss to handle the new situation. She knows that she worked hard and well in the last year and should get what she wants, but she does not consider herself a good negotiator. Therefore, she recently got the PN *and prepared herself for this negotiation with the device.*

Throughout the negotiation described in the scenario Bianca receives help from the device. Several functions are described in this scenario including, e.g., the management of emotions, generating new options, and receiving advice from the system. The scenario ends with a deal in which both parties gain something and are satisfied with.

Collaborative Preparation (Coll. Preparation). Negotiation involves a lot of emotions on both sides of the bargaining table, but also within one party, e.g., between two partners buying a house together. In this case the first step is to merge the demands and preferences of both partners before starting a negotiation with the opponent side. Our scenario describes a couple that is planning to buy a house together and uses the NSS during the preparation to sort out their preferences and to download domain knowledge about real estate.

The 'collaborative preparation' module starts up. After a short introduction the PN *asks each of them to put in their preferences for a house separately. Since they also have the* PN *software installed on their laptop they put in their preferences in parallel. From both preference profiles the* PN *creates a matching profile and shows the clashes of their preferences. It advices the couple discussing the clashes and trying to find trade-offs between them that suit both.*

During this process of compromising the couple gets into a quarrel in which both insist on their own wishes without even communicating the underlying reasons in detail. In this case our device takes on a proactive role and interrupts the couple to give advice on how to handle the conflict.

The PN *senses the noise and the angry voices in the room and assumes an argument. The* PN *suggests calming down [and] prompts them to put in an emotional value on a scale from 'I don't care at all' to 'I would die for this' for each variable they have different preferences on.*

After having sorted out all their preferences they start looking for houses. In the last scene of the scenario the couple visits a house and takes advantage of the PN's feature of taking pictures and storing them together with other information about the house in a database.

Negotiation on the phone (Phone). A negotiation in which both parties are not situated in a face-to-face setting, but are distant from each other offers different design challenges for a NSS. First of all one party does not see the other party and therefore the use of a NSS can take place without each others' notice. Especially in real estate situations, e.g. when buying a house another aspect to consider is that the negotiation is split into a number of phone calls. This gives the user time in between the calls to use the system in each step of the negotiation. Our scenario describes a couple negotiating for a house. Before the interaction with the opponent they prepare themselves with the help of the NSS.

Furthermore, the PN *has downloaded housing domain knowledge, such as contracts and legal issues and the prices of similar houses in the neighborhood to take into account. Before Mary came to work this morning she had decided with Piet to set a first bid around 450.000 Euro.*

At work Mary calls the agent and starts negotiating. Before and during the phone calls she uses the NSS on her laptop to receive advice about different steps in the negotiation, e.g. the PN advises her to not start the negotiation with offering a price, but instead talk about other issues and options.

The bidding goes on for a while and the PN *shows a visualization of the bids in the outcome space based on the preferences of Piet and Mary and the estimated preferences of the agent. After a while the* PN *detects that the bidding is not reaching a win-win situation.*

After finding new variables to include in the negotiation to reach an agreement that suits both parties they finally close a deal.

Face-to-Face Negotiation, Open Use (Car Dealer). We decided to include another scenario that has a face-to-face setting, but showing an open use of the NSS meaning that the other party is aware of the use. This scenario is about a couple buying a car. Our belief is that the car dealer's setting enables people to use the NSS more openly. When buying a car it is usually not necessary to stick to one specific car dealer. No long-term relationship needs to be considered. Therefore, the couple in the scenario openly states that they will be using the NSS and explain what they can do with it.

The focus of the scenario lies in the advice of time-outs at strategic points during the negotiation. During the process of looking at cars and refining their preferences for the new car, they enter information about the state of the negotiation into the NSS. They receive strategic advice on how to proceed and when to take the time to recapitulate.

He [the car dealer] *shows them a range of more sporty looking family cars and the couple chooses their favorite. They enter that into the* PN. *The* PN *advices them to take a time-out and check whether they have considered all their preferences and whether all the information they need has been disclosed.*

After they have found an interesting car the bidding starts in the car salesman's office. The NSS assists the couple by comparing prices with similar cars online. They disclose to the salesman that the market price is lower than his offer. The salesman drops his price. They negotiate about a few extras and finally leave with a new car and a deal they are satisfied with.

5.2 The Questionnaire Structure

The questionnaire is based on the model shown in Figure 1. For details about the constructs and questions, see Appendix A. After a short introduction we collected the user characteristics. The factors intention to use (IU), subjective norm (SN) and social acceptability (SA) were measured after each scenario presented to the respondent. At the end of the survey we collected more general information about the attitude towards NSS (PNA), including behavioral control (BC) and usefulness (USE). For the majority of questions we asked the respondents to rate their agreement with a number of statements

on a 7-point Likert scale and for an explanation for the ratings after each scenario to explore why people might accept the system in one scenario but not in another.

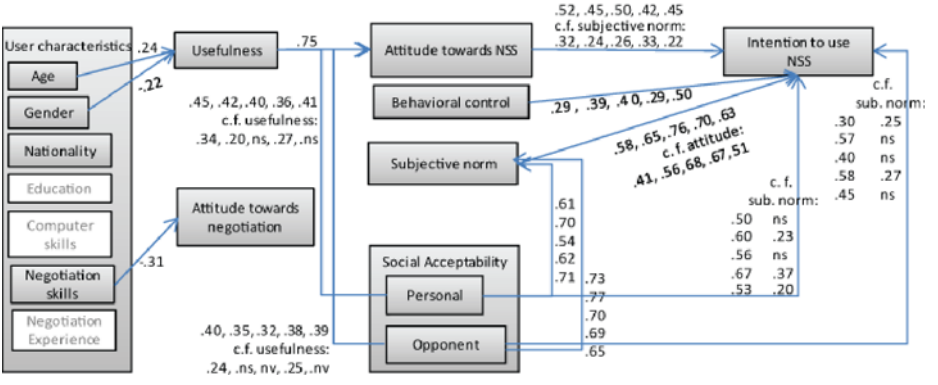

Fig. 3. Model with (partial) correlations, 5 numbers: per scenario, cf = controlled for, ns = not significant, nv = no value

5.3 Versions

We setup a Dutch version with short videos (3 min) and a Dutch and English version each with screenshots from the videos and text explaining the situation. The version with videos took about 45 minutes to fill in and the picture versions 10-15 minutes. To avoid order effects we shuffled the order of scenarios and statements.

5.4 Survey Distribution and Response

With NetQuestionnaires (www.netquestionnaires.com) we administered and distributed the survey online. We used an opportunity sample strategy to select participants for the study. We took advantage of personal networks and online forums to invite people to participate. We also asked each invited participant to motivate other friends and colleagues to participate. The questionnaire was approached by 365 people, and 178 started filling it in. In the following statistical analysis we included 120 (74 male, 46 female) from 18 countries, who completed the questionnaire. From these 120 participants 72 completed the English, 31 the Dutch version with videos and 17 the Dutch version with pictures. The most represented countries were the Netherlands (48), Sweden (19), Germany (15) and Greece (10). The age span ranged from 20 to 68 ($M = 32.28$, $SD = 10.36$). Participants are mostly familiar with computer usage, with the average number of hours spent at the computer being 44.86 ($SD = 20.14$) and highly educated (102 with university degrees). The negotiation experience of the sample is rather low. Only about a fourth of the participants are regularly engaged in negotiations in their jobs (31 participants). On average participants have bought 0.65 ($SD = 0.97$) and sold 0.47 houses ($SD = 2.43$) and have had less than seven job interviews ($M = 6.65$, $SD = 10.33$).

6 Results

6.1 Measurements of Contructs

For an overview of all constructs used in the questionnaire see Appendix A. We used Cronbach's alpha to test the reliability of the constructs usefulness (USE) (.95), and behavioral control (BC) (.72) and calculated aggregated measures for both including all original items. The Cronbach's alpha for attitude towards negotiation (NAT) including all four original items is very low (.04), but increases to .69, if the items NAT 1 and NAT 4 are deleted. Therefore, we decided to keep only the items NAT 2 and NAT 3 and combined them to an aggregated measure. For the construct negotiation skills (NSK) we keep the three items NSK 1, NSK 4, NSK 5 reaching a Cronbach's alpha of .71, while removing NSK 2 and NSK 3. The reliability of social acceptance (SA) was measured per scenario (Cronbach's alpha between .81 and .94). We did not calculate an aggregated measure for the acceptance, but kept them separate in the further analysis.

Table 1. Results of regression analysis for each scenario

Scenario	R	R^2	Adj. R^2	SE	df_{reg}	df_{res}	F	p
Train	.684	.467	.453	1.341	3	116	33.90	$<.001$
F-2-F	.762	.580	.569	1.143	3	116	53.39	$<.001$
Coll. Preparation	.674	.455	.439	1.434	2	69	28.78	$<.001$
Phone	.764	.584	.577	1.151	2	117	82.15	$<.001$
Car Dealer	.577	.333	.327	1.521	1	118	58.83	$<.001$

6.2 Data Analysis

We used correlation analysis to check our hypotheses. Significant correlation coefficients can be found in Figure 3.

User's background. We found a positive correlation between age and usefulness and a negative one between gender and usefulness. Computer skills and negotiation experience were not correlated with usefulness, attitude towards negotiation or behavioral control. We removed the item education from the model, since our data was not heterogeneous enough to draw any conclusions on the effects of education level. We also removed nationality because the data was not equally distributed. Interestingly, we found that negotiation skills are negatively correlated with the attitude towards negotiation opposing our initial hypothesis. However, negotiation skills were rated subjectively by the respondents themselves, which might not correspond to their actual negotiation skills. This issue needs further research.

Usefulness, Subjective Norm and Social Acceptance. We found a positive correlation between usefulness and the attitude towards NSS, which confirms the relationship predicted by TAM. We found that social acceptance, (personal (SA 1) and opponent

Table 2. Estimated coefficients of regression models for each scenario

Scenario	B	SE	β	t	p	VIF
Train						
Constant	-.77	.644		-1.19	.24	
SN	.46	.111	.394	4.10	<.001	2.01
BC	.38	.126	.237	3.04	.003	1.33
SA	.22	.105	.188	2.11	.04	1.73
F-2-F						
Constant	-1.25	.523		-2.39	.02	
SN	.52	.097	.441	5.33	<.001	1.89
SA	.36	.088	.339	4.08	<.001	1.91
BC	.24	.095	.157	2.56	.01	1.04
Coll. Preparation						
Constant	-.41	.794		-.51	.61	
SN	.67	.102	.595	6.53	<.001	1.05
BC	.34	.144	.215	2.36	.02	1.05
Phone						
Constant	-.37			-.71	.48	
SN	.82	.076	.704	10.88	<.001	1.18
BC	.21	.102	.131	2.03	.05	1.18
Car Dealer						
Constant	1.01	.383		2.63	.01	
SN	.70	.092	.577	7.67	<.001	1.00

(SA 2) view), is correlated with the attitude towards NSS and the intention to use for all scenarios. However, when controlled for usefulness in the first case and subjective norm in the second, the correlations are either weaker or not significant. This suggests that the attitude towards an NSS is mainly influenced by how useful people consider it. The intention to use the system depends mainly on the subjective norm, i.e. whether others relevant to the respondent believe he or she should use it.

The dominance of subjective norm was further analyzed by regression analysis (Table 1) for each individual scenario. We used a stepwise method with the dependent variable intention to use NSS in a particular scenario and the following independent variables: attitude towards negotiation (NAT), behavioral control (BC), subjective norm (SN) and social acceptance (SA). Table 2 gives an overview of the regression models with included variables and coefficients. We can see that subjective norm has the major influence in predicting intention to use in all scenarios. In the car dealer scenario it is even the only variable included in the model (β= .58, t(118) = 7.67, p < .001). In the collaborative preparation and the phone scenarios behavioral control were also included in the model. In the face-to-face and the train scenario behavioral control as well as social acceptance was included in the model. Whereas face-to-face the social acceptance is the second strongest indicator before behavioral control, in the train scenario it is the other way around. This is not surprising since in the situation with the boss social rules are much more important and can have stronger consequences than when sitting on a train. People using mobile devices on a train are a common sight and therefore social acceptance has less influence. More interesting is that in the other three scenarios

social acceptance is not included in the model. In the phone and collaborative preparation scenario this might be due to the lack of a public setting.

Looking at the comments respondents gave voluntarily, we get deeper insight into how people see social acceptance considering the opponent's view in the different scenarios. People tend not to care whether the opponent accepts the NSS if they are not in eye contact ("This [on the phone] seems like the best application of the NSS, because it is invisible to the 'opponent'.") In the face-to-face scenarios people value the opponent's opinion highly. In the car dealer scenario some respondents doubt the acceptance of the NSS by the opponent. However, usefulness, the competitive situation ("I think the opponent will accept it because otherwise people would go to the competitor.") or the ability to put pressure on the opponent ("I like the secret weapon!") cause people to care less about the opponent. In the job scenario between an employee and her boss, most respondents are worried about the opponent's opinion on the use of an NSS. The comments show different views considering not being honest ("I think it is not acceptable because she lies about using an NSS."), impolite ("Its very impolite to use an electronic device during a face-to-face negotiation."), embarrassed ("I would be embarrassed to use an NSS in this situation."), nervous ("Stealth mode would make me extremely nervous.") or appearing weak ("In a face-to- face negotiation this would make you look like you cannot think for yourself."). A dominant opinion was that the interaction with the device will interrupt the communication flow ("The boss could get angry for not paying attention, the communication would be disturbed").

As shown in Figure 4, the social acceptance generally depends on the situation in which the NSS is used. Whereas most scenarios have an average rating above the scale's mean (4), the face-to-face situation with the boss got a low rating (3.06) lying significantly below the average ($t(119) = -6.25$, $p < .001$). This means, in the latter scenario people do not accept the use of an NSS. The situations which are most favorable for NSS use are negotiations on the phone and preparation on the train. At the car dealer or during the collaborative preparation NSS are accepted, but the average rating is closer to the neutral value.

7 Design Implications

Bringing the results of the data analysis into perspective of NSS design, we learned that not only functionality and usefulness play a role, but also social aspects like the subjective norm and social acceptance. An NSS is not only a tool people use to fulfill a certain task but it is a social device depending on the use context. Therefore, the designer has to determine in which context the device should be used and fit the design to the context and its social norms. Furthermore, our survey has shown that the respondents value the opinions of close friends or family highly, both for deciding whether to use an NSS and when taking decisions during the negotiation. Some respondents mention explicitly that they consult others before an important negotiation. ("I would take others' opinions into consideration as well, [...]", "In buying something like a car [...] I get advice for prices online, from friends.") This behavior made us contemplate about the idea to create NSS that are connected to social networks. Friends using the same type of NSS could be connected to each other, and whenever one needs to take a decision they could provide help or generally comment on each others' actions.

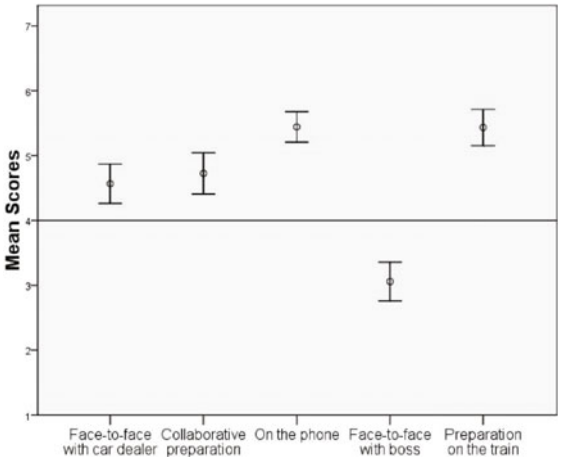

Fig. 4. Mean social Acceptance ratings (1=low to 7=high)

Another idea is storing negotiations within this network in a database that every NSS can access. This will enable users to see what strategies friends used in similar negotiations. These ideas fit social computing trends [16] by bringing mobile information spaces to the user and using social networks to enhance the system's functionality. Also, if people like to ask friends for advice when negotiating, a good NSS should be designed to behave in a similar manner. Surely, there are more ways designers can think of to make NSS more social devices.

8 Limitations

The study presented in this paper has a few limitations. First of all, the participants were not offered the chance to interact with an implemented system. Since we are at the beginning of the development of a novel NSS there is no implementation at hand yet. Furthermore, this study intended to inform the design process of this new NSS, instead of evaluating an existing design. On purpose we tried to focus rather on the use situations than the functionality the NSS could offer. We believe that by showing scenarios of use contexts in the questionnaire we found a good way to give participants a vision of what the system could be able to do, but on such a level that it does not distract from the focus on the situation. We think that people could get a feeling for the usefulness of the system and judge whether they would be able and willing to use it. Since the TAM model is based on constructs which can be perceived by the user when interacting with a real system, we excluded variables from the model that could not be perceived by only watching videos or seeing pictures, e.g. perceived ease of use.

Further limitations concern the number of participants in the study and the opportunistic sample. Unfortunately, these aspects did not allow us to make any general claims about the acceptance of NSS with regard to cultural or educational backgrounds or differences depending on age groups. Despite this, we believe that we offer interesting results that put NSS into a different light. The fact that both subjective norm and

situation dependency were major influential factors needs to be taken into consideration when designing new NSS, especially for mobile use.

9 Conclusion

We presented and analyzed data from an online survey with 120 respondents with little negotiation experience to investigate attitudes people have towards an envisioned mobile NSS in different use contexts. We learned that when designing NSS social issues cannot be neglected. Our survey shows that the use context of an NSS is an important factor influencing its social acceptance. The survey's respondents would not accept the use in face-to-face situations when the relationship to the opponent was important, i.e. with one's boss, but when the relationship is less important, i.e. with a car dealer. In situations in which the opponent is not aware of the NSS, e.g. on the phone, it is most accepted. Surprisingly, the subjective norm is the most dominant factor influencing the intention to use a mobile NSS. People value opinions of their close ones high when deciding whether to use an NSS and they also ask them for advice when negotiating.

We were able to obtain these results by giving people a vision of how a new kind of mobile NSS could be used by the help of filmed scenarios. This enables us to inform the design process of our envisioned system in an early stage. After implementing first prototypes in the near future we will be able to investigate more factors, which can only be perceived during the interaction with a prototype, e.g. ease of use. Other aspects to be considered for future research are the influences of educational and cultural background of the user on attitudes towards negotiation and NSS.

Overall, when designing novel, mobile NSS we should aim for creating NSS not merely as tools but as social devices considering the use context and social networks.

Acknowledgments

We thank the project team and all participants of this study. This research is supported by the Dutch Technology Foundation STW, applied science division of NWO and the Technology Program of the Ministry of Economic Affairs. It is part of the Pocket Negotiator project with grant number VICI-project 08075.

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A Questionnaire - English Version

(Unless otherwise specified in the footnotes the answers were measured by a 7-point Likert scale)

Item/Construct	Question	Item included
	Before all scenarios	
GEN	What is your gender? (male/female)	
COU	What is your nationality? (open)	
EDU	What is your level of education? (No degree, vocational training, university degree)	
AGE	How old are you? (open)	
CSK	How many hours do you spend using computers per week? (open)	
(NEX)		
NEX 1	How many houses have you sold? (open)	
NEX 2	How many houses have you bought? (open)	
NEX 3	How many job interviews have you had? (open)	
NEX 4	Is negotiation an important part of your job? (yes/no))	
(NAT)		
NAT 1	Negotiation is a game.	
NAT 2	I try to avoid negotiations.	*
NAT 3	I enjoy negotiations.	*
NAT 4	Negotiations are a necessary must.	
(NSK)		
NSK 1	I am a good negotiator.	*
NSK 2	I would rather negotiate myself if the negotiation task is simple.	
NSK 3	I would let someone else negotiate for me if the negotiation task is simple.	
NSK 4	I would rather negotiate myself if the object of the negotiation is important for me.	*
NSK 5	I would let someone else negotiate for me if the object of the negotiation is important for me.	*
	After each scenario	
IU	I would use the Pocket Negotiator (PN) in the situation shown in the video/picture.	
SN	Most people who are important to me would think a Pocket Negotiator is useful in this situation.	
(SA)		
SA 1	I think it is socially acceptable to use a PN in this situation.	*
SA 2	I think the opponent would think it is socially acceptable to use a PN in this situation.	*
Specific		
train	I expect a PN to prepare me in a short (1-2 hours) time before a negotiation.	
f-2-f	A PN would be useful to propose new options for the negotiation.	
coll.prep.	I expect a PN to help me organizing data (e.g. information from the Internet).	
phone	I expect from a PN to give me a clear overview of the negotiation process.	
car dealer	I believe the advice that the PN gives is useful for the negotiation.	
Comment		
COM	Could you please explain what you based your ratings on? (open)	
	After all scenarios	
PNA	My attitude towards using a PN is positive.	
BC		
BC 1	I would probably feel comfortable using a PN on my own.	*
BC 2	Learning to operate a PN would probably be easy for me.	*
BC 3	I would probably understand how to use a PN.	*
USE		
USE 1	A PN would help me to reach a better outcome in a negotiation.	*
USE 2	I would feel more confident in the negotiation while using a PN.	*
USE 3	I will learn how to negotiate better through using the PN.	*
USE 4	Using a PN would increase my productivity.	*
USE 5	Using a PN would increase my negotiation performance.	*
USE 6	Using a PN would enhance my effectiveness in negotiations.	*
USE 7	Using a PN would make negotiations easier for me.	*
USE 8	Overall, I find the PN useful for house/job negotiations.	*
OCM	Please feel free to enter comments here: (open)	