Evaluating Generation Y Interaction Qualities in an Office Work Context

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ABSTRACT
This study presents evaluations conducted with a working prototype in practice. The goal of these evaluations was to both evaluate the prototype and to find out what effect a new tool can have on the office workers' interaction behavior. By evaluating the interaction qualities we also evaluate what was found before in theory and practice. The working prototype is set out in practice in a series of contextual evaluations. The prototype supports office workers in experiencing Generation Y type of interactions in the work context. The overall evaluation was positive with some valuable suggestions to its user interactions and features.

Author Keywords
Generation Y interactions; interaction qualities; office work; contextual evaluation.

ACM Classification Keywords
H.5.2. User interfaces: Evaluation/methodology.

INTRODUCTION
To make the outdated office interactions catch up with the advanced home interactions, we identified six key interaction qualities [2], which are shown in table 1. They were used for developing a novel office tool – YPhone [3]. Interaction qualities are also called experiential qualities [1, 8], they only come about through actively engaging with a product, system or service [4, 7]. Together these six interaction qualities embody a style of interaction that we label as 'Generation Y', referring loosely to the first generation of people (roughly born between 1980 and 2000) that have grown up as digital natives and that is currently starting to dominate the office work [9].

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Qualities	Definition
Instant	The interaction is experienced as immediate, spontaneous and on the spot
Playful	The interaction is experienced as engaging, enjoyable and challenging
Collaborative	The interaction is experienced as supportive, unifying and shared
Expressive	The interaction is experienced as open, free and animated
Responsive	The interaction is experienced as alert, quick and reactive
Flexible	The interaction is experienced as adaptable, accommodating and adjustable

Table 1. The six Generation Y interaction qualities and their definition.

This study was set up to evaluate the interaction qualities of the YPhone prototype. The objective of the study was to explore the contributions of such interaction qualities on new ways of working. The research question is: How are the interaction qualities of the new design experienced (in the work context)? A contextual evaluation was conducted to assess to what extent the interaction qualities implemented in YPhone are experienced in a realistic office work context. Since YPhone was an explorative research prototype and was not fully robust, a longitudinal study involving repeated observations of the actual use of YPhone over an extensive period of time, was not possible. Instead, it was decided to conduct contextual interviews with potential end-users, using scenarios as triggers for interaction to make the participants envision themselves using YPhone in future work situations and reflect on the interaction qualities with the prototype.

METHOD
In a contextual evaluation we visited participants and introduced YPhone for them to react to. Each participant experienced YPhone in his/her own work context, and the evaluation procedure was controlled and the reaction was observed [5, 6]. We did not get involved in performing the user interactions but remained a passive observer, watching, listening to and documenting the ways of interacting. The participants were encouraged to relate more to the

experience of their everyday work, e.g., tasks, environments and situations.

PARTICIPANTS

We selected 9 participants, who were young entrepreneurs (4), office managers (3) and other office workers (2) in small and big business. There were 5 male and 4 female participants. Their ages were between 23 and 31. They had different educational backgrounds: design (1), technical (4), management (3) and other (1). Their educational levels varied: undergraduate (6) and graduate (3). Participants also presented various nationalities and various mother languages. 3 participants reported that they had more than one year of experience managing their offices, the rest of the participants reported an experience working in dynamic and fast-paced working environments.

SETTINGS

To get a variety of culture, work fields and company sizes, the evaluations took place in the participants' work contexts (see Figure 1): EngageIT in Amsterdam, BINK36 in The Hague, Exact headquarters in Delft, Facebook headquarters in Menlo Park, Mozilla in Mountain View and goBalto in San Francisco. Young office workers were dominant at Facebook and Mozilla. The settings of YPhone, researcher's computer, the digital video camera and chairs were controlled. In this way, the camera recorded both the interaction and possible gesturing and pointing during the interview. Note: Video recording was not allowed at Facebook, Mozilla and goBalto. Only pictures were allowed.

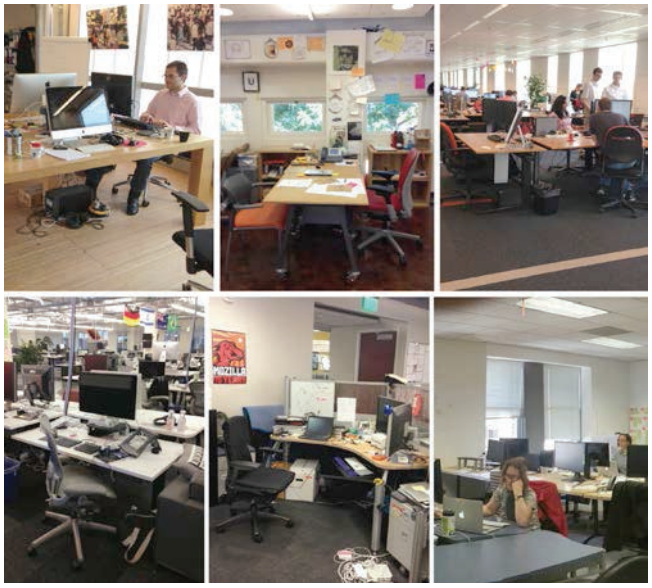

Figure 1. The participants' generic work contexts. From top-left to bottom-right: EngageIT, BINK36, Exact, Facebook, Mozilla and goBalto.

INSTRUCTIONS AND SCENARIOS

To assist the participants to experience the prototype as much as possible, a set of instruction pictures (see Figure 2) was created. The participants were asked to experience the actual use of YPhone and the detailed interactions. Key user-phone interactions (e.g., swiping in the air above the phone to browse phonebook) were demonstrated by illustrations and described by key words.

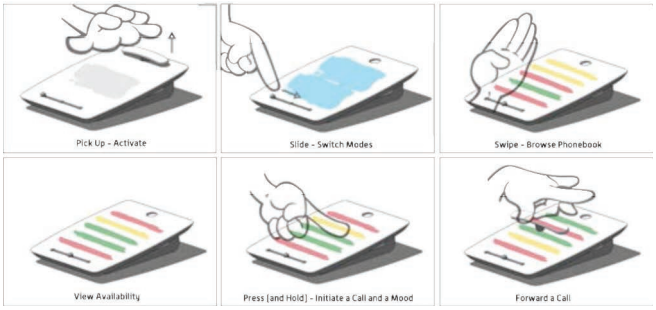

Figure 2. The instruction pictures that illustrate activating the phone, switching modes, browsing phonebook, viewing contacts' availability status, making a call and forwarding a call.

User scenarios were used to have the participants enact specific use situations, while interacting with the prototype. Moreover, this was done in their specific work context, to facilitate them to relate the scenarios to their own work practice, and to make it easier for them to refer to their own situation. The scenarios determine the workflow of YPhone that the participants were asked to imagine and play out. The scenarios were described as follows:

- Anne is a 25-year old female office manager. A client of her colleague Bill comes in, requesting to see Bill immediately because of an urgent situation. Anna tells the client to wait in meeting room B-01 and then she calls Bill. She activates her phone, switches to phonebook mode and is presented an availability overview of all her colleagues. She browses the phonebook to find Bill, who is available at the moment. She initiates the call and sends a mood complementing the ringtone. Bill receives a visual indication and a ringtone. Bill understands Anne's mood and picks up the call quickly. After the call he rushes over to meeting room B-01 to meet with his client.
- Anne receives an incoming call from her colleague David in an overseas office. She picks up the call. David asks her to forward this call to Bill. It is urgent. Anne browses her phonebook to find Bill, who is not available at the moment. She tells David that Bill is away and she can forward his call to a colleague, who works with Bill on the same project. David agrees. She browses her phonebook to find Cindy and Edgar. Cindy is busy and Edgar is available at the moment. She forwards the call to Edgar and sends an urgent mood complementing the ringtone.

PROCEDURE

Each evaluation took about 30 - 40 minutes per participant, during which they went through the following steps:

1. The researcher verbally introduces the project background in brief.
2. The participant is given the instruction pictures (see Figure 2) and is asked to try out each user-phone interaction with the YPhone prototype.
3. The participant reads both two specified scenarios for 3-5 minutes and is asked to act these through (see Figure 3). The acting is video recorded.
4. The participant is invited to explain in what ways the new design is related to the IT tools at home, if certain qualities are transferred from home to work, and where they succeed and where not.
5. The participant views the recorded video and assesses if the Generation Y interaction qualities are in the design.
6. Round up discussion and reflection on the ways the new design would improve (or not improve) the office work.

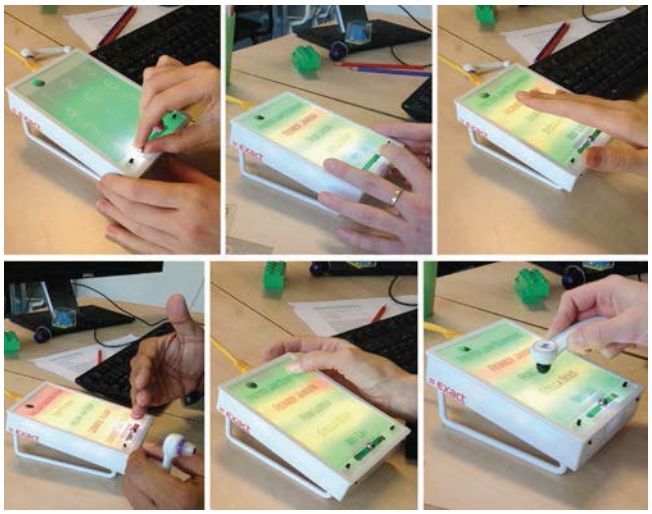

Figure 3. The participants experienced YPhone on their working desks, walked through the specified scenarios and evaluated the design based on their experiences.

RESULTS AND ANALYSIS

Data from the study were:

- Observations of participants interacting with the prototype, e.g., recorded in videos and notes.
- Selected remarks by participants recorded noted as quotes.
- Answers by participants of the evaluation of interaction qualities, in what ways the new design is related to the IT tools that are richer at home and in what ways the new design would improve (or not improve) the office work.
- Transcripts from the evaluations.

Experiencing YPhone in an Office Work Context

In general, the participants experienced the YPhone as easy to use. Most participants immediately understood this user-phone interaction after viewing the instruction pictures. Sliding the magnet ball was experienced as fun, physical and playful. The ball was preferred to move all the way to the right position to explore further features. Swiping to flip the phonebook left or right was experienced as natural, intuitive and animated. Enabling vertical swipes to browse phonebook was requested. Some participants even tried to use multiple fingers to trigger urgent calls. Female participants with small finger size tended to use their thumbs to trigger an urgent call, because they had to push down really hard to meet the force sensor value. It was expected that the participants would not have a clue about sending a mood when reading the instruction pictures. The intention was to see if they could observe and explore different mood when making phone calls. It turned out that they understood and successfully sent the urgent mood after trying out the user-phone interaction. Forwarding a call was experienced as being quite complicated.

While acting out both user scenarios, the participants described their experience on how YPhone is operated. They believed that the interactions were appropriate within the office context, which are in line with the research findings and user expectations described in previous work [3]. They thought that operating the phone was simple and experienced the user-phone interactions as tangible, natural and intuitive. Putting the earphone on a contact to forward a call was new to all participants.

The participants were asked to compare these user-phone interactions to the interactions they experience in their home context. In general, these interactions were experienced at home, but in a different form and with a different meaning. More specifically, they mentioned several interactions that were experienced and preferred to have in their home context, e.g., gesturing with a video game console. The participants expressed a wish to transfer interactions experienced at home to work. They enjoyed YPhone's physical interaction (e.g., sliding and pushing) and argued that swiping would be a good interaction to be transferred from home to work. They agreed that sending a mood would increase efficiency of communication, so this was a good interaction to be transferred. There were some interactions that the participants experienced as new and would like to experience at work, e.g., triggering an emotion.

Some participants described serendipitous experiences, which were seen as a fun way to bring out new thoughts. For example, a participant dropped the magnetic ball by accident on table because he used too much power to slide, a participant could not swipe to flip the phonebook smoothly until the window curtains were closed (the proximity sensors are less responsive under bright light). These experiences triggered discussion on design (e.g.,

taking out the magnetic ball to manually set availability status) and usability issues.

Below are the participants' quotes as from the steps of the evaluation procedure related to interaction qualities when experiencing YPhone in their work context.

Quotes from step 2:

- 'Sometimes it is not reactive if I do it (i.e., swipe) fast, seems it does not register my swipe in this case.'
- 'I would keep playing (i.e., spinning and sliding) with the ball when I get bored at work.'
- 'I am so used to slide vertically to browse a phone book.'
- '… my first thought on the color bars … were used to highlight selected contacts, thus I ignored to observe the change of colors.'
- 'It is reasonable to use enough force to ensure an emergent mood is sent.'
- 'At the beginning, I don't understand sending a mood, but seeing different states from the other phone, I get it.'
- 'I misunderstood that I have to flick a contact to forward a call.'

Quotes from step 3:

- 'Within gentle, intuitive and well limited gestures, you can still call people, forward a call, get some information from a friend and you can have people join in I guess … well limited means that you are given a designed space to operate the phone.'
- 'I can use my left hand to operate it easily, so my right hand is saved for doing more complex work.'
- 'It is very interesting that I have to physically move the ball to the middle, it is interesting because it is different from operating on digital screen.'
- 'Swiping is natural, just like flipping book pages … although I have to adjust the distance and angles of my hand.'
- 'Sending availability signal from my side is useful, the phone reacts to my physical positions.'
- 'Push and hold with a force … I really need you now, Bill.'
- 'I was not really sure where the idea of putting the earphone on the phone to forward a call came from, but once learned, I like it.'
- 'These two phones really work together, the other phone is reactive timely.'

Quotes from step 4:

- 'These interactions are similar … to my home situations.'
- '… you used the ideas more or less from the house.'
- 'It is general human use, but it is designed for office use, I think it is interesting to see home styles (i.e., interactions) at work.'
- 'I especially like the sending and checking availability interaction because it is reactive and responsive … it is somewhat there in home situations, but it is definitely not there in work situations.'
- 'I like that you borrowed the flipping (i.e., swiping) idea from Kinect.'

Quotes from step 5:

- '… yeah … swiping is commonly seen in Wii sports games, because this interaction is fun and learnable.'
- '… swiping interaction … from game consoles to office tools.'
- '… you can use this interaction to design other tools, for example, an interactive calendar that notes important meeting schedules.'
- 'I also see new interactions, for example, checking availability timely and sending availability automatically.'
- 'Pushing is not new, but pushing with a certain force to trigger an emotion is.'
- 'The operations (i.e., interactions) of activating, calling and forwarding are both innovative in my home and work situations, because I do not feel that I try out (i.e., experience) this type of interaction so often … I am a typical Windows OS user.'

Quotes from step 6:

- 'I would encourage you to design multiple means to make an urgent call, for example, I would tap on a contact to make a call and tap twice to make an urgent call.'

Evaluation of Interaction Qualities

Through analyzing the transcripts the following results were found regarding the experience of the six Generation Y interaction qualities:

- Instant. The participants experienced switching between interfaces (modes), viewing change of colors and receiving timely feedback as instant. 3 participants found instantness obvious and used similar words to describe it, e.g., quickly and timely. Their experience is instant when feedback is immediate and spontaneous, e.g., taking the earphone to activate the dial pad interface timely.
- Playful. Most participants experienced sliding the magnetic ball, swiping to browse phonebook, changing of colors and pushing hard to send an urgent mood as playful. All participants found playfulness obvious and used similar words to describe it, e.g., engaging, pleasing and fun. Their experience is playful when user action is new, engaging and enjoyable, e.g., swiping with different

speed and gestures (e.g., with palm or with two fingers) to flip phonebook left or right.

- Collaborative. The participants experienced viewing contacts' availability status and putting on the earphone on a contact to forward a call as collaborative. 2 participants found collaboration obvious and used similar words to describe it, e.g., co-work and share. Their experience is collaborative when office tasks are shared and when it is in the product's function, e.g., viewing contacts' availability in three status and sending own availability information.
- Expressive. The participants experienced swiping to browse phonebook, push down with a force to send a mood and putting the earphone on a contact to forward a call as expressive. 8 participants found expressiveness obvious and used similar words to describe it, e.g., natural, intuitive and open. Their experience is expressive when user action is natural and playful, e.g., pushing down hard on a contact to send an urgent mood.
- Responsive. The participants experienced sliding the magnetic ball, switching between interfaces (modes) and sending availability status as responsive. 7 participants found responsiveness obvious and used similar words to describe it, e.g., reactive and alert. Their experience is responsive when feedback is quick and reactive, e.g., sliding the magnetic ball in to slots to switch interfaces (modes).
- Flexible. The participants experienced wearing the wireless earphone and putting the earphone on a contact to forward a call as flexible. 7 participants found flexibility obvious and used similar words to describe it, e.g., free and adaptable. Their experience is flexible when user choice is adaptable and adjustable, e.g., wearing the earphone to free hands.

The participants thought that the new design, YPhone, would improve their work situation. It brings new ideas into re-designing old-fashioned office equipment. '… to improve my work situation, of course, in many ways, it is more direct and natural, … compared with my office phone …'. The participants stated that YPhone's interactions and operations comply with office etiquette, 'decent touching and finishing, no shouting, no big arm waving', 'it understands me and my colleagues … availability checking … I do not have to manually set my status as in Skype', 'to use different force to call with different mood, well fit'. One participant said that he might end up with playing with a magnet ball for a long time (when he is bored at work). In this case the design would not improve his work situation.

Further Remarks regarding YPhone and its Interactions

The participants provided several suggestions for improving the interaction with YPhone in the office context. These varied from improvements in functionality, 'enabling loudspeaker' and 'connecting to Outlook calendars to see availability status', to changes in physical appearance, 'aligning the color and shape with the office environment'. Valuable suggestions were directed at the user-phone interaction, 'allowing for tapping or rubbing the phone to send an ease mood', 'projecting contacts on a table and interact from there', 'using two fingers to swipe, it feels intuitive and cool', and 'exploring even more decent and appropriate gestures in office'.

DISCUSSION

The results of this study indicate that YPhone and its user interactions would fit into the work context. The playful, expressive, responsive and flexible interaction qualities implemented in YPhone would be experienced well in a realistic office context. Functional qualities interfere with interaction qualities, resulting in the instant and collaborative qualities being experienced less than the other four qualities. Users can have an understanding of and can use the Generation Y interaction qualities to describe interactions with the prototype.

Supporting Generation Y Interaction Qualities

We had discussed the findings according to the six Generation Y interaction qualities, for which the research questions were set up. The biggest success was bringing the notion of interaction qualities from theory to practice and transferring rich Generation Y type of interactions from home to work. Although people know how to evaluate product functionalities by conducting usability tests, evaluating interaction design by using interaction qualities is new. Usually when researchers and designers consider interaction qualities, they would fit them into user experience. But typical user experience evaluations only address user feelings, memories and expectations from interacting with the interfaces. These evaluations do not really address interaction qualities. In this study, we found that four out of six interaction qualities (playful, expressive, responsive and flexible) were really supported by the YPhone design. We had expected the good experience for these four, but were surprised by the not so good ones (instant and collaborative). This is relevant for other researchers and designers to know.

Fitting into the Work Context

YPhone's user-phone interactions and its tangible form were highly valued by all participants. The design enabled experiential but rather subtle interactions, created a sense of virtual presence and allowed users to express emotions. Also, having a physical device on a work desk was experienced as a low threshold for interaction, which may also have had an influence on the strategies of user-phone interactions (e.g., viewing and calling) described earlier, one can reach out to the phone easily and interact with it. Most participants found the actions such as sliding, swiping and pushing down hard as intuitive and appropriate for work situations. The actions of viewing and sending availability status between colleagues, made the participants more consciously think of others' (work)

situations, which supported their sense of co-working. Nevertheless, the participants did not express a desire for more accurate or detailed emotions and statuses, rather they expressed appreciation for YPhone's experiential interactions. The lack of sound in the interface was not seen as a problem. This feedback suggested that YPhone enabled rich interactions and communicated intuitively with colleagues.

Evaluation of the YPhone Prototype

It was worth to build interactive prototypes such as YPhone, because such prototypes enable participants to experience interaction qualities implemented within a design (in the same way in the same evaluation settings). And the design iterations are relatively easy. And because in the making (while designing) the ideas about interaction qualities mature as we explore and experience the interaction qualities in a tangible form. All participants actively experienced YPhone throughout the evaluations, suggesting that the prototype succeeded in maintaining user engagement.

CONCLUSIONS

A challenge in the design and evaluation of office tools for Generation Y users motivated us to design and develop YPhone. Despite some interactive tools already available in office work, it has been difficult for researchers and designers to identify how these designs affect Generation Y ways of interacting and working. In the evaluation the YPhone prototype worked convincingly in demonstrating Generation Y interaction qualities and bringing Generation Y ways of interacting from home to work. The evaluation results indicate that the interactions transferred from home to work would fit into their work contexts and enrich their work situations. Most participants readily accepted both the physical design and the user-phone interactions.

The primary contribution of this work to the existing knowledge domain is the understanding of how interaction qualities support interaction design research on Generation Y ways of interacting and working. By carefully choosing evaluation methods and consistently controlling the evaluation procedure, we have been able to verify key interaction qualities for supporting Generation Y interactions. If researchers and designers would make designs that appeal to Generation Y type of interactions, contexts, tasks and people, the approach of following interaction qualities are recommended. Although the present study focuses on office tools only, a similar approach may be valid for other forms of (computer supported interactive) tools, applications and services.

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