

Exploring ‘Generation Y’ interaction qualities at home and at work

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Abstract Information technology support of office work has increased rapidly in functionality, but new ways of interacting have evolved more slowly. This paper adds to the design research community’s notion of interaction quality by exploring these new ways of interacting and comparing them in the home and work contexts. We describe and analyze two interview studies conducted with office workers to consider how they perceive, experience and compare interaction qualities. Six interaction qualities (instant, expressive, playful, collaborative, responsive and flexible) were identified that together embody an interaction style that we have labeled ‘Generation Y.’ From learning and comparing these qualities, we found that personal and natural type of interactions were mostly experienced in the more private home context. Formal and subtle type of interactions were mostly experienced in the more public work context. We also found that the office workers scored the interaction qualities in their home context as richer than in their work context. This study resulted in a set of design guidelines, aiming to be used to implement the Generation Y interaction style in future office tools and applications. Designers and researchers

will benefit from the result of this study from understanding rich interaction design in the work context.

Keywords Generation Y office workers · Interaction qualities · Contextual interview · Design guidelines

1 Introduction

The rapid development of information technology (IT) in the past decade has enabled the introduction of a number of highly engaging tools in everyday life, such as instant messaging, podcasting, blogging and social networking. These tools offer people new ways of interacting, enabling them to create, retrieve and broadcast an enormous amount of digital information, using a large variety of devices, techniques and media (Cruz 2007; Report 2006; Lloyd 2007; Oblinger and Oblinger 2005; Oxygen Report 2010). As a result of this constant exposure, people are more socially active by quickly exchanging information and are more capable and ready to integrate their virtual world with their physical world (Accenture 2008; Bassett 2008; Carlson 2008; Macleod 2008; Prensky 2001; Tapscott 1998; Turner and Turner 2012), using highly interactive devices, such as mobile phones, laptops and multi-touch tablets. Thus, they frequently snap digital pictures with their smartphone, e-mail them to their friends and send them to their Flickr account and Facebook page within seconds. They have personalized their Yahoo home page to get local headlines and weather, have preselected which news stories to receive based on their preferences and have created their own greatest hits collections by downloading their favorite songs. Songs that subsequently are shared on several social networks with a large community of ‘friends,’ with whom

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they have frequent and immediate contact via e-mail, instant messaging and tweets. Along with this change in functionality have come new modes of interaction, characterized by short, expressive gestural interactions like swipes, flicks and shaking, and a lower threshold to starting up short activities.

So far, however, this typical behavior has mainly manifested itself in people's private context, while in the more public work context, the rich interactions that these new technologies are offering do not seem to be supported to a great extent yet (Blain 2008; Felix 2007; Jones et al. 2005; Spiro 2006; Vyas et al. 2012; Woods 1998). Whereas office applications have increased sometimes dramatically in functionality, the ways of interacting with all these functionalities have evolved much more slowly. As a consequence, most office work is still done through the ubiquitous, almost 40-year old, setup of keyboard, display and mouse, which is often referred to as WIMP: windows, icons, menus and pointer (Myers et al. 2000), a setup which only supports limited behaviors, such as keyboard tapping and mouse clicking. Even the technological visions of the 80 and 90s (e.g., Xerox PARC (2012), which aimed to create 'the office of the future') have not found their way into everyday offices yet, although the bottleneck does not seem to be technological feasibility.

This paper provides some insights and guidance to face this challenge. It starts out by identifying the qualities of the interactions that people experience in both home and work through a number of contextual interviews. From these interviews, six qualities are derived, which together define the interaction style associated with the previously described rich behavior. In a second series of interviews, these six interaction qualities are subsequently used to compare home and work contexts and to identify opportunities for porting advantages from one to the other. Finally, the findings of this second study are translated into a set of guidelines for designing future office tools and applications.

2 Interaction qualities and related work

There has been several research projects aimed to design and enhance quality in user product interaction. Interaction qualities are also called experiential qualities (Frens 2006; Hult 2003; Löwgren 2006; Rullo 2008), denoting 'the experienced attributes of artifacts-in-use' (Arvola 2010; Djajadiningrat et al. 2004; Ross and Wensveen 2010), which means they only come about through actively engaging with a product, system or service (Locher et al. 2010; Ross et al. 2009; Øritsland and Buur 2003).

In the home context, Strong and Gaver (1996) designed 'Feather' for the situation where one person who is traveling while another is at home. The traveling person

triggers the feather's movement by holding a picture frame, causing the feather to ascend and descend expressively as it catches the wind. Wensveen (2005) applied a tangible approach to design and build an alarm clock prototype, which recognizes human emotions. The prototype has a round shape and features twelve sliders circularly divided. The interaction design with the sliders allows for a myriad of setting the alarm time. Frens (2006) designed a camera prototype that is operated by means of rich actions instead of actions typical for conventional interactive products (e.g., button pressing). The design enables users to experience rich camera interaction by integrating form, interaction and function. Visser et al. (2011) designed an interactive lamp that creates interpersonal awareness between users in two different homes. The lamp displays movement of a remote user by glowing itself. Users exchange nudges by shaking their lamp in order to making the remote lamp blink. Rittenbruch and McEwan (2009) suggested that tangible interaction, opposed to screen-based interaction, would be more effective in the home context, because tangible interaction is more intimate, simple, emotionally meaningful and esthetically pleasing.

In the work context, Keller (2005) designed cabinet that helps designers collect and organize their visual material for inspiration. The design makes interaction with digital material more physical by dragging digital images on a table as if they are real objects. It offers a fluent way to add physical material to the digital collection by digitizing and projecting any objects placed on the table. This type of study was followed by several other recent projects in the domain of computer supported collaborative work (CSCW), such as designing and testing of a mixed reality (MR) system that supports collaborative troubleshooting of office copiers and printers (O'Neill et al. 2011), designing an intelligent robot worker that transports goods and samples in semi-public hospital context (Ljungblad et al. 2012) and designing a shape-changing communication device that facilitates expressive 'knocking' communications between two office workers (Rasmussen et al. 2012). Another example is the intelligent reading lamp, which aims to demonstrate ethics and esthetics in products and systems (Ross 2008). By moving the hand over the lamp, a 'living light' can be directed onto an object such as a book. This interaction design can fit into both the home and work contexts.

The above examples seek, as an outcome, to design and enhance the quality of user product interaction. However, the designs do not clearly represent specific user groups and interaction qualities. For example, it is not entirely sure whether the camera's various tangible interfaces are designed for novice, experienced, teenager or senior users or whether these different groups react to it differently. The interaction qualities for each variation are not specified, and the criteria for assessing the designed interaction are

missing. Designers would benefit from having such descriptions, or preferably even recommendations and guidelines along those qualities. Rasmussen's shape-changing communication device does evoke expressive quality, but it is not entirely convincing whether this creative interaction style can be accepted and adopted by all types of office workers. Some office workers who use highly interactive devices often may find this device very expressive, yet other office workers may not experience this in the same way, they may even argue not to design such a device for them because they require a more formal communication style. We envisage the potential to associate a specific group of office workers and interaction qualities with new ways of interacting could enable future office tools and applications to develop. With this in mind, we explored interaction qualities that are currently experienced in the home and work contexts.

3 Research objective

Our research objective has been to explore how to bring the richness of the interactions that people currently experience in the private context of their homes and friends into the more formal context of their offices and colleagues. This is an interesting challenge that presents itself to developers, designers and researchers.

4 Study 1: Identifying interaction qualities at home and at work

As a first step toward comparing the richness of interactions in home and work contexts, a series of contextual interviews was conducted. The research question was what are the main interaction qualities that people currently experience while interacting with IT in both of these contexts?

4.1 Method

Four interviews with ten office workers have taken place at four companies, which are small medium-sized enterprises

(SMEs), with the number of office workers varying from 10 to 100 employees. They were young entrepreneurs, wholesalers and office managers. We used basic interviewing technique (Paton 2002; Taylor and Bogdan 1998) in the form of face-to-face conversation between researcher and participants. The interview made use of generative toolkit (Sleeswijk Visser et al. 2005), pictures and words, to trigger memories and responses, such as turning a car key to start the engine. The pictures representing activities were similar to those shown in Fig. 2. At the start of the interview, participants were asked to create a collage to illustrate their personal experiences, then to reflect on their collage in the discussion part of the interview. See Fig. 1 for an impression. Each interview included six steps as described below:

1. Start with an observation of the work context.
2. Ask the participants to select a number of pictures, which express their behaviors and interactions in life and work the best. A set of pictures illustrating user product interactions was provided to evoke memories and trigger responses, e.g., turning a car key to start the engine.
3. Participants use the words and the selected pictures to make collages in order to illustrate their personal experiences.
4. Collect stories, trigger discussion and gain reflection from their experiences.
5. Cluster the collages in order to find categories of interaction qualities.
6. Round up discussion and reflection.

Audio recordings were taken for the interviews, which then later were turned into transcripts. Photographs were also taken during the interviews. In addition, during the interviews, field notes were taken by the researcher to capture informal conversations and contextual observations.

4.2 Results and analysis

Qualitative analysis started with all the data (transcripts, collages, field notes and visual materials) gathered in the interviews, followed by communicating the 'selected and



Fig. 1 The interviews at the four companies with ten Generation Y office workers, including observations, collage making and clustering

distilled insights' (Stappers 2012) with two researchers. First, each researcher individually read the transcript, marking possibly relevant quotes. For example, a quote reads like 'for me, working in a software company means that you can basically work from any place that have Internet connections.' Secondly, the researchers consolidated the selection by turning about 150 quotes into explicit interpretations in the format of a statement card. Key part of the format was the interpretation (paraphrase), in which the researchers made explicit in their own words what the quote is saying. For example, an interpretation reads like 'internet enables flexible working for me.' Third, the researchers clustered these statement cards into manageable groups (interaction qualities), which were labeled and described. Finally, the words and pictures from the collages were also clustered together with the statement cards to help describe the interpretations and convey insights.

4.3 Discussion

Based on the clustering of the statement cards, we identified six key interaction qualities that together embody an interaction style that we have labeled 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 work place (Cole et al. 2002; Cruz 2007; Erickson 2008; Liu et al. 2011). These six interaction qualities are as follows: instant, expressive, playful, collaborative, responsive and flexible. Table 1 explains the interaction qualities with specific examples.

In general, the participants describe their working relations as very friendly, supportive and open. The main tools they use are personal computers and mobile (smart) phones. Besides these, digital tools, whiteboards, papers, notebooks and flip charts are also still considered important in their daily work. They put very high demands on the applications, services, devices and networks that enable and support life and work and clearly expressed that some (online) tools that assist them instantly and playfully in their private life were not available or did not meet their expectation in

their work settings. One participant said that 'pulling down a list to updated Tweets on an iPhone is experienced very playful in his private life, but such interaction is not experienced in his work.' They also stated that expressive communication channels were lacking at work, highlighting a significant friction in expectations versus reality, e.g., calling a colleague urgently without getting him/her notified about the urgency. One participant claimed that 'shaking an iPhone to shuffle songs very natural and animated. But I don't feel I am in control at work yet. Now is really only about work, nothing more. I think I should personalize it more.' Another participant said that 'I like arranging things with a whiteboard at home. Although it's chaotic, I exactly remember each bullet, each line, what it's all about.' Flexible work styles, locations and patterns have changed the ways of working. This creates a better-connected, more responsive and increasingly complex work environment. Three participants related responsive to more user product interaction aspect. For example, they found 'tapping on the touchpad of a computer to wake it up alertly' very responsive. Key trends are increasing the collaboration within virtual teams (geographically spread), the changing demand for flexible employment (in time and place) and the increased number of mobile workers. One participant said that 'I use laptop, phone and Google Docs application to create, store and share agenda...especially to share to do things within the company...where they grow faster than the time to think.' These office workers have much more choice in products or services that help them to do their work. They value a smart communication between people and information in their network. This gives direct and relevant insight and helps them run their business better. To them, information is the key to communicate and to deliver the best service. Considering these situations, future office tools have to take further steps to accommodate these new and evolving ways of interacting.

4.4 Conclusions of study 1

In study 1, six interaction qualities typical for Generation Y type of interactions were identified. These interaction

Table 1 Generation Y interaction style: qualities, definitions and examples

Quality	Definition	Example
Instant	The interaction is experienced as immediate, spontaneous and on the spot	Drag files into Dropbox to store and share timely
Playful	The interaction is experienced as engaging, enjoyable and challenging	Pull down a list to update on an iPhone
Collaborative	The interaction is experienced as supportive, unifying and shared	Game with virtual friends online
Expressive	The interaction is experienced as open, free and animated	Shake an iPhone to shuffle songs
Responsive	The interaction is experienced as alert, quick and reactive	Tap to wake up a device alertly
Flexible	The interaction is experienced as adaptable, accommodating and adjustable	Play game with a Wii controller instead of a mouse

qualities were given concrete examples in the home and work contexts. Based on the quotes and the interpretations on the statement cards, we got the impression that these interaction qualities were experienced more prominent in the home context than the work context. In study 2, we set out to verify this impression.

5 Study 2: Comparing interaction qualities between home and work

After we identified the interaction qualities that make up for the newly defined Generation Y interaction style, a second series of contextual interviews was conducted with the following two research questions. (1) What are the differences between the home and work contexts for the six interaction qualities? (2) What are the possible opportunities for enriching the interactions in the work context?

5.1 Method

To focus the interviews more on the six interaction qualities, a generative interview toolkit (Fig. 2) was developed (Sleeswijk Visser et al. 2005). The interview toolkit was to serve two purposes: (1) prompting the participants to recall concrete experiences and to think about how they experience certain interactions and, related to that, (2) evoking the participants to make comparisons between the home and work contexts.

The interview toolkit, shown in Fig. 2, consisted of 6 boards, each with sets of activity cards (Sleeswijk Visser et al. 2005), a set of blank cards and a number of colored pens and post-its. Each set of activity cards contain two copies of each card, one for ‘home’ and one for ‘work,’ depicting 24 IT-related activities most commonly performed in the home and work contexts. At the start of each interview, the participant was asked to arrange the activity cards according to the degree in which they felt that the interaction quality was experienced in that activity. One copy of the card was to be placed in the ‘work’ range above the 0–7 Likert scale (1932) and the other copy in the ‘home’ range under the scale.

5.2 Participants

The character of the study was explorative and qualitative, aimed at laying bare prominent relations, not a quantitative study aimed at proving a necessary hypothesis. For this, a small number of participants sufficed. We selected six participants, who were young entrepreneurs, wholesalers, designers and other office workers.

They worked in companies of different sizes, varying from a two-man consultancy to companies over 100,000 employees, in order to sample a variety of the work contexts.

5.3 Procedure

Each interview was preceded by a 15-min guided tour by the participant in his/her workplace. Then the interview took place, including the activity rating exercise and a reflective discussion, which lasted about 1 h. The participants were asked to describe their daily activities and recall their experiences in interacting with IT tools. During this they were encouraged to refer to their experiences in terms of the six interaction qualities. The actual interview included seven steps as described below:

1. Start with the first interaction quality (randomized per participant).
2. The researcher briefly introduces the definition of the quality, then
3. The participant selects at least five activities from the card set, in which he/she feel this interaction quality is best represented in either home or work context.
4. If the participant finds activities are not in the presented card set, he/she is invited to create these on blank cards.
5. The participant arranges the activities on the board for both the home and work contexts. The position of the 0–7 scale rounded to a half number is taken as a score for that activity on that quality.
6. The participant discusses the rationales, reasons behind, expectations, suggestions, etc. He/she is asked to focus specifically on significant differences between the home and work contexts, and if he/she sees opportunities for porting qualities from one to the other.
7. Repeat with the other five interaction qualities.
8. Round up discussion and reflection.

All participants were asked to describe in words how they perceived the six interaction qualities (instant, expressive, playful, collaborative, responsive and flexible) and to indicate where and how they experienced these in the home and work contexts. Demands and wishes for new ways of working were put on the boards as notes and sometimes drawings. Audio recordings were taken for the interviews, which then later were turned into transcripts. Photographs were also taken during the interviews. In addition, during the interviews, field notes were taken by the researcher to capture informal conversations and contextual observations.

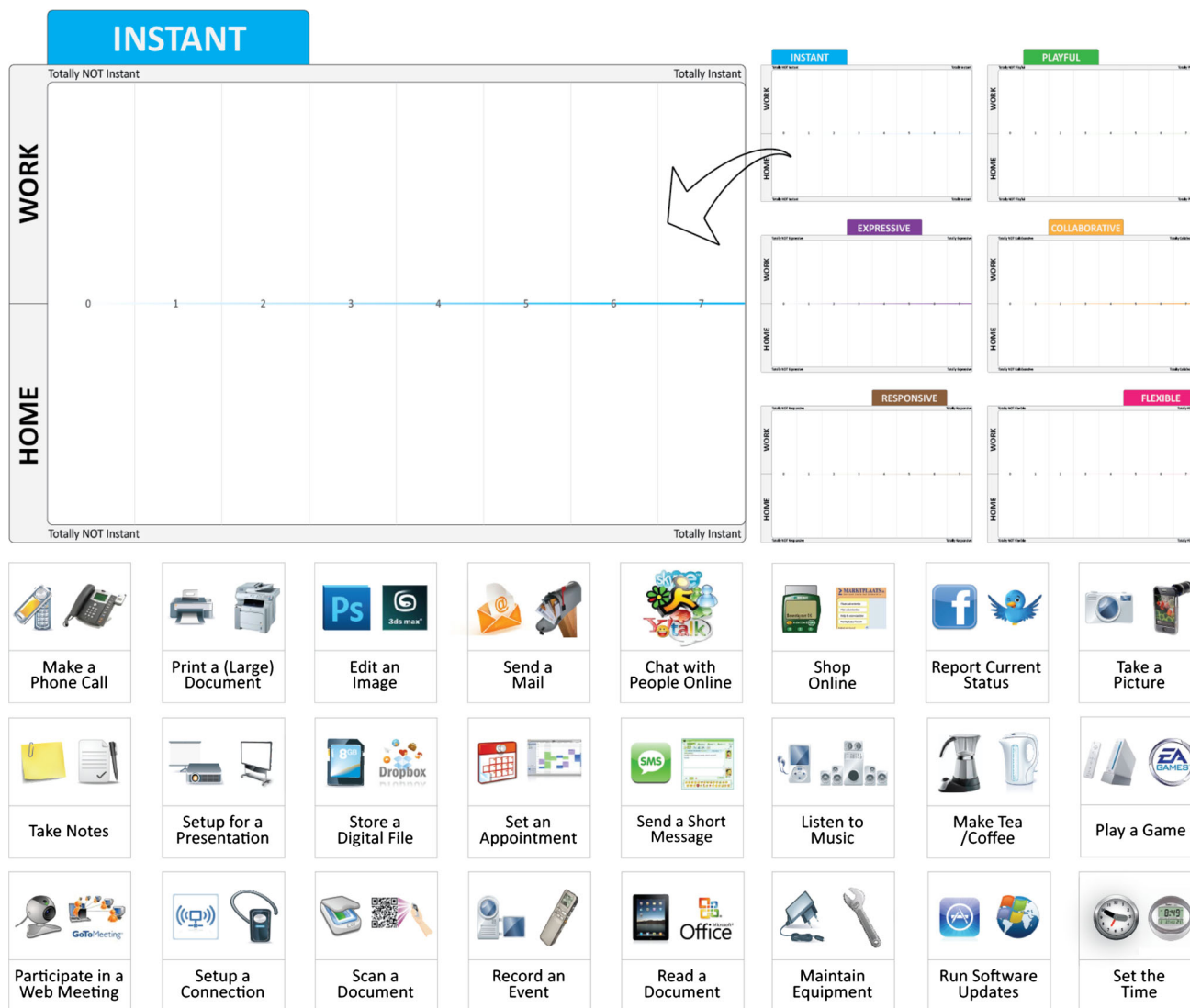


Fig. 2 The boards and activity cards in the interview toolkit

5.4 Results and analysis

All participants completed the activity rating exercise. They were open and cooperative in showing their workplace, describing their daily activities and tools involved and explaining their ways of interacting in the home and work contexts.

In the guided tours, we found that all workplaces contained a diversity of tools requiring different ways of interacting. The computer, mouse, keyboard, printer, camera and mobile phone were the frequently found IT tools in all workplaces. These tools varied in physical product design, thus the ways of interacting with them varied. For example, scrolling the wheel on a mouse was considered ‘the proper interaction’ (participant JF) to view a Web page, while sliding in papers and pressing on buttons on a printer led to get documents printed. We also

found that the participants relied on ‘(laptop) computers to do daily work’ (participant JD). The computer was the central tool to interact with and was wired to other office tools, such as printer, scanner and other computers. Furthermore, software applications were also regarded as office tools. Instant online messengers (e.g., Skype) and social network Web sites (e.g., Twitter) helped the participants work besides the traditional drawing applications (e.g., Adobe Photoshop). They functioned as communication tools in the work context. Two out of the six participants used Exact Online and Synergy, software solutions from Exact, which are mostly used for administrative tasks such as placing travel requests and making reimbursements. Participant VR used Exact Online for one to 2 h per day.

Six sets of completed interview boards served as a data pool for analysis as well as triggers for discussions between

the researcher and the participants. The activity cards were rated and placed on the boards, accompanied by notes and drawings during the interview. About a dozen of new activities were created on the blank cards (e.g., set a reminder and turn on a machine). An example is shown in Fig. 3. We found that participant JD rated the interaction quality ‘responsive’ in her home context higher than in her work context. For example, ‘editing an image’ scored 5 in the home context and scored 2 in the work context, ‘reporting current status’ scored 5.5 in the home context and scored 1.5 in the work context.

The main function of the toolkit was to serve as triggers during the interview and in discussions among researchers in the qualitative analysis. In an interpretation session with three researchers, the transcripts were reformulated to nail down specific user interactions and to build a shared understanding among the researchers. Transcripts, field notes, and the notes taken on the interview toolkits by the participants were used in the analysis. A team of three researchers selected interesting portions of the quotes. Each researcher first gave his own interpretation of a quote of a participant. Then, the team reviewed the interpretations, discussed possible conflicts and differences in perspectives and then agreed on a final interpretation. Interpreted quotes

were gathered from all the interviews and clustered (Stappers 2012).

5.5 Discussion

Activities (e.g., gaming) in the home context required different ways of interacting, but involved more personal, expressive and natural types of interactions, such as pulling down a list to update on an iPhone and punching fiercely with a Wii controller to play a boxing game. Instant communication was popular through use of the Internet and mobile technology, e.g., Skype and Twitter. Participants preferred this immediate way of communication with their family, friends and colleagues. Communication in a wider social network created opportunities for them to interact with a larger and more diverse group of virtual friends than they would meet face-to-face in the real home and work contexts.

In general, the work context contained a diversity of activities, requiring different ways of interacting. Formal, subtle and decent types of interactions were mostly experienced while interacting with the frequently found IT tools in the work context, such as tapping quietly on a keyboard. The computer, mouse, keyboard, printer, camera and

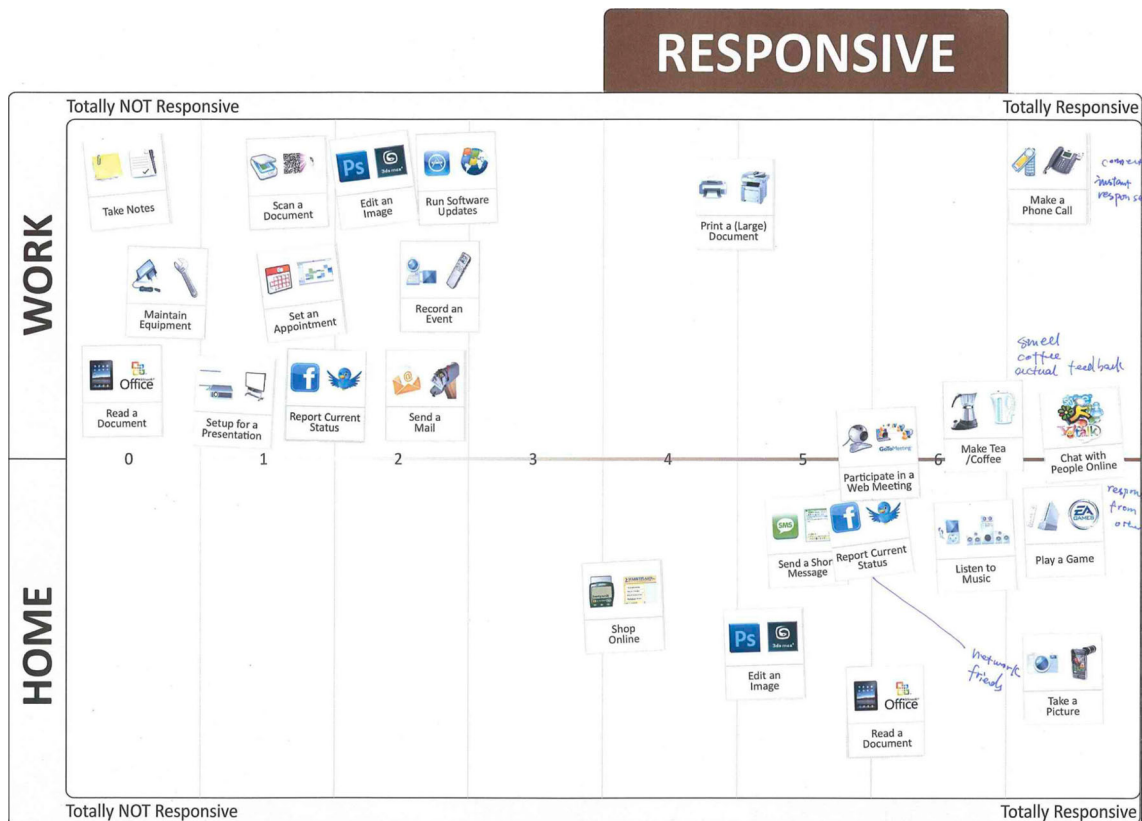


Fig. 3 The completed board by participant JD, showing a comparison between the home and work contexts for the interaction quality ‘responsive’

mobile phone were the frequently found IT tools. These tools varied in physical product design, thus the ways of interacting with them varied as well. Also, conventional user actions were still frequently found. For example, scrolling a mouse wheel was considered ‘the right interaction’ (participant JF) to scroll up/down a Web page, while pressing buttons on a printer led to get documents printed. They relied on ‘(laptop) computers to do daily work’ (participant JD). The computer was still the central tool to interact with and was wired to other office tools, e.g., printer, scanner and other computers. Online tools supported them at work beyond the traditional tools, e.g., a fixed office telephone. They functioned as communication tools at the workplace.

We found that the participants scored the interaction qualities in their home context as higher than the interaction qualities they experienced in their work context. As mentioned above, the aim of this study was to uncover possible patterns, not to prove general patterns (which would require quantitative analysis and a substantially larger group of participants). Based on the locations on the boards and the interpretations from explanations in the transcripts, the four qualities instant, collaborative, expressive and flexible seem to give the best opportunity for improvement for the work context. These interaction qualities will thus be more worthwhile to investigate in our future research. The participants experienced the interactions in the home context as much more playful, expressive and responsive than in the work context. The wish of experiencing the same interaction qualities in the work context was also expressed. We also found that the participants desired switching modes between home and work tasks. They did switch these tasks at work, but they did not experience it as being a fluent way of switching tasks.

The most relevant interpretations of each interaction quality are described below. These interpretations come from the user data (e.g., transcripts) on the corresponding interview boards.

5.5.1 *Instant*

The participants related instant to ‘time saving, immediacy, quick reactions and less response time.’ They experienced the interaction qualities in the home context as almost equally ‘instant’ in the work context. In the home context, they used mobile applications for instant online chatting, e.g., Skype. They experienced dragging to send a photograph in Skype and pressing on a remote controller to turn on the TV as spontaneous, especially pressing and holding an icon on an iPod to arrange icons as very spontaneous. In the work context, they used Dropbox to store and share files, dragging files into Dropbox within a few mouse clicks so colleagues can reach these files immediately, which they

felt as instant. They evaluated dropping files in Dropbox as equivalent to physically dropping an object. They also believed that their devices detect Wi-Fi environment and connect to the Internet automatically instant.

5.5.2 *Playful*

The participants related playful to ‘fun content, non-routine, non-boredom, freedom and surprise.’ They experienced the interactions in the home context as much more ‘playful’ than in the work context. In the home context, they regarded bodily and embodied ways of interaction typical for enabling playfulness. They enjoyed sliding to unlock an iPhone and swinging a Wii controller to play a game. In the work context, transferring files from a memory stick to a computer made them feel bored and unchallenged. They argued that button pressing actions eliminate playfulness at work. They regarded work activities as functional and lacking of engaging interactions (e.g., multi-touch) compared with home activities. An extreme case was participant VR, who found bodily interactions at work totally not playful (e.g., printing).

5.5.3 *Collaborative*

The participants related collaborative to ‘team working, control and automation and degree of self-control.’ They experienced the interactions in the home context as less ‘collaborative’ than in the work context. In the home context, some of them did cooking, cleaning and shopping together with their family members. Corresponding supportive interactions included passing plates in kitchen, putting clothes into a washer and picking fruits in a supermarket. In contrary, some activities require commitment so it cannot be shared, e.g., typing a pin code on a banking Web site to make a payment. In the work context, they experienced making outlook appointments as unifying. They clicked time slots on screen-based interfaces to send and confirm appointments with colleagues from different time zones. They also used Google Docs to co-create documents and used social networks to update their work progress with colleagues.

5.5.4 *Expressive*

The participants related expressive to ‘freedom of (input) choice, fluent and rapid response.’ They experienced the interactions in the home context as much more ‘expressive’ than in the work context. In the home context, they enjoyed making photograph albums by using their preferred camera settings. They experienced sliding an espresso capsule into the coffee machine and tapping on its touch screen as animated, one form of expressive. They preferred tapping

the multi-touch screens of mobile phone over mouse clicking on traditional computer monitors. They experienced shaking an iPod to shuffle songs as very expressive. In the work context, they felt their open and free ways to do tasks are limited because the tools used are too ordinary and outdated. They found work interactions not inviting, because everyone did the same actions. They wanted to be expressive and unique when editing images.

5.5.5 Responsive

The participants related responsive to ‘directness of interaction, ability of access and not being blocked.’ They experienced the interactions in the home context as much more ‘responsive’ than in the work context. In the home context, they experienced dragging as a quick input action for attaching files to an e-mail. Participant JD swiped her mobile phone screen to browse contacts fluently without being delayed. In the work context, they experienced a lot of interactions as not alert and reactive because they do not provide immediate feedback to give them confidence. For example, there was no confirmation or notification for successfully sending e-mails.

5.5.6 Flexible

The participants related flexible to ‘rules and limitations, availability and physical location.’ They experienced the interactions in the home context as more ‘flexible’ than in the work context. In the home context, they preferred digital reading and reading texts from their mobile phones. They found physical interfaces (e.g., mouse, joystick) for game play more adaptable and accommodating than the interfaces for office work. For example, the interaction with a Wii controller requires meaningful bodily engagement, but the interaction with mouse only requires gentle clicking action. They also had multiple means for sending e-mails (e.g., through Web pages and mobile phones), which makes accessing and managing information flexible. In the work context, they experienced online chatting with colleagues limited because it was not adjustable. For example, sending a (voice) message from an office phone to an online chatting application was not possible.

6 Implications for design

The results from comparing the interaction qualities offered a rich source of experiences, anecdotes and routines on the ways of interacting in the home and work contexts. To make these results more instrumental, they will be translated into a set of implications, which can be subsequently used as to implement the Generation Y interaction

style in future office tools and applications. Each design guideline contains information of one interaction quality and specific work context(s).

In the interaction design literature, implications for design are often presented in the form of guidelines for designers. There are several lists of general guidelines (Bannon 2011; Borchers 2001; Koskinen et al. 2011; Kumar 2005; Pasman 2003; Preece et al. 2007; Temkin 2007). Compared with these general design guidelines, our guidelines specifically focus on supporting office workers to experience rich interaction qualities in the work context.

- *Use instant interactions to convey meaning*—designing instantness in an office context should not only be aimed at increasing efficiency or effectiveness, but should also at generating a sense of professionalism or importance. Interactions should therefore not only be experienced as quick and prompt, but as constructive and solid as well. File transfer, for example, might be enhanced by providing feedback that also communicates the status, confidentiality or state of completion of the file or document.
- *Integrate playful interactions in low-attention office tasks*—playful interactions, such as the full-body movements people perform while operating the Wii, are highly valued within the home context, since they evoke fun, pleasantness and engagement. Within the office context, however, playfulness should be designed to fit the context of use rather than being the dominant interaction quality. By adding small playful interactions to low-attention office tasks, such as entering numerical data or browsing e-mails, the monotony and repetition of such tasks could be influenced in subtle, yet meaningful ways.
- *Integrate collaborative interactions into office teamwork to strengthen the connectedness of the team*—doing things together is a very important element in establishing and strengthening a bond between people. Especially in games many strategies have been implemented that require people to collaborate to achieve certain goals. The recent introduction of multi-touch tablets and tabletops, with its interactive surfaces and simultaneous multiple user inputs, has provided designers with a new pallet of interactions that require group processing, social skills and physical coordination. Office work, however, even when done in teams, is still designed around the single-user, single-computer paradigm. Designing interactions that would require the simultaneous input and collaboration of more than one person at the same time could therefore contribute to a team’s cohesion.
- *Integrate expressive interactions into regular office tasks*—many office tasks involve small, rigid and

subconscious interactions, such as button pressing or mouse scrolling, that leave little to no room for expressiveness. Providing opportunities to make these interactions more animated could give office workers the possibility to communicate certain emotions or intentions, such as affection, urgency or frustration, in subtle and implicit ways, thus adding meaning to otherwise identical and repetitive tasks.

- *Make office tools and systems more (emotionally) responsive*—responsiveness characterizes a tool's or system's behavior during an interaction with a user. The tool or system is responsive if its behavior adapts itself to the behavior of the user. More specifically, it is emotionally responsive when it is able to adapt to his or her emotional expressions. Emotional expressions are the non-verbal behaviors that signal emotions (e.g., smiling, laughing, sighing and soft voice tone). Using sensing technology expressions could be measured and translated subsequently into responsive interactions. For example, the expressiveness of typing an e-mail (see previous guideline) might be an indication of importance, anger or affection, to which the system might react by changing the responsiveness of the keys on the keyboard.
- *Allow for flexibility while interacting to overcome physical limitation of workspace*—the services should offer the office worker many possibilities to easily access, store and display work content of various kinds. The interaction should therefore possess a highly flexible character, enabling the office worker to fully concentrate on the information flow from colleagues, which makes up the work content. Besides, customization of services is highly appreciated in office work. The customization interaction should allow the office worker to set personal preferences in a high degree (e.g., customize settings and reorganize the interface).

7 Conclusions

We have conducted two interview studies on the ways of interacting with IT in the home and work contexts. The goals were to identify the main qualities that people experience while interacting with IT, to find out differences between the home and work contexts for the qualities and to classify possible opportunities for enriching the interactions in the work context. Our design challenges lie in supporting a Generation Y interaction style within the context of office work.

Our contribution to the existing body of knowledge is to draw attention to IT supported new ways of interacting that are currently emerging from organizing, mixing and

separating private life and public work. Six interaction qualities (instant, expressive, playful, collaborative, responsive and flexible) were identified, together defining a Generation Y interaction style. These interaction qualities were then used as criteria to assess and compare the experience of user interactions in the home and work contexts, which resulted in a set of design guidelines for supporting Generation Y interactions.

Our work follows that of Frens (2006), Locher et al. (2010) and Ross and Wensveen (2010) in discussing the idea that rich interaction and esthetics of behaviors in interaction are two key criteria for designing intelligent products and systems. We argue that the use of interaction qualities could be appropriate as these two criteria for designing new ways of interacting. However, our perspective on doing interaction design differs from only integrating factors of form, function, esthetics, etc. We have a strong focus on studying our target users and meeting their wishes in the early phase of design. Our findings have implications on the development of the future office services that should utilize the power and advantages of the interaction qualities, yet integrate the rich interaction qualities from the home context to the work context. The six interaction qualities together, with their corresponding guidelines, as a set offer a new way to design and enrich new types of user interactions in the work context. Many of our design guidelines can also be used in the development of other services and/or tools for conceptualization.

In the future, we envision going further by designing prototypes of office services in which the design guidelines are implemented. These prototypes will demonstrate how the design guidelines can be used and will also assess how well the design guidelines can benefit the future office work.

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