Making the Office Catch Up
Exploring Interaction Qualities at Home and at Work

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The rapid development of information technology (IT) in the past decade has enabled the introduction of a number of highly engaging tools into 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. As a result of this constant exposure, people are more socially active and more capable and ready to integrate their virtual world with their physical world, using highly interactive devices such as mobile phones, laptops, and multitouch tablets. Along with this change in functionality have come new modes of interaction, characterized by short, expressive gestural interactions like swipes, flicks, and shakes, and a low threshold to start up new activities.

So far, however, these new technologies have mainly been used in a private context, while the more public work context does not yet seem to support these technologies' potentially rich interactions. Office applications have increased sometimes dramatically in functionality over the years, but 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, a setup that supports only limited interactions such as keyboard tapping and mouse clicking. Even the technological visions of the 1980s and 1990s (e.g., Xerox PARC, which aimed to create "the office of the future") have not yet found their way into everyday offices, although the bottleneck does not seem to be technological feasibility. An interesting challenge therefore presents itself to developers, designers, and researchers: 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.

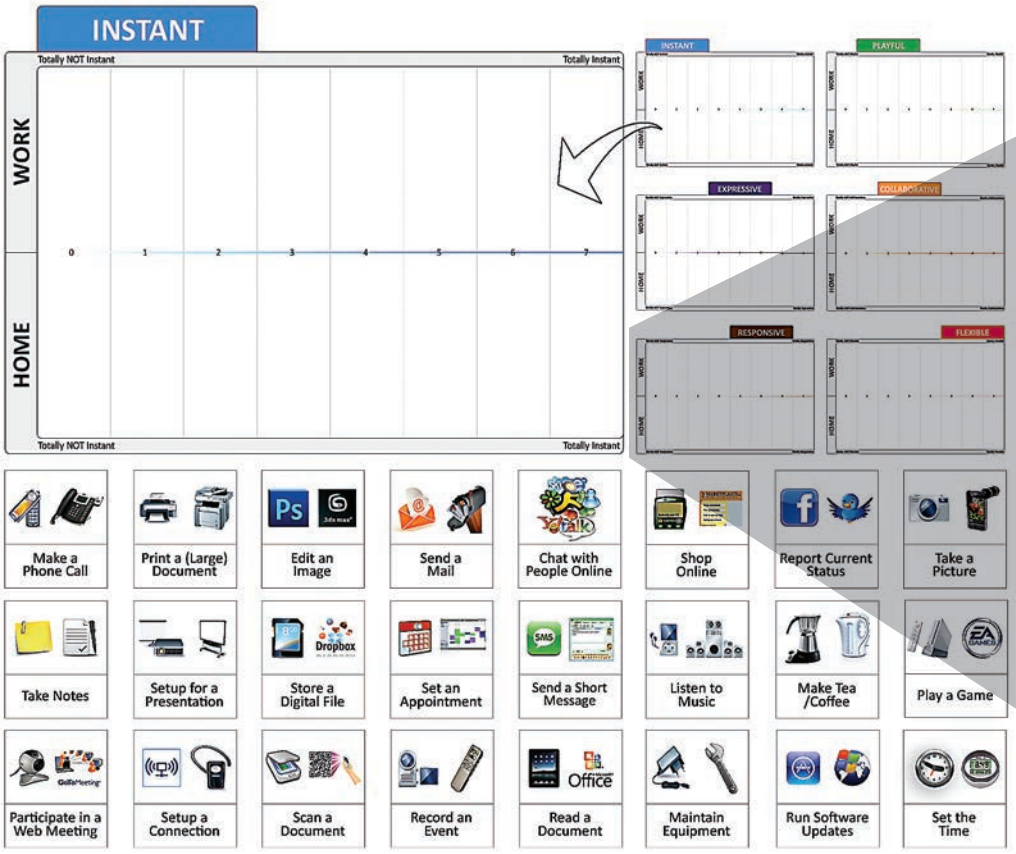
Identifying Interaction Qualities at Home and at Work

Interaction qualities are also called experiential qualities, denoting "the experienced attributes of artifacts-in-use" [1], which means they come about only through actively engaging with a product, system, or service [2]. Rob Strong and Bill Gaver designed "Feather" for the situation in which one person is traveling while another is at home [3]. 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.

QUALITY	DEFINITION	EXAMPLE
Instant	The interaction is experienced as immediate, spontaneous, and on the spot	Drag files into Dropbox to store and share instantly
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
Flexible	The interaction is experienced as adaptable, accommodating, and adjustable	Play game with a Wii controller instead of a mouse

▸ Table 1. Generation Y Interaction Style: Qualities, Definitions, and Examples

▸ Figure 1. The interviews at the four companies with 10 office workers, including observations, collage making, and clustering.



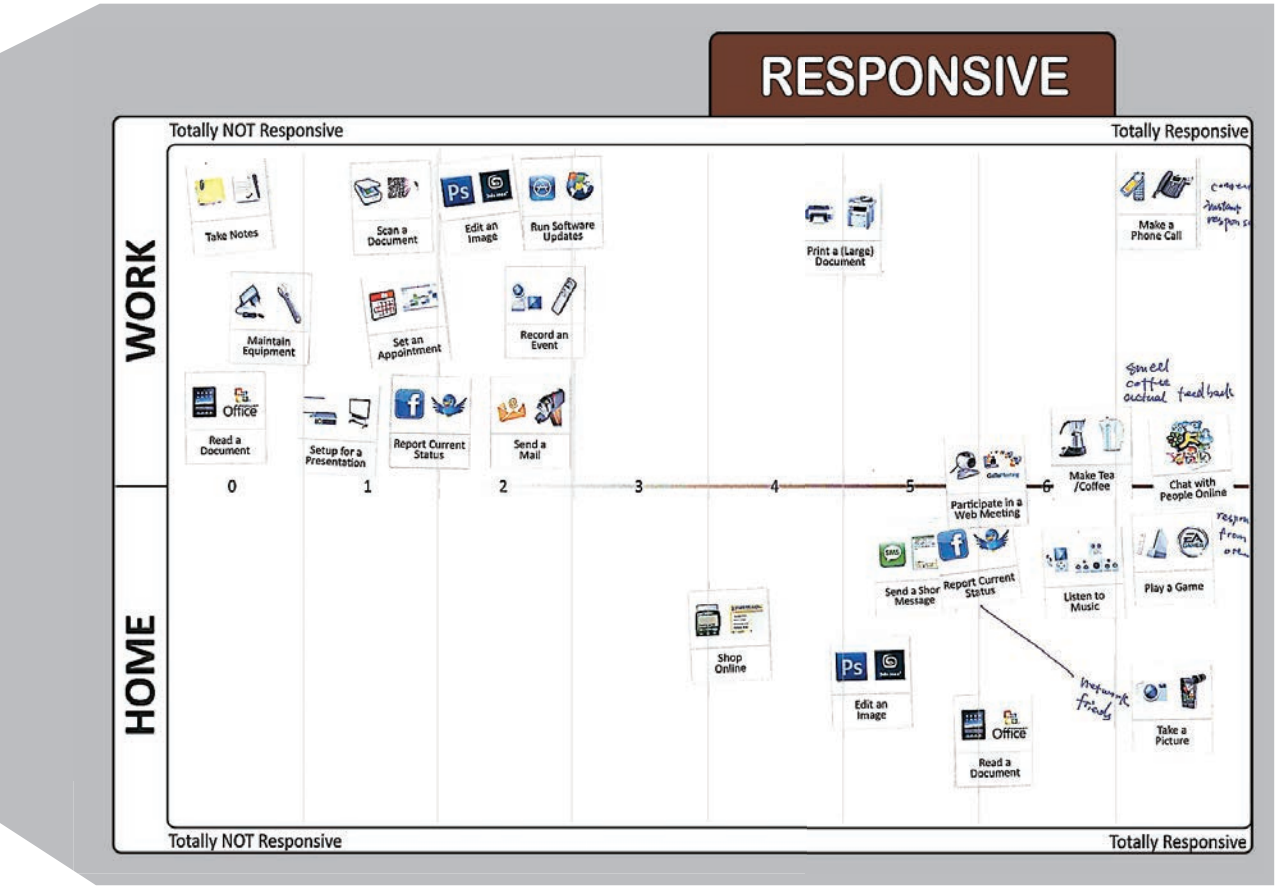
▸ Figure 2. The boards and activity cards in the interview toolkit.

Stephan Wensveen applied a tangible approach to design and build an alarm clock prototype that recognizes human emotions [4]. The prototype has a round shape and features 12 sliders circularly divided. The interaction design with the sliders allows for myriad ways of setting the alarm time.

We believed that the potential to associate a specific group of office workers with interaction qualities could enable the development of future office tools and applications. With this in mind, we explored interaction qualities currently experienced in the home and work contexts. As a first step toward comparing the richness of interactions in these contexts, we conducted a series of contextual interviews. Four interviews with 10 office workers took place at four companies, which are SMEs (small to medium-size enterprises). The number of employees varied from 10 to 100. We used a basic interviewing technique in the form of face-to-face conversation between researcher and participants. The interviews made use of generative toolkits [5], which consisted of pictures and words to trigger memories and responses. See Figure 1 for an impression.

Qualitative analysis started with all the data (transcripts, collages, field notes, and visual materials) gathered in the interviews and was performed by two researchers, using the "statement card" method [6]. First, each researcher individually read the transcript, marking possibly relevant participant quotes. Then the researchers paraphrased about 150 quotes, which in turn were clustered into groups with similar meaning, which were labeled and described. Finally, the words and pictures from the collages were clustered together with the statement cards to help describe the interpretations and convey insights.

Based on the clustering of the statement cards, we identified six key interaction qualities that together embody an interaction style that we labeled "Generation Y," referring loosely to the first generation of people (born roughly between 1980 and 2000) that has grown up as digital natives, and



▸ Figure 3. The completed board by participant JD, showing a comparison between the home and work contexts for the interaction quality "responsive."

which is currently starting to dominate the workplace. Table 1 explains the interaction qualities with specific examples.

Comparing Interaction Qualities Between Home and Work

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

To focus the interviews more on the six interaction qualities, we developed a generative interview toolkit. The interview toolkit, shown in Figure 2, consisted of six boards, each with sets of activity cards, a set of blank cards, and a number of colored pens and Post-its. Each set of activity cards contained 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.

The character of the study was explorative and qualitative, aimed at laying bare prominent relations, rather than being a quantitative study aimed at proving a hypothesis. For this study, a small number of participants sufficed. We selected six participants, including young entrepreneurs, wholesalers, designers, and other office workers. They worked in companies of different sizes, so we were able to sample a variety of work contexts.

Each interview started with the first interaction quality (randomized for each participant). The researcher briefly defined the quality, then asked the participants to select at least five activities from the card set that they felt best represented this interaction quality in either the home or work context. If they thought of activities that were not in the presented card set, they were invited to create these on blank cards. Participants arranged the activities on the board for both contexts. The position on the 0–7 scale rounded to a half number

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was taken as a score for that activity on that quality. The participants then were asked to talk about their decisions, including the reasons behind them, expectations, suggestions, and so on. They were asked to focus specifically on significant differences between the home and work contexts and whether they saw any opportunities to transfer certain qualities from one context to the other. The participants repeated these steps with the other five interaction qualities. The interview finished up with discussion and reflection.

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 home and work contexts. Six sets of completed interview boards served as a data pools 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. Figure 3 shows a completed activity board for participant JD. 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.

Results

Activities in the home context, like gaming, 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 or punching fiercely with a Wii controller to play a boxing game. Instant communication was popular through use of the Internet and mobile technology, including applications such as 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 real home and work contexts.

In general, the work context contained a diversity of activities requiring different ways of interacting. The computer was still the central tool to interact with and was wired to other office tools, for example, a printer, a scanner, and other computers. Formal, subtle, and decent types of interactions, such as tapping quietly on a keyboard, were mostly experienced while interacting in the work context. Also, conventional user actions were still frequently found. For example, scrolling a mouse wheel was considered "the right interaction" to scroll up and down a Web page, while pressing buttons on a printer led to getting documents printed. Online tools supported them at work beyond the traditional tools, such as a fixed office telephone.

We found the participants scored the interaction qualities in their home context higher than the interaction qualities they experienced in their work context. Participants experienced interactions in the home context as much more playful, expressive, and responsive than those in the work context, while expressing the wish to experience the richness of these interactions in the work context. As mentioned earlier, 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 of explanations in the transcripts, the four qualities—instant, collaborative, expressive, and flexible—provide the most promising opportunities for improvement in the work context. These interaction qualities will thus be more worthwhile to investigate in our future research.

Design Guidelines

Comparing the interaction qualities offered a rich source of experiences, anecdotes, and routines on ways of interacting in home and work contexts. To make these results more instrumental, they were translated into a set of design guidelines, which will subsequently be used to implement the Generation Y interaction style in future office tools and applications. Each design guideline addresses one specific interaction quality and related work context(s):

- *Use instant interactions to convey meaning.* Designing instantness in an office context should be aimed not only at increasing efficiency or effectiveness, but also at generating a sense of professionalism or importance.
- *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.
- *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 bonds between people. Games, in particular, often include strategies that require people to collaborate to achieve certain goals.
- *Integrate expressive interactions into regular office tasks.* Many office tasks involve small, rigid subconscious interactions, such as button pressing or mouse scrolling, that leave little to no room for expressiveness.
- *Make office tools and systems more (emotionally) responsive.* A 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.
- *Allow for flexibility while interacting to overcome the physical limitations of the 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.

Conclusion

We hope our findings help influence the development of future office services by utilizing the power and richness of the identified interaction qualities. The six interaction qualities, together with their corresponding guidelines, hopefully will offer designers a new perspective for designing new user interactions in the work context. Implementing them successfully, however, does require a better understanding of the meaning of the identified interaction qualities within the office context. What exactly is "playful" or "expressive" in a business setting, and how does this translate into the experiential qualities of an interaction, such as feedback, fluentness, or resistance? Future research will therefore involve applying the design guidelines to the development of a new office tool and subsequently evaluating this tool in an actual office context.

ENDNOTES:

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