Reflection on Exploring and Designing Generation Y Interaction Qualities

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Abstract. This paper addresses the main findings of a research project on Generation Y interactions, including reflection on the research questions, the conceptual framework, the research framework and designing for interaction qualities. The perspective of this research underwent two big changes through understanding and designing Generation Y interactions. First, we started with demographics, which changed to styles of interaction. Secondly, we worked with interaction qualities instead of function qualities, developed a way to specify them for office situations, and used and evaluated them in design.

Keywords: Interaction qualities · Generation Y · Reflection · Office work

1 Introduction

The rapid development of information technology in the past decade has enabled the introduction of a number of new communication tools and platforms 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 large amounts of digital information, using a great variety of devices, techniques and media. As a result of this constant stream of information, people have become more socially active as well as become more capable and ready to integrate their virtual world with their physical world, using highly interactive devices, such as mobile phones, laptops and multi-touch tablets.

So far, however, this kind of interactive behavior has mainly manifested itself in people's private context, while in the more public work context the rich interactions that all these new technologies are offering do not seem to be supported to a great extent yet. Whereas office applications have increased sometimes dramatically in functionality, the ways of interacting with all these functionalities have evolved much more slowly [17]. As a consequence, most office work is thus still done through the ubiquitous, almost 40-year old, set-up of keyboard, display and mouse, which only supports limited behaviors, such as keyboard tapping and mouse clicking.

This lack of richness in interaction is becoming more evident, now that a new generation of workers is quickly entering the market. This so-called Generation Y, born in the 1980s and early 90s, are digital natives [21, 25], who have experienced digital technology their entire lives. Thus they have developed new ways and habits of interacting with their (digital) world, putting very high demands on the applications, services, devices and networks that enable and support these interactions.

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An interesting challenge therefore presents itself to designers and researchers: How to bring the qualities of the interactions [13, 14, 23] that people currently experience in the private context of their homes and friends into the more public context of their offices and colleagues?

This challenge is taken on through a number of studies, in which the following research questions were addressed:

1. What are Generation Y styles of interaction in home life and office work?
2. What are the interaction qualities that make up Generation Y styles of interaction?
3. How are these interaction qualities experienced within home and office context?
4. What are opportunities to design office tools or services that support Generation Y styles of interaction?
5. How are the interaction qualities of these new designs experienced?

Figure 1 shows the research framework, which distinguishes three major components: (1) people (Generation Y), (2) technology and (3) context (home vs. work). On the intersections of these three components are the interactions that are at the core of the research.

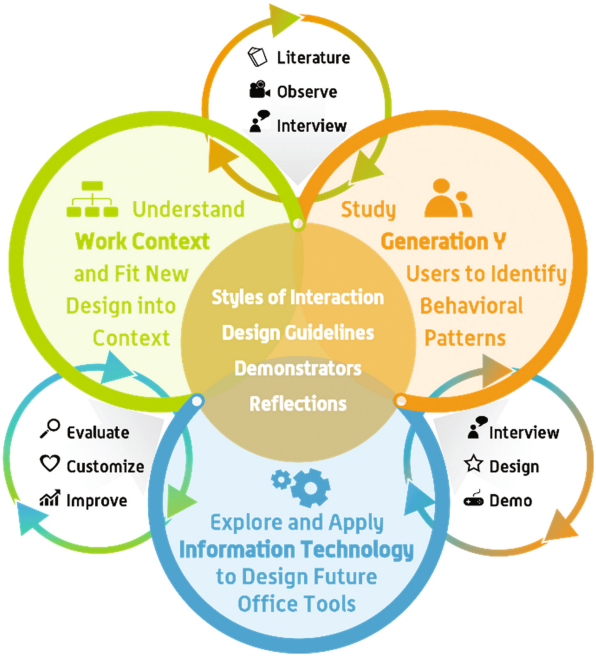

Fig. 1. The research framework

2 The Research Questions

The starting point of this research was formed by the research questions as listed in the introduction. In the remainder of this section, the author discusses what answers were found.

2.1 'What Are Generation Y Styles of Interaction in Home Life and Office Work?'

The literature review showed that Generation Y has experienced a different state of technology and ways of (social) interaction than the generations before them, e.g., in that they grew up online, and experience mobile devices and social media as the natural condition of life. We gathered a set of examples of activities representative of what people currently do in their home and office context, and found that they could be grouped into a style of interaction [1, 18], which we have labeled as 'Generation Y'. We also noticed that this style of interaction seemed to be more prominent in the home situation than in the office context.

2.2 'What Are the Interaction Qualities that Make up a Generation Y Style of Interaction?'

Table 1 shows six interaction qualities make up this particular style: instant, expressive, playful, collaborative, responsive and flexible [10]. These six qualities functioned well in categorizing activities from home and work situations, and in having office workers describe how they would like qualities from home activities to be more present in their work situations. Each of the qualities could be given concrete examples in the home and work context. We strengthened the impression that these qualities were better represented in home situations, such as gaming or chatting, than in office conditions, where traditional screen interfaces have seen less change over the past decade.

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

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

2.3 'How Are These Interaction Qualities Experienced Within the Home and Office Context?'

The six interaction qualities were used as criteria to assess and compare the experience of user interactions in the home and work context. Playful, expressive, responsive and flexible seem to give good directions for improving interactions at work, while instant and collaborative showed less opportunity. The latter, however, but may have been because of the choice of the particular office activities. The above might suggest a straightforward solution for improving interactions at the office: bring in the Nintendo Wii and the Microsoft Kinect controls, and social media. In practice, however, not all workers are Generation Y people, not all are digital natives, and the office equipment has to support collaborations between different people. For that reason, designing for Generation Y qualities is more subtle (and more limited) than just bringing in devices and techniques that Generation Y is familiar with.

2.4 'What Are Opportunities to Design Office Tools or Services That Support Generation Y Styles of Interaction?'

The interviews and discussions showed that the six interaction qualities made sense to users and designers alike. However, mostly designers would pick up the names of the qualities, whereas users tended to refer to examples that were given. This may be because designers are more used to talk about interactions and qualities as abstract things, whereas other people will refer to their direct experiences. The six interaction qualities together, with their corresponding guidelines, could be used by the author, and by design students with some success to design and enrich new types of user interactions in the work context. However, although they supported discussions and gave direction, this depended a lot on where in the design process they were used. In order to demonstrate Generation Y interactions, a pair of YPhone prototypes were designed and developed.

2.5 'How Are the Interaction Qualities of These New Designs Experienced?'

In the evaluation, the YPhone prototype worked in demonstrating Generation Y interaction qualities, transferring the Generation Y style of interaction from home to work. Moreover, the evaluation results indicated that the interactions would fit into work contexts and enrich people's work situations. And we found that the qualities could be fitted in the Hassenzahl model of qualities [5]. Most participants recognized the intended user-product interaction qualities, except for instant and collaborative.

3 The Conceptual Framework

The Besides finding (partial) answers along the directions of the research questions, the research helped sharpen our understanding of how interaction qualities might be instrumental in design processes. It turned out to be important where the qualities are positioned, both in the solution space of what is evaluated or designed, and in the design process.

3.1 Interactions Between Context and Product

Interactions do not exist by themselves. They are situated on an activity level between the context of use level and the functional and product level. The interaction between user and products lies between these two, and the interaction qualities at this level are connected to the other two levels. At the Why level, a person has an urgent reason to consult a colleague over the phone. At the What level, he does this by using the designed product, a phone. And in between is the interaction where he uses the phone toward the goal.

Both these levels are hurdles for interaction designers. Many interaction designers see their main focus on designing 'the concept', i.e., that there are things like urgent consultations and who is involved in these. For many, the interaction and its qualities only come into view after the functional problems are being solved. In the student projects, this problem surfaced most visibly. Many struggled so hard with designing interactive technology that they were satisfied when 'the button was pushable and could start the show', showing difficulty in mustering the sensitivity to consider 'whether the button was big, small, quick, slow, etc.'. Even when we tried to have them focus explicitly on the qualities by restricting the solution space to a pre-given context (i.e., the Pong game), the students pushed toward modifying the context (i.e., the pirate ship Pong) or a modality (i.e., the stereo audio Pong), with limited explorations along axes of interaction qualities [12].

In their defence, interaction qualities can easily be confused with functional qualities of a product [16, 20]. In the evaluation of YPhone, we found that the playful, expressive, responsive and flexible interaction qualities implemented in YPhone were experienced well in a lab context and in a work context, but the instant and collaborative qualities were experienced less. It may well have been that respondents found it difficult to assess whether YPhone's interactions were experienced as instant and collaborative, because the activity of making a phone call is being perceived as instant and collaborative by nature, i.e., talking in real time with somebody else.

3.2 Interaction Qualities in the Design Process

The above difficulties suggest that interaction qualities are most helpful at guiding design actions during detailing rather than conceptualization. Possibly, designers should first solve the issues of context and product level before attending to interaction qualities to tweak, tune and polish them in subsequent iterations. This implies that the

design should first be grounded in scenarios, storyboards and first functional prototypes, before the part of solution space is opened up where interaction qualities can help. Earlier research prototypes, e.g., those by Frens [4] and Wensveen [27] were also fully functional.

3.3 Qualities, Words and Experience

As noted earlier, the six interaction qualities were readily picked up by designers to discuss activities and products, and served well as labels for groups of collected activities for respondents in research. However, giving only the names and a verbal definition or description to student designers had only limited value. Often stories, memories, demonstrations and examples, were needed to give guidance. One reason for this is that the qualities are more abstract than product qualities like 'soft', 'yellow' and 'curved' that designers have been used to deal with: interaction qualities are essentially relations (between user and product), depending highly on dimensions like time (fast or slow), proximity (close or distant) or amplitude (small or big), that manifest themselves in bodily experiences. For each of these, the symbolic nature of language is a limited means of expression and communication.

In order to support designers in working with interaction qualities, they may need to develop not only a vocabulary, but also a 'sense', a repertoire along these dimensions. Designers could then pick one or more interaction qualities from such a repertoire of examples, and use these as a benchmark against which they later could compare their designs.

Tools for exploring interaction qualities are also needed. For classic product qualities, such as the color of a display, many simple and sophisticated tools exist. But the subtlety of flicking the magnet ball in YPhone requires fine-tuning resistance, friction and stability, which can currently only be done by careful craft, i.e., repeatedly cutting the running groove with appropriate tools. New developments in 3D printing may well prove important in enabling such explorations, e.g., by creating a series of variations of running grooves for testing their motion qualities.

4 Designing for Interaction Qualities

Traditionally in design, products were designed to look beautiful and to function well. These products were created by combining technology trends, software capabilities and product functions rather than focusing on the application and experience of user interactions in a specific context. Since two decades ago, IT products have become interactive and with the maturing of interaction design as a discipline, attention is gradually shifting from designing quality of aesthetics and function to designing qualities of interaction. The focus there becomes managing relations, such as trust and experience, along longer stretches of time and in more complex environments.

This research contributes to the existing body of knowledge in this domain by taking the notion of interaction qualities from theory to practice and bringing Generation Y interaction qualities from home to work. Although other researchers and

designers know how to start designing from a functional perspective, designing using interaction qualities is new. Previous work [4, 22, 23, 27] sees interaction qualities as analytical tools and inspirational instruments, and would fit them into user experience, which addresses user feelings, memories and expectations from interacting with the interfaces. In this research, interaction qualities, as a new strength in guiding design, are about what experience a user can get with a design through actively engaging with a product, system or service. They can help designers give specific emphasis when designing the interactions they want their product to evoke.

We believe that interaction qualities can serve as a tool to guide the design process, especially in tuning interactions that have been chosen. The six interaction qualities become a set to guide designers in realizing Generation Y interactions. They are a key set for this research and are helpful to guide designers, but not a complete set (e.g., the playful quality may extend to cheerful, engaging and passionate qualities) for reaching out every detailed aspect describing user-product interactions.

Are there only six interaction qualities? In our studies, six interaction qualities were sufficient to categorize the set of activities we found in the home and work context, and all six had some value in giving direction to designers. But the ease in which these six qualities could be fitted into the Hassenzahl model [5] may be a sign that there may not be a complete set. It may even be questioned if making a complete set would be useful, given the observation that none of the six qualities were identical to the ones in the Hassenzahl model. Rather, the most important lesson may be to direct the designer's attention to interaction qualities as something that can (or should) be designed, and to point out how the solution space can be explored, possibly by showing a repertoire of solutions that instantiate each quality.

5 Reflection on the Approach

In this section the author reflects on methods used in this research on Generation Y interactions.

5.1 Literature and Interviews

In the first part of the project, literature study, contextual interviews were the main methods. Although the literature helped with identifying Generation Y demographics, lifestyles and behaviors, little was found on the specific level of interactions.

The open-ended nature of face-to-face interviewing was assisted by generative toolkits and guided tours through the users' home and work environment served to identify the interactions, and to derive a model. Previous work [2, 3, 6, 29] shows that interviewing and designing with a toolkit can engage users in a user-centered design process and support them in activities such as sharing experiences, building skills and implementing ideas. In this research, the toolkit [10] served as a trigger to overcome the difficulties of getting people to talk about interactions. It helped prompt the participants to recall concrete experiences and to think about how they experience certain contexts and interactions [19, 24, 28]. This evoked the participants to make comparisons on

interactions between the home and work context. Because the design of the interview boards and the activities was somewhat ambiguous, the boards mainly served to help the participants talk about memories and opinions, rather than answer specific questions. This enabled us to discuss possible conflicts and differences in perspectives, and to cluster the interpretations based on the transcripts, field notes and the notes. A consequence of this openness was that the interpretation of individual cards and terms varied. Although the placement of the cards on the boards might be regarded as ratings on 7-point scales, a statistical analysis was not possible. Rather, the analysis focused on interpreting what the participants said to explain their placements.

5.2 The Value of Doing Design as Part of the Research

Research offers methods to conduct studies and to gain knowledge on a current state of affairs. In order to study a state of affairs that does not yet exist, we can bring that state into being, which requires an act of design. In research through design, both the resulting prototype and the act of designing itself can contribute to that new understanding. The prototype can be evaluated in the setting, with regular methods of study. In the act of designing, the designer-researcher is confronted with the difficulties of realizing the theoretical ideas into the real world. Reflecting on the design decisions also provides understanding, which is more difficult to capture than the results that are visible in the prototype. In this research project, the author's own design iterations [11, 12] and his involvement in student projects provided continuous occasions to reflect on and reconsider the value of the interaction qualities in guiding him or the students, and to collect examples of situations where the qualities are best represented. Although this process was not documented explicitly, it contributed implicitly to the progress of the research.

5.3 Prototypes and Evaluations

Prototypes [11, 12, 26] were built with an iterative design process and with the intent to demonstrate Generation Y interactions. It was worthwhile to build prototypes such as YPhone, because such prototypes enabled the participants to experience interaction qualities implemented in a design (in the same way in the same evaluation settings). Considering all the techniques used in the design process, ranging from sketching, storyboarding to play-acting, demonstrating a new design with a working prototype was the most important. By designing and building prototypes, different aspects were integrated from theory and practice. By setting out and demonstrating prototypes that cover interaction qualities, feedback from users, peers and experts was gathered. Prototypes make it possible to communicate complex results through demonstration. They guide users in imagining different office situations by demonstrating interactions and user scenarios. This is valuable, as users do not only reflect on an envisioned experience, but on an embodied experience, when they are immersed in the experience by touching and operating the prototypes.

For the controlled in-lab evaluations [9], the evaluation questionnaire borrowed was based on the Hassenzahl model, which was proved to work well for assessing interaction qualities [5]. This worked because it addressed the right interaction qualities, which are the Generation Y interaction quality word pairs and the qualities in the Hassenzahl model. In other research through design projects [4, 22, 27], the researchers primarily focused on controlled in-lab and longitudinal studies to evaluate a main hypothesis. Compared with their approaches, the approach followed in this research has a broader range of involving user, experience and context. This was essential to capture the real-world user experiences in the work context. This helped form and improve our understanding of how to design office tools with Generation Y type of interaction. Figure 2 shows user experience of the YPhone prototype.

Fig. 2. The participants experienced YPhone and evaluated the design based on their experiences

6 Discussion

This research project was started with the aim of finding guidelines for practitioners to design 'the next generation interfaces for office use'. We aimed the work to be both useful for practitioners and design researchers. In this section the author suggests recommendations for each group.

6.1 For Office Tool Developers

At this moment (beginning of 2017) there still aren't too many examples of office tools being fully integrated with new interactions (e.g., Generation Y interactions) and new technologies (e.g., high-tech sensors and actuators). The few notable exceptions are

mostly conceptual designs, which are not broadly experienced and adopted by office workers. To point a direction for developers, like Exact, who care about supporting office situations with new tools, applications and services, starting out projects from user-centered perspectives and from the interaction perspective are recommended. One direction that could be explored is to gamify specific ways of working, which apply elements such as training, practicing, competing and rewarding within the design of applications. The interaction qualities approach can enhance this by promoting designs that are not just game-like in a structural sense of taking turns and earning rewards, but, e.g., also more playful as an experience.

6.2 For Design Practitioners, Educators and Students

The six interaction qualities can help designers develop products that fit with the new interaction styles that have entered our lives in the last decade. These qualities indicate directions, present examples, and provide relevant dimensions to evaluate a design. On the basis of the experiences, the author recommends that the qualities are applied after a basic design direction has been chosen, i.e., both a context and a product. The qualities help in improving the how of the interactions, but provide less guidance during the earlier phases where the goals and the interactions are chosen. Moreover, it is recommended that the designer chooses some examples of existing interactions to exemplify the design directions, so that he or she can make intuitive use of his bodily experiences, rather than going 'by the name of the quality' alone. Building a personal collection of 'inspiring examples of qualities' may serve the designers in future projects. Such a collection may also prove of value for education.

For design students, it is important gain a feeling for the difference between interaction qualities, context and product level. Such a feeling can be fostered by design exercises in which the product and context are clearly fixed, and in which the qualities are systematically varied. Such exercises can also deliver rich examples to guide others, as they have done for classic design parameters such as color and lifestyle.

6.3 For Design Researchers

This research studied how a specific set of qualities can be identified and put to use in designing products. The research was mainly exploratory and qualitative, and served to highlight opportunities and pitfalls. We can claim that we now understand the specifics of the new generation of devices better, and have provided means to find such qualities, evaluate their presence in existing products and prototypes of new products, and guide designers toward improving those qualities in their designs. But in none of these can we claim to have provided the final word. It is not unthinkable that an extra quality is still found. Also, the complexities of context and product level also provide some difficulties in presenting the qualities as ready-to-use tricks.

Future research may validate the qualities in more controlled conditions. But more urgently, it would be helpful if the repertoire of qualities is mapped out with examples into a collection that researchers, but also practitioners, educators and students, can use.

Such a repertoire may convey the subtlety and richness of Generation Y experiences. It can be a tool to assist designers in exploring the solution spaces that underlies the qualities. Optimally, such a tool should itself be instant, expressive, playful, collaborative, responsive and flexible.

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