Designing Generation Y Interaction by Eliciting Interaction Qualities

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Abstract
With more and more products becoming digital, mobile and networked, paying attention to the qualities of interactions with these products should have is also getting more relevant. While interaction qualities have been addressed in a number of scientific studies, little attention is being paid to their implementation into a real life, everyday context. This paper describes the development of a novel office phone, YPhone, which demonstrates the application of a specific set of interaction qualities into the context of office work.

Author Keywords
Generation Y; interaction qualities; office work; experiential design

ACM Classification Keywords
H.5.2. User interfaces: Prototyping.

General Terms
Design

Introduction
Interaction qualities are also called experiential qualities, denoting 'the experienced attributes of artifacts-in-use' [1,4,6], which means they only come

about through actively engaging with a product, system or service [5]. There have been several research projects aimed to design and enhance quality in user product interaction, such as 'Feather', an interactive communication device that facilitates expressive, physical and emotional connections [8]. In the domain of office work, 'BlueSpace Cubicle' [2] and 'Microsoft Vision 2019' [9] envision future offices being filled with intelligent user interfaces and information gadgets, which provide users with natural interactions. However, these designs and visions are created by predicting technology trends, software capabilities and product functions rather than focusing on the application and experience of interaction qualities that fit a specific context. We envisage that developing new office tools from this latter perspective will lead to more innovative and meaningful ways of working.

An interesting challenge presents itself here to developers, designers and researchers: what are the design opportunities to bring interaction qualities from theory to practice in future office work? This paper addresses this challenge by describing a new office phone, YPhone, which has been designed principally from the perspective of the qualities of its interactions.

Generation Y Interaction Qualities

In our previous work of studying user interactions in the home and work contexts [3], we identified six key interaction qualities: instant, playful, collaborative, expressive, responsive and flexible. Together they 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 office work [7]. These six Generation Y interaction qualities will serve as criteria to design and evaluate future office tools.

The Design of YPhone

An office phone was chosen as a vehicle to bring the Generation Y interaction qualities into an everyday context. From categorizing notes and making collages in a series of observations were therefore conducted with Generation Y office workers, we operationalized the six interaction qualities into six design guidelines, which are summarized below.

- Instant – Use immediate and spontaneous reactions when making and receiving phone calls.
- Playful – Integrate enjoyable and meaningful indications, in which user attention is organized and presented in an engaging and enjoyable way.
- Collaborative – Allow office workers to collaboratively communicate with their colleagues to strengthen connectedness.
- Expressive – Animate the urgency of phone calls with expressive input gestures from the office workers and reactions from the phone.
- Responsive – Indicate (and broadcast) availability status of the colleague being called at the moment.
- Flexible – Keep a call connected by overcoming physical limitation of workspace.

User Scenario

A user scenario with action storyboards was created to envision how the interaction qualities would be integrated and perceived in the actual office context. The scenario is as follows: Y1 is a 25-year old female office manager. She is about to use her office phone to

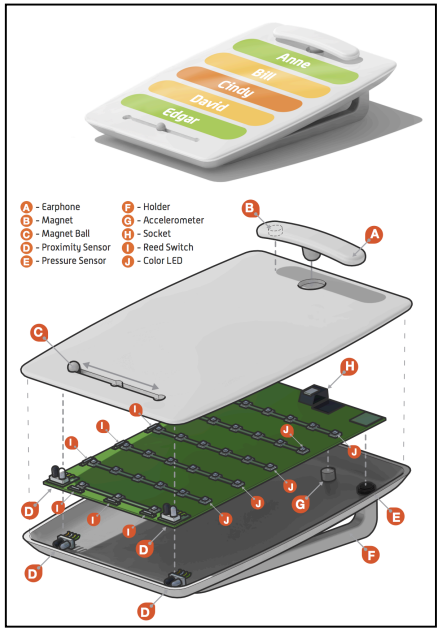

Figure 1. Concept design of YPhone.

make a call to her colleague Y2. She activates the phone and is presented an availability overview of her contacts. She gestures to browse her phonebook to find Y2, who is available at the moment. She initiates the call and sends an urgent mood complementing the ringtone. Y2 receives an urgent visual indication and an urgent ringtone. Y2 understands Y1's mood and picks up the call quickly.

The Experiential Design - YPhone

The experiential design, YPhone (Figure 1), has a flat surface, on which digital information is displayed. Phonebook can be flipped horizontally by swiping hand in the air above the phone. A magnetic ball is embedded in a slot in front of the phone. A wireless earphone magnetic stands on the top of the phone. Sending an urgent mood is realized by pushing down hard on the phone. When receiving an urgent mood (call), the phone shows a caller's name, glows and plays a ringtone intensely. YPhone prototype is being developed using Max/MSP, Phidgets sensors and Arduino environments. A pair of prototypes will be built to demonstrate and to evaluate the Generation Y interaction style in office work.

- 'Instant' is supported by picking up the wireless earphone to activate the dial pad interface immediately and spontaneously. One magnet is mounted in the earphone. One reed switch is mounted on the circuit board beneath the earphone. The magnet and the reed switch are coupled to activate the dial pad interface.
- 'Playful' is supported by bouncing the phonebook interface back when reaching the end. Four proximity sensors are embedded on the top front of the prototype to detect the hand swiping gesture. Five rows of color LEDs are programmed to animate the bouncing effect of the phonebook interface.
- 'Collaborative' is supported by putting the earphone on a contact in the phonebook to invite the selected contact to a group call. Five reed switches are mounted on the circuit board besides the five rows of color LEDs. The magnet in the earphone and the five reed switches are coupled to forward a call.
- 'Expressive' is supported by swiping in the air above the phone to flip through the phonebook and by pushing down hard on a contact to send an urgent mood (call). Four proximity sensors are embedded on the top front of the prototype to detect the hand swiping gesture. Two pressure sensors are mounted on the back of the circuit board to detect the degree of pressure when sending an urgent mood.
- 'Responsive' is supported by sliding a magnetic ball to switch between interfaces and indicating contacts' availability status. One magnet ball is placed on a magnetic sliding slot on the top front of the prototype. Three reed switches are mounted on the circuit board beneath the sliding slot. The magnet ball and the three reed switches are coupled to switch between interfaces. Four proximity sensors are embedded on the front of the prototype to detect the contacts' availability status.
- 'Flexible' is supported by wearing the wireless earphone to free up hands and by swiping on its backside to flip through the phonebook. The earphone can be worn to free up hands as well. Eighteen groups of color LEDs are programmed to animate information (e.g. from the phonebook) flexibly.

Further Development of the Prototype

We hope office workers will experience the interaction qualities that have been put into the YPhone design. We will further refine the experiential prototype:

- To adjust and fine-tune sensors values. Proximity sensor value will be adjusted. After adjustment, the prototype is expected to stably detect user presence at a distance of 20 to 30 centimeters and the hand gesture at a height of 5 to 20 centimeters.
- To make detailed interface specifications, which will help the researchers to communicate the logic, workflow and user interactions in detail with designers and developers involved in the further development.
- To add user interfaces, which will be printed on transparent plastic papers. To provide a real-world experience when evaluating the YPhone design, these interfaces will be use in a Wizard-of-Oz approach.

Conclusion and Future Work

Our findings suggest that adapting interaction qualities for a specific user group and a specific context of use can bring the concept of interaction qualities from theory to practice. Our future work is to complete the development of the prototype and to use the six interaction qualities as evaluation criteria to conduct user experiments, aiming to find out if the designed interaction qualities are experienced as intended.

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