BRIDGING TROUBLED WATER: QUALITY OF EXPERIENCE IN A MOBILE MEDIA CONTEXT

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Abstract

The ICT environment went through notable changes, which have had an irreversible and strong influence on both ICT innovation processes and the role of end-users. In this context, technology developers are increasingly expected to take users' experiences with technology into account during the process of developing applications or frameworks. As technology is more and more embedded in users' daily lives, they seek out those personalized values to satisfy their own, situational needs. As a result, a thorough insight in users' expectations and experiences at various levels (both explicit and more latent) and in different contexts (eg. mobile) has become a crucial determinant for the successful development, introduction and adoption of new ICTs. To this end, our paper focuses on the increased importance of Quality of Experience (QoE). It provides a conceptual model for QoE and furthermore discusses the prevalent gap that still exists between QoE and Quality of Service (QoS). Our main objective is to present a new methodology for correlating user experience to QoS parameters. This methodology was tested in the context of an exploratory interdisciplinary study on QoE-measurement. This new approach goes beyond QoS-parameters and aims to also grasp the social and contextual dimensions of users' experiences.

Keywords

QoE (user experience), QoS, measurement, living lab, interdisciplinary research

Introduction and Context

> *'We don't just use technology; we live with it. Much more deeply than ever before, we are aware that interacting with technology involves us emotionally, intellectually, and sensually'*
> (McCarthy, Wright, 2004, p. ix)

The relationship between technology and technology users (or society as a whole) has already been studied from various perspectives. Traditionally, the theory of diffusionism, connected to the notion of 'technological determinism', is assumed to have dominated the theoretical debate for a few decades. In this perspective, it is argued that societal changes are primarily due to technological advancements. Furthermore, the adoption and use of technology is believed to follow a predictable path.

This paradigm was however soon challenged by other, more user-centred approaches such as the 'Social Shaping of Technology' or 'Social Construction of Technology Approach' (SCOT) (Haddon et al., 2005). These approaches stress the dynamic relationship between technological and societal forces in this respect (Rickards, 2003, p. 1095, Trott, 2003, p. 836). Furthermore it is argued that technological advancements can also be influenced by societal processes and forces.

Indeed, it became clear that the diffusionism idea did not always apply (anymore) for certain sectors, such as the ICT sector. Given a number of major developments in the wider domain of ICTs (i.e. increased market liberalisation, growing convergence and empowerement of technology users), more and more authors pointed to the phenomenon of failing innovations and the deviation of adoption curves from the traditional Rogers' curve. More and more ICT-innovations

thus failed to follow the predictable diffusion and adoption path. In this respect, authors such as Poiesz and Van Raaij (2002, p. 32), illustrated how market evolutions drastically influenced innovation processes in various ways. Affected by the increasing pace of ICT innovation processes, companies have been pushed to shorten or even skip important research stadia. Poiesz and Van Raaij use the notion of 'innovation spiral' in this context.

This notion of failing innovations can also be linked to the abovementioned 'technology push' view, which minimizes the role of social and user-related dimensions that might influence the use and adoption of new technologies. At a theoretical level, these dimensions are embedded in the domestication perspective, which is dedicated to the use of technology in the domestic environment and to people's interaction with technology in everyday life (Lievrouw, 2002, p. 185; Silverstone & Haddon, 1992; Haddon et al., 2005, p. 4). This increased stress on the user and the way users interact with and co-shape technology, has been influenced by the changing user roles over the last decades. Due to the exponentially increased offer, which started off a process of empowerment, today's users have turned into more demanding and critical stakeholders. As a result, it is increasingly assumed that a better understanding of the user is necessary in order to stimulate true innovation development from the 'user's perspective' (Munnecke and Van der Lugt, 2006, p. 8).

However, the inclusion of such social and user-centered insights is often still a missing link in ICT innovation processes. With respect to the issue of failing innovations, De Marez (2006, p. 33-34) mentions the lack of accurate prior-to-launch insight in the end-users' expectations, wants and needs. Whereas failings have often leaded to QoS-optimizations and technical improvements, these improvements did not automatically result in a better Quality of Experience or experience as perceived by the user. Put differently, there is still a gap between the rather technology-deterministic and user-centered visions.

The 'interactionism' perspective provides us with a theoretical basis for uniting both: it explains the success of the adoption and diffusion of technology by the continuous interaction between technological and societal forces (Rickards, 2003, p. 1095, Trott, 2003, p. 836). Boczkowski (2004, p. 255) aptly describes this 'interactionism' as *'social shaping and diffusionism being so intimately tied that they should be seen as the two sides of the same innovation coin'*. Building on this 'interaction' idea, this paper will focus on the prevalent gap between Quality of Service and Quality of Experience from an interdisciplinary perspective. More concretely, we will explore how such a perspective can strengthen and improve the current Quality of Experience-measurement practices.

With some of the previous studies on ICT innovation and user involvement in mind and building on previous research on QoE, this paper will restrict itself to focus on the importance of the concept of *Quality of Experience* in the field of ICT innovation and development. Furthermore, it discusses the issue of QoE-measurement.
The paper is structured as follows: the first section focuses on Quality of Experience at a conceptual level. Drawing on the multidimensional conceptual model for QoE presented in this paper, section two deals with the challenge of adequately measuring QoE. This section is dedicated to the creation of a new and interdisciplinary methodology for correlating user experience to QoS parameters. In line with this, our attention also goes out to some of the opportunities and problems ensuing from interdisciplinary collaboration. Subsequently, section three discusses how the newly developed methodology was tested in a living lab setting by means of an exploratory study. Some empirical results and experiences are shared. Finally, the last part suggests how the new approach could be further refined and validated.

Quality of Experience as a multidimensional concept

> *"Experience does not come to us readymade. The quality of an experience – whether it is well rounded or fragmented, for example – depends significantly on our readiness to experience and to round off experience in a present. The personal meaning of an experience depends significantly on the sense we make of it given our particular history and disposition"*
> *(McCarthy, Wright, 2004, p. 105).*

Turning now to Quality of Experience as an important concept in the context of ICT innovation, we cannot ignore its growing presence in many research fields. Whereas Quality of Service parameters and technical performance metrics received a lot of attention in the past, it can be argued that the concept Quality of Experience has now taken over this role. Driven by an ongoing shift from 'push' to more 'pull' and user-driven approaches, QoE is said to go beyond QoS: it is assumed that a good Quality of Experience is important for both adoption and loyalty purposes (Crisler, Turner et al., 2004, p. 61; Jain, 2004, p. 96-97). In this respect, Pine and Gilmore (1999, p. 2) refer to experiences as a '*fourth economic offering'*, a '*new source of value*'. Furthermore, Corrie, Wong et al. (2003, p. 2) argue that '*QoE is how the user feels about how an application or service was delivered, relative to their expectations and requirements'*, thus emphasizing the importance of end-users' expectations and experiences.

In spite of the gaining popularity of the QoE-concept however, it entails a number of challenges. One of these challenges can be described as the lack of an adequate approach for measuring QoE. Such an approach should acknowledge the importance of two perspectives, namely the more technical-oriented QoS-perspective on the one hand and the more subjective and user-centered QoE-perspective on the other hand.

However, in order to tackle this challenge and to contribute to the current state of the art regarding QoE-measurement, clear insights in terms of both the conceptualization and definition of QoE are required. Several authors from a variety of disciplines and fields (HCI, engineering, design, psychology …) have attempted to define QoE. As a result, literature on the conceptualization and measurement of QoE can be regarded as rather scattered. To date, a clear conceptualization, integrating all these perspectives, was still lacking.

Given the inconsistency and fragmentation of existing definitions and interpretations, our previous research on QoE thus dealt with Quality of Experience at a conceptual level. With reference to both the objective (QoS~) and more subjective (user-oriented) dimensions of QoE, an extensive literature review, combined with the consultation of an expert panel[1], resulted in a broad conceptual model of QoE consisting of five main building blocks and many sub dimensions (see figure of the conceptual model). This model was developed within the context of the E2E QoE[2] project (funded by IBBT). The five main building blocks include:

- *Quality of Effectiveness:* this building block is all about the accuracy and technological performance, at four levels (application/service, server, netwerk, device/handset).
- *Quality of Efficiency:* Does the application, device… work well enough for the user?
- *Usability:* how easy is it for the user to accomplish tasks?
- *Expectations:* This dimension refers to the subjective character of the 'experience' concept. The degree up to which the expectations are met, will then determine the Quality of Efficiency.
- *Context:* Since experience does not happen in 'a vacuum', it is also necessary to consider experience in its broader context.

The proposed model aims to cover not only the technical performance variables (~QoS), but also what people do, could do and hope to do with technology, what they expect from it, in what context they (intend to) use it in, and to what degree it meets their expectations and thus results in end-user happiness. Referring to the fact that QoE is really a subjective and 'open-ended' matter (Drogseth, 2005, p. 64), this model can however not be considered as exhaustive in terms of sub dimensions.

Furthermore, given these various parameters and factors that influence users' experiences with technology (e.g. usage context, personal and social context, technical issues etc.), the adequate measurement and translation of what users expect and experience in a specific context, remains challenging. Although social researchers have a number of methodological tools at their disposal in this respect, the process of exchanging knowledge from user research with engineers and developers appears to be a missing link. As a result, engineers and technical experts often think of end-user QoE optimisation in terms of QoS optimisation. In current practice however, incorporating users' wants, needs, expectations… is increasingly considered to be essential in order to successfully enhance end-users' QoE.

Development of new methodology

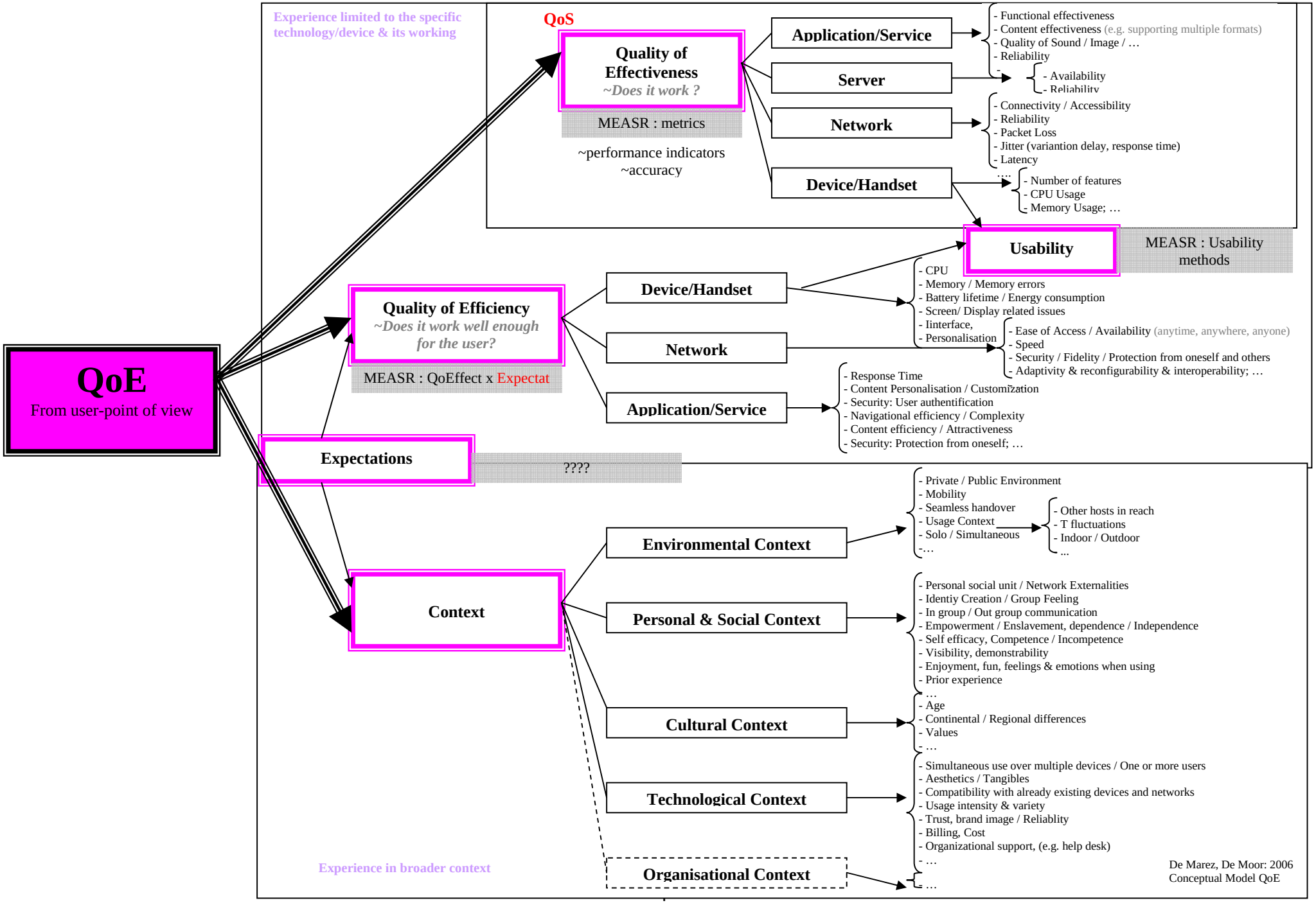
"Participating in a long-term ICT development project as a social scientist is indeed a culture shock"
(Limonard and Koning, 2005: 168, referring back to Haddon and Kommonen, 2002, p. 17).

As mentioned above, previous research on Quality of Experience (De Moor, De Marez, 2007) suggested that there is still a prevalent gap between QoE and QoS. Put differently, to date there is a lack of tools and methods for creating a meaningful link between the - more subjective - QoE-dimensions on the one hand and the – more objective – QoS-related parameters on the other hand. Furthermore the 'translation' of user requirements into technical requirements (and vice versa) often poses a problem within (new) product development processes. It can be assumed that well-structured interdisciplinary practices are too often missing.

Indeed, social science research can uncover certain expectations and dimensions that are crucial with regard to users' Quality of Experience. At the same time however, social scientists cannot extrapolate these subjective user expectations and dimensions into accurate technical parameters and standards.

[1] This panel was consulted by means of an online survey on QoE definitions and statements.

[2] End-to-End QoE is a 3 year project (2005-2008) funded by the Interdisciplinary Institute for BroadBand Technology (IBBT), that aims to study and develop techniques that are able to match future user quality expectations in heterogeneous environments and a secure usage context where resources (such as band width and battery power) are limited and the environment is dynamic in nature. (https://projects.ibbt.be/qoe/)


QoE
From user-point of view
Experience limited to the specific technology/device & its working
QoS
Quality of Effectiveness
~Does it work ?
MEASR : metrics
~performance indicators
~accuracy
Application/Service
Server
Network
Device/Handset
- Functional effectiveness
- Content effectiveness (e.g. supporting multiple formats)
- Quality of Sound / Image / …
- Reliability
- Availability
- Reliability
- Connectivity / Accessibility
- Reliability
- Packet Loss
- Jitter (variantion delay, response time)
- Latency
- Number of features
- CPU Usage
- Memory Usage; …
Usability
MEASR : Usability methods
Quality of Efficiency
~Does it work well enough for the user?
MEASR : QoEffect x Expectat
Device/Handset
Network
Application/Service
- CPU
- Memory / Memory errors
- Battery lifetime / Energy consumption
- Screen/ Display related issues
- Iinterface,
- Personalisation
- Ease of Access / Availability (anytime, anywhere, anyone)
- Speed
- Security / Fidelity / Protection from oneself and others
- Adaptivity & reconfigurability & interoperability; …
- Response Time
- Content Personalisation / Customization
- Security: User authentification
- Navigational efficiency / Complexity
- Content efficiency / Attractiveness
- Security: Protection from oneself; …
Expectations
????
Context
Environmental Context
Personal & Social Context
Cultural Context
Technological Context
Organisational Context
- Private / Public Environment
- Mobility
- Seamless handover
- Usage Context
- Solo / Simultaneous
-…
- Other hosts in reach
- T fluctuations
- Indoor / Outdoor
...
- Personal social unit / Network Externalities
- Identiy Creation / Group Feeling
- In group / Out group communication
- Empowerment / Enslavement, dependence / Independence
- Self efficacy, Competence / Incompetence
- Visibility, demonstrability
- Enjoyment, fun, feelings & emotions when using
- Prior experience
- …
- Age
- Continental / Regional differences
- Values
- …
- Simultaneous use over multiple devices / One or more users
- Aesthetics / Tangibles
- Compatibility with already existing devices and networks
- Usage intensity & variety
- Trust, brand image / Reliablity
- Billing, Cost
- Organizational support, (e.g. help desk)
- …
- …
Experience in broader context
De Marez, De Moor: 2006
Conceptual Model QoE

To this end, a new and interdisciplinary methodology for correlating user experience to QoS parameters in mobile media and living lab environments was developed within the context of a project called ROMAS, *'Research on Mobile Applications and Services'*. In this project, funded by the Interdisciplinary Institute for BroadBand Technology (IBBT)[3], the living lab of i-city Hasselt is very important. i-City is a wireless city environment, that offers unique possibilities for extended user research. Using technologies such as WIFI, Bluetooth, GPRS, Edge, Mesh, UMTS, HSDP, Wimax etc., i-City offers several wireless applications for PDA's, portable computers, smart phones etc. to a large panel of test users and is therefore the largest living lab in the world for testing mobile applications on a large scale in real life situations. Several work groups cover a large number of topics like health care, mobility, tourism, culture and heritage, logistics, education, e-government, food and retail. The i-City mobile platform is supported by the Flemish government and several industry partners such as Microsoft, Telenet, Siemens, Concentra, Fujitsu-Siemens Computers and Research Campus Hasselt (i-City, n.d.).

The five-step interdisciplinary approach that was developed in this context does not only take into account the 'hard' technical parameters. It also aims to take the more subjective (social, contextual etc) QoE-dimensions and the translation of user requirements in technical requirements into account. The five steps include:

1. **Pre-usage user research** i.e., to detect "most relevant QoE dimensions" and users' expectations. In this first phase, a combination of qualitative and semi-quantitative methods is used.

2. **Pre-usage translation workshops** to find optimal match between 'user-indicated QoE dimensions' and 'measurable QoS parameters'. This step aims to connect the social/user perspective to the technical perspective.

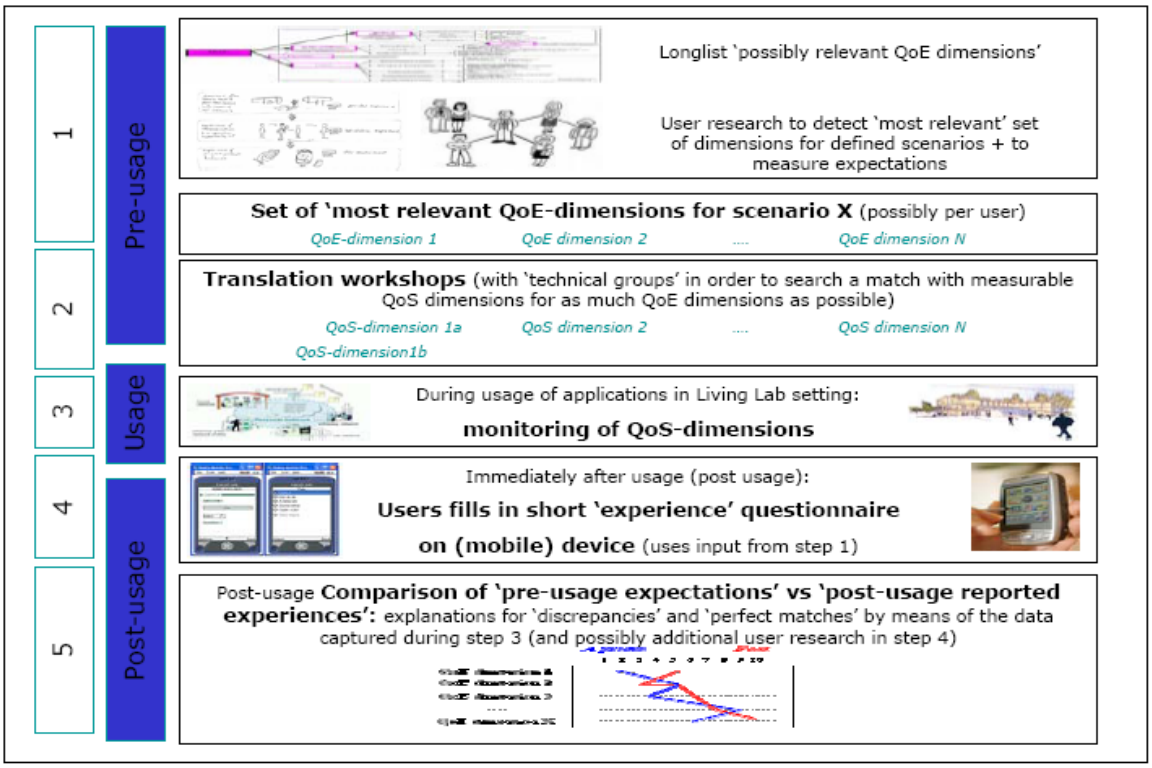
3. **Monitoring during usage** of QoS parameters. In order to collect the relevant data, a probe model that measures data across the different dimensions influencing the user experience, has been created. This model consists of three layers. Each layer consists of one or more software monitoring probes (contextual probes, QoE probes and QoS probes) (Deryckere, Joseph et al., 2008).

4. **Post-usage questions** on device (e.g. PDA). During this step, respondents receive a number of questions on the device, inquiring about their perceived QoE.

5. **Post-usage comparison** of expectations versus experience (based on information gathered in step 3 and further user research) in order to identify and explain differences/matches between both.

[3] More information can be found on www.ibbt.be

Figure 1: new methodology for correlating user experience with network QoS



Some results from an empirical case-study

This approach was tested in a small-scale study (N=10)[4] for a number of i-City applications, such as the i-City Wineguide[5], i-City Photoblog[6] and the wapedia application. For all applications, a wireless internet connection is required.

The **first phase (pre-usage)** aimed to uncover participants' expectations concerning mobile city applications in general, and more concretely concerning the two selected applications. This phase included a semi-qualitative group session (with both groups), which started with a free listing exercise. We asked the participants to reflect on those dimensions or issues that are crucial for having a good experience with a mobile phone. Some of the issues that were mentioned in this respect were battery lifetime, price, easy navigation, speed, display size…

Subsequently, the participants were asked to reflect on their current and future mobile applications usage (usage context etc.) in a more formal and structured way: they were asked to fill in a short questionnaire (4 questions), which was discussed in group. Building on this group discussion, a brainstorm on 'mobile applications and services that would make life easier', was initiated. Ideas such as traffic jam alerts, public toilets-locator, house for sale-locator etc. were mentioned.

Next, the focus of the discussion was narrowed to the selected applications. After briefly introducing them, we tried to gain more insight in the participants' expectations regarding such mobile applications. We used the conceptual model for QoE (configured as a **list of items**) as an 'experience-breakdown tool'. By using such a list, users are encouraged to reflect on their future expectations in a multidimensional way. Furthermore, it can elicit them to be more 'exhaustive' and 'creative' when thinking about optimising their experience for each of these dimensions. In addition, the list provided us with an overview of the important sub dimensions (as considered by the individual participants) for both applications. Aspects such as personalisation of content, price,

[4] Ten test users were involved in this study.
[5] The wineguide is an application that assists people in searching and finding information about wines. The application also gives the possibility to create a personal wine collection.
[6] This application allows I-City test users to share their photos with others and to tag and comment others' photos.

speed, display size etc. were found to be important. Furthermore, a number of contextual variables were found to be important. To conclude, this step was followed by a **prioritizing** exercise: the participants were asked to make a top 3 of most relevant Quality of Experience-dimensions. Examples of top 3 dimensions are speed, display size, usage context, easy navigation.

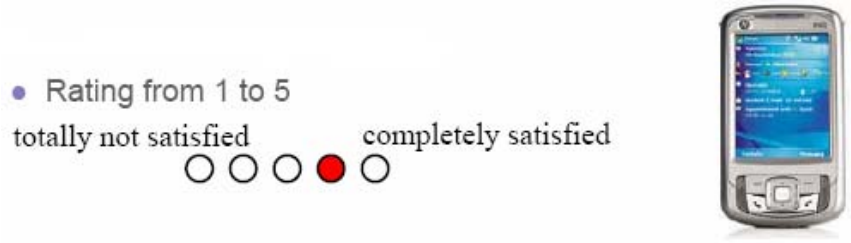
The **second phase (pre-usage)** consisted of **translation workshops** between the social scientists and engineers involved in the case-study. In one of those workshops, the parameter 'download speed' - which was found to be important in the pre-usage research -was configured by means of a photo-download application that simulates different download times (ranging from 0 to 5 seconds) by means of different 'scenarios'. The developed 'translation tool' allowed us to go beyond merely listing the important sub dimensions. The feedback given to the technical developers included the following results: the 0; 0,5; and 1 second scenario was found to be acceptable for respectively 100%, 100% and 90% of the respondents. The 3 seconds scenario was found to be acceptable for 60% of the respondents, whereas the 5 seconds scenario was found not to be acceptable for the majority (70%) of the respondents.

During the **third phase (i.e. usage)** the respondents were invited to test the selected applications. Different usage scenarios had to be completed by the test users: each scenario consisted of a number of tasks. Furthermore, the scenarios were completed under different reception levels. During usage, one parameter was continuously monitored, namely signal strength (influencing the reaction speed of the applications).

Figure 2 : illustrations of the usage phase

Immediately **after usage** (**fourth phase**) of the application for a specific scenario, the test users were asked to fill in a short experience-questionnaire of 6 questions (5-point Likert scales) on the device (PDA). The data gathered in this phase were correlated with the data from the monitoring and pre- and post-usage user research.

Figure 3: example of the questionnaire on the device

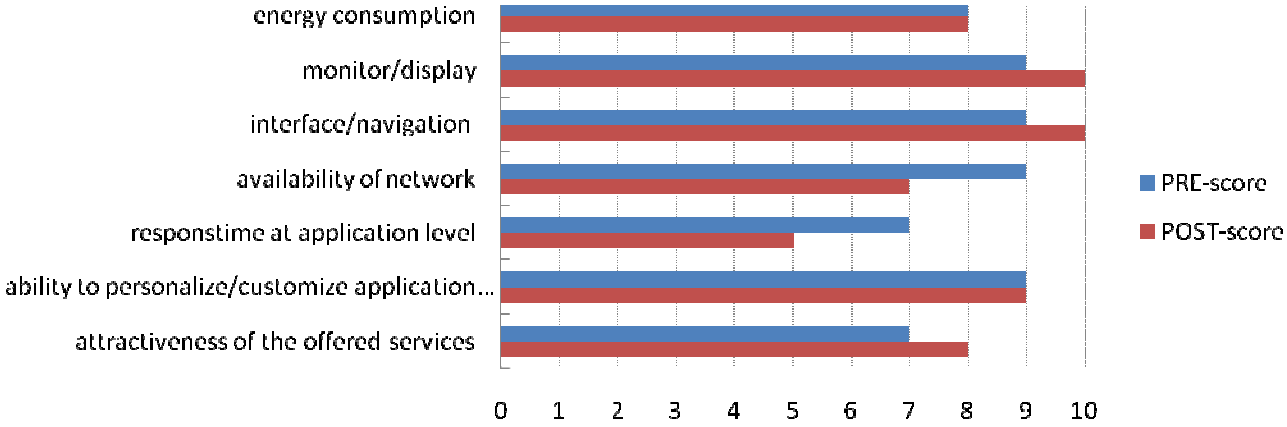


The **fifth and final phase (post-usage)** consisted of a comparison, drawing on the user information from the previous phases. Whereas we particularly focused on 'expectations' in the first phase, the emphasis was now on the participants' actual 'experiences' with the applications. We opted for **semi-qualitative group session**s in which some of the steps from the first session were repeated. Once again, the participants were asked to **freely list** the components and dimensions of a good mobile user experience. Secondly, we focused on the **conceptual model** of Quality of Experience by once again using the list of items as a means to stimulate discussion and to get an overview of the importance attached to every sub dimension. In addition, the respondents were asked to '**score**' their experience for every dimension a 10-point scale. This step was followed by a **prioritizing exercise** similar to the one used in the first phase.

This phase intends to link the pre-usage expectations to after-usage experiences in order to identify differences gaps between both. To this end, the data gathered from the usage phase and post-usage questionnaire were compared.

Let's take a look at the results for one of the respondents (respondent B, male, 30 years old), who tested the Wineguide application. The comparison of PRE- and POST usage scores for a relevant subset of dimensions, illustrate that respondent B was not very satisfied with the availability of network and the response time at the application level. On the other hand, the application exceeded his expectations for dimensions such as interface/navigation and attractiveness of the service.

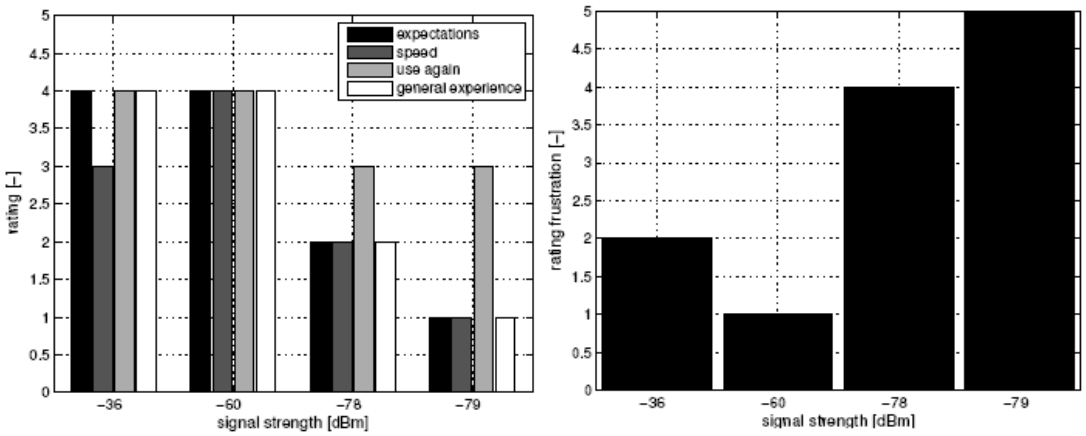
Figure 4: comparison of PRE-usage expectations and POST-usage experience on a 10 point-satisfaction scale (respondent B) (subset of dimensions)



The question is now: why was respondent B rather dissatisfied of two of the abovementioned QoE-dimensions? In order to answer this question, we need to take a look at the data from the monitoring phase and the small surveys on the device. The graph below shows the rating of the answers to the questionnaire as a function of the median signal strength: there is a gradual degration of the rating for decreasing signal strength. We can thus say that the reaction speed (influenced by the signal strength) influences person B's Quality of Experience. His user satisfaction is correlated with signal strength.

Furthermore, the second graph (on the left), shows that person B's level of frustration was higher at the first location (with best reception quality) then at the second location (with lower reception quality). This could be explained by a 'first usage frustration'. The results for the third and fourth location indicate that person B's frustration was the highest in those locations with the worst reception quality. These findings were also supported by the pre-usage reseach in which person B had mentioned the dimension 'speed' in the prioritizing exercise.

Figure 5: Results questionnaire in function of the signal strenght (left graph) and results frustration in function of the location (right graph)



Despite the small scale of these first tests, it has been exemplified how end-user experience is measured in a meaningful way by an interdisciplinary team: in this approach, both QoS-parameters and more subjective and contextual factors are taken into account.

Conclusion

In brief, this paper has focused on the growing importance and role of the user within ICT innovation processes. As mentioned above, the user's expectations, needs and experiences, have become crucial determinants for the success of new technologies. To this end, the increased importance of the Quality of Experience-concept was stressed. We presented a conceptual model for QoE and discussed one of the measurement challenges it ensues. With this we refer to the prevalent gap that still exists between the rather objective Quality of Service-parameters and the rather subjective, multidimensional interpretation of Quality of Experience.

A possible solution for bridging this gap was found in a new, interdisciplinary methodology for correlating user experience to Quality of Service. This methodology intends to take both social, contextual and technical dimensions into account. By defining the relevant QoE dimensions and by the creation of a multilayered probe model, we are able to study the correlation between the different dimensions. Furthermore, the proposed method integrates a number of fragmented traditions and findings into one meaningful, interdisciplinary approach.

Future research will focus on the validating and extension of this methodology at different levels. Based on the results from phase 1, the subset of relevant dimensions for every respondent should lead to a personalised set of questions on the device. Futhermore, for each category of probes, new modules reflecting more parameters that can be monitored during service consumption, should be added. For example, the contextual probe can exist of GPS data (environmental context), information coming from the users agenda, or user-generated information about the current mood, activities, ... To conclude, future research will also include the testing of this methodology in a living lab setting with a high number of test users and in several usage contexts.

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Author biographies

Katrien De Moor received the Master degree in Communication Sciences from Ghent University (Belgium) in 2005. Currently she works as a junior researcher at the Research Group for Media & ICT (www.mict.be), affiliated to IBBT and Ghent University. In this capacity, she is preparing a Ph.D on user involvement and the importance of Quality of Experience/user experience in ICT innovation processes.

Lieven De Marez received the Licenciate degree in Communication Sciences from Ghent University (Belgium) in 1999 and his Ph.D degree in 2006. His research focuses on segmentation forecasting and the diffusion and marketing of innovations. Currently he is affiliated to the department of Communication Sciences of the University of Ghent as a senior researcher within the research group MICT-IBBT.

Tom Deryckere received the M. Sc. degree in electrical engineering with the specialisation of micro- and optoelectronics from Ghent University (Belgium) in july 2004. The same year he started as researcher in the field of interactive media applications. His research interests are interactive applications, personalisation, User Interfaces and user experiences. He is affiliated with the department of Information Technology (INTEC) at Ghent University and working within the IBBT-WiCa research group.

Wout Joseph received the M. Sc. degree in electrical engineering from Ghent University (Belgium), in July 2000 and Ph. D. degree in March 2005. His scientific work was focused on electromagnetic exposure assessment, measuring and modelling of electromagnetic fields around base stations for mobile communications related to the health effects of the exposure to electromagnetic radiation. He is affiliated with the department of Information Technology (INTEC) at Ghent University and is senior researcher within the IBBT-WiCa research group. His professional interests are electromagnetic field exposure assessment, propagation for wireless communication systems, antennas and calibration. Furthermore, he specializes in wireless performance analysis and Quality of Experience.

Luc Martens received the MSc degree in electrical engineering and a PhD degree in development of a multi-channel hyperthermia system: electromagnetic modeling of applicators, generator design, and estimation algorithms for thermometry from Ghent University (Belgium), in July 1986 and December 1990, respectively. Since January 1991, he has been a member of the permanent staff of the Interuniversity MicroElectronics Center (IMEC), Ghent and is responsible for the research on experimental characterization of the physical layer of telecommunication systems at INTEC. Since April 1993, he has been a professor of electrical applications of electromagnetism at Ghent University.

Presentation

Bridging troubled water: Quality of Experience

In the current ICT environment, users' expectations, needs and experiences have become crucial determinants for the success of new technologies. To this end, this paper focuses on the increased importance of the Quality of Experience-concept in the context of the shift towards a more user- and 'pull'-oriented mentality. The paper presents a conceptual model for QoE and discusses the prevalent gap that still exists between QoE and QoS. A possible solution for bridging this gap was found in an exploratory interdisciplinary study on QoE-measurement, which has lead to the development of a new methodology for correlating user experience to QoS by taking into account not only technical, but also social and contextual dimensions.

Speakers

Katrien De Moor, MICT-IBBT (Ghent University)

Authors

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Lieven De Marez
Tom Deryckere
Wout Joseph
Luc Martens

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