

A Use-Qualities Approach to Judgements in Interactive Media Design

Abstract: The activity of judging design alternatives is without doubt one of the key activities for successful design work, but the criteria used for judging goodness are often implicit. This article is about how to work with 'use-qualities' when judging the goodness of interactive media systems. Use-qualities denote the attributes of artefacts in use (e.g. effectiveness, safety, awkwardness). A theoretical background to the concept of use-qualities is given, as well as examples of how to create criteria for judgements based on use-qualities. The examples are drawn from the design case a novel multimedia platform for domestic leisure use. During the design process three prototypes were developed, 56 hours of situated interviews were made in eight homes, and tests were performed with 21 users. This formed the empirical material used to identify desirable use-qualities that could be utilized as criteria for judging the goodness of design alternatives. The desirable use-qualities were also hierarchically organized to clarify them as design objectives that can be shared and discussed in a design team and among stakeholders in a project. It is finally argued that working explicitly with desirable use-qualities has the potential to increase the self-consciousness of judgement in interactive media design and that it can open up for challenge, examination, specification and revision of operative criteria.

Keywords: Interaction design, human-computer interaction, use-qualities, judgement, quality, goodness, assessment.

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Introduction

We constantly make implicit and explicit judgements of the technology around us. For designers, the activity of judging design alternatives is without doubt one of the key activities for successful design. For interactive media criticism it is the main activity, but the criteria used for goodness are often implicit. Assessments are made with varying degrees of self-consciousness, and analyses of judgements would indeed be informative. This would open up for questioning, refining and modifying the criteria used. In relation to architecture (Saunders, 1999) writes:

*And what if one called time-out and examined implicit criteria in journalistic architectural criticism?
Or at a public review of a design for a city plaza?
At a board meeting held to choose among designs for corporate tower?
[...]
In a conversation of a couple selecting a house from among several?
In all these situations, evaluations are expressed, more or less carefully and self-consciously. And in all, analyses of judgments would be illuminating—the opportunities for questioning, refining and changing operative criteria would be vast.*

This article is about judgements of interactive media systems. It contributes by giving a theoretical background to the concept of ‘use-qualities’ and it provides illustrative examples of how to create criteria for judgements. A full account of the work in the design case has also been reported elsewhere (Arvola, 2005, 2006).

The object for design in interactive media design is dynamic and experiential: ways of interacting and using a product in relation to content and in relation to other people (Arvola, 2005). The design domain of “interaction design” can be conceived as a design domain focusing on how humans relate to other humans through the mediating influence of products, systems, services, experiences, and activities (Buchanan, 2001). Designers who work in the area need to judge the goodness of particular ways for people to interact, they need to assess usage, and they need to evaluate user experiences. Properties of interaction, usage and experiences are emergent in use, and accordingly, interaction design needs to occupy itself with the qualities that the artefact—product, system, media or service—exhibits in usage (Löwgren, 2002).

Use-qualities (also called qualities-in-use) denote the attributes of interactive artefacts in use (Löwgren & Stolterman, 2004). The presence of desirable use-qualities is what defines good design of interactive artefacts (Arvola, 2005). Some of the use-qualities are objective and others are not. Some are social and yet other qualities are subjective (Paulsson & Paulsson, 1957).

Criteria for Judging Goodness in Interaction Design

Judgements in interaction design are often seen as decision points in engineering, partly due to a strong heritage to human-computer interaction (HCI) with its roots in software engineering, human factors and experimental psychology. Criteria for good design are often derived from heuristics, guidelines and design principles (ISO 9241, 1998; Nielsen & Molich, 1990; Norman, 1988; Shneiderman & Plaisant, 2005). A problem of such heuristics is that they sometimes can be difficult to apply. Another approach is to define the criteria in terms of usability goals, user experience goals, contextual usability goals, or use-qualities. The focus for this paper is on use-qualities, but the concepts of usability goals, user experience goals, and contextual usability goals will firstly be covered.

Usability goals. In the seventies and the early eighties, criteria for good design were commonly stated as “the product will be easy to use” (Tyldesley, 1988). Later on, more specific criteria for usability were used, and they included user performance, user attitude, and ease of learning (Brook, 1986). In the LEAF definition of usability, the criteria Learnability, Effectiveness, Attitude and Flexibility were used (Shackel, 1986). The main thought within this tradition is that designer approach the situation of use trying to learn what the criteria, e.g. effectiveness, mean for the particular artefact, task, user and context of use. Based on that understanding, the designers then create specific usability goals and objective measures that can be used to decide whether the goal is obtained or not.

The main industry standard of usability today is the ISO 9241 (1998), which defines usability as: “the effectiveness, efficiency and satisfaction with which specified users can achieve specified goals in particular environments”. Another, more recent, ISO-standard (ISO/IEC FDIS 9126, 2000) defines usability in terms of understandability, learnability, operability and attractiveness which leaves us with a similar list of attributes as the LEAF model, but without the catchy mnemonic. It has also been suggested to add safety, utility, and memorability to a growing list of important criteria to consider in the composition of an interaction design solution (Preece *et al.*, 2002).

User experience goals. Something interesting happened in the early nineties. It was no longer a matter of designing software that was merely useful and economically justifiable, but also delivered rich experiences in use (Winograd, 2001). Therefore another approach developed to characterize what to design for: user experience goals. This can be seen as a direct expansion of the notion of usability goals, but instead of objectively measurable attributes the focus is on subjective attributes. The list of criteria to consider is now extended to include enjoyment, fun, entertainment, helpfulness, motivation, aesthetical pleasure, support for creativity, reward, and emotional fulfilment (Preece *et al.*, 2002).

Contextual usability goals. In the late eighties and the early nineties the subjective usability approach developed into contextual design (Beyer & Holtzblatt, 1997). The meaning of the term ‘usability’ began to diversify. A deeper understanding of what made an artefact usable was developed and soon it became important to design not only for effectiveness, efficiency, and satisfaction. Interaction designers should also aim for social criteria such as co-operation, work practices, invisible work, business processes, common ground, knowledge management, professional development, fun, affection, accessibility, customization, localisation et cetera.

It is clear that the sheer number of objectives for interaction design this leaves the designer with is quite difficult to manage, and the idea of user experience goals and contextual usability goals does not seem help very much in this respect.

Use-qualities. In contrast to the other approaches described above, the use-qualities approach builds on the assumption that not all of the criteria for interaction design introduced over the years are equally relevant for every artefact. Furthermore, to meet them all in one design solution is regarded as most unlikely. The basic thought is to take a step back and ask what makes a certain artefact good to use from several different value perspectives (instrumental, aesthetical, social/communicational, constructional, ethical), and from the perspectives of different stakeholders in different situations with different purposes and expectations. Good design is defined in the interaction with society in general, including laws, legislations, agreements and norms. It is furthermore decided by basic ideological positions like democracy, culture and care for the environment. In this complex situation, the designer must fall back on his or her judgements of design alternatives. The judgements of goodness are based on an individual stance where the designer takes into account multiple value perspectives. Much of what design skills is made up by is related to this process of judging the goodness of alternatives. (Löwgren & Stolterman, 2004)

One approach to developing the skill of judgements in interaction design is to articulate models of use-quality (Holmlid, 2002). The idea is that you start with identifying the characteristics that make an interactive artefact good to use, its desirable use-qualities. This is a prescriptive approach, but you can also take a descriptive approach and identify the qualities an interactive system has in its use and

based on that, pose the question of which of those qualities that are good and which that are bad (a critical approach). This activity will in the end produce models of use-qualities for that particular interactive artefact, and based on those models the designers can give the system form in accordance to how it is put to use.

The use-quality models can also be seen as repertoires of use-qualities that are applicable to a certain genre of artefacts such as for example the Internet-based encyclopaedia. This will allow for transfer of design knowledge between artefacts within a genre. (Hult, 2003)

Multiple Aspects of Use-Qualities

Given our focus on identifying and modelling use-qualities to create criteria for judgements, it is important to remember that usage can be approached from several different perspectives. Every perspective that is taken will disclose a number of different aspects and qualities of the artefact-in-use. For example, if we are looking for practical issues, that is what we will see. If we are looking for social issues instead, we will see more of those and less of the practical issues.

Several multiple aspects models of usage of artefacts have been suggested (Paulsson & Paulsson, 1957; Löwgren & Stolterman, 1998, 2004; Ehn *et al.*, 1997; Ehn & Löwgren, 1997; Dahlbom & Mathiassen, 1993). They are similar in thought, perhaps because they all draw heavily on Aristotelian ideas in the writings of the antique architect Vitruvius. He held the opinion that good architecture is characterised by strength, utility and grace (Lambert, 1993). A building has to be strong in construction, of practical use, and graceful to the eye.

The different models are overlapping and complementary to each other. I will therefore offer a synthesis of them. The synthesis, which I suggest includes instrumental aspects, social/communicational aspects and aesthetic aspects of using an artefact. Constructional aspects and ethical aspects that also are part of the synthesized model are salient during the design and construction of an interactive artefact, but they are occasionally disclosed in usage as well.

The instrumental aspects include the usage for utilitarian and practical purposes. For example a chairs are made to sit on, and perhaps they also need to be stacked on top of each other. These are specifiable goals to be met and it is possible to assess or even measure how well and efficient these goals are met.

The social/communicational aspects are the ways in which an artefact is used in relation to other people. Artefacts shape the discourse of a dialogue between people and may facilitate intersubjectivity. For example, the way chairs and tables are placed in a lecture hall shaoe how people tend to interact with each other. Artefacts also have conventional and cultural meanings ascribed to it as a symbol and it is used and interpreted according to the traditions and institutions within a community. This also means that it is associated with authority, power and appropriateness. For example, some chairs belong in the kitchen, but not in the living room.

The aesthetic aspects present themselves in an immediate experience of an artefact. This experience preferably stands out from routine experience in a memorable and rewarding whole of unity, affect, and value which is directly fulfilling (Shusterman, 1999). It is also the contemplation upon that experience (Paulsson & Paulsson, 1957). For example, when the hand strokes over the arm of the chair. It is directed towards experiential goals of affect and meaningful whole.

Ethical aspects, such as democracy at work, have for a long time been at the core of participatory design (Ehn & Löwgren, 1997). The questions of whose voice is heard, who wins and who loses on implementing a certain design is central to that tradition. Designers should at times take a step back and reflect on his or her values, and the overall systemic consequences of the particular design project. See for example the work by Friedman (1996, 1997), and Stolterman and Nelson (Stolterman & Nelson, 2000; Nelson & Stolterman, 2003) for a further elaboration on these matters.

Constructional aspects are concerned with the material in which we design. In interaction design, it is most often the material of information technology. It is a very agile material, but there are always questions of what can and cannot be done on a certain platform within the constraints of memory size, processor speed and bandwidth. It is a question of how to put the material to best use, while maintaining performance and robustness at a reasonable cost.

Judgements of Use-Qualities

The term ‘use-qualities’ denotes the attributes of an interactive artefact-in-use. The presence of desirable use qualities is what defines high quality-in-use of products and services. Use-qualities of an artefact can be on different levels of abstraction. They can be at a high level, functioning almost as dimensions of use. Examples include, the ‘space of action’ that is set up by the artefact; the ‘changeability’ in terms of freedom to change the form, structure, or functionality of the artefact; and the ‘character’ of the artefact-in-use, in terms of the set of qualities of the actions the system is designed to mediate.

Other use-qualities are more specific descriptions of how the artefact is, or how it should be (desirable use-qualities). These specific use-qualities can be expressed in the form of adverbs, adjectives or descriptively used nouns like ‘effectiveness’, ‘elegance’ or ‘integration’. All of these statements about how an interactive system is or should be in its use can be utilized for specifying and assessing design solutions.

Use-qualities are multi-faceted and have all the different aspects described earlier; the different aspects are disclosed in acts of seeing-as. Every action or even the entire activity of using an artefact has instrumental, social/communicational, aesthetic, constructional and ethical aspects. Some actions are more easily described as being instrumental, communicational or aesthetic, while other actions are more complex and can be described in terms of any of the aspects. Therefore, when a user, designer, or other stakeholder argue that the system ought to be, for example, ‘reliable’, its ‘reliability’ should be discussed in terms of its instrumental, social/communicational, aesthetical, constructional and ethical aspects.

When use-qualities are used in a prescriptive rather than descriptive fashion, it becomes noticeable that some use-quality criteria come into conflict with each other. Should a new web application for example be easy to learn or should it be efficient to use? Not all criteria can be upheld at once. This means that there are tensions between desirable use-qualities. This will lead to violations of expectations that can produce anticipation and desires, or a sense of unease, anxiety or incompleteness. This is what Heidegger denotes *not-yet* (Coyne, 1998).

If the conflicting use-qualities cannot be resolved in design, a designer or a user will have to make a choice. An act of justifiable valuation must be made to discriminate the relative importance of the use-qualities. Which is the most important? This valuation is, however, not an expression of relativism. It is rather an expression of pluralism and most especially of self-consciousness and reflective judgements. As Saunders (1999, p. 2) writes: “It is absurd to argue about preferences; it is absurd not to argue about judgements.”

A question that in previous literature remains unclear is how to go about identifying use-qualities that can be utilised as a ground for making judgements of a solution. The remainder of this paper will, in a case study of the design of novel multimedia platforms, illustrate how traditional qualitative research methods can be put to use in identifying use-quality design objectives.

Data Collection

The focus for this paper is not on the particular data collected, but rather on the procedure of data analysis to make it useful in the design work. In all design, a solid pre-study is however essential.

To provide a solid basis for the design work in the design of a novel multimedia platform for domestic leisure use, 56 hours of situated interviews were conducted in eight homes. The term 'multimedia platform' refers here to a device for consuming, using, and managing multimedia content over different distribution channels (CD, DVD, Internet, Broadcast et.c.). The interviews took the form of technology tours (Baille *et al.*, 2003). Field notes were taken during all interviews and most of them were audio recorded (some participants did not want to be recorded). 3-hour long interviews were conducted with five participants (two male and three female), out of which two were in their late twenties, and three were forties and had children who had left home. One of these interviews was conducted as a group interview with a couple. All of these 3-hour long interviews included the discussion of some scenario of future technologies in use.

Furthermore, interviews were conducted with four elderly people about the technology they had in their homes (two male and two female). The elderly got disposable cameras, which they could use to document technology that they encountered. Resulting photos were used as material for conversation in following interviews. The researcher met with the four elderly in their homes at three occasions, and each participant was interviewed for ten to twelve hours in total.

Moreover, 21 users were observed during testing of different multimedia platforms (including three prototypes), and interviewed afterwards about their experiences. In total 7-8 hours of observations and semi-structured interviews were made during these tests. The ages of participants ranged from 21 to 30 years, and half of them were male and half of them were female. All of them were considered to have high degree of computer experience. The tests took place in environments that looked like somebody's home but it was still obvious that nobody lived there. The reason for not testing at home with the testers was that it was cumbersome to set the system up. Field notes were taken during all test sessions and seven out of 16 test sessions were recorded for closer analysis.

Design Case

As mentioned above, three prototype systems running on different multimedia platforms were developed, in order to study use-qualities of such artefacts in domestic leisure use. The first was a quiz game for digital television that utilized a novel kind of feedback for allowing the players who did not have the remote control to follow the interaction. The second was a news service for digital television that made use of two remote controls. The third prototype was a multimedia platform with multiple wirelessly connected devices (tablet computers, mobile phones, television et cetera) that was called Locomotion. It provided space for individually parallel activity but also for co-ordinated joint activity. For full account of the design of these three prototypes see (Arvola, 2005). In Figure 1 the basic situation of use for this kind of systems is depicted.



Figure 1. The Locomotion multimedia platform in use.

Above we see Locomotion in use. In this setup of the multimedia platform, it was based on two tablet computers and a computer connected to a plasma screen. Users can move media objects between the displays by a simple drag and drop. A user can also hold the tablet so that the other users can either see the screen or not. A media object can be moved the plasma screen if a user wants to make it prominent to the other. If one would want to, one can also drop it on the other's tablet.

Identifying Desirable Use-Qualities

During the design of Locomotion and other alternative multimedia platforms, much effort was put into figuring out their desirable use-qualities. The data, which was collected during testing and in interviews and observations, was essential for this process. Sketches, annotated with +/- lists, were also used to clarify desirable qualities of a multimedia platform in domestic leisure use.

The process described below in seven steps is built on the concentration and categorisation methods that are frequently used in qualitative research (Ely, 1993; Kvale, 1997).

The first step was to get a feel for the material by reading through the written up and transcribed field notes, listening or watching the recordings, and going through the sketches of design alternatives.

The second step was to find meaningful episodes in the texts where stakeholders (the designer included) expressed their view on the use of interactive systems or when observations regarding the same issue were made. The first tentative categories of use-qualities were formulated by marking expressions in the texts describing how it is or should be to use an artefact in that situation. For example, in the field notes from the empirical research made during the design of Locomotion the following episode was found and the underlined expressions were marked out.

If you have very different interests, then it's a little hard, because if one is like the worst sports geek and the other hates sports, then one think it's boring as hell when he only wants to watch sports. (Tester of a prototype)

The third step was to concentrate these meaningful episodes in the text to short phrases that expressed a central theme from the perspective of the person who it concerned, and this theme was scribbled down in the margin. In the example above the theme can be expressed as 'personal interests can hinder togetherness'.

The fourth step was to put the question of what the use should be characterised by, to the meaningful episode. Descriptive themes were transformed into prescriptive themes (e.g. 'personal interests can

hinder togetherness' was turned into the two prescriptive themes 'personal interest' and 'togetherness'). This provided an initial list of desirable use-qualities.

The fifth step was to get a more manageable set of qualities, since the number of use-qualities identified at this stage was vast. Therefore, the method of affinity diagramming was applied. This means that the categories were grouped and sorted according to their affinity to each other and higher-level categories are formed as the groups are named (Ely, 1993; Holtzblatt & Beyer, 1993). Below follows a list of the groups of use-qualities created during the design of Locomotion. Some use-qualities belonged to several groups.

- Laidback usage: comfort, effortlessnes, effectiveness, autonomy, spontaneousness.
- Engagement: challenge, personal interest, social interest, nostalgia.
- Togetherness: social interest, politeness, participation.
- Safety: participation.
- Style: identification, appropriateness, beauty, nostalgia.

The sixth step was to elaborate the different aspects of the use-qualities. The instrumental, social/communicational, aesthetic, constructional and ethical aspects of every use quality were described in order to cover all potentially meaningful aspects of them. To exemplify, the desirable quality of 'togetherness' was described in the following way:

When people meet they want to do something together, and feel togetherness with each other. Designers of multimedia platforms must be clear on what those things are so that the usage of the system can support them or at least not interfere with them. Togetherness is mainly coloured by the social aspects of usage, but instrumental, aesthetic, ethical and constructional aspects are also present in this quality. The instrumental aspects include how the mechanics of establishing and completing a joint project is performed. The aesthetic aspects emphasize the feeling of togetherness with others or lack thereof. The ethical aspects have to do with whom to include and whom to exclude from a particular joint project. Finally, the constructional aspects refer to the construction that can facilitate the participation. Can one for example build a system with smaller downloading times so that the will not be that awkward silence?

The seventh step was finally to connect every quality back to, and ground it in the empirical material by using excerpts from field notes and transcribed recordings. This makes the desirable qualities more concrete and also more convincing. For example, the description of the use-quality of 'engagement' included excerpts of users talking about 'personal interest' as well as transcripts of observations of users posing as 'challenge' to each other in games. Here we see an excerpt where players of a quiz game challenged each other by teasing:

Olof: ((reads the question aloud and answers correctly)) I got a piece! I'll just continue then. You cannot play, Kent.
Kent: Damn, you are so tedious. ((both laughs and Kent hands over the remote control)) I'll have a cookie instead.
Olof: ((answers incorrectly)) No! ((with a moaning voice, hands over the remote control))
Kent: Exactly. ((sounds pleased, hits the die, moves and gets a question)) Oh...
Olof: ((laughs and takes the remote control))
Kent: ((laughs))

The procedure described resulted in a list of desirable use-qualities based in qualitative empirical material. They were, however, not prioritized, and they are not ordered. This means that it still was difficult to work with them, since they were too many. The list of desirable use qualities were nevertheless developed specifically for multimedia platforms in domestic leisure use, and this made it

much more precise than a generic list of criteria like LEAF or the ISO 9241, where attitude and satisfaction tend to become categories for everything that does not fit anywhere else.

In order to get this unsorted list of desirable use-qualities sorted out and more manageable, the qualities need to be clarified and ordered as design objectives.

Clarifying Design Objectives

In order to get a shared view in a design team and among stakeholders, on what the essential objectives are, the objectives tree method can be used (Cross, 2000). The basic idea is to identify which qualities in the list of desirable qualities that have intrinsic value. A value is intrinsic if it cannot be justified by reference to anything else (Jones, 1992). The other desirable qualities must then be of instrumental value, which means that they are justified as means to the intrinsic values. In this way, a means-ends hierarchy can be set up between the desirable use-qualities in order to clarify them as design objectives. The objectives are clarified by posing questions of 'why?' 'how?' and 'what?' To give an example, 'why is this use-quality desirable?', 'how can it be achieved?' and 'what implicit objectives lies behind the stated ones?' This provides a hierarchical means-ends structure where some objectives are not ends in themselves, but are rather means for other objectives. The affinity groups made in the identification of desirable use-qualities were used in this analysis to provide a starting point.

The first step was to depart from the list of desirable use-qualities identified in the qualitative analysis of the empirical material.

The second step was to order that list in objectives that are of intrinsic value and objectives that are of instrumental value.

The third step was to draw an objectives tree that depicted the hierarchical relationships. The arches represent necessary means to achieve the design objectives that are of intrinsic value. Below follows an example of what an objectives tree looked like in the design of Locomotion. If the diagram is read from left to right it explains what desirable use-qualities that must be met in order to fulfil the use-quality where one started to read. For example, if one takes 'laidback usage' in Figure 2, 'comfort', 'effortlessness' and 'effectiveness' must be met. To achieve both 'comfort' and 'effortlessness' one also needs to fulfil 'spontaneousness'. If the diagrams are read from right to left they answer the question of why a quality is important. For instance, 'spontaneousness' is important as a means for 'effortlessness'. One should, however, not read the diagrams as hierarchical breakdowns of every quality. There is more to 'effortlessness' than 'spontaneousness', but the subordinate objectives are means for achieving the higher objectives.

The design objectives should be revised as the design process progresses and as you learn new things about what is needed and wanted. The unsorted list of desirable use qualities became, in this analysis, a hierarchy of objectives to design for, and that list can also be prioritised by a ranking (Cross, 2000; Jones, 1992).

Discussion

In this paper I have provided a theoretical background to the concept of 'use-qualities', and given an example of how desirable use-qualities can be identified, elaborated and clarified in empirical material and during design work. Examples have been taken from the design of novel multimedia platforms for domestic leisure use.

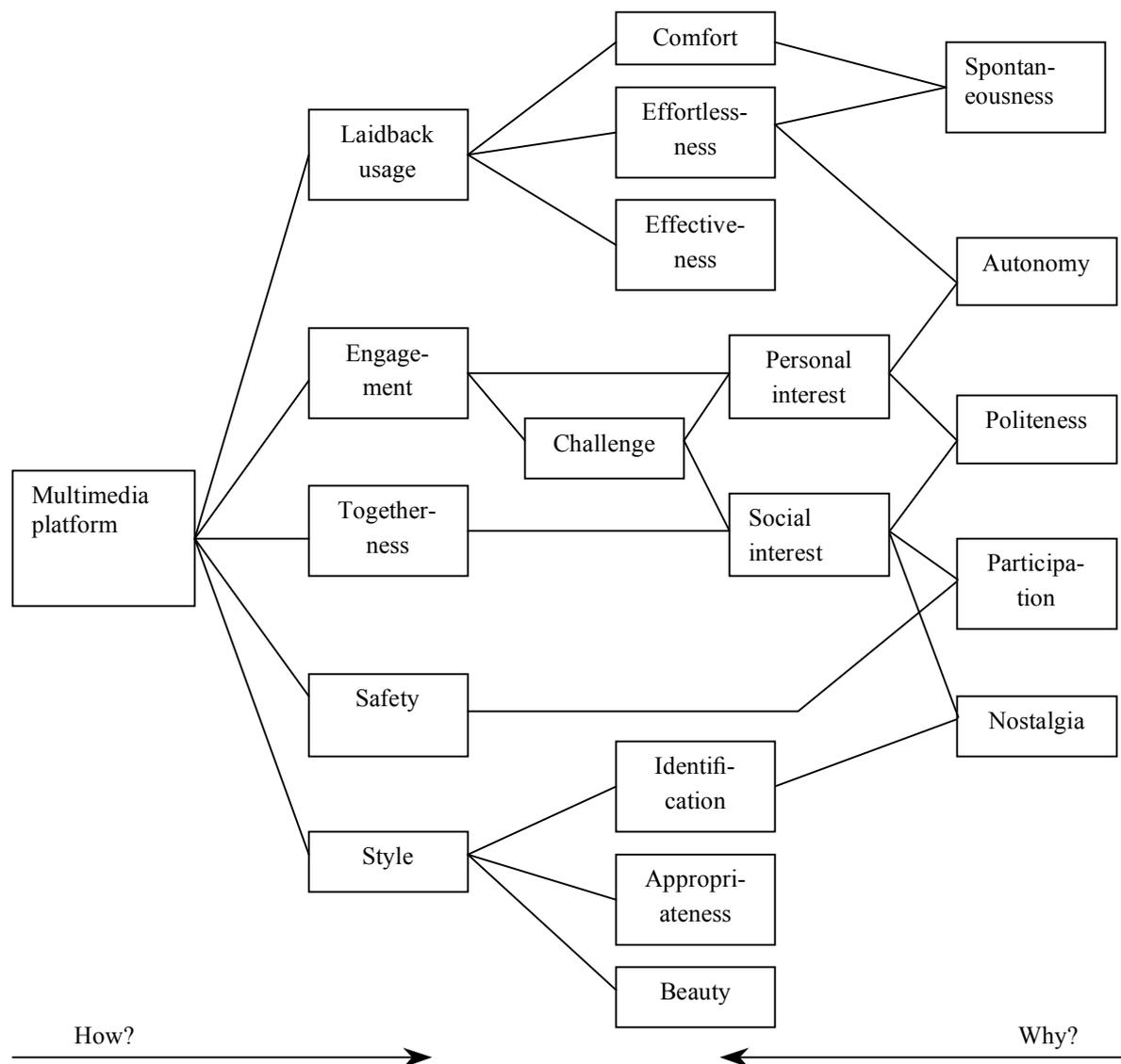


Figure 2. Objectives tree of use-qualities for a multimedia platform in domestic leisure use.

I have briefly illustrated how use-qualities can be enriched and articulated upon, by considering their instrumental, social/communicational, aesthetical, constructional and ethical aspects. This idea deserves some further attention. One can use a figure for thought that is an analogy to the refraction of light in a prism. When light is refracted through a prism the different colours of the light appear and you can see the whole colour spectrum. In an analogy the same can be made with the usage of artefacts; the usage can be refracted so that we see different aspects of usage (see Figure 3).

Every person will see the prism from a slightly different perspectives depending on their background and disposition to the world and the qualities of an artefact-in-use are hence refracted differently for each individual. Some people have an inclination to think of instrumental aspects while others tend to focus on aesthetics, for instance. To see more of the complexity in the design situation it is therefore a good idea to work jointly when identifying desirable use qualities.

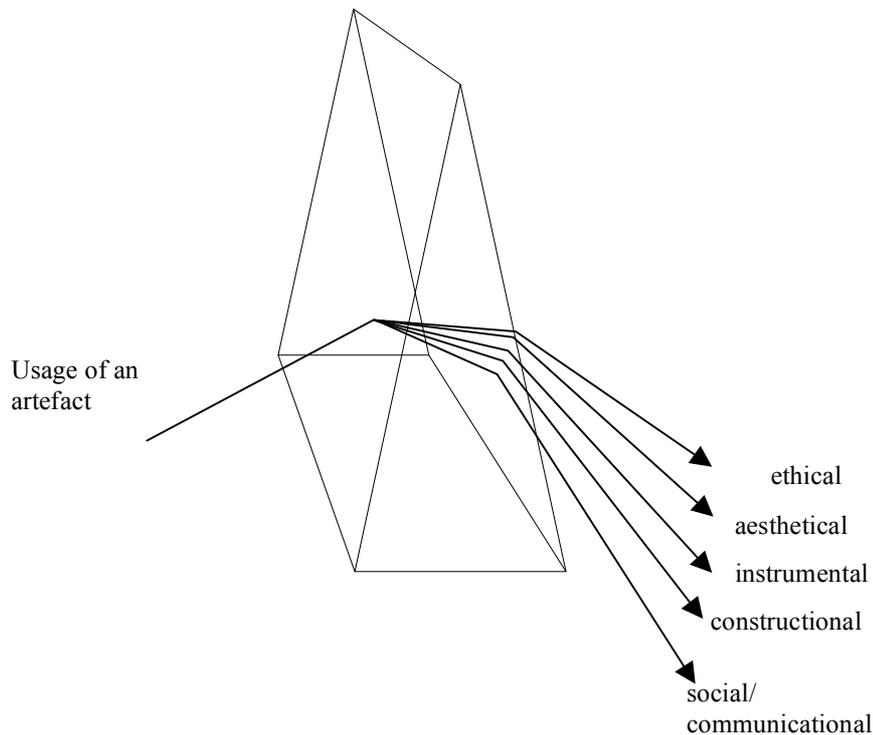


Figure 3. A prism where usage is refracted to disclose its instrumental, social/communicational, aesthetical, constructional and ethical aspects.

A hierarchical analysis of design objectives should not be seen as a hierarchical breakdown of higher order qualities to lower order. It should rather be seen as a search for means to achieve good quality in use. A quality will not automatically be fulfilled if the lower level qualities are fulfilled.

An objectives tree helps to clarify what the designers need to fulfil in their product. As Cross writes, the client who comes with a brief to a designer may know the type of product that is wanted but do not know the details, or the variants that are possible (Cross, 2000). The client may initially be even more vague. Clarifying desirable use-qualities into design objectives is necessary for the interaction designer to know what to design for, and how to assess solutions, and it can also function as communicative aid with the client. The early statements of objectives will be changed, expanded, contracted or completely replaced as the problematic situation is better understood and as design solutions are developed. In cross-functional design teams this is even more important since every designer brings his or her perspective to the design situation and this means that each and every member of the team may have conflicting or competing design objectives. Being clear on what to aim at is therefore vital to success of the design process (Jones, 1992).

It could be argued that personal responses from different stakeholders can change over time and that they therefore are an unstable ground for design. However, the apparent instability of personal responses is partly due to that the designer has not looked behind the responses to see the mechanisms that produce them for that person within his or her life-world. Instead the designer takes the expressed will or expressed need as is. In order to understand a response it is necessary to understand what it was that made a person express a will or a need in a certain way. This is where qualitative research enters as an approach in design.

Use-qualities are the attributes that characterize the use of an interactive system, but used as design objectives they are seen as the things that stakeholders in a design projects care about. However, identifying desirable use-qualities is clearly not sufficient in a pre-study. The methods presented in

this paper need to be complemented with functional analysis and conceptual modelling. Qualitative field studies is a suitable research tool for identifying what people care about (both qualities and functions), through the analysis of their motives for doing what they do, in the way they do, to the materials, things and people they do it to.

Thinking in terms of desirable use-qualities has the potential to aid when selecting, ranking and weighting criteria, when writing performance specifications, and when setting up test sessions. A good idea is to write +/- lists of pros and cons continuously during sketching on various design alternatives. These lists should refer to the desirable use-qualities and the design objectives. Sometimes the designer realizes that he or she uses other operative criteria than the ones earlier expressed, and in such moments there may be a call for a revision of the criteria. Consequently, the employment of explicit use-qualities has the potential to make the designer more self-conscious of the judgments he or she makes from one moment to the next during the process of design. Working with use-qualities opens up space for revision and insight into what the operative criteria of goodness are in interactive media design.

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