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Enjoyment: Lessons from Karasek

1. INTRODUCTION

What makes some experiences enjoyable, and other experiences not? How can we understand enjoyment in human factor design; what components should we consider when we are designing for enjoyment? This chapter explores a theoretical model for understanding the components and nature of enjoyment, and how HCI (Human Computer Interaction) professionals can predict and evaluate enjoyment. The model is a modified version of Robert Karasek's well-known demand-control-support model used in work and organisational psychology (Karsek & Theorell, 1990).

Enjoyment is a subjective experience that may be understood in relation to theories of motivation. Two distinct types of motivation to engage in an activity may be distinguished. Extrinsic motivation depends on the reinforcement value of the outcome of the activity, and parallels the idea of 'technology as tool'; in a traditional usability perspective, whether or not the technology functions as a mean to complete well-defined tasks, particularly work related tasks. Intrinsically motivated action is perceived as rewarding in it self, and is a parallel to the idea of 'technology as a toy'. In their study of motivation and computers in the workplace, Davis et al. (1992) conclude that both intrinsic and extrinsic motivation explain workers' intentions when using computers.

It is central to the understanding of user behaviour that a complex pattern of behaviour may consist of both the extrinsically motivated tasks and intrinsically motivated activity. As an example, search behaviour on the WWW will often not follow a strict goal oriented pattern. Rather the user may soon be lured away from her search task for by an interesting piece of information that diverts her attention in a joyous short-lived oasis of distraction before she returns to her original search chore; probably only to be lured away a second time. Even the most boring tasks may include refuges of intrinsically motivated activity, in the same way, joyous activities may involve the solving of extrinsically motivated tasks. These two kinds of behaviour may be close in time and space; but they still involve dissimilar sets of human factors issues and different theoretical assumptions.

1.1 Karaseks demand-control-support model

Karasek's paradigm describes a simple theoretical framework of good and healthy work. The model postulates that job satisfaction and wellbeing result not from a single aspect of the work environment, but from the joint effects of the experienced demands of the work situation, the decision latitude available to the worker, and finally the degree of social support from co-workers

and management. Job satisfaction and wellbeing occur when job demands, job decision latitude and social support, are high (Karasek & Theorell, 1990).

The goal structure of a good working life in Karasek's terms is similar to the goal structure of enjoyable activities. A good working life is not seen as the engagement in a series of well-defined tasks, achieving well-defined goals. Rather it consists of an interwoven complexity of activities in dynamic environments with several actors and conflicting interests. Jacob Nielsen (1996) has proposed that in business or work it is becoming common to cater to subjective whims and satisfaction. It is also interesting that work has been referred to as "hard fun" (Jensen, 1999). Traditional usability assessment does not address this aspect of work life at all, but is mainly focused on optimising task performance for the lonely worker in a static work environment. However, it should be noted that Shneiderman (1987) refers to "subjective satisfaction" as one of several usability goals.

We contend that the demand-control-support model will be useful in the investigation and understanding of the enjoyable experience, because the model includes components that seem to be universal in the understanding of activities associated with wellbeing. Csikszentmihalyi (1992) states: "It would be a mistake to assume that only art and leisure provide optimal experience" (p. 52). It should then be reasonable to expect that an adjusted version of the Karasekian model may help to understand and predict fun and enjoyment in human factors design. Literature on the theory of fun and enjoyment in support of the proposed model will be reviewed below.

2. DEMANDS AND ENJOYMENT: CHALLENGE AND VARIATION

Challenges and variation of procedures and tasks are regarded as important aspects of the demands of a work situation. Variation reflects the degree of an active experience, which is essential to the design of good jobs (Karasek, 1979; Karasek &Theorell, 1990). The concept of demands is understood as the degree of variation and challenge experienced by users of technology, and is also an important aspect of enjoyment. Products and services for enjoyment do not necessarily provide a given task to be performed, but rather a notion of "a good experience". The central element in the optimal experience is that the activity is a goal in itself (Csikszentmihalyi, 1992).

The concept of challenging demands is not unknown in the human factors literature. According to Skelly (1995) variation is a well-known means of exploiting the element of curiosity or surprise. It has similarly been argued that a certain degree of unpredictability is important for the experience of fun (Davenport et al., 1998). Thackara (2000) points out that future human factors design should take into consideration the fact that people enjoy being stimulated.

2.1 Challenges

"*A lot of pieces that you deal with are very straightforward … and you don't find anything exciting about them ... but there are other pieces that have some sort of challenge … those are the pieces that stay in your mind, that are the most interesting*."

Csikszentmihalyi (1992, p. 51).

Many people use their leisure and spare times to solve hard puzzles or seek out difficult actions. As an example, computer games are often experienced as fun when they have a certain level of difficulty. This can be explained by the notion that a dynamic environment is associated with

challenges that invites activity and involvement. Those users meet challenges that are stimulating and encourage creativity. The users get the opportunity to test their own skills (Holmquist, 1997).

Csikszentmihalyi (1975) refers to other examples of challenging demands: surgeons performing difficult operations or rock climbers struggling to scale an unclimbed mountain peak. Situations like these may be intensely demanding, but at the same time they may elevate the individual to a level of optimal experience or a “flow” experience: An experience that takes the individual to a state of absorbing engagement. In literature, “demands” in terms of challenges and variations are connected to the opportunity and motivation to learn (Karasek & Theorell, 1990; Jones, 2001). The opportunity to acquire mastery may promote a feeling of self-confidence and intrinsic motivation to use a particular technology.

Figure 1. *BigBrother in Norway - one of the most watched and successful TV programmes ever shown on Norwegian Television. Its popularity may be explained by the fact that BigBrother was something new and surprising.*

Correspondingly, Springel (1999) proposes that the computer is becoming a device for stimulation. Springel suggests that the growing interest in games, web-entertainment, online chat etc. foreshadows a new attitude towards media. In turn this may shape a different form of media, which directly engages and challenges users and allows them to take active roles in co-creating the new media experience. A variant of this is the concept of reality TV, such as “Big Brother". As a viewer you can vote for the participants you like or dislike. You can also choose to follow the program in different media channels such as the Internet and mobile phones and you have the opportunity to e-mail and chat with the participants in the show. The same tendency is reflected in other media channels such as MUDs (Multi User Domains). This trend is moving users away from being passive consumers to becoming active collaborators.

2.2 Variation – and the surpassing of users' expectations

In the face of routine and repetitiveness, people easily get bored. Variation may be seen as hinged on assuming a universal human interest in novelty and fascination for surprises, spontaneity, freshness and a certain degree of unpredictability. The importance of variation is congruent with the meaning of demands stated in the Karasek-model.

From a human factors perspective, the concept of variation involves the prediction that products or services with a static design, and at the same time no novelties or change, will lose users’ interest. Today we see an increasing rate in the turnover of news, trends, systems, applications and products to meet the demands of variation and something novel. Karasek and Theorell claim that “new challenges must constantly be confronted - and offering them will be a significant challenge for work designers” (Karasek & Theorell, 1990, p. 173). The same challenges will probably be significant for the human factors designer.

Unpredictability, or the element of surprise, is an important facet of variation. There are of course different levels of unpredictability. Regarding human factor design, it is unpredictability just on the edge of security, involving no more than minor risks or possible penalties, which will be of central

relevance to fun (Davenport et al., 1998). Psychoanalytic theory also emphasises the importance of risk to jokes and fun (Freud, 1960). Hassenzhal et al. (2000) state that products should have elements added in order to make them interesting, novel, or surprising. Designing for fun may involve the inclusion of something unexpected, an element of surprise and unrelated or opposing events. Surprise and unpredictability are also well-known approaches in marketing research to gauge consumer experience. Consumer experience is often understood in terms of the discrepancies between ex ante expectations of a product and the products ex post performance. The best predictors of a good experience are when the product actually exceeds the users' expectations (Oliver, 1981).

Unpredictability and challenges may partially be in conflict with principles of traditional usability (Hassenzahl et al., 2000). Making something as simple as possible may make it boring. In the Karasek model the importance of the joint effects of demands and decision latitude is addressed. Karasek (1979) stresses the importance of matching challenges with individual skills and control. Csikszentmihalyi (1975) states that "flow" requires a subtle balance of not being too simple and not being too challenging. Demands without the experience of control will result in a stressful and frustrating experience, rather than the experiences of joy. Decision latitude or control without any demands will probably imply a passive and probably boring interaction. An enjoyable experience is dependent on the balance between demands and control.

3. DECISION LATITUDE AND ENJOYMENT: SKILL DISCRETION AND DECISON AUTHORITY

User control is regarded as an important aspect of an enjoyable experience and is addressed through the concept of decision latitude. In consonance with the Karasek model, the concept is defined as including two aspects: the ability to use and develop skills, and the availability of decision-making authority or freedom of action. Decision latitude can also be seen in the light of engagement, a concept discussed by Brenda Laurel (1991). Engagement refers to the user's feeling of being in control of the interaction. Laurel writes about computer fiction, games, etc. and addresses the subject "I" who interacts in a virtual world. There should be nothing to mediate the communication between the user and the system. "I do, what I myself want and feel involved in what I am doing." (p. 116). Laurel suggests that the frequency of interaction, the range of possible alternatives available for selection at a given time and the effectiveness of the inputs influence engagement. The interface should enable the user to see the effects of her or his actions, to give a sense of agency or personal power.

3.1 Skill discretion: the opportunity to use and develop skills

Getting to use one's own skills to the fullest range possible helps to make activities enjoyable. Everyone knows the truly intrinsic joy attached to engagement in activities that invite the utilisation of acquired skills. The ability to use and develop skills may be seen as related to the term "self-efficacy". Within social cognitive theory self-efficacy is the belief "in one's capabilities to organise and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Self-efficacy involves monitoring and evaluation one's own actions, and influences thereby the individual's decision about what activities to engage in, whether to proceed with the activity when faced with obstacles, and the mastery of that particular activity. Self-efficacy is not a measure of skill, but is closely related to the likelihood of the individual to reach the ability to use a given technology at a level of contentment. Factors such as unwanted complexity, unrealistic tolls on the knowledge of potential users, and other comfort issues faced by the users, may be construed as self-efficacy deficits. Low self-efficacy is likely to mean that the use of technology is not perceived as rewarding, following which it is less likely that the technology will be used in the future (Eastin & LaRose, 2000).

Conversely, high self-efficacy will be correlated with the tendency of increased technology use, and also the development of skill and mastery.

The development of skills may be seen as a path winding from the first faint attempts of the novice, to the full-blown repertoire of skills of the expert. Dreyfus et al. (1986) describe progress from novice to expert as going through qualitatively different stages; from early efforts of learning rules and repetitive training, to the non-reflective mastery of the expert. As skills develop, the engaged-in activities will gradually become intrinsically satisfying.

3.2 The decision-making authority of the user

According to Karasek, elevating the level of the decision-making authority of the worker improves wellbeing at work. Similarly, providing the user with extended powers of decision-making may enhance the fun experienced in a user-technology interaction. The level of decision-making authority of the user is a consequence of constraints inherent in the relation between the user and the technology. Unlike constraints on decision-making in a workplace, rules, strict routines, organisational hierarchy and repetitiveness, the constraints of the user-technology relation are a consequence of the user not seeing or understanding the possibilities represented by the technology. Choi et al. (1999) address this point in their analysis of computer-game design factors. They suggest that fun computer games are characterised by the gamers freedom and leadership in the progression of the game's story. In order to make possible the leadership of the gamer, computer-games must give hints in a manner the gamers can perceive and understand. This, of course, without giving away the complete solution to the game.

Another example of user control is the opportunity of "fun design" through personalization of the technology. "Personalization" of technology may be said to have its genesis in a 1993 book by marketing experts Don Peppers and Martha Rogers called "The One to One Future", arguing for the possibility of selling in different ways to each customer. Nokia have served their users with products they can personalize with tremendous success.

In the case of, for example, the Nokia 3350, users can personalize their phones by using a ringing tone as an SMS alert or compose their own SMS alerts for originality. A picture editor allows users to create and personalize picture messages for all occasions. The phone's rhythmic backlight alert accompanying a ringing tone also makes it fun to receive a call. Users can also opt for a fully personalized look by downloading profile names, logos and ringing tones. Other personalization options include an exclusive range of changeable Xpress-on covers in new and exciting colours.

These opportunities to personalize the technology give the user decision-making authority over the technology. It enables the user to influence and to create their own experience in a dialogue with the technology. The role of personalization may also be seen in relation to another phenomena, social cohesion or social identity; that you give the user a feeling of being part of a group, which will be discussed further in section 4.2.

4. SOCIAL SUPPORT AS ENJOYMENT: CO-ACTIVITY AND SOCIAL COHESION

Many leisure activities may be characterised as socialising. Thackara (2000) states that providing the user with a sort of community is important in design for a good user experience. Also an awareness of the conditions that support enjoyable social interaction is important in the design of systems (Monk, 2000). The parallel in Karasek is social support. Karasek and Theorell (1990) define social support as "the overall levels of helpful social interaction available on the job from both co-workers

and supervisors" (p.69). Two element of this may be useful in explaining enjoyment: co-activity and social cohesion.

4.1 Co-activity

The concept of co-activity implies collective action; a user's social behaviour, not just human-computer interaction as a single user of the system. User studies have pinpointed the fun of doing things together (Mäkelä & Battarbee, 1999; Mäkelä et al. 2000; Battarbee et al., 2000), and technology that promotes an opportunity for social interaction probably supports an enjoyable user experience.

Figure 2. *Game boy Advanced: with multi-player opportunities*

Communication and interaction are identified as user top choices on the Internet (December, 1996). Likewise, the spread and use of mobile telephones can be seen as an example of a social need. Studies indicate that young people and adults use mobile telephones differently, where young people engage in expressive rather than informative use (Ling, 1999). A Swedish field study that mapped the use of mobile telephones among youngsters, found that both the mobile phone and the information on it is often shared among users and made public in various ways. Young people use mobile phones for doing things together in collaborative, social action, rather than task-related communication (Weilenmann & Larsson, 2000). The sharing of experiences, feelings and information is considered to be rewarding, pleasant and enjoyable. However, there may also be an element of competition or contest, which by nature is seen in relation to fun. Studies show that young people are likely to use the computer for playing games together, rather than playing in isolation (Wartella et al., 2000). These findings may be explained by the social facilitation effect; it is easier, and more rewarding and motivating to do things in the presence of others, because mere presence of others is arousing (Zajonc, 1965). Children play more enthusiastically if a playmate is near by, even if only engaged in parallel play

4.2 Social cohesion

Social cohesion is related to a social expression of your being part of or attracted to a community. Social psychologists define cohesion as the attraction towards the group and motivation to participate in the activities of a group (Cartwright & Zander, 1960,). Being part of groups with high levels of social cohesiveness is positively related to individual wellbeing (Sonnentag, 1996). The term affiliation is related to social cohesion. Affiliation occurs because social contact is rewarding. The rewarding aspect of affiliation includes emotional happiness and cognitive stimulation, opportunity for self-confirmation through the attention of others, opportunity for relevant self-knowledge through social comparison, and the opportunity of emotional support and sympathy (Hogg & Abrams, 1993). Individually experienced rewards associated with social cohesion may be important

to understand fun in human factors design. Mäkelä et al. (2000) found that children use digital images for joking, storytelling and sharing art. One of the purposes of sending images seemed to be to maintain attraction between group members. The social nature of technology use is also reflected in the boom of communities of young media users who create their own web pages (Wartella et al., 2000). Such personal online publishing offers a fun way for young people to connect with their peers and others interested in the same topic. Jordan (1997) considers 'pleasure with products' to be characterised by social relations and communication enabled by the product. These products bring people together and provide topics of discussion or conversation (see also Reed in this volume).

Interactive technology is not, and should not be, socially isolating. On the contrary, it should be used for important social activity. High levels of social support are, according to Karasek and Theorell (1990), important in providing favourable effects in the interaction between demands and decision latitude. Human factors design should focus on the development of design, which provides more social opportunities, to facilitate enjoyable experiences.

5. CONCLUSION

Karasek's demands-control-support model, which predicts wellbeing and motivation in the context of work, is useful for understanding enjoyment in human factors design. When designing for enjoyment, professionals should consider demands, but at the same time allow a high degree of decision latitude and socially rewarding activity. The factors of demands and decision latitude have been treated separately, but it is important to address the crucial interaction effects between these. It has been explained that an enjoyable user-technology interaction depends on the interaction effects of challenge and use and development of skills, as well as variation and the enabling of the decision-making authority of the user. How these joint effects enable an enjoyable experience will of course depend on the context (see Blyth and Hassenzhal elsewhere in this volume) In addition, the effects of co-activity and design in support of social cohesion have been discussed. On this basis, three implications for human factor design to create an enjoying technology may be formulated:

1. ***User control and participation, with appropriate challenges***: To enjoy technology the user should be enabled to carry out challenging activities. These activities should attract the user's attention and test his or her skills. Besides being challenging the design should allow the user to feel in control of the interaction. The user also needs to see the effects of her actions in order to give a sense of agency or personal power. To give the users an experience of active participation is central to an enjoyable experience.
2. ***Variation and multiple opportunities*:** The user should be provided with a high level of variation by offering multiple possibilities and services. There should be an opportunity to personalise the product. This should be under direct user control, where the user explicitly selects between certain options. A key point is to give the user more than they actually expect.
3. ***Social opportunities in terms of co-activity and social cohesion****:* The technology should give the user a feeling of being part of a group. The technology should also strive to give the opportunity of doing things together in social activities. A socially rewarding environment is necessary and essential for all humans, also when it comes to enjoyment.

Future research should focus on the development of reliable and valid measures of the factors and aspects that have been introduced. In addition, the question of integrating knowledge and the evaluation of fun in the design process will be a major challenge in the future.

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