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Persuasive GERONtechnology: An Introduction

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Abstract. The motivationally positive property of technologies has both a functional and an attractiveness component. The first one concerns the use of interactive technology to encourage or discourage specific behaviours by controlling the conditions under which they occur. Riding a motorcycle for the excitement, is a good example of the second component.

*Geron*technology, as a service of human health and well-being during development and aging, has been defined in 1991. After 15 years it is time to view the persuasiveness of current and future practices to focus our behaviour and attitude towards a lifespan with enlarged vitality and independence.

1 It Started from Ergonomics

Definitions of technology and aging range from assistive technology, computerized health care, or technology to serve aged persons, to a broader definition encompassing quality of life through the whole life span. In the last case the aim is a technology for a maximum of vital and independent years [1]. It is this approach, first formulated in 1991 in Eindhoven (the Netherlands) and designated gerontechnology, that appears to be especially legitimate in our changing, aging society with its call for extending working phases of life, and reducing costs of care in the later life periods. It is an interdisciplinary effort contributed to by many established scientific and technological disciplines.

Although a young domain, gerontechnology pertaining to the whole life span of man, has already been the subject of a number of studies. Dedicated international conferences were held [2-6], books published [7-8], and a journal erected [9]. A search in general literature databases from the year 2000 onwards [10], revealed another 31 publications (6 in gerontology or ergonomics journals, 15 in other journals, and 10 in conference proceedings).

Most of this published work in gerontechnology focuses on ergonomics. The assumption is that the technology we have, exists and will be used whether it is easy to use or not, e.g., the ATM machine, the automatic telephone menus, or the train-ticket machine that also older persons cannot escape from. Ergonomics deals with making the task of using these machines easier to perform, either by training or improved design or both. However, the motivation to use the technology is assumed. We need access to our money, we need to carry out tasks that use the telephone, and we want to take a train for leisure or work. Persuasive technology extends the depth of analysis of the motivational aspect of technology. It brings more focus to the attractiveness component.

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2 Elderly Participation

The theoretical framework for the gerontechnology domain consists of a matrix with 'Domains of human activity' and 'Technology intervention or impact level' as its 2 dimensions [11].

The question of motivational properties of technology is addressed in the enhancement and satisfaction level of gerontechnological intervention. This is shown by 2 of the 3 design cases in this session: the personal navigation tool of McCreadie et al. [12] and the story telling table of Knipscheer et al. [13,14]. In these cases, active participation in the design process of the target group, the older persons, was realized. The designers aimed at changes in behaviour, such as increased exercise or communication levels, through compensation of failing abilities or restrictions (a different impact level in the gerontechnology matrix). Objective assessment did not show such changes.

To the surprise of the designers, the participation of the end-user in the design of the navigation tool shifted the aim. What was initially meant to be a device focussed on way-finding is slowly becoming a companion for commentary about (interesting) locations!

As to the story table, the cooperative designing process not only changed the outcome of the story table, the process itself caused a major increase in social intercourse and conversation in the assisted living facility where it took place [14]. This is archived in 92 consecutive pictures (http://gallery.waag.org/verhalentafel). Social intercourse needs attractive content in addition to means. Bidirectional video and audio between housebound elders and their friends in the senior centre worked, where e-mailing and chatting with the anonymous internet world lagged behind [11].

The smart pill box of Sterns & Mayhorn [15], the third design case in this session, is an example of 'Support of care and care organisation' as the technological impact level. It is a good example of an upgraded ergonomics approach. Participation of older persons in the design process is more limited, and motivation to take the pills is taken for granted. But the smart technology in a PDA is enjoyed by some of the older users. Fozard & Kearns [11], in their overview, mention other developments in medication adherence, such as the 'Health Buddy' that elicits changes in attitude of the older user.

3 Technology Aided and Traditional Health Interventions

Fogg [16] has defined persuasive technology as: 'interactive computing systems designed to change people's attitudes and behaviours'. De Kort at al. introduced the concept in the domain of Gerontechnology [17] without emphasising the role of older persons as co-designers.

Apparently, we are at the beginning of a new line of thought. Persuasive technology examines more closely how gerontechnology can exert its motivational effects, either through the attractiveness of the technology or the growing ability of interactive technology to shape behaviour. Active participation of older persons in the design process appears to be a key factor in effective persuasion, probably since it bridges the technology-generation gap between older users and younger designers.

Little research has been done in comparing technology based interventions designed to improve life style to 'traditional' approaches. Can technology based interventions do a better job? None of the 3 design examples objectively showed life changes by technologically influencing attitude and behaviour of older persons. But both the personal navigation tool [12] and the story telling table [13] arouse attractiveness feelings in older persons comparable to the excitement that riding a motor cycle does in some people. Interestingly this is comparable to some earlier classical computerless health promotion programs, e.g., in one measured dietary behaviour did not improve as a result of the intervention but over half of the older persons liked the health education program [18].

4 It Ends in Motivation

Persuasiveness originates from the end-users, the older persons themselves, and is included through active participation in the design process. It might result in designs different from the first intentions of the designers, but with increased attractiveness and functionality. The strongest example mentioned in the overview of Fozard & Kearns [11], Fred's motivation and changed attitude, is still a view in the future. Motivation, credibility, trust, control, ethics, ambient awareness, and intelligent agents are issues that need more attention if we are to attain gerontechnology's goal of vitality and independence up to the highest possible age.

This session will show that a start has been made, but that it is still a long way to a real persuasive gerontechnology that brings joy, leaves individuals master of their own situation, and does a better job than the 'traditional approaches' to improve life style. Already Fogg [16] devoted a whole chapter on the ethics of persuasion through technology. Persuasive *geron*technology, as a collaboration of the two new domains of gerontechnology and persuasive technology, could become a breakthrough in our handling of aging issues in society. The role of experience and motivation of older persons in exploiting technological change will remain basic in research and design.

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