

THE DIFFUSION OF HIGH-TECH SOCIAL INNOVATIONS AMONG SENIOR CONSUMERS

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Abstract

The current literature on diffusion of innovations mostly focuses on adoption behavior of younger generations of consumers (Rogers, 1995). Research in this area has rarely investigated how innovations are diffused among older generations, mainly because these latter have not been viewed as early adopters compared with their younger counterparts. The economic and social impact of the demographic ageing of population in Europe forces European policy makers to encourage firms to increase research and development on new products and services which provide social benefits to the senior population. We hereby present findings based on two exploratory studies which were funded by the European Commission. The first one captures through non-participative focus group observation the perceptions of high-tech innovations of 15 senior consumers. The second study consists in a series of semi-structured interviews with 50 technology enablers in order to better understand the firms' approach in developing high-tech innovations for senior consumers. This paper brings new insights into how senior consumers perceive a particular social innovation and how firms apprehend the development of social innovations geared toward senior consumers. The findings hold important implications for practitioners.

Key words: diffusion of high-tech innovations, senior consumers, technology enablers

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1. Introduction

The rapid evolution of Information and Communication Technologies (ICT) require equally rapid adjustment from its users. It is generally accepted that young generations of users (generations X and Y) are faster than their older counterparts in adopting and subsequent active use of technological innovations (Morris & Venkatesh, 2000; Rogers, 1995). Especially the so-called Generation Y representatives own computers, cell phones, MP3 players, use

instant messaging on a daily basis and are capable of active and passive multitasking. In contrary, senior consumers display a much higher level of anxiety when using new technologies and information systems (Laguna & Babcock, 1997), which is partly due to their declining physical and cognitive abilities (Grundy, Ahlburg, Ali, Breeze, & Sloggett, 1999). Therefore, in general, the senior consumer has greater difficulties in using computers (Eilers, 1989). Though, despite the need to better understand the adoption behavior of elderly users, little is found in the current technology adoption literature in this area. As a result, practitioners and policy makers have little clue on how to increase the adoption of new technologies by senior users. This research attempts to fill the gap in the literature by bringing more insights into the relationships between senior consumers and technology adoption.

1.1. Worldwide population ageing and disability rise challenges

Our modern societies based on the widespread presence of ICTs in everyday life cannot exclude senior citizens from the “community” which is increasingly based on the capacity of its individual members to be “ICT present”. The fast growing population of senior citizens (65+) is expected to be 2 Billion, that is approximately 22 per cent of the worldwide population by 2050. The highest proportions of senior citizens are present in the post-industrial countries (the Triad and OECD): over one fifth of the population is currently aged 65+ and it will become nearly one third by 2050 (see statistics for Europe in Figure 1).

Figure 1: European population by age groups, 1950-2050

	in 1000					in % of total population				
	1950	1970	1995	2025	2050	1950	1970	1995	2025	2050
Age 0-14	143,175	166,367	139,464	103,212	90,430	26.2	25.3	19.2	14.7	14.4
Age 15-64	359,162	421,432	487,110	451,599	364,277	65.6	64.2	66.9	64.3	58.0
Age 65+	44,981	68,642	101,338	147,524	172,985	8.2	10.5	13.9	21.0	27.6
Age 75+	14,553	22,762	38,139	63,663	91,343	2.7	3.5	5.2	9.1	14.6
Total	547,318	656,441	727,912	702,335	627,691	100.0	100.0	100.0	100.0	100.0

Source: 1998 UN World Population Prospects

As for any kind of disability, it affects 15-20% of every country's population and it is estimated that there are at least 650 million people with disabilities worldwide. The total number of the population between 16 and 64 years old with a long-standing health problem or a disability (LSHPD) in the 25 member states of the European Union is estimated at 45 million citizens. Cognitive disabilities may result from a range of disorders including Parkinson's disease, motor visual and hearing impairments or progressive degenerative illnesses such as Alzheimer disease. The ageing of the population together with growing proportion of the disabled are the key macro-economic and social issues underlying the growing need for technology services adaptation to the specific perceptual and mobility abilities and cognitive status of the seniors and the disabled.

1.2. Connecting senior ICT users: smart homes interfaces

Smart homes are expected to promote independence and enhance living experience for the elderly as well as the disabled. They should be able to monitor users in a nonintrusive way to create a safe environment as well as support daily routine tasks, e.g. medication intake, cooking, and operating household appliances. In order to achieve this goal, user interface technologies will have to meet the needs of users and tasks.

Caradec (2001) claims that ageing is not any different from 'normal behaviour'. Surveys and studies that oppose the effects of age to so-called 'generation effects' are in our view biased as age cannot be held accountable for the non-use or infrequent use of ICT by itself. An explanation of why some elderly people acquire and use certain equipment in spite of their age must be based on a more thorough and comprehensive basis. It should include their past professional access to the ICT and technological innovation in general. Furthermore frequency of ICT use should differentiate between experience and expertise. Indeed, both experience and level of expertise determines affinities or rejections towards technological innovations (Caradec, 2001). Furthermore, the senior citizens' lifestyle is structured by the level and intensity of their social and cultural activities. Their social proactivity plays an important role in their ICT appropriation process. High level of sociability triggers and/or

expands their open-mindedness towards technological innovations (Roupa et al., 2010). Finally, disability theorist Marks (1999) has formulated the following insight: “people's level of independence should relate to their autonomy and control over their own lives, rather than on the ability to perform particular technical activities.”

2. Material & Methodology

We hereby present partial results of two studies on the needs of senior ICT users including perceptions concerning emerging Web & TV platforms and services (connected TVs or Set-Top Boxes), and the current practices of technology enablers in developing adaptive technologies for this segment of population. The research was conducted within the European Research and Technological Development Project GUIDE ("Gentle user interfaces for elderly people") and consisted of two studies:

1. The first study consisted of in-depth interviews of 24 senior consumers of television-related products (10 males and 14 females), all with mild to moderate visual, hearing, motor and/or cognitive disability. The objective of the interviews was: (1) to identify their needs and requirements in different areas with specific mention to perceptual and mobility abilities and cognitive status; and (2) to obtain information about their attitudes towards new technologies. The interview has been administered by two different psychologists with background in neuropsychology discipline. It has been a face-to-face interview, individually administered.
2. The second study consisted of a small survey and two focus groups of technology enablers. The objective was to better understand their perceptions of the challenges in developing new technologies for senior consumers.

4. Results & Findings

The first series of interviews revealed that senior consumers tend to have a defensive attitude toward new technologies:

- a. They are mostly impressed by new technologies and have a preference for older versions with simpler functionalities;
- b. They seem to be skeptical about the latest technologies and are reluctant to use them;
- c. Though, interestingly they realize that they need to learn more about using new technologies if they want to benefit from improved product experience.

- d. They tend to phone their enlarged younger family members as soon as they don't understand technology interface commands or reactions.

Mastery of sophisticated functions on emerging Web & TV platforms and services' interfaces is limited the most among seniors compared to the younger user groups. The high level of technological sophistication does not seem to match the needs of their potential senior users. It even detracts them from products that could satisfy needs because they perceive their functionalities as inappropriate and 'overdesigned'. This confirms previous findings by Conte (2001) that senior ICT users show a clear reluctance to adopt excessively sophisticated technologies or functionalities. Demiris et al. (2004) also found that smart technologies have been underutilised by the senior generation (Demiris et al. 2004). Mann et al. (2007) reports similar concerns about the user-friendliness of devices designed for seniors despite their general overall positive attitude towards smart technologies. In conclusion, senior consumers' attitude toward new technologies is dictated by a preference for simpler functionalities, yet they realize that new technologies can improve their product experience and overall ICT expertise.

The second study shows that technology enablers understand the need to adapt new technologies to the behavior of senior consumers, which may consist in more static and standard user-interface with intuitive control systems. Both the survey and the focus groups show that the interface is a key to adoption and should be at least as important as the new service or product itself. The main challenge is to adapt the interface of a new product or service to the specific cognitive style of senior consumers while allowing them to access the same advanced functionalities as to younger consumers. All participants in the two focus groups agreed that most technology enablers do not invest in the development of senior-specific interfaces mainly because of three reasons:

- a. The cycle of new products or services is shortening, which means that the investment in adapting interfaces to seniors more costly;
- b. Senior consumers are often technology-skeptics and tend to have lower willingness to pay for new technologies;
- c. Senior consumers often do not adopt a new product or service before they get feedback from a reliable reference group, which lengthens the time of adoption (early adoption is often critical to new products and services targeted at younger users).

5. Discussion & Conclusion

This research, yet limited in scope, shows that the individual needs of these consumers are even more diverse than those of their younger counterparts. Although we didn't aim to exhaustively cover economical variables such as cost, we are well aware that developing tailor-made individual solutions would be cost prohibitive. Assistive high-tech innovative devices should attempt to remain broadly tailored to the general needs of senior users. It is with no doubt a worthwhile task given the current and future worldwide demographics.

As it has been already mentioned above, it is widely accepted that older generation comparatively to the younger ones show low adjustment to the advent of new technologies, either because they are not technologically savvy or because of their current health status. It is in our view erroneous to continue to apply the classical model of technological innovation adoption to the 65+ advanced ICT users. They simply do not follow it, i.e. they are not pioneers or early adopters who are later imitated by their age group peers. They tend to rely heavily on “trustworthy” individuals recruited among younger technologically savvy members of their enlarged family group or friends. It would be erroneous to target ICT users aged 65+ with incentives for “impulse” purchasing act as they tend to consider carefully the usefulness of acquiring a new device. According to Marris and Galland (2004) that senior individuals follow a different mental process of adoption of ICT devices based on a triple “personal equation” of three weighed variables: its usefulness, its features and duration of learning process and its correspondence to social norms. We suggest that technology enablers should better control the technological obsolescence and broaden their offer of devices with simplified interfaces providing a broad panel of functionalities. They should further involve senior ICT users in the conception loop.

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