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A USER-ORIENTED POLICY FOR ICT ACCEPTANCE: THE 'RELATIVE UTILITY' APPROACH

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Abstract

Business strategies and policies which proved to be successful in increasing internet penetration in the early days may no longer be appropriate. This is likely to be highly probable in countries where the majority of people are already connected to the internet. As more people have the ability to be connected online, it becomes more likely that the remaining fraction of non-adopters is either difficult to convince, under-skilled or simply lacking the financial resources to afford a connection. In view of this problem, this paper proposes a policy approach aimed at increasing personal computer and internet acceptance in collaboration with industry. The measures developed within this approach are based on strategies of segmentation and differentiation. This entails the specific targeting of product offerings towards different socio-demographic groups within the population. In addition, our approach not only concentrates on removing barriers, as most e-inclusion policies do, but also at increasing the value of ICT for end-users. This approach is based on a project that applied both qualitative and quantitative research methods in an investigation to determine the relationship between the socio-demographic and socio-economic characteristics of non-adopters. In addition, it also looked at, their profile in terms of access levels, ICT skills and attitudes towards ICT and their requirements and expectations (if any) with reference to ICT. In this paper we show, firstly, that members of homogeneous socio-demographic and socio-economic groups indeed share similar characteristics in terms of access, skills and attitudes and, secondly, that these groups can be effectively reached by policy makers and businesses with specific product offerings.

Keywords: E-inclusion, digital divide, user research, policy, personal computer & internet penetration, ICT literacy

1. Introduction

E-inclusion is one of the dimensions of policies relating to overall inclusion and cohesion. According to the meaning determined by the European Commission, e-inclusion contains a twofold approach [eInclusion@EU, 2004: 3]: Firstly, it focuses on preventing exclusion. This means that policies should prevent the leaving behind of disadvantaged people in the development of the information society. Secondly, e-inclusion refers to exploiting new technological opportunities in order to provide better inclusion of socially disadvantaged people or groups, or less favoured areas. In brief, e-inclusion refers to policies that enhance participation in society by means of ICT [Kaplan, 2005].

In view of the pervasiveness of ICT in society and our increasing dependence on ICT in everyday life, the goal of any 'information society' policy should be to achieve full internet access for all. This may require a continuous effort on behalf of policy makers. ICT inequalities are not likely to diminish or disappear of their own accord. In societies that have already achieved high levels of internet penetration, this may be determined by specific measures which differ to those adopted in the early days of the internet. The remaining non-adopters may be structurally lacking financial resources in order to afford the internet, they may be poorly educated or under-skilled or it may be difficult to convince them to use the internet because they fear the technology or simply because they resent using it. In this paper we propose the findings of a research project that aimed at developing policy measures suitable for this context.

Our approach is characterized by two main features. Firstly, unlike many e-inclusion policies, our approach not only aims at removing barriers but equally, or alternatively, at increasing the value of ICT for end-users. Secondly, the measures developed within this approach are specifically targeted towards different segments of the population, the assumption being that by focusing on specific groups (with low adoption rates) the proposed measures will be more effective and less expensive than generic policy measures.

The approach was conceived from a confrontation between theory and political practice. This has affected the way in which we set up and conducted our research. In the first section of this article we outline these practical considerations. In the second section we describe our theoretical assumptions and their methodological elaboration. The third section summarizes the main findings of our survey and evaluates their significance.

2. Field Experience

The Federal Agency for Information and Communication Technology (Fedict) in Belgium is currently studying policy options based on our research. One of the possibilities being considered is the provision, through commercial outlets, of cheap customizable starter packages to people who are not yet connected to the internet at home. The offer would consist of a PC and internet connection, a free training session plus free access to a personalized information page. This campaign would have to be coordinated with telecommunications service providers, equipment manufacturers as well as professional and social organizations which are representative of particular categories of users.

The basic package would be offered to the general public through ordinary commercial outlets on a non-discriminatory basis. However, most importantly, in addition, customized packages would be offered to specific user groups so as to

accommodate the needs of specific segments of the population. The composition of these packages would be negotiated between professional organizations, industry and the government. It is expected that the measures developed within our 'relative utility' approach will be more effective and relatively less expensive than the previous action on which it is partially inspired, the 'Internet for All' project of the Belgian government in 2006.

The 'Internet for All' campaign consisted of providing one affordable package deal to potential buyers, consisting of a PC, an internet connection plus a training session. The main 'political' difficulty was to convince industry (PC manufacturers, ISPs and retailers) to participate. Eventually, three consortia consisting of well-known PC manufacturers and ISPs offered a package. The main resistance was from the organization of small retailers, who feared that the low profit margins would cause an unacceptable loss of income. After evaluation, the Internet for All project proved to be advantageous for the retailers as well as all other parties involved. It was calculated that the project contributed to 16% of the increase for new internet connections over a period of one year. The slipstream of the project was estimated to be 50%. The slipstream is buyers who were initially interested in the package but eventually opted for another (more expensive) commercial offering. The sum total for the project is that it contributed to almost a quarter of the increase in internet connections between March 2006 and March 2007.

A critical evaluation of the Internet for All campaign revealed different elements, two of which inspired our research. The first was merely the confirmation regarding what could be expected. Not all of the groups in society were equally well served by the campaign. As noted in the previous paragraph, some preferred to buy a better performing and more expensive equipment, whilst for others the packages were too expensive, either because the up-front entry cost was too high, or because of the recurring costs for an internet connection. The second source of inspiration was an incidental call made by a representative of a professional organisation for physical therapists who proposed that the target of the campaign should be towards the members of his organisation. These two, apparently commonplace observations, triggered a reflection that inspired the new policy approach and adjoining research.

3. Research Outline

3.1. Inequality in the information society

A variety of concepts exist that describe the nature of social divisions between people who are favourably placed in information resource distribution and others who are not [Vehovar et al, 2006: p.280-281; Yu, 2006]. The division is often defined as the gap between those who do and those who do not have access to computers and the internet [Van Dijk, 2005: p.1]. However, such a dichotomous portrayal is not tenable scientifically. An increasing mass of research shows that conceptualizations of inequalities concerning ICT solely in terms of technologically ‘rich’ and ‘poor’ is too limited and rudimentary in analysis [Selwyn, 2004: p.345; Van Dijk, 2006: p.233]. Income or socio-economic status remains the most important factor in explaining differences in ICT adoption and use. Lower levels of income are consistently shown to be associated with ICT inequalities [De Haan and Rijken, 2002; Lenhart and Horrigan, 2003], but there are several other inequalities which run in parallel.

- Gender differences (men having more access and using more ICT than women) are important in explaining inequality, even though recent research indicates declining gender differences in ICT access and basic levels of engagement [Compaine, 2001; Van Dijk and Hacker, 2003];
- Age is still one of the most important dimensions of ICT inequalities: increased age is associated with lower levels of access, limited modes of use and patterns of connecting. Age differences are especially pronounced in those individuals aged 60 and over [Van Kesteren and De Haan, 2000; Roe and Broos, 2005];
- Lower levels of education are shown to be associated with digital divides related to access and use of a range of ICT [Servon, 2002; Bonfadelli, 2003; Roe and Broos, 2005];
- Family structure or composition is related to more or less ICT access and use. The presence of school-age children tends to increase contacts with ICT [Van Rompaey, 2002];
- In addition to these variables there are others such as race, geography/rural-urban location, culture/social participation, etc. that determine access to and usage of ICT.

3.2. Relative utility theory

Our approach is articulated around the concept of 'relative utility', a sociological reinterpretation of the economic concept of 'marginal utility'. The notion of ‘cost’ is extended to any effort required to appropriate a product, which is not only money but also, for example, the time required to acquire skills. Under ‘utility’, we understand all perceived benefits a user may obtain from using a product [Greene & Baron, 2001: p.243]. The relative utility of a product is the perceived increase of utility obtained by appropriating one more unit of that product in relation to the available resources. The term resources, not only refers to income, but to all socio-economic dispositions that influence the adoption and use of ICT.

It then becomes possible to determine a hypothetical 'turning point' for ICT adoption, namely the point at which the benefits will outweigh the costs of appropriating an ICT product for a certain category of users. This is based on the assumption that costs and benefits are similar for homogeneous socio-demographic and socio-economic groups. Homogeneity, in this context, means people sharing the same characteristics in terms of the most important resources that determine the use of ICT: access, skills and attitudes (ASA). A specific combination of conditions in terms of access to ICT, skills to master the devices and attitudes towards the technology is then called an ‘ASA-profile’.

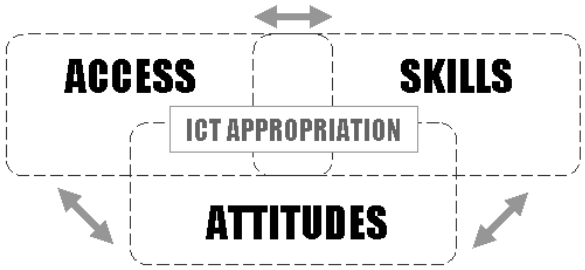

Figure 1: The ASA-approach.

On a practical level, in order to set up effective e-inclusion measures, the advantage of this method is that groups of individuals with relatively homogeneous ASA-profiles

can easily be identified and reached by policy makers. Very often they are represented by professional or social organizations which know how to reach them and are willing to collaborate with the government. A specific offering can then be proposed to these groups, taking into account the specificities of their ASA-profile and socio-economic background.

For example, a high-income and low-skills group, say butchers, will be offered specific training, and attitudinal problems will be tackled taking into account their socio-economic background. A low-income and positive attitude group, say single mothers with children, may require less convincing but more help in terms of lowering the barriers to entry. Moreover, it is also possible to increase the benefits of personal computer and internet usage, either by providing information about specific applications or by increasing the net added value of usage.

3.3. Our approach

The approach proposed is based on a research project consisting of three consecutive research stages. Phase I aimed at refining the assumption that members of homogeneous socio-demographic and socio-economic groups share similar ASA-profiles. It consisted of a quantitative survey designed to gain insight into the perceptions of access, skills and attitudes by groups of individuals with shared socio-demographic and socio-economic characteristics. Phase II of the research consisted of qualitative in-depth and focus group interviews with respondents from each group. The main objective of this phase was to improve our understanding regarding why people do not use ICT at home and to examine possible leverages to lift people over the turning point between non-usage and usage. Phase III was intended to provide the validation of the findings of the two previous phases.

In this paper we discuss the main results of Phase I, which consisted of a quantitative survey of non-adopters. We define them as people who do not use a personal computer and internet in a residential context. This means that they may use computer/internet at work or at other places, for instance in libraries or with friends or family. We wanted to test our assumption that individuals belonging to homogeneous groups with similar socio-demographic and socio-economic profiles will display a common ASA-profile (sharing the same characteristics in terms of resources that determine ICT acceptance). Furthermore, we also wanted to ascertain that policy makers can effectively target and reach these people collectively, as a group. This compelled us to use a specific sampling method that took account of the affiliation of people with a representative professional or socio-economic organisation.

3.4. Sampling procedure

We recruited individuals who were members of groups in society with a certain level of organisation and who can be reached through a legitimate point of contact. These groups were sampled in a theoretical way, meaning that we selected individuals based on a limited number of characteristics, i.e. variables shown by previous research to be of major importance for the (non-)adoption of ICT. This resulted in certain prototypical profiles which exemplify societal diversity but which may not be representative of the overall population.

The following groups were selected: 1) single mothers with children; 2) people who had just started a basic computer and internet training; 3) people who manage a micro company (in our case butchers); 4) liberal professions (in our case physical therapists); 5) low educated people with a technical background (in our case labourers); 6) highly skilled people with a technical education (in our case mostly

with an engineering degree); 7) unemployed people; 8) people who work in the social sector (in our case nurses); 9) civil servants and 10) people who are aged 60 and above. A number of professional and social organizations assisted us with the recruitment of the potential respondents. 200 individuals completed the questionnaire, of which 184 valid questionnaires were retained.

All users, except for groups 2 and 6 are self-declared non-users. Nevertheless, approximately 80% indicated that they had access to a computer at home, and 66% had an internet connection at their disposal. These figures are quite high in comparison to the overall population: in 2007, it was estimated that in Flanders, where we recruited our respondents, 72% of the population owned at least one computer at home and 65% of the population had access to the internet at home (FOD Economie, 2007). This bias can be explained by taking into account that, except for group 10, all respondents were recruited from the age group between 35 and 55.

In order to map their perceptions of computer and internet usage at home, we presented the respondents with a list of statements. The statements were based on the adoption determinants of Rogers [2003: p.222] and complemented by determinants developed by De Marez [2007: p.365-424]. A number of these statements aimed at obtaining information about the respondents' specific ASA-profile: (1) positive or negative attitudes towards computer and internet at home; (2) the presence or lack of skills and competences; and (3) the presence or absence of barriers to access ICT. Other statements served as measurement scales in order to gain insight into the influence of more generic factors such as, for example, the influence of social networks or marketing strategies of the ICT industry.

4. ASA-profiles

4.1. Main findings

Based on the mean scores of each statement (measured on a five-point scale varying from 'I do not agree at all' to 'I fully agree'), the perception of all of the users was that computers and internet are expensive. In addition, these respondents believed that ICT may be too expensive for a larger part of the population. The negative perception of the price factor only weakly relates to people's attitudes toward ICT. Indeed, even though respondents were selected as non-adopters (at home), we observed that the majority had positive attitudes towards ICT. They thought that using computers and internet at home would make life easier. Our respondents indicated that most of the members of their social network are enthusiastic about computer and internet at home. Social influence plays an important role but for most respondents negative perceptions of members of their social network would not cause them to not adopt computer and internet into their households.

Responses were much more divided with regards to skills, measured via statements such as 'complexity' or 'self-efficacy'. Some reported that they lacked the basic skills (which prevented them from starting to use a computer at home), whilst others could be considered as being sufficiently ICT-competent, for example because they (have to) use a computer at work. In addition to the perceptions of the respondents towards complexity and usability of ICT, we also examined the actual ICT skills of our respondents. For this purpose they were shown a list of ICT related tasks, varying from very basic (for example, sending and receiving e-mail) to the very complex (for example, installing a new version of Windows).

Respondents were most skilled in (basic) activities such as 'putting files into folders', 'word processing', 'e-mail', 'retrieving information via a search engine'.

Many were familiar with tasks such as 'finding information via a search engine', 'sending and receiving e-mail', 'showing someone else what information can be found on the internet', 'moving a word to another place in a text' or 'adding a picture to a text'. For more complex activities such as 'keeping the computer up-to-date', 'repairing hardware troubles', or 'making a website' a significant section of the respondents stated that they were not familiar with this and a minority indicated that they were actually capable of performing these tasks.

We asked people about their actual interest in computer and internet applications by asking them to rate different types of activities on a five-point scale varying from 'no interest at all' to 'very interested. We applied a varimax factor analysis (SPSS) to the answers in order to reduce the list of 35 computer and internet applications to eight categories: 'information', 'news', 'pc-applications', 'e-government', 'learning & job', 'multimedia', 'bridging distances' and 'transactions'. Our respondents indicated that they were most interested in using ICT for information, news and basic computer applications. They had less interest in transactional services (with the exception of online banking, which people see more as a familiar 'informational service').

Another part of our survey examined the influence of the social network of the respondent on the use of personal computer and internet at home. We investigated the number of interactions with family, friends, acquaintances, colleagues and neighbours and, additionally, we mapped out the 'social resources' people had at their disposal within their social network, that is the social contacts that people could rely on to ask for advice when purchasing equipment or obtain assistance from in case of computer problems [Van Dijk, 2005: p.53]. We also paid attention to the 'technological culture' of people's social network, which is the manner in which people dealt with technological artefacts and applications in their social relations and in the everyday culture of their households [Punie, 2000: p.558]. The results of this analysis show that family is still the most important determinant for the appropriation of a computer and internet at home. People prefer to receive help from family members for commercial advice and for troubleshooting as well as to learn new skills.

4.2. Further analysis

An important goal of the first research stage was to test the assumption that socio-demographically and socio-economically related respondents would yield similar profiles in terms of access, skills and attitudes (ASA). We also wanted to know if it was possible to draw-up a consistent ASA-profile for people, who are more loosely connected, through affiliation with a representative social organisation. We described this ASA-profile as the specific combination of conditions in terms of access to ICT, skills to master the devices and attitudes towards the technology.

To test this assumption we performed a cluster analysis (SPSS) based on the statements discussed in the previous section. The first step in the analysis consisted of reducing our five-point measurement scale to bipolar categories (for example 'agree' vs. 'not agree'). This allowed us to distinguish the answers of the respondents in terms of bipolarities between Ac+, Ac-, S+, S-, At+ and At- and was necessary in order to compare the different cluster groups with each other.

Ac(cess)	+	people have no problem with access to computer and internet at home
Ac(cess)	-	people have problems with access to computer and internet at home
S(kills)	+	people are skilled sufficiently to master the devices
S(kills)	-	people lack skills to master the devices
At(titudes)	+	people have positive attitudes towards the technology
At(titudes)	-	people have negative attitudes towards the technology

Table 1: ASA bipolarity.

The cluster analysis resulted in five distinctive groups with maximally internal homogeneity and external heterogeneity. We labelled each of these clusters:

LABEL	N
Incapable refusers	39
Self-conscious indifferents	34
The willing but incapable	13
Skilled ICT-lovers with limited access	30
Price sensitive positives	68

Table 2: ASA-profiles.

The clusters demonstrate the existence of different typologies in terms of ASA-profiles. These profiles indicate the motivation of people to use (or not) the computer and internet at home. Each profile represents a different combination of the factors investigated, in which each factor carries a different weight. Moreover, statistical testing is also conclusive about the relation between the ASA-profile and the group affiliation. The results of Chi-Square Test (Pearson Chi-Square) show a clear-cut relationship (statistical significance $p < 0{,}001$) between the membership of the groups (of the theoretical sampling) and the membership of the ASA-profiles.

The figure below gives an overview regarding which groups could accept our hypothesis and indicates the ASA-profile in which the majority of the members of the groups appear:

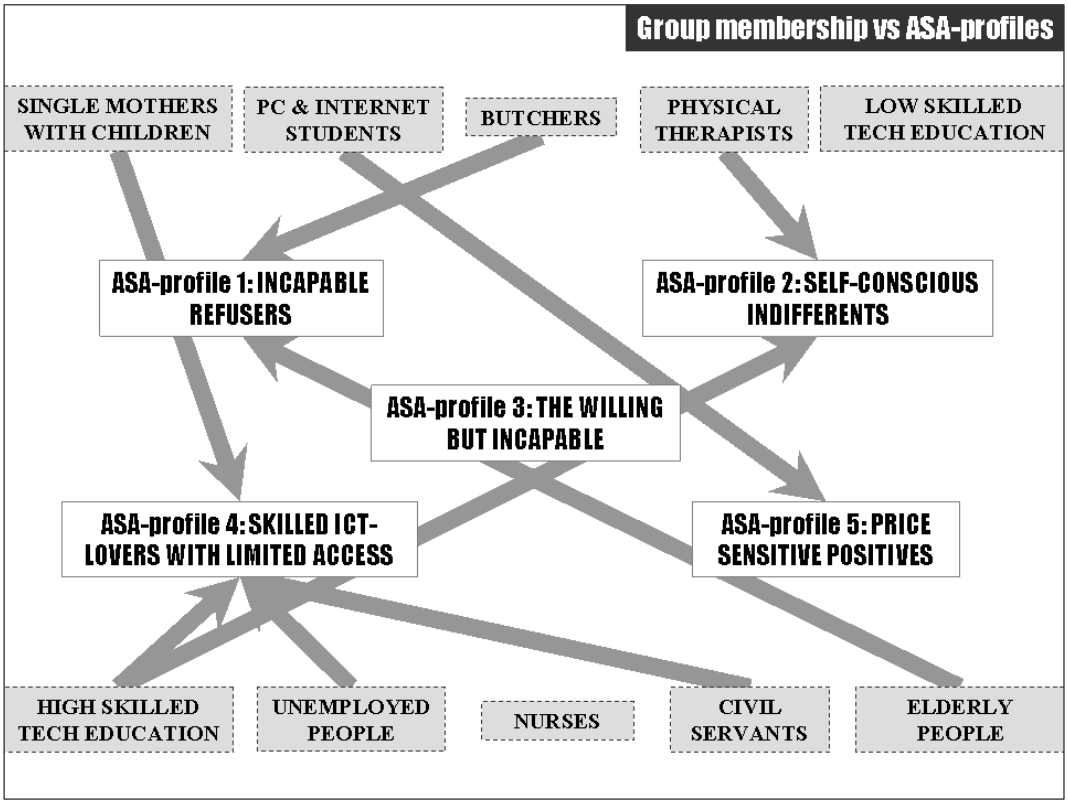

Figure 2: Membership of ASA-profiles.

As shown in figure 2, there are two cases in which the socio-professional affiliation of people does not correspond with a specific ASA-profile: the nurses and those with a lower technical education. Both groups are distributed across different clusters.

The nurses constitute what could be called a negative case (which may actually also be considered a confirmation of the validity of the approach). The nurses are represented in four of the five profiles, but under-represented in Profile 4, 'skilled ICT-lovers with limited access'. Our data indicate that this might be due to the fact that women are generally more moderate in term of attitudes, and that the nurses in our sample were not able to familiarise themselves with ICT. The second exception involves those who possess a poor education but with a technical background. This group is distributed across all profiles. The figures suggest that being male in combination with having a technical training, yields more positive attitudes than for the nurses. But this also causes them to be more dispersed across the different profiles. In this, they differ significantly from those who are higher educated with a technical diploma as this group has a clear-cut profile.

5. By Means of Conclusion

Our research provides an empirical foundation for a policy that aims at improving internet penetration by means of a segmentation and differentiation strategy. However, the research also cautions us against drawing too hasty conclusions. Some of our findings have been counter-intuitive, in particular the observation that the group of nurses and the group of labourers did not generate or fall under any specific ASA-profile, even though they are homogeneous on the basis of critical factors such as education and income. The first, most evident conclusion would be that these groups are in fact heterogeneous in composition due to the influence of another factor. Our research is not conclusive in that respect. However, even if this was the case, it leaves unanswered the question as to why other groups, selected on the basis of education and income, such as the engineers and the physical therapists, do yield a specific ASA-profile.

Another possibility is that we may actually have traced evidence in support of our relative utility theory. This follows from the observation that the groups with higher education and income generate specific ASA-profiles, as opposed to those groups with lower to moderate income and education. Relative utility means that the perceived 'cost' of ICT is related to the perceived 'utility'. If this is so, a relatively low perception of utility will have a less negative effect on those with a high income than on those with a low income. The reason is that the cost of acquiring that utility represents a lower proportion of that persons' income and therefore takes a lower proportion out of the budget that could otherwise be spent on other utilities. Moreover, higher education generally contributes to a better and more positive perception of ICT-utility. Consequently, saying that high income and high education are decisive factors in fostering adoption is not the same as saying that a moderate or low income is decisive in motivating non-adoption.

The observation that attitudes towards ICT strongly differ in groups with low incomes and low education also suggest that adoption may also be stimulated by increasing the (perceived) utility of ICT for these people, as this will legitimize the expense for ICT. The next, qualitative, stage of our research will allow us to refine our insight with regards to this matter. It will also assist us to better understand the positive stimuli that might be decisive in generating ICT acceptance by specific groups.

Disclaimer

The points of view expressed in this paper are the sole responsibility of the authors. They do not by any means engage the Federal Agency for Information and Communication Technology, its political authorities or its partners.

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