

Profiling the Non-user: ICT Acceptance Measures Based on Strategies of Segmentation and Differentiation

Pascal VERHOEST¹, Pieter VERDEGEM²

¹*The Federal Public Agency for Information and Communication Technology (FEDICT),
Maria-Theresiastraat 1/3, Brussels, 1000, Belgium*

Tel: +32 2 212 96 80, Fax: +32 2 212 96 99, E-mail: Pascal.Verhoest@Fedict.be

²*Research Group MICT – Ghent University (UGent) – Interdisciplinary Institute for
Broadband Technology (IBBT), Korte Meer 7/9/11, Ghent, 9000, Belgium*

Tel: +32 9 264 84 77, Fax: +32 9 264 69 92, E-mail: Pieter.Verdegem@UGent.be

Abstract: Business strategies and policies that were successful in increasing internet penetration in the early days may no longer be appropriate. This is most probable in countries where a larger part of the citizens is already connected to the internet. As more people are online, it becomes more likely that the remaining fraction of non-adopters is either hard to convince, under-skilled or simply lacking the financial resources to afford a connection. In view of this, we propose a new policy approach to increase ICT acceptance. The approach is characterized by the intermediation of industry as well as social and professional organizations. In addition, the measures developed within this approach are based on strategies of segmentation and differentiation. This entails that product offerings are specifically targeted towards different socio-demographic groups in the population. In this paper we discuss the results of both quantitative and qualitative research to investigate the relation between the socio-demographic and socio-economic characteristics of non-users, and on the other hand, their profiles in terms of access levels, ICT-skills and attitudes towards ICT and their needs and expectations (if any) about ICT. We show firstly that we found empirical foundation for the assumption that similar groups yield similar profiles in terms of access, skills and attitudes. Furthermore, we demonstrate that being a non-user can be explained by the outweighing effect of one of these aspects, or, a specific combination of them. We clarify also how our results can serve as input for new initiatives concerning ICT acceptance.

Keywords: Digital divide, e-inclusion, user research, policy initiatives, PC & internet penetration, ICT literacy.

1. Introduction

The pervasiveness of ICT in society and our increasing dependency on ICT in everyday life makes of our capacity to use ICT at home a more important condition for social participation [1]. The goal of any e-inclusion policies should therefore be to achieve full internet access for all. This will require a continuous effort on behalf of policy makers. Indeed, inequalities in ICT adoption and usage are not likely to diminish or disappear of their own accord [2].

In societies that have already reached higher levels of internet adoptionⁱ, increasing internet penetration may require specific measures that differ from those of the early days of the internet. The fraction of remaining non-users may be structurally lacking financial resources to afford a connection [3], they may be poorly educated or under-skilled [4] or they may be hard to convince to use ICT because of emotional reasons (e.g. technophobia, [5]) or simply because they resent using it [6].

Bearing this in mind, we have set up a research track for new policy initiatives concerning ICT acceptance. The approach was born out of a confrontation of theory with political practice. This has affected the way in which we set up and conducted the research. Our approach is characterized by two main features. Firstly, unlike many e-inclusion policies, our approach does not only aim at removing barriers but equally, or alternatively, at increasing the value of ICT for end-users. Indeed, we assume that the (perceived) added value of using ICT products may have a decisive influence on actual usage. Secondly, the input for new measures developed within this approach is specifically targeted towards different segments of the population.

The latter is influenced by the idea that policy initiatives based on strategies of segmentation and differentiation will be more effective and less expensive than generic policy measures. Prerequisite for this kind of policies is that specific groups in society are relatively homogeneous and can easily be targeted as a group. In the first part of this paper we explain and contextualize the considerations that inspired our research approach. In the second part, we describe the research outline and its methodological base. In the third part we describe the most important research findings and evaluate their significance. In conclusion we illustrate how our findings can be transposed into concrete policy measures.

2. Field Experience

Our approach is mainly inspired by the 'Internet for All' campaign of the Belgian government in 2006. This action consisted of providing an affordable package deal to potential buyers, consisting of a PC, an internet connection plus a training session. The main 'political' difficulty was to convince the industry (PC manufactures, ISPs and retailers) to participate. The main resistance was from the organization of small retailers, who feared the low profit margins would cause an unacceptable loss of income. Eventually, three consortia including well-known PC manufacturers and ISPs offered a package.

Upon evaluation, the Internet for All campaign proved to be advantageous for the retailers as well as for other parties involved. It was calculated that the project contributed to 16% of the increase of new internet connections over a period of one year. The slipstream of the project estimated to be 50%. The slipstream are buyers that were initially interested by the package but eventually opted for another (more expensive) commercial offering. Sum total is that the project contributed to almost a quarter of the increase of 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 of what could be expected. Not all of the groups in society were equally well served by the offer. Some buyers preferred to buy a more performing and more expensive equipment, whilst for other people the packages were too expensive, either because the up-front entry cost was too high, or because the recurrent costs of an internet connection. The second source of inspiration was an incidental call of a representative of a professional organization for physical therapists who proposed to target the campaign also towards members of his organization. These two apparently banal observations triggered a reflection that inspired the new policy approach and adjoining research.

3. Research Outline

3.1 Traditional Parameters of Digital inequalities

An in-depth understanding of why people are not able or not willing to use computer and internet at home is indispensable for both scientific and political purposes. The dichotomous portrayal (the divide between 'haves' and 'have nots' or between

technologically 'rich' and 'poor') is no longer tenable, as these conceptualizations are too limited and rudimentary in analysis [7, 8].

A wealth of scientific research exists that scrutinizes the most important variables for explaining digital inequalities. Income or socio-economic status remains one of the most important factors in explaining differences in ICT adoption and usage. Even in highly industrialized societies, lower levels of income are consistently shown to be associated with ICT inequalities [9, 10]. Other dimensions for explaining different levels of engagement to ICT are gender (men having more access and using more ICT than women, although recent research indicates declining gender differences [11, 12]), age (increased age is associated with lower levels of access, limited modes of use and patterns of connecting [13, 14]), education (lower levels of education are shown to be associated with divides related to access and use of a range of ICT [15, 14]), family structure (the presence of school-age children tends to increase contacts with ICT [16]).

In addition to these variables there are others such as race, geography/rural-urban location, cultural/social participation, etc. that determine access to and usage of communication technologies. A thorough understanding of these parameters and their mutual dependencies is the keystone of any e-inclusion policies.

3.2 Our Approach: Relative Utility Theory

Our approach is articulated around the concept of 'relative utility', a sociological reinterpretation of the economic concept of 'marginal utility'. Under 'utility', we understand all perceived benefits a user may obtain from using a product [17]. 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 resources available to an individual. The term 'resources' does not only refer to income, but to all socio-economic dispositions that influence the adoption and use of ICT. The notion of 'cost' is thus extended to any effort needed to acquire a product, which is not only money but, for example, also the time required to acquire skills.

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 individuals. 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 that people share 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'.

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 that know how to reach them and are willing to collaborate with government. A specific offering can then be proposed to these groups, taking into account the specificities of their ASA-profile and socio-economic background.

3.3 Methodological Base

The approach proposed is based on a research project comprising 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 project consisted of qualitative research with respondents of each group. The main objective of this phase was to improve our understanding of why

people do not use ICT at home and to examine possible incentives to lift people over the turning point between non-usage and usage. Phase III intended the validation of the findings of the two previous phases.

We recruited individuals as they are members of groups in society with a certain level of organization that can be reached through a legitimate contact point. These groups were sampled theoretically, meaning we selected individuals based on a limited number of characteristics, i.e. variables previous research has shown that they are of major importance for (non-) adoption of ICT. This resulted in certain prototypical profiles that are exemplary of the societal diversity without being representative for the overall population.

The following groups were selected: 1) single mothers with children; 2) people who 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) lowly 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 years and older. A number of professional and social organizations helped us with the recruitment of the potential respondents. 200 individuals completed the questionnaire, of which 184 valid questionnaires were retained (after data cleaning). Data collection was organized via personal interviews.

We also highlight the most important findings out of the qualitative research stage. We conducted both in-depth personal interviews as well as focus group interviews with in total 42 respondents.

4. Understanding Non-Users

4.1 Main Findings

An important goal of the first research stage was to test the assumption that socio-demographically and socio-economically related respondents yield similar profiles in terms of access, skills and attitudes (ASA). We also wanted to know if it is possible to draw-up a consistent ASA-profile for people that are more connected through affiliation with a representative social organisation.

In our quantitative survey respondents were confronted with 37 statements on access, skills and attitudes. Respondents were asked whether or not they could agree with these statements (on a five point scale). The statements were based on an elaboration of Rogers' traditional adoption determinants, combined with ICT acceptance determinants emanating from disciplines such as social psychology [18].

Positive answers were attributed a plus (+) and negative answers a minus (-). For example, a person who fully agreed with the statement "Computers and internet are user friendly technologies" was considered to provide an indication of a positive attitude and got an At+. This way of working (for each of the 37 statements) allowed us to distinguish the answers of the respondents in terms of bipolarities between Ac+, Ac-, S+, S-, At+ and At-, as illustrated in Table 1.

Table 1: ASA Bipolarity

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

Adding up these scores for each of the 37 statements allowed us to profile the respondents in terms of their ASA characterization. Subsequently, we performed a cluster analysis (segmentation) based on the respondents' answers on this list of 37 statements concerning their perceptions of computer and internet at home.

Table 2: ASA-Profiles

LABEL	N
INCAPABLE REFUSERS	39
SELF-CONSCIOUS INDIFFERENTS	34
THE WILLING BUT INCAPABLE	13
SKILLED ICT-LOVERS WITH LIMITED ACCESS	30
PRICE SENSITIVE PRAGMATISTS	68

The clusters demonstrate the existence of different typologies in terms of ASA-profiles. Each label in this classification (Table 2) represents a specific combination of the factors investigated, in which each factor carries a different weight.

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 $p \leq 0,01$) between the membership of the groups (of the theoretical sampling) and the membership of the ASA-profiles. In Table 3 below we give an overview for which groups we could accept our hypothesis and indicate in which ASA-profile correspond to a majority of the group members.

Table 3: Membership of ASA-Profiles

GROUP MEMBERSHIP	ASA-PROFILES
Civil servants	Skilled ICT-lovers with limited access
Unemployed people	Skilled ICT-lovers with limited access
High skilled technical education	Skilled ICT-lovers with limited access
Single mothers with children	Skilled ICT-lovers with limited access
Physical therapists	Self-conscious indifferent
PC & internet students	Price sensitive pragmatists
Elderly people	Incapable refusers
Butchers	Incapable refusers
Nurses	
Lower education with technical diploma	

As shown in Table 3, there are two cases in which the socio-professional affiliation of people does not correspond with a specific ASA-profile: the nurses and the people with a lower technical education. Both groups are distributed across different clusters. One of the goals of the qualitative research was to refine our insight in this matter.

4.2 Description of Classification

The goal of the qualitative research was to refine our insights into the different profiles of non-users. We sought to understand why certain groups contain a majority of people that belong to a specific ASA-profile and why other groups do not. We also wanted to examine the possible incentives that can lift people over the turning point between non-usage and usage. Our qualitative research allowed us to put the VAT-scores of our respondents into perspective, to reflect about their specificity and to make suggestions as to how policy can approach these groups.

Incapable refusers: For these people, computer prices and internet tariffs are not a major obstacle for acceptance, but they lack the skills to master ICT and they have rather

negative attitudes towards ICT. Their ICT illiteracy and their lack of interest reinforce each other, which renders it difficult to persuade this group to start using ICT at home. Easily accessible computer and internet initiations should be organized in order to familiarize these people with the benefits ICT can offer. In addition, government or (preferably) representative organisations should use awareness campaigns to explain the value of ICT.

Self-conscious indifferent: The non-usage of individuals of this group can mainly be explained by their negative attitudes. Access is not a problem and they are sufficiently skilled to deal with ICT. Since they potentially have access and know how to use ICT, these individuals could also be categorised as 'want nots'. The main challenge will therefore be to convince these individuals that the computer usage will also add value to their private life. More communication and creating awareness concerning ICT use could be possible measures, as well as offering dedicated services to suit their profiles.

The willing but incapable: Members of this group are motivated to use computer and internet at home, but they lack the necessary skills and they have difficulties accessing ICT. Purposeful initiatives should focus on offering both cheaper internet access and computers as well as providing low-threshold internet initiations.

Skilled ICT-lovers with limited access: These individuals have positive attitudes towards ICT and they are ICT literate. Consequently, their main problems resides in having access to ICT at home. Government does not need to raise awareness, but should in first place focus on offering low-cost computer and internet access. This could be realized by providing these people with a specific package consisting of both a cheap(er) computer and an internet connection. It is unlikely that these people will be attracted by computer initiations. They may find more advanced training more attractive.

Price sensitive pragmatists: These are individuals who have average ICT-skills and who are moderately motivated. The (perceived) high prize of infrastructure and connection to internet is the main barrier. Initiatives for these individuals should focus in first place on lowering the cost for using ICT. An affordable package deal should be combined with initiatives to improve their ICT-skills and to create more awareness about the possible benefits that ICT usage could offer.

4.3 *The Meaning Behind the Data*

This description still leaves unanswered the question of why we could not detect generic ASA-profiles for two groups. A sensible explanation could be that these groups are in fact heterogeneous in composition. This could indeed account for the 'lowly skilled with technical education', but not for the nurses. For the 'nurses' we found instead that they were represented in all but one profile, namely the 'skilled ICT-lovers'. Closer examination during the qualitative interviews revealed that the decision of these people not to adopt and use ICT at home, is very strongly motivated by a lack of skills. In other words, the 'cost' of acquiring the necessary skills did not outweigh the expected benefits.

The observations about these two groups add evidence in support of our relative utility theory, along with the observations that the groups with higher education and higher income generate specific ASA-profiles, contrary to the groups with lower to moderate income and education. Indeed, relative utility means that the perceived 'cost' is related to the perceived 'utility'. If this is so, a relatively low perception of utility will have less negative effect on persons with a high income than on persons 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. The observation that attitudes towards ICT strongly differ in group with relatively lower incomes and lower education also suggests that

adoption also may be stimulated by increasing the (perceived) utility of ICT for these people, as this will legitimate the expense for ICT.

4.4 Heuristic Interpretation

In Figure 1, we have reduced the 37 ASA-scores, in order to obtain a heuristic instrument that allows us to compare the different profiles in terms of their ASA-characteristics. We used a four point scale, ranging from very positive (++) to positive (+), over negative (-) to very negative (--) perceptions of problems with respectively access, skills and attitudes. Reflection on our qualitative findings also yields the insight that a negative perception of one of the ASA dimensions may influence the perception of the other ASA dimensions, as illustrated in Figure 1.

	Ac(cess)	S(kills)	At(titudes)
ASA 1: INCAPABLE REFUSERS	- > +	-- ←	- →
ASA 2: SELF-CONSCIOUS INDIFFERENTS	+	+ > ++	--
ASA 3: THE WILLING BUT INCAPABLE	-	-	++
ASA 4: SKILLED ICT-LOVERS WITH LIMITED ACCESS	-	+ > ++	++
ASA 5: PRICE SENSITIVE PRAGMATISTS	- > +	- > +	- > +
ICT UNDER-SKILLED		← --- →	
REJECTIONISTS/REFUSNIKS		←	← ---
ECONOMICALLY LESS FAVOURED		--- →	→

[Legend: + = positive / - = negative / > = varying from X to Y / → = influence]

Figure 1: Heuristic Scheme

We have also added three additional profiles of people who have an extremely negative scores on one of the ASA dimensions. The nurses' case falls under the category of 'ICT under-skilled'. 'Rejectionics/Refusniks' are people who consciously refuse to use ICT for cultural or ideological reasons. The category of 'Economically less favoured' is self-explanatory. As was illustrated in the nurses case, an extremely negative score on one of the ASA-dimensions may constitute a blockage, regardless how positive the scores are on the other two categories. A targeted approach is certainly recommendable in these cases.

5. Conclusion

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

The basic package would be offered to the general public through ordinary commercial outlets on a non-discriminatory basis. But 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 the professional organizations, the industry and government. It is expected that these measures – based on our approach – will be more effective and relatively less expensive than the previous actions on which it is partially inspired, the ‘Internet for All’ campaign of the Belgian government in 2006.

References

- [1] Kaplan, D. (2005). *E-inclusion: new challenges and policy recommendations*. Brussels: eEurope Advisory Group.
- [2] Selwyn, N. & Facer, K. (2007). *Beyond the digital divide: rethinking digital inclusion for the 21st century*. Open Education Series, Futurelab.
- [3] Martin, S. & Robinson, J. (2007). The income digital divide: trends and predictions for levels of internet use. *Social Problems*, Vol. 54(1), pp. 1-22.
- [4] Livingstone, S. (2004). Media literacy and the challenge of new information and communication technologies. *The Communication Review*, Vol. 7(1), pp. 3-14.
- [5] Van Dijk, J. (2005). *The deepening divide: inequality in the information society*. Thousand Oaks, CA: Sage.
- [6] Selwyn, N. (2006). Digital division or digital decision? A study of non-users and low-users of computers. *Poetics*, Vol. 34(4-5), pp. 273-292.
- [7] Selwyn, N. (2004). Reconsidering political and popular understandings of the digital divide. *New Media & Society*, Vol. 6(3), pp. 341-362.
- [8] Van Dijk, J. (2006). Digital divide research, achievements and shortcomings. *Poetics*, Vol. 34(4-5), pp. 221-235.
- [9] De Haan, J. & Rijken, S. (2002). The digital divide in the Netherlands: the influence of material, cognitive and social resources on the possession and use of ICT's. *The Electronic Journal of Communications*, Online, 12(1&2).
- [10] Lenhart, A. & Horrigan, J.B. (2003). Revisualizing the digital divide as a digital spectrum. *IT & Society*, Online, 1(5).
- [11] Compaine, B.M. (2001). Declare the war won. In: B.M. Compaine (Eds.) *The digital divide: facing a crisis or creating a myth?* London: MIT Press.
- [12] Van Dijk, J. & Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *The Information Society*, Vol. 19(4), pp. 315-326.
- [13] Van Kesteren, M. & De Haan, J. (2000). Digitaal kapitaal: verschillen in computerbezit en –gebruik tussen jongeren en ouderen. *Tijdschrift voor Communicatiewetenschap*, Vol. 28(3), pp. 186-213.
- [14] Roe, K. & Broos, A. (2005). Marginality in the information society: the socio-demographics of computer disquietude. *Communications: the European Journal of Communication*, Vol. 30(1), pp. 91-96.
- [15] Servon, L.J. (2002). *Bridging the digital divide: technology, community and public policy*. Oxford: Blackwell.
- [16] Van Rompaey, V. (2002). *Media on/Family off? An integrated quantitative and qualitative investigation into the implications of information and communication technologies (ICT) for family life*. Unpublished PhD dissertation, Leuven: Dept. Communicatiewetenschap, Fac. Sociale Wetenschappen.
- [17] Greene, J. & Baron, J. (2001). Intuitions about declining marginal utility. *Journal of Behavioral Decision Making*, Vol. 14(3), pp. 243-255.
- [18] Rogers, E.M. (2003). *Diffusion of innovations* (5th Edition). New York: The Free Press.

ⁱ In 2007 67% of households in Belgium owns at least one computer, while 60% of the total population has internet access at home (Eurostat, 2007). The information society is thus more developed than on average in the EU, however, Belgium is not one of the frontrunners.