6 Condition 1 for effective use of user profiling: Access[8]

6.1   Introduction

Particular characteristics of users are crucial conditions for the acceptance of profiling applications as user-friendly and trusted systems as well as for the initial and continued use of such applications. These conditions are twofold. The first condition is *access* to the digital technology that is used for profiling applications. The concept of access relates to the problem of the so-called *digital divide:* one part of the population has access to the new technology whereas the other does not. The second condition is *interest, motivation and preference* to adopt user profiling as a tool in electronic information retrieval, communication, transactions, registrations and entertainment. An investigation of these conditions is able to produce answers to the following research questions:
- What kinds of users are most likely to accept and use applications of user profiling by means of information and communication technology?
- What kinds of users will probably not accept and apply these applications because they do not have access to the means or are not able or motivated to work with them?

In order to answer these questions, this chapter will summarise the state of the art of digital media user research predominantly focused on computer and Internet applications. A comprehensive causal model of factors explaining the acceptance and use of profiling applications by individual users will serve as a framework and guideline for a concise presentation of the most important empirical and theoretical results in this field so far. The chapter will finish with the identification of a number of potential adoption groups considering user profiling, from those most likely to adopt these applications to those less likely to do so.

In this chapter, usage and user characteristics will be emphasised. In Chapter 8 the other determinants of acceptance will be stressed, such as the characteristics of the innovation (applications of user profiling) and social system variables (the organisational and wider social context).

6.2   Main concepts

Mostly, user characteristics are framed in terms of *demographics*. However, this approach is much too superficial to explain the actual and probable acceptance and use of applications such as user profiling. The static and simplistic approach in terms of individual attributes fails because the full appropriation of technology is:
- a *behavioural process*, with preconditions and consequences, itself consisting of a number of phases of appropriation: motivation to use the technology, physical access, skills required and actual usage;
- a *relational affair* of suppliers/organisations offering the technology and others using it; some using it sooner and more frequently than others, thus appropriating the technology for themselves (J.A.G.M. van Dijk, 2005).

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8 Author: J.A.G.M. van Dijk

In this chapter, a relational approach of technology acceptance by different groups of users is elaborated: relations among users with different characteristics and relations between users and suppliers/organisations. In the context of user profiling, it is important to frame ICT applications that employ user profiles as a *means of relationship* between a particular manufacturer and consumer, a provider and a client, a government agency and a citizen, a management and an employee. Only in this way will one be conceptually prepared to find the most probable compromise for the conflicts of interest attached to user profiling: the informed consent of both parties. Moreover, the appropriation of the technology itself is also a relational affair between opposing social categories that are known to be unequal both in social position and new media access: younger and older generations, males and females, management and employees, the rich and the poor, those with high and low educational levels, with many or few credentials, ethnic majorities and minorities, etc. All research on the contemporary digital divide shows that the first-mentioned of these categorical pairs are also the first to appropriate the new technology and use it for their own interests (see J.A.G.M. van Dijk, 2005, for a summary).

As an anchor for the present chapter, we use an adaptation of a comprehensive causal model is new media use and acceptance. The original model is published in J.A.G.M. van Dijk (2000, 2003, 2004, 2005) and (partially) tested by University of Twente and Sociaal Cultureel Planbureau (Social and Cultural Planning Office) researchers in multivariate analyses and structural equation modelling in L. van Dijk et al. (2000), de Haan (2003), and de Haan and Iedema (in press). See below for the model adapted to the purpose of this chapter.
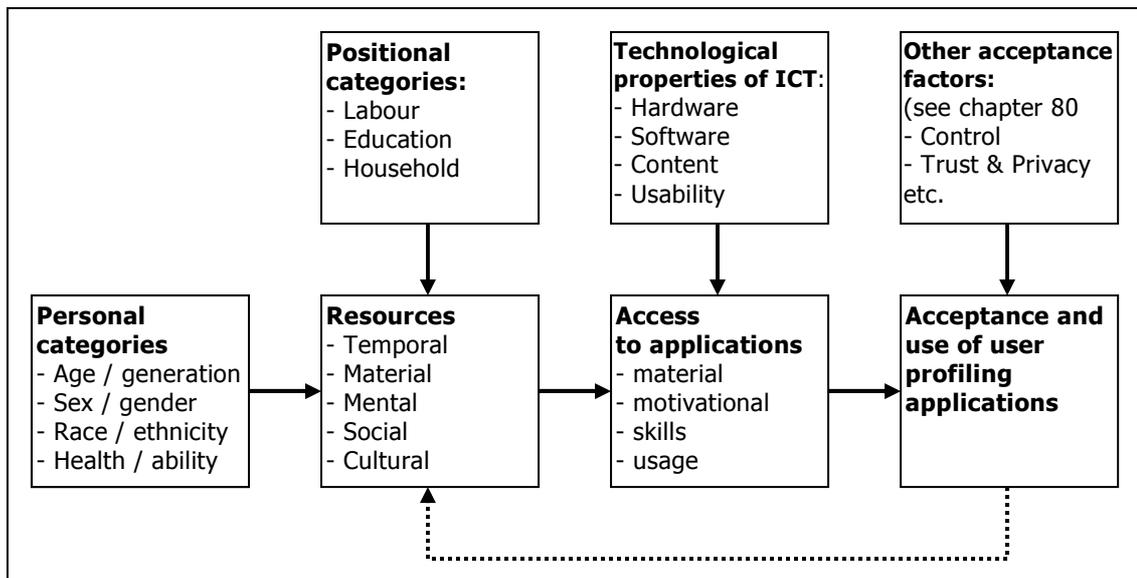

Figure 6.1: Comprehensive Causal and Sequential Model of Factors Explaining the Acceptance and Use of Profiling by Individual Users

As figure 6.1 shows, access to applications depends on the technological properties of the applications and the resources of the user. In turn, these resources depend on a number of user characteristics that can be divided into two categories: *personal*, referring to individual characteristics, and *positional*, referring to the relationship of an individual with other individuals or organisations. The individual user characteristics are considered as not having a direct relationship with *access*, but a relationship via the *resources*, which thus becomes a central concept in the model.

6.3   Main theories and Research overview

All theories and research about access to and acceptance of digital media applications show that the most important personal and social demographics correlate with access and acceptance: age, sex/gender, race/ethnicity, health/(dis)ability, work or occupation, educational level and household composition. See for example NTIA (1995, 1998, 1999, 2000, 2002), Pew Internet & American Life Project data (2000-2004), UCLA Internet reports (2000, 2001, 2003) for American data and L. van Dijk et al. (2000) and de Haan (2003) for Dutch data.

The Dutch Sociaal Cultureel Planbureau (Social and Cultural Planning Office) tries to explain the correlations revealing wide gaps of access with a theory of resources or economic, social and cultural capital, whereas J.A.G.M. van Dijk (2005) adds a relational view on social and informational inequality following Tilly (1998). A combination of both theoretical approaches is able to explain the inequality of access (the 'digital divide') by different possessions of resources that in turn can be explained by a number of personal and positional categorical inequalities (see top-left part of Figure 6.1). The categories and resources will serve as the framework for the first part of the overview.

6.3.1 Personal categories

Age is the most important determinant of access, and probably also the acceptance of user profiling. All available research data reveal the highest levels of access among people under 30, moderate access between 30 and 40, subsequently declining and even falling rapidly with senior citizens over the age of 65. People between 50 and 65 caught up somewhat between 2000 and 2005.

These data suggest that acceptance of user profiling will probably be higher among the young generations than it will be among older generations. This projection is reinforced by user preferences and attitudes to the new technology and to privacy. Young people care less about their privacy in using these media (Heuvelman, van Dijk, & Peeters, 2004). Conversely, older generations have a more critical attitude to the digital media, inspired by higher levels of distrust and fear, and on average they have more problems with potential privacy violations. As this study (and others) hold, the technology of user profiling is still loaded with issues concerning trust and privacy.

Gender is the second most important personal characteristic. In terms of physical access the gender gap of digital media access has almost closed in the western high-tech countries (according to all references mentioned above), but not in other countries and certainly not in the developing countries. However, gender inequalities in skills and usage of these media are still large in western countries too (J.A.G.M. van Dijk, 2003, 2005; J.A.G.M. van Dijk & Hacker, 2003). Combined with the category of age, it is likely that elderly and middle-aged women will be among the last groups to adopt user profiling.

Race, or rather **ethnicity,** is certainly among the most relevant characteristics that affect resources. In all countries with minority ethnic cultures, they appear to have less access to the digital media than the majority culture (according to all references mentioned above). This gap is caused by lower income and education and by fewer speaking and writing skills in the common language and/or English. Moreover, many applications are biased in favour of majority cultural views, values, expressions, symbols and ways of thinking.

(Dis)ability is recognised as a fourth personal characteristic of importance. People with motor, sensory or cognitive disabilities have significantly less access to the digital media than fully functioning people do (Madden, 2003; NTIA, 2000, 2002).

6.3.2 Positional categories

Perhaps even more important than personal characteristics are the *positional* characteristics of individuals: the characteristics that relate people to one another and to organisations.

Education is a strong predictor of computer and Internet access and use. Those who did not become acquainted with digital media whilst at school (roughly those over 35), and who did not recover from this lack of experience later on in their professional life will most likely be found on the wrong side of the digital divide. Education is a prime motivator and big differences in practice will occur between types of education. At some schools, primarily remedial drills (i.e. filling in databases, learning word processing and making simple calculations) are practiced with computers, whereas at others advanced intellectual skills are learned (Warschauer, 2003; Wenglensky, 1998). In this way different digital skills are learned (see below) with more or less competencies to engage in user profiling.

Employment. Having a job or a particular occupation is also a reliable predictor of the use and acceptance of computers and the Internet. Having to use computers for job-related tasks (data entry, text processing, etc.) may well compensate the lack of computer use in one's education (as many people over the age of 35 have experienced). People who are employed are much more likely to have access to computers and the Internet with the opportunity of experiencing e-commerce and e-government, such as filling in forms and questionnaires and being a candidate for user profiling, than are the unemployed and those having a manual or executive job requiring no, or very simple and temporary dealings with the computer.

Household composition is the final important positional category to be mentioned here. Sharing a household increases the chances of having a computer and Internet connection. Households with schoolchildren are the biggest computer owners of all. In the Netherlands even ethnic minority households (on average, low in income and education) had a computer penetration of 97% (!) in 2001 if they had schoolchildren (de Haan & Huysmans, 2002b). In general, households of more persons, and especially those with children, are the best candidates for user profiling.

6.3.3 Resources

Personal and positional categories determine the *resources* people have. Having these resources directly affects the sequential four types of access (see 6.5) and the indirect cause of the probability that users will accept and employ user profiling applications.

Temporal resources seem to be the most interesting for access to user profiling applications as they determine the length of daily digital media use. Two considerations may be taken into account:

- Since in many applications efficiency may be the most important motive for applying user profiles, people with little time are the most likely to accept and use these applications. People with greater temporal resources (pensioners, the unemployed) are not candidates for accessing and employing user profiling applications, whereas people with a full agenda might well profit the most, and therefore be good candidates.
- However, taking advantage of user profiles for the sake of efficiency also demands an investment in time. Time is needed to fill in questionnaires, boxes of preferences, etc. Busy people will not be particularly motivated to do this.

Material (financial) resources remain a condition of computer access in general and user profiling in particular, even in rich countries (J.A.G.M. van Dijk, 2003, 2005; L. van Dijk et al., 2000). People with sufficient purchasing power form the most preferred target group for suppliers and the most probable user group of consumers of user profiling. Those with little purchasing power might be interesting to profile as (high-)risk groups (not paying, etc.). Data on financial resources might even be important for applications employed to detect crime and tax fraud.

Mental resources (knowledge and technical skills) are important for computer access. People with general technical skills acquired early in life, such as the contemporary 'digital youth', will have much fewer problems with motivational access, digital skills access and advanced uses of digital media. Even if applications are designed for a maximum usability ('sense and simplicity') – which is often not the case – they may need extensive user instructions and help before they can be used. And even if people can use an application (e.g. retrieve information correctly), it might be desirable that they understand how the application works (e.g. understand how the information is produced and selected by the system so as to be able to judge its reliability). It is questionable, however, whether users are *willing* and *able* to understand technical systems to that extent.

Social resources (networks and relationships) are an often neglected source of access to the digital media (J.A.G.M. van Dijk, 1999, 2005). The motivation to purchase or install a computer, Internet connection, advanced mobile phone and the like stems from the social environment of the potential user. The social network also helps with technical problems, with the acquisition of digital skills and with drawing attention to particular applications. It will also be vital for the acceptance of user profiling. In such a network, both positive and negative experiences with profiling will spread rapidly.

Cultural resources (cultural goods, preferences, lifestyles and interests or hobbies) are crucial determinants for digital media access and the acceptance of user profiling. Access and profiling have to fit a particular lifestyle that is characterised by a medley of cultural goods and experiences, attitudes to achieve things in life and make new discoveries. The most important new media user types discovered in a 2002 German survey were the 'young wild', the 'experience minded', the 'achievement minded' and the 'new culture minded', whereas the 'classical culture minded' (the 'haves' of many traditional cultural goods), and especially the 'home loving', the 'solitary/retired' and even the 'sociable, active' (in traditional ways), simply hated computers and all types of new media applications offered (van Eimeren, Gerard, & Frees, 2002). Most likely, these conservative lifestyles will reject all efforts required to participate in user profiling (as they are the most important non-response groups in contemporary surveys).

6.3.4 Access

An important assumption made in this chapter is that there are different, subsequent and accumulative types of access as a process of complete appropriation of new technologies. It is obvious that the problem of the digital divide is not solved as soon as (almost) everyone has a computer and Internet connection. People should also be motivated to use the technology, they should have the necessary skills and they should adopt a multitude of applications appropriate for them. This is expressed in the model in figure 6.2, which can be seen as a elaboration of the 'Access' box in figure 6.1.
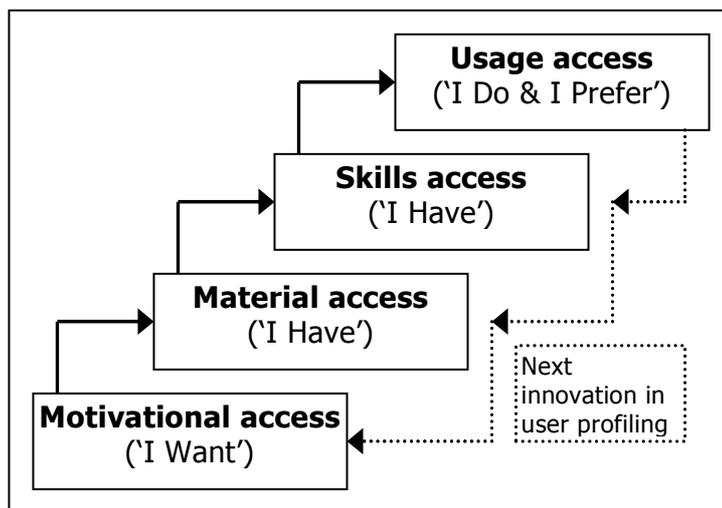

Figure 6.2: Model of digital access (J.A.G.M. van Dijk 1999, 2003, 2004, 2005; J.A.G.M. van Dijk & Hacker, 2003).

Some people are insufficiently motivated to attempt to obtain access. These 'want-nots' consist of a diverse collection of intermittent users, dropouts, and net-evaders. Currently, they comprise about half of the people in the developed countries without access. The other half are the 'truly unconnected', who have no choice about computer use or few opportunities to choose. The dividing line between these two groups is not distinct, and it is constantly shifting. The reasons supplied in surveys and interviews for this lack of motivation are both emotional and rational. They include no need for use or for significant usage opportunities, no time or liking, rejection of the medium, lack of money, and lack of skills. The people with a lack of motivation to gain access to computers and networks should not be accused of being backward. Instead, the finger should be pointed at the current flaws in the technology concerned: lack of user friendliness, usefulness, attractiveness, affordability, and safety. (J.A.G.M. van Dijk, 2005, p. 43).

6.3.4.1   Motivational access

Behind motivational access problems often lie specific mental or psychological problems. Computer anxiety, 'button fear' and technophobia are much more widespread than the ICT industry tends to think. Technophobia – fear or hatred of computers or any computerised technology – was found among 30,3% of new Internet users in the U.S., declining to 10.8 % among (even) experienced Internet users (6 years and more) in 2002 (UCLA, 2003, p.25).

To these general problems of motivational access, specific problems of motivation, trust and security concerning user profiling should be added. They are discussed in other

chapters of this report. Particularly, they refer to the rejection of the medium referred to in the aforementioned quote. Many 'want nots' distrust computers and their applications because to them they are obscure machines, they lack any knowledge of computer networking and they have heard too many negative stories about them (whether or not in the media).

6.3.4.2   Physical/material access

Contemporary digital divide discussions and research are completely pre-occupied with physical access to the technology. In this chapter, a broader concept is used: material access. This concept also contains conditional access to the new media (payment and access permissions) but allows for many more details in the observation of physical access (advanced versus basic equipment, software and applications).

If we track the evolution of basic and simple access to computers and the Internet, we will observe that between 1985 and 2000 all gaps in physical access in terms of age, education, income, employment and ethnicity increased in the Western world (see: J.A.G.M. van Dijk, 2005, pp. 51-51). The only exception was the gender gap that (almost) closed during this period. From about 2000 onwards, the other gaps have also started to decrease as the 'top categories' reach a stage of saturation. However, large differences remain between the top and the bottom social categories. At present, we do not know how much these gaps will close in the developed world – in the developing countries they are still widening. However, recalling the history of the telephone that needed seventy years to reach the current (almost) universal distribution, it will take several decades to reach the same distribution for computers and the Internet. In 2004, about one-third of the population, even in the most advanced high-tech societies, had no physical access at home or at work (the Scandinavian countries and the Netherlands score better).

It goes without saying that physical access, and depending on the application also conditional access, is a prerequisite for user profiling applications.

6.3.4.3   Skills access

Digital skills are even more unequally divided among the personal and positional categories mentioned in 3.3.1 and 3.3.2 than motivation and physical access are (J.A.G.M. van Dijk, 2003, 2004, 2005; J.A.G.M. van Dijk & Hacker, 2003). Digital skills are the skills needed to operate computers and their networks, to search and select information in them and to use them for one's own purposes. In this definition, three types of digital skills are mentioned:
- *Operational* skills are the skills to operate computer and network hard- and software. Operational definitions are to be found, among others, in the seven modules of the European Computer Driving Licence (see: http://www.ecdl.com/main/index.php).
- *Information skills* are the skills to search for, select and process information in computer and network sources. They consist of formal information skills, such as being able to handle the file structure, information structure and hyperlink structure of computers and the Internet, and of substantial information skills such as learning to search for information in a systematic way in electronic sources, learning to make selections, learning to edit information oneself and being able to apply quality assessments of information sources. See van Dijk (2005, pp. 81-86 for the complete list).

- *Strategic skills* are the capacities to use the information sources as the means for specific goals and for the general goal of improving one's position in society (on the labour market, in education, in households and in social and sexual relationships).

Research worldwide indicates that operational skills access is more unequally divided than physical access (e.g. de Haan, 2003; NTIA, 2002; Park, 2003). Categories with no or few digital skills are (large) majorities of people over 55, unemployed women over 35, and people with low levels of education and income. These figures may even be optimistic as most data are derived from self-assessments in surveys. The actual skills observed in real tests of capabilities are far poorer (see e.g. Hargittai, 2002).

The situation is even more alarming with respect to information skills (see J.A.G.M. van Dijk, 2005, pp. 85-86). Often these are not even sufficiently mastered by journalists and scientists: information seekers *par excellence*.

However, the worst results are to be expected with strategic skills. Unfortunately, exactly these skills are paramount to the appropriate use of profiling agreed on by providers and users. Most are not able to judge whether they should comply with a particular profiling request, which personal data they should reveal and what they should refuse, let alone react to the unsolicited attempt of profiling. Most users simply have no idea how the Internet works, how mobile telephony services work, how database management works, what operations are carried out with their data, what file coupling means, what is safe and what is not, let alone the practices of data mining and knowledge discovery in databases. The average user not only lacks such technical knowledge, but also the (bureaucratic) competency to judge which input will result in which organisational action by providers. The world behind user profiling is a completely obscure and abstract world of networks, databases, organisational procedures and marketing strategies.

These observations regarding skills access have important consequences for the feasibility of 'informed consent' in user profiling. Open and informative information policies and explanations have to be created that are accessible to everyone. Even so, a substantial role for intermediaries and advisers of individual users will become inevitable.

Usually, digital skills are not learned through formal education, but in practice, through trial and error and in communities of work, school and interest (de Haan & Huysmans, 2002b; J.A.G.M. van Dijk, 2005). Only senior users are taking considerable advantage of computer courses and computer books in adult education. For others, daily user experience will result in basic digital skills.

6.3.4.4 Usage access

Physical access does not emulate the actual use of digital media. The actual use and usage time of computers and the Internet is much more unequally divided. For example, whereas the gender gap in terms of physical access has almost disappeared, in 2000, Dutch males used computers and the Internet at home more than twice as often as their female counterparts, according to time diary studies. For telephony, the opposite occurred (Breedveld & van den Broek, 2001). All known social and cultural differences between personal and positional categories of people become visible again in the actual use, the usage time and the usage diversity of digital media. They strongly depend on the different kinds of resources mentioned above.

Actual use, the usage time and the usage diversity are the most important usage variables to be investigated in this field, together with the increase in broadband use and creative use (not only consuming but also producing information for computers and the Web). As the relevant data are far too numerous to be presented here; we refer to de Haan and Huysmans (2002a) and Huysmans, de Haan and van den Broek (2004) for the Netherlands; Katz and Rice (2002), Wellmann and Haithorntwaithe (2002), for the United States; and J.A.G.M. van Dijk (2005, pp. 106-116) for a general overview.

In the context of user profiling, usage diversity seems the most important variable. As ICT merges more and more in society and everyday life, so too is usage diversity increasing daily among all the personal and positional categories discussed above. This is quite normal for an individualising and differentiating society (J.A.G.M. van Dijk, 1999). However, distinct media user types and structural inequalities of use (usage gaps) are also appearing in this way.

Considering the new media, the following user groups can be distinguished on account of their particular lifestyles en preferences (de Haan & Huysmans, 2002a; McQuail, 1997; van Eijk & van Rees, 2002; van Eimeren, Gerard, & Frees, 2001):
- information seekers;
- communicators;
- commerce- and service-oriented people;
- entertainment and infotainment seekers.

Obviously, all users reveal these preferences up to a certain extent, but for particular groups of users one or two of them are dominant. This has a particular relevance to user profiling applications as they are more or less designed for one of these purposes. Most of them are designed for transactions of e-commerce and e-government. Others are a kind of information agent. Others, still, improve message exchanges (for instant messaging, teleconferencing or dating) with intelligence.

A usage gap appears between one part of the population using advanced applications of information communication and commerce, with a large potential demand for advanced user profiling (niche markets), and another part of the population using simple applications of information, communication and commerce and primarily entertainment with a potential demand for simple and accessible user profiling (mass market), see van Dijk (1999; 2003; 2004; 2005). This gap has important consequences for the adoption groups of user profiling to be expected. See the Conclusions below.

6.3.5 Technological properties of ICT (user profiling applications)

Evidently, the technological properties of user profiling applications, i.e. the properties of the hardware, software and services concerned, also have an impact on potential access. These properties are accessibility, usability and user-friendliness. Accessibility is the relatively complicated conditional or initial access to user profiling. Usability refers to the objective structure and design of the user profiling application more or less enabling use. User-friendliness concerns the subjective behavioural aspects of daily use appropriate to the needs of users such as the ease, enjoyability and gratification of use. These properties are discussed in (van Kuijk & Jansen, forthcoming).

6.3.6 Acceptance and Use (the ultimate effect)

All previous factors affect directly or indirectly the acceptance and use of user profiling in general and particular types thereof. On the basis of survey data and with multivariate techniques of analysis, it is possible to predict the acceptance of certain profiling applications by particular groups of users within large margins of error. However, this can only succeed with a broad concept of access that includes the user needs for these applications and the drive to start using them at all (motivational access).

The conclusions in section 6.6 will identify three broad classes of potential adopters to start this research with. These classes can be specified by taking a particular application of user profiling into account. This could be done with every new application to be developed and marketed. It will, moreover, inspire continuous future research.

6.3.7 Feedback: user profiling as a new resource

Figure 6.1, which formed the basis for this chapter, shows a feedback connection between the use and acceptance of user profiles on the one hand, and the resources on the other. This feedback line is essential, because the ultimate goal for users who accept the profiling application is to turn this into a new resource that saves time (temporal), saves on expenses (material), adds to the knowledge of one's own needs, lifestyle and position in life and society (mental), helps to improve social resources (online and offline contacts, communities, user groups) and contributes as a cultural resource to the quality of life (e.g. as a tool to organise the complicated average day of work, care, rest, leisure time and mobility). If these goals are insufficiently achieved by the special effort and risk (misuse) of using profiles, they will simply not be adopted and fail on the market.

6.4   Conclusions

The available research, summarised in this chapter, suggests that in general three groups of users can be distinguished, according to the intensity of usage and acceptance of applications that take advantage of user profiles. Probably, these groups do not differ significantly from those that use and accept ICT and new media in general. There are no reasons to suppose that the divide in use and acceptance of user profiles will differ from the existing 'generic' digital divide

6.4.1 The information elite

About 15% of the population in developed high-tech societies is working with the new media for a large part of the day. A 'broadband elite' is developing that uses about 10 different applications of ICT daily (Pew Internet, 2000-2004). They are active information seekers and communicators, strongly motivated to use the digital media. They have complete and multi-channel physical access, and they are experienced users who possess the required operational, information and strategic skills. They might be the most interested in user profile applications, but they are also the most critical users. They are able to judge their assets because they have the strategic skills that are necessary for a serious input to 'informed consent'. Several niche markets of user profiling applications can be explored for the information elite.

6.4.2 The electronic middle class

About 55 percent (the majority) of the population in developed high-tech societies has access to the digital media, usually only one or two channels (at home and at work). They have a more focused motivation to use them. They have moderate operational and information skills. They have few strategic skills. They use the digital media only for a few purposes, first of all for entertainment and secondly, for simple applications of information, communication and transaction. Only very basic, highly accessible, user friendly and trustworthy user profiling applications will attract their attention, which are consequently the only applications that are appropriate for a mass market. The mass market population will need consumer organisations and other intermediaries to support them in the informed consent to user profiling.

6.4.3 The digital illiterates

The unconnected and the non-users form about one third (30%) of the population in developed high-tech societies. With no access to computers and the Internet, they only use digital media such as televisions, telephones and audio-visual equipment. Within this group, the elderly (over 65), unemployed women, people with little education, people with a low income, disabled people and migrants or members of ethnic minorities are over-represented. A large proportion of these groups lacks the motivation, the resources and the skills to use computers, the Internet and complicated other digital media. All the conditions for user profiling applications are simply absent among this part of the population. This is an important issue for government services in particular, as they are supposed to reach the entire population. To solve this problem would require additional effort in providing basic public access sites (of computers and the Internet) with service staff and/or similar applications of user profiling on the basis of old media (print media, telephony and face-to-face service).