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Social Learning in Multimedia:
Main insights from seven case studies of digital cities
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Abstract

This article is based on a research conducted by CITA at the University of Namur on social learning aspects of digital cities. The social learning approach focuses on the negotiation and interaction processes between suppliers and users, on the representation of the user by the supplier and on the user's appropriation of the technology. But this approach tries also to stress the lessons learned by the actors of the shaping process of the technology and by the researchers.

In this paper, we will develop a major aspect of social learning which concerns the representation of the user and the configuration of the user in seven case studies on digital cities.

Introduction

This text presents some results of the SLIM research in which CITA is contributing and is based on the first version of CITA's final report. SLIM, *Social Learning in Multimedia*, is a research project within the TSER¹ program of DGXII, coordinated by the Research Centre for Social Sciences from the University of Edinburgh and involving 8 research centres² throughout Europe. The general objectives of this research are 'to analyse the development and implementation/consumption of the multimedia technologies (...) drawing upon the 'social shaping of technology' perspective and related insights from recent advances in technology studies', 'to improve our empirical knowledge³ and our theoretical understanding of the development and

¹ Targeted Socio-Economic Research.

² RCSS - University of Edinburgh, COMTEC - Dublin City University, CITA-FUNDP Namur, STS - University of Trondheim, Technical University of Denmark, ESST-EPFL Lausanne, Telecommunications Research Group - University of Bremen.

³ Underlined in the original text.

implementation/consumption of these multimedia' technologies and 'to explore the social and policy implications of these research findings'⁴.

The concept of social learning refers to a complex negotiation and interaction process where a special attention is put on the user, on its representation by the supplier and on its appropriation of the technology. But social learning is also, according to van Lieshout (1998), the learning process that takes place during the shaping of the technology, i.e. the lessons learned by the actors of this shaping process but also by the observers, namely the researchers which use their learning to build recommendations to policy-makers.

The SLIM research aims at observing the social learning processes that surround three fields of development of multimedia technologies. These are the education sector, the culture/entertainment sector and the public sector in which we have decided to focus on digital cities.

This research seems to provide a lot of interesting empirical and theoretical findings on digital cities. In this article, we will only develop a specific element which concerns the representation and configuration of the user in digital cities applications. The findings are based on seven case studies made by the SLIM researchers and that will be briefly developed hereafter.

1. Presentation of the concept of digital cities and on the seven case studies

1.1. The concept of digital cities

These last years, and even last months have seen an explosion of digital cities (Graham, 1995), also called virtual cities, electronic towns, cybercities, webcities, webbed cities, etc. (Graham, 1996; d'Udekem-Gevers, 1998).

Graham and Aurigi (1997) try to propose a typology of Web digital cities in the European Union. According to them, *'two main types of Web digital cities are emerging'* (p. 36). The first type uses the metaphor of the City *'to group together wide ranges of Internet services located across the world'* (p. 36). These digital cities are considered as *"non-grounded"* Web cities. In these cases, the *'urban metaphor is simply a convenient way of packaging the Internet's services in a user-friendly way which users can most relate to'* (Graham, 1995, p. 199). On the contrary, *"grounded"* digital cities are *'developed by local agencies to feed back positively, and relate coherently, to the development of specific cities'* (Graham and Aurigi, 1997, p. 36).

In these grounded digital cities, there can be *'glossy advertising and promotional spaces, with no useful information for residents'* or *'civic services providing "public electronic spaces" supporting political and social discourse about the city itself'* (p. 36). According to Graham (1995), this kind of virtual cities is *'being*

⁴ Technical annex of the SLIM proposal (4141 PL 951003), p. 2.

developed as policy tools supporting a wide range of urban planning and policy objectives' (p. 200).

Most of the SLIM cases do not strictly fall into these categories of digital cities. Craigmillar Community Information Service (CCIS) can rather be described as a community on-line project while Frihus 2000, at the present time, is only a feasibility study but not a developed project. Geneva-Man has the same project status of a high speed and quality ATM network mainly devoted to international organisations based in Geneva. Nevertheless, these three projects can provide us with a lot of information that can be used to analyse the more general concept of digital cities.

1.2. The seven case studies

1.2.1. Copenhagen Base (CB): A User-Driven Database⁵

CB, Copenhagen Base, was originally an information database initiated during the late 80s following an indirect demand from the citizens of the Danish capitale. Indeed, they were frequently asking for a lot of public information, mainly in the libraries of the city, and the idea came to centralise this information in a database fed by the 6 municipal departments.

It soon appeared that the first version of the database required too many technical competences and that information was difficult to find because of the structure of the base, very close to the functional breakdown of the departments. The webmaster that was engaged after this first informal assessment created a new structure, changed the technology, adapted the system and proposed a new version of the database in February 96, accessible through Internet and quickly available via text-TV. He also ask for a first official assessment of the new structure, with the help of an external institute, on the information structure, the technology and the users' point of view. Since then, some changes had been made to the project and a "new look" version of the base has been proposed in December 97.

Throughout the project, users have been involved, mainly internal users from the local administration through a user group, but also external users, i.e. citizens, namely through the official assessment.

This case study emphasizes a lot of relevant information like the opposition between the information administrative logic and the logic of the citizens demand, the vulnerability towards the technique, the importance of the assessment in this project and the involvement of the users.

⁵ JAEGER Birgit (1998), *The Copenhagen Base - Information about the Municipality, SLIM case study for the integrated study on digital cities.*

1.2.2. *Craigmillar Community Information Service (CCIS): The Problem of the Community Concept and the Need to Create User Constituencies*⁶

Craigmillar is a depressed district of Edinburgh. Former industrial place, it has now a lot of social problems with 80% of the local population receiving social allocations. In this context, a lot of community groups try to improve this situation. The aim of CCIS, Craigmillar Community Information Service, is to link all these community groups in order to share information and maybe to create an on-line community.

At the beginning of the project, CCIS was only a BBS. Since 96, when the Web technology began to emerge, a Web service, open to the world through Internet, was adopted by CCIS alongside the BBS (as a complementary service). For some people, this questions the definition of the users, of the communities concerned by this project and of a 'community service'.

In fact, users seem to have always been a problem for CCIS. Local users show a low interest for the project and the local manager, convinced of the need of "*local depth but global breadth*", felt obliged to find new user constituencies, by taking on the role of European hub of the OneNet network, and through taking on a new role as an Internet service provider.

Even if CCIS is more a community on-line project than a digital city, it emphasizes the difficulty to create the feeling of community and of membership of such an on-line community. It also underlines the fact that on-line developments, by providing on-line services, are developed in order to try to improve local life conditions in marginalised areas through re-creating a membership feeling.

1.2.3. *De Digitale Stad (Amsterdam) (DDS): Between Public Domain and Private Enterprise*⁷

De Digital Stad (DDS) has been the first digital city in the Netherlands and one of the first in Europe. Nowadays, it is usually taken as example of a successful project in that field but it seems that this successful experiment is difficult to transfer and to adapt with the same success elsewhere.

DDS is born in 1994 as a first ten weeks experiment during the local elections. This private initiative, from cultural organisations and hackers association mainly with the objective of experimenting with new media in a social and societal vision, has been subsidized by the city as a limited social experiment. These ten weeks were very successful and after hard times of reflection, the project continues with some changes in the main actors. In order to survive, DDS

⁶ SLACK Roger (1998), *Craigmillar Community Information Service, Revised Report, 04/16/98 v 2.1, SLIM discussion of projects in terms of social learning, RCSS, University of Edinburgh.*

⁷ VAN LIESHOUT Marc (1998), *The Digital City of Amsterdam: between public domain and private enterprise - final draft, SLIM case study for the integrated study on digital cities, April 1998.*

has to become more commercial and to offer commercial services, but together with free services (e-mail address, Web pages hosting, ...) to follow the originate goal.

The use of the city metaphor helped to attract people and made Internet accessible and understandable to the lay-men. DDS interface has changed three times since the first step, from a text based version to more developed WWW and graphical elements. The interface really integrates the metaphor of the city with quarters, squats, metro, ...

As a successful project and maybe as a role-model, the DDS case raises interesting questions like the use of the metaphor and its consequences, the influence of changing techniques on the interfaces and the transferability of these experiments to other digital cities projects. It also underlines the importance of the information representation in the digital cities, the communication structure, the nature of interactivity, the difficulty to configure the user and to integrate user needs into technical artefacts.

1.2.4. Digital Metropolis Antwerp (DMA): DDS's Sister⁸

DMA has been the first digital city developed in Belgium. This project can also be seen as the first application in which the optical broadband network of Antwerp (MANAP) is used for services aimed at the citizenry. It is integrated within a lot of multimedia initiatives taken in the city for some years.

The structure of DMA is very close to the DDS project of Amsterdam due to the collaboration between the two cities in the development of these two digital projects. It uses different interesting metaphors like 'bridge' (between the administration and the inhabitants) or 'quarters' which indicate specific themes (sport, culture, education, ...) rather than specific places or streets.

The DMA project, which aims at a direct interactive link between local authorities and Antwerp's citizens, comes within a more global move of administration re-organisation, namely the decentralisation of the inner-administration.

Apart from offering a lot of interactive MM services to the citizens, the City also emphasized the necessity to provide access to these services for the citizens, namely via cybercafés, cyberbooths and access from home with a modem or through an Internet provider. The possibility of accessing DMA via the cable TV is thoroughly studied and tried.

The DMA case emphasizes the importance of the re-organisation process of the local administration in order to be able to provide better services to citizens. It also shows examples of ways of creating a feeling of community within virtual

⁸ PIERSON Jo (1998), *Case study (final version): Metropolitan Area Network Antwerp (MANAP) - Digital Metropolis Antwerp (DMA), SLIM-TSER case study for the integrated study on digital cities, in cooperation with CITA, VUB-SMIT, Brussels.*

inhabitants and of trials to integrate the local administration in the everyday life through the quarters sections of the Web site.

1.2.5. *Frihus 2000: A New Version of the Telecottage Project of the 80s*⁹

Frihus 2000 is a project of information highway infrastructure development in the municipality of Frederikstad in South-East Norway. The main objective of this project is the economic development of an economically backward region in the context of regional and even parochial sentiments against the central government.

In June 1997, a feasibility study on this project has been conducted and involved different user groups in the Norwegian tradition of industrial democracy and user orientation. In the conclusion of this study and in the current developments of the project, it appears that only the technical requirements and demands have been heard and followed, maybe due to the importance of Telenor, the most important Norwegian telecom operator, in the process. As it appears now, Frihus 2000 will probably be very close to an adapted version of the Telecottage experiments of the 80's, i.e. a type of teleworking but with high-level telecom infrastructure, which however did not prove to be very successful in the past. The Frederikstad telecottage, announced in February 1998, will open in March 1998 but a new feasibility study is needed in order to evaluate the potential of this project.

This case, even if not really a digital city case, raises a lot of relevant questions on the transferability of experiments at different levels: the will from Telenor to transfer the experiment to other cities if successful but also the inspiration taken from other projects, in New Brunswick (Canada) and Salford (UK), but very different in size and ambitions. It also emphasizes the local strategy of a national telecom operator in the deregulation context, the difficulty to put feasibility studies in concrete form and the fact that user orientation and requirements do often 'compete' with technical experts opinions and that in this 'battle', experts win most of the time.

1.2.6. *Geneva-MAN: A High Speed ATM Network for International Organisations*¹⁰

Geneva-MAN is a project of developing a high speed ATM network in the city of Geneva, especially for the international organisations based there. The original idea initiated in 1994 came from a small number of telecom responsables of some non governmental organisations who wanted to adapt and update the possibilities of the existing network.

⁹ BROSVEET Jarle (1998), *Frihus 2000: Public Sector Case Study of a Norwegian IT Highway Project*, STS Working Paper 1/98 (SLIM working paper No. 3), Center for Technology and Society, Norwegian University of Science and Technology, March 1998. ISSN: 0802-3573-147.

¹⁰ GLASSEY Olivier (1998), *Geneva-Man*, SLIM case study for the integrated study on digital cities, June 1998.

In a first phase, a pilot project was set up with objective of testing the potentialities of ATM, developed by one of the participants to this project. A second phase will be implemented in order to use this network as the backbone of the new local infrastructure.

This project involves a lot of different actors with different and sometimes incompatible objectives and at the present time, even backed by a strong political will and the clear support of Swiss Telecom, the former national operator, did not lead to any convincing result. Another project, Smart Geneva, whose aim is to economically exploit the infrastructure and to propose services to firms and households of the canton is also waiting for operational decisions.

Even if the project is not yet operational, the current state of development gives some interesting elements of reflection like the difficulty for Swiss Telecom to develop its infrastructure in a area that could be considered as a very attractive market and the will from the telecom operator to search for 'local' markets in the context of dereglementation, the predominance of the technical experts in the users representation, the consequences of the high number of participants involved in the project and the problems raised by the ATM technology.

1.2.7. Périclès: A Technology Push Vision¹¹

Périclès is a global IT project in the City of Namur, in the French-speaking part of Belgium. It includes three different applications that were put together in the same project for reasons of economies of scale and maximisation of the possibilities of developing and marketing generic applications. These three applications are the PBFlow project which concerns the exchange of documents (planning permission at first) between the local administration, the architects and the regional administration based in Namur; the Syrecos application, together with European partners in a European funded project of teleservices for SMEs training and, finally, the citizens application. All three projects are presented as the digital city of Namur but referring to our definition, only the citizens application is worth studying. Moreover, different problems have led to the split up of the global project in its three componens with specific development rhythms, objectives and actors, even if some are common.

Even if, according to a study made in Summer 1997, it seems to be one of the most developed digital cities of the French-speaking Belgium because it offers free e-mail address and 2 PC for public access¹², Périclès's citizens application proposes very few relevant MM services to the citizens.

This project is characterised by a large number of partners and a lack of a unique project manager, a multitude of objectives included in an utopian discourse, conflicting and misunderstanding relations between the main actors, no users

¹¹ VAN BASTELAER Béatrice, in collaboration with Claire Lobet-Maris (1998), *Périclès: A Global IT Project for Namur*, SLIM case study for the integrated study on digital cities, February 1998.

¹² When compared with the equipment provided in other digital cities of this SLIM sample, it gives the feeling that the French-speaking digital cities have still a long way to run before becoming real digital cities offering a lot of services to citizens.

implication in the project following a technology push vision, and globally, a clear conception of the city as a huge and modelised information system. However, some learning processes have been observed like the development of an Intranet inside the local administration, induced by Périclès.

2. The representation of the user

2.1. Theoretical introduction

The '*socio-politique des usages*' (socio-political analysis of uses) proposed by Thierry Vedel (1994) is quite similar to the concept of social learning as presented by Robin Williams in the SLIM proposal and in different articles (1996, 1997) and by Knut Sørensen (1997). According to this approach, the use of technology in society is at the crossing of four logics: technical and social logics that can be grouped by the concept of **socio-technical configuration**, and offer and use logics that are approached by the concept of **representation of the user**. This last notion is the focus of this article.

As a preliminary remark, let us mention that this focus on the user is not new. According to Proulx (1994), since the beginning of the 80s, a lot of European and American researchers are interested by users and their use. The concept of user is more and more integrated in political discourses (Proulx, 1994) but there is still a major problem: how to really integrate the user in the innovation process, how to design products that best match user requirements, how to understand the social uptake and use of these new technologies (Williams, 1997). For Chambat (1994), it seems really difficult to take the concept of user into the definition and diffusion of ICT and to escape from the traditional model of supplier-demander, or transmitter-receiver.

Richard Delmas from the European Commission admits that most political and administrative responsables of the European research programmes had not during a long period of time realise the social importance of the problematic of users and uses (Proulx, 1994). Most research have been concentrated on the supply side even if things are slowly changing at the European level, for instance with the TSER program of DGXII or with the MIND and METASA projects of DGXIII (d'Iribarne, 1997) and are expected to change further in the fifth framework programme.

After these preliminary remarks, an important question to raise is the **content of the concept of representation**. This relates to two meanings (Vedel, 1994; Chambat, 1994):

- the political expression of interests, i.e. the ways people may collectively express their needs and have an influence on technological processes;
- the image that ideas men or designers have concerning a technology and its potential users.

The first meaning of representation raises different problems. The first one is related to the fact that these users are a social virtual group which has difficulties

to organise itself as a pressure or lobbying group due to that fact that the users' interests are frequently various, dispersed or even contradictory (Vedel, 1994), that users are composed of individualities, of 'atomised' people who have no common identity and who have difficulties in initiating a collective action (Chambat, 1994). As underlined by Williams (1996), users are not homogeneous, their potential responses to the technological artefact are differentiated by gender, generation and class and shaped in the complex social dynamics of the family.

According to Chambat (1994), this difficult collective representation is even reinforced by the specificities of ICT, either in their surrounding ideology or in their concrete use, which tend to increasing individualization. A second problem linked to the collective representation is the frequent lack of expertise of users (Vedel, 1994) that induces an inveigling of the interests representation by experts or specific spokespersons (Chambat). This dominant role of experts is of course even stronger in (apparently) complex technical matters.

Another consequence of the representation problems and of the 'atomization' of users where the only possibility for the user to express its opinion is to buy (or not) the product once available on the market is, according to Chambat (1994), the proximity of a market situation. In such situation, market could be assimilated to democracy, user to consumer or client and liberty to choice. This trend is already observed nowadays, notably in the SLIM integrated studies on education and digital cities, when assimilating schools or cities to a market for instance. The assessment on 'The Amsterdam Pavillion' proposed by van Diemen and quoted by Pierson (1998) is an example of this trend of assimilating a citizen to a consumer rather than to a co-producer of information and of the consequence of this tendency on the design of the technical artefact (less interactive, providing less forms of communication).

According to Chambat (1994), the deregulation and privatisation of the telecom market and of other public services reinforce - or clearly express - this trend.

Still and finally at the level of the collective representation, the existence or non existence of public debates - in the field of ICT for instance but not only - reveals the importance given to users and, more precisely, reveals their place as actors of the technological change process (Chambat, 1994).

The second notion of representation relates to the **image of users** that designers have in mind when they construct the artefact (Vedel, 1994; Chambat, 1994). During this shaping process, ideas men postulate needs and precise behaviours from users. But users have also ideas about the technology and its potential use. However, some of these ideas may be induced, configured by the designers. It is then interesting to see, according to Vedel (1994), how designers will influence users, will orient users' representation of the technology to make it coincide with their objectives concerning the technology and its potential use. But one problem in this specific field of digital cities, or mainly in the seven SLIM cases on digital cities, is the heterogeneity of actors, as underlined above, and the fact that each of these actors may have different perceptions of the user and then different strategies to influence and configure users.

To configure the user, designers have different solutions (Vedel, 1994): advertisements, directions for use, technical guide, experiment or test-period, accompanying discourses. At the level of discourse, public authorities, as show in the first part of this document, play an important role by usually and sometimes continuously relying on motivating myths concerning information and communication technologies, Internet and the Information Society in general.

Some of these configuring solutions try in fact to overcome the absence of users as an important actor of the technological change process, a fact that has also been observed in the SLIM research on digital cities. To cover up this deficiency, different strategies may be followed:

- using a market approach by market studies but Vedel (1987) underlined that this kind of approach is ineffective when concerning new products that the public does not know;
- conducting social experiments and assess uses before generalising the product (Chambat, 1994);
- opting for a pure supply approach postulating that demand and use will follow, but maybe on an appropriated and not predicted way. However, this is rather difficult for private firms that have profitability requirements;
- using results of former research and integrate these elements in the new products (Vedel, 1987). However, this raises the problem of the transferability of results that will be developed in the social learning section.

Another complex element in that issue is due to the specificity of ICT which is not a traditional product of immediate consumption but that requires a rather long time for use to be created (Chambat, 1994). According to Chambat, users' satisfaction can only be measured after an uncertain period of time. This period can be divided into three big steps underlined by Moricot and Scardigli quoted by Chambat:

- the first period of collective fantasy and motivating myths either from industries or from the State;
- the second time which concerns the effective use of the product but within traditional and former way of life, without any social innovation;
- the third and last period where some innovations emerge as radical innovations involving new values, new social structures and new day-to-day practices.

Theoretically thus, it seems difficult to solve this paradox of a central user but so difficult to represent due to different reasons inherent in the notion of user and in the specificities of ICT and multimedia. However, some interesting elements on that subject may be found in the SLIM cases either at the moment of the design of the application (configuring the user) or at the time of the implementation of the project (enrolling the user), even if the two steps are not always clearly separated. The second step will not be developed in this article.

2.2. Configuring the user in the SLIM cases

The way user is configured in a technological artefact is expressed through hypotheses made on it underlying the choices taken at different levels. At the level of the delivery platform, choices have been made concerning the access possibilities. Choices are also taken at the level of the application. The central question is which hypotheses are made on the user and how they are integrated at these diverse levels.

First of all, it is worth underlining that the extent to which this configuration is hypothetical depends on the **existing knowledge** on the potential users. In most of the SLIM cases, there are few precise information on the users. The less real users are known, the more it will be necessary to make hypotheses on these users and the more these hypotheses will be vague.

As underlined above, we may distinguish the choices made at the level of the application and the ones concerning the delivery platform.

For the **applications**, different choices are taken and configure the user. They are related to the interface, the metaphor, the language, the services or the rules.

A structured **interface**, with a very simple structure and self-speaking titles, is probably based on the hypothesis that the user is not used to the technology and needs to be guided during its navigation. At the contrary, a rather vague and unstructured interface may either induce that the user is accustomed to the technology and to interfaces in general and is able to find his way on the application, or that there is no hypothesis on the user and no reflection on its capacities. The use of well-known **metaphors**, like the city, the square, the post office, the metro, the pub, the squat, the house, ... underlines also the capacity of the user or its degree of familiarization with the technique. It is another way of guiding the user for which the technology is supposed to be new and sometimes a little bit scaring. In DDS, it is clearly observable that the use of the metaphor of the city has been a way of attracting lay-men to a technology that, for most of them, was completely unknown.

The use of the **language** as a configuring element is rather clear in the CB case where the choice of Danish configures the user, but rather on a negative way, as it excludes all users who are not able to understand Danish. It clearly precises the boundary of the target users. According to Marc van Lieshout (1998), the language used within DDS (citizens/tourists, names of the squares, of the houses, ...) has played an important role in configuring the city but also the users. But these specific names are related to the metaphors underlined above.

More generally, the **services** offered and especially the interest and value added of these services and their target public are other configuring elements. The services offered, for instance the offer of a free e-mail address or of space on the server, the type of information proposed, the structure of the presentation of the information or the level of interactivity of this information, reveal the hypotheses made on the user.

The free e-mail address or the space on the server induces that the user is not connected to Internet yet, either because he has no money to do so or, maybe more frequently, because he does not see the necessity of being connected to the network. The solutions that are proposed in some digital cities (free address and space) are ways of attracting the user and to make it use the network. The fact that this e-mail address is only given to local inhabitants for example expresses that potential users are mainly local.

The provision of local or tourist information also reveals hypotheses about the user, being a local inhabitant or a foreign visitor while economic or general information indicates if the user is the citizen, the individual or enterprises.

The way of structuring the information induces that the user is enough trained or accustomed to electronic applications (use of search functions or of a tree structure for instance) to be able to find the information on the server.

Endly, the **rules** that have to be applied in the city - the netiquette for instance or the prohibition to make commercial advertisements in personal homepages - are another way of configuring the user (van Lieshout, 1998).

Concerning the **delivery platform**, the main configuring element is related to the **access possibilities**. Providing several access possibilities and places means that the user is not well equipped at home or at the office and needs other ways of accessing the application.

Choices made at the level of the **training** concerns either the delivery platform, i.e. the capacity to use a specific equipment, or the application, i.e. the capacity to find a precise information for example.

All these choices reveal the main hypotheses made on the user. Is he a citizen or a consumer? Is he an inhabitant of the real city or a visitor? If the application is mainly administrative, is he an internal user of the administration or an external one? Does he have the necessary equipment to access the application or is he under-equipped? Is he a lay-man or is he accustomed to the technology? In some cases, contradictions could be observed at the level of the hypotheses where a specific choice induces that the user is for instance well-equipped but that another characteristic of the project shows that he is not. Or there can be contradictions with already known elements of the context. For instance, there can be only a few access possibilities in a region where the PC equipment level and the Internet connection rate are quite low.

We will now review the seven case studies and try to identify the main hypotheses made on users through the specific configurational choices. As we have indicated above that hypotheses are dependant on the existing information, we will indicate for each case if such information on the user exists.

2.2.1. CB

The external users of the CB are moderately known or, at least, not at the beginning of the project. Due to an assessment made during the project,

information about the external users becomes available. There are more information on the internal users since people representing these have been involved in the development process, either through the steering group at the beginning of the project or through the user group during the management of the project.

The Copenhagen Base is thus designed for internal as well as external users. These external users are only the Danish inhabitants of Copenhagen or those among the foreign residents who understand Danish. External users are maybe more considered as consumers of administrative services and information than as citizens because there are only few possibilities of producing information.

The user is moderately equipped in PC and needs a free connection. Moreover, the services can be available through text-TV because much more citizens in Copenhagen have a TV at home than a PC. Since there are no specific training sessions proposed, the user has to be already well-trained and must be able to handle the base itself. It must then be able to use search functions or to find its own way through the organisational structure of the information.

2.2.2. CCIS

In CCIS, the user is quite unknown and its needs are so unidentified that it was necessary to find new constituencies and to offer new services.

There is no distinction between internal and external users. The user was originally defined as a local community group, including enterprises, and then extended to a global community whose common denominator is rather vague. The case study provides few information about specific training and access strategies.

2.2.3. DDS

In Amsterdam's Digitale Stad, the user was not known at the beginning of the project but information on it came from two surveys conducting during the diffusion process of the project. The DDS case study unfortunately does not clearly indicate if the information given by these two surveys has a specific influence on the user configuration and on some specific elements of the technical artefact.

There is no distinction between internal and external users. At the beginning of the project, the user was supposed to be a lay-man that needs to be guided through the application with a clear and structured interface and to be attracted with a well-known metaphor. Afterwards and maybe due to the success of the first ten weeks of experiment that probably reveals that the user was not so inexperienced, this user was supposed to be able to use a more advanced technology, the Web. But it was not necessarily the case and the designers then realise the difficulty to configure all users in a specific artefact.

Concerning the level of equipment, the DDS user is supposed to be well-equipped since the application can only be accessed through dial up phone and the free e-

mail address provided or through Internet. The five public terminals that were provided during the ten weeks of experiment were abandoned for different reasons, even if providing low access is still considered as a priority for DDS which seems a bit contradictory.

It appears thus that from the beginning of the project to a more advanced level, designers have changed their ideas about the user or have thought that the user has changed a lot in several months. Indeed, the user became rapidly trained and able to use the application, since it was not at the beginning, and it suddenly get access means to the technology. Of course, a lot of modems were sold during the 10 weeks of experiment but maybe not until changing the situation completely. But this change related to users representation is maybe not only due to changing hypotheses on the user. This is also probably linked to changing objectives following the new private status of the managers.

Finally, in DDS, the user is principally seen as a citizen rather than a consumer. This is quite coherent with the initial objective of the project, i.e. experimenting with the new media and assessing its influence on the society and the social link that implies to see the user as a co-producer of information, as a producer of this social link.

2.2.4. DMA

In DMA, there is a distinction between internal and external users. The internal user is rather well-known at the beginning because it has been involved in the development of the project but there are more uncertainties concerning the external user. Here, choices taken reveal that users are both the local administration and external users which mainly include the local inhabitants but also the visitors. However, information proposed is mainly local and thus does not provide a lot of interest for foreign visitors. The external user is mainly seen as a citizen that needs to be informed on the local decisions, the official decrees, on different administrative information but that is also a producer of information through newspapers, homepages, notice boards, and so on.

The user is considered as being moderately trained and equipped. Indeed, several access possibilities are proposed either within the city or in the suburbs (the local user is thus not necessarily living or coming frequently in the city). Free e-mail address and space-disk are proposed revealing that the normal user is not necessarily connected to Internet yet. Finally, the user needs training sessions and on-line helps which means that it is not sufficiently trained.

2.2.5. Frihus 2000

Frihus 2000 is the SLIM case where the user is the most known, or at least the potential user. Within the different types of potential users (the enterprises, the local administration, the citizens, ...), one category will be privileged: the commuters that will become 'telecommuters'. However, additional information is needed concerning this specific type of users. This information will be gathered in a new feasibility study.

There is thus a clear emphasis on local inhabitants mainly seen as consumers but there is no distinction between internal and external users. The users are not well-equipped since the aim of the main application of Frihus 2000, the Telecottage project, is to provide equipment and access to a broadband network and videoconferencing to these users. The case study does not give information about existing or future training possibilities.

2.2.6. Geneva-MAN

For Geneva-MAN, there is quite a lot of information about the potential users which participate in the taskforce and are the basis of the project. In this project, the user is clearly a consumer of infrastructure and of services. The case study does not provide enough information on the training, the equipment level or the services but this is maybe due to the fact that the project is not yet implemented.

2.2.7. Périclès

In Périclès, the user is quite unknown. It is supposed to be mainly external and living in Namur or in its province. Indeed, the information proposed is available only in French (even if the Dutch and English flags are put on the homepage, indicating that the information could be available in these two languages but there are no pages linked to these buttons) and concerns the local institutions: administrations, schools, associations, ...

The user is supposed to be quite well-trained since the interface is not much structured and rather unuser-friendly. Indeed, the user must be able to find its own way on the web site or to use search functions. Concerning its equipment level, the situation is a bit contradictory since the user is supposed to be not so well-equipped and needing a free-mail address but only few other access possibilities are proposed.

Finally, the user is mainly seen as a consumer of information as really few interactive services are proposed and very few possibilities of producing its own information are available.

Table 1: Summary of the main configuring elements on the SLIM cases

Cases	Existing information	Access possibilities	Training	Hypotheses on the user
CB	<ul style="list-style-type: none"> * information on internal users (involved in the development process) * no information on external users at the beginning * information on external users from the assessment 	<ul style="list-style-type: none"> * free e-mail address * accessible through text-TV 	<ul style="list-style-type: none"> * no training session 	<ul style="list-style-type: none"> * moderately known * internal and external * local inhabitant * well-trained * moderately equipped * consumer rather than citizen

CCIS	* few information about the user, either the original one or the new constituencies	information missing in the case study	information missing in the case study	* largely unknown * no distinction between internal and external * local and then 'worldwide' * consumer rather than citizen
DMA	* information on the internal users * no information on the external users	* free e-mail address * numerous access places and possibilities (dial up phone, Internet, information kiosks, soon available through cable TV)	* training sessions * on-line help	* moderately known * internal and external * mainly local inhabitant but also foreign visitor * moderately trained * moderately equipped * citizen rather than consumer
DDS	* no information on users at the beginning * information through surveys during the project	* free e-mail address * few access possibilities other than by dial-up phone or Internet	* no training sessions	* moderately known * no distinction between internal and external * local inhabitant and foreigners, no necessity to live in Amsterdam to become a DDS inhabitant * moderately trained * well-equipped * citizen rather than consumer
Frihus 2000	* a lot of information about different types of potential users * information needed on the telecommuters (new feasibility study)	* access to a broadband network and videoconferencing facilities in Telecottages	information missing in the case study	* well-known potential users * no distinction between internal and external * local inhabitant and especially commuter * not well-equipped * consumer rather than citizen
Périclès	* no information about the user	* free e-mail address * few access possibilities other than by dial-up phone or Internet	* no training session	* unknown * mainly external and local inhabitant * well-trained * moderately equipped * consumer rather than citizen
Geneva-MAN	* information about the user through the taskforce	information missing in the case study	information missing in the case study	* well-known * no distinction between internal and external * local organisation * consumer rather than citizen

Conclusion: The user, a still unknown actor

In the SLIM research, the user has a central place. However, it appears that this is not necessarily the case 'in the reality', that it seems difficult to involve it in the

shaping process of technology and that, moreover, the user is still rather unknown.

Sometimes, efforts have been made to directly associate the user in the conception or in the set up of digital cities but these efforts are not really conclusive and the expert or technical orientation approach is still dominating. This has been observed in Frihus 2000 or in DDS. In other cases, there is no will to involve the users in the project. This is clearly the case in Namur. In other places, only some groups of actors are associated in the development of the project but the question of their representativity is raised. The problem appears thus to be complex. And the European Commission requires more and more that projects submitted to selection for funding include groups of users in their conception or development. Even if no generalisation could be made on our seven case studies, they just raise this problem that should be studied on a larger scale to help the Commission to define its criteria of selection and to assess the submitted projects.

As we have underlined concerning the representation and configuration of the user, when the user is unknown, it is necessary to make hypotheses about it and about its behaviour. We have stressed the hypotheses that, to our point of view, are made in the different case studies. It is now interesting to question the relevance and the adequacy of these hypotheses or in fact, to suggest that these hypotheses are rarely tested in the reality, i.e. confirmed or infirmed by the reality. In some cases, when the hypothesis appears to be wrong, the more usual analysis is that users are 'resistant to the technology' but not that the hypothesis must be adapted.

In fact, except DDS, there are few social experiments which, during a limited period of time, following a scientific approach, try to test the hypotheses and confront them to reality, modify them and adapt the technical artefact if necessary. However, even in DDS, this attitude has been observed during the first ten weeks of experiments but not necessarily after the end of this limited period.

Last but not least, concerning hypotheses on the user, an important think is, according to us, to make complete and coherent scenarios. In fact, hypotheses on the users have to be made or to be applied on each dimension of the project: interface, metaphor, language, services, rules, access and they have to be coherent. For instance, if concerning the interface, the user is considered as being moderately trained or accustomed to the technology and needs to be guided through a user-friendly interface, training policies have to be proposed. Or, if the user is considered as being moderately equipped and requires to access the network freely through dial-up and modem, it is also necessary to propose specific other access possibilities. Such coherent and complete approach has hardly been observed in the SLIM cases.

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