Digital cities in Europe

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DIGITAL CITIES IN EUROPE

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1. Introduction[1]

One of the themes in the Danish discussion concerning the information society has dealt with the public authorities' role in its development. While most other western nations are relying on the private sector as the driving force in the development of the information society, in Denmark we have chosen a different strategy. Instead of the market forces acting on their own, the public authorities are expected to play a significant role in cooperation with the private sector and "lead the way with an efficient utilization of information technology." (The Ministry of Research, 1994, p. 28)

The public authorities can lead the way in many different ways. The focus of this paper is on the manner in which the public authorities electronically present themselves to the citizens. This can occur via municipal home pages, city nets or bulletin boards created by the city's public authorities. When speaking of local authorities these are referred to in Europe as "digital cities."

This paper will focus on the development of digital cities in Denmark as well as in the rest of Europe. First I will examine the background for the idea concerning the digital city itself. Thereafter a concrete example of a Danish digital city will be presented, namely the Copenhagen Base. The story about the Copenhagen Base is a part of a greater European project: Social Learning in Multimedia (SLIM)[2]. The story about the Copenhagen Base can therefore also be found in a more comprehensive and detailed form in a book that is to be published in conjunction with the conclusion of the project (Jæger, forthcoming). In addition to the Danish example, the SLIM-project worked with examples from six other nations[3]. In the concluding report from the SLIM-project (Bastelaer & Lobet-Maris [eds.], forthcoming) all seven cases are presented together with conclusions that are made while considering the cases in relation to one another.

This paper builds directly upon the work of the SLIM-project and it is therefore also the same theoretical perspective that is employed. The foundation for the project has been an understanding of the technology on the basis of a social constructivistic perspective. In other words, the technology is considered to be a social construction. The technology does not on beforehand embody any values or characteristics, but are created by the actors that are involved in the development process. In other words, the technology is formed in a network of different actors with different interpretations of the technology[4].

In the light of this theoretical perspective, the Danish and other European examples will be discussed in the closing of this paper on the basis of selected

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[1] A slightly different version of this paper is previously printed in Danish in Jæger (1999)

[2] The SLIM-project ran over a period from May 1996 to February 1999. It was financed by the EU and consisted of participants from England, the Netherlands, Ireland, Belgium, Norway, Switzerland, Germany, and Denmark.

[3] The project selected the following digital cities as cases: The Digital City ("De Digitale Stad" - DDS) in Amsterdam (the Netherlands), Craigmillar Community Information Service (CCIS) in Craigmillar (Scotland), Digital Metropolis Antwerp (DMA) in Antwerp (Belgium), Freehouse 2000 ("Frihus 2000") in Frederikstad (Norway), Geneva-MAN in Geneva (Switzerland), Périclès in Namur (Belgium) and the Copenhagen Base (CB) in Copenhagen (Denmark).

[4] A more comprehensive description of the social constructivistic perspective in technology studies can be found in Bijker, 1995 and Jæger, 1995. A more comprehensive description of the SLIM-project's theoretical perspective can be found in Williams, 1997; Bastelaer & Lobet-Maris (eds.), forthcoming, as well as in Van Lieshout, Egyedi & Bijker (eds.), forthcoming.

theoretical terms. I have chosen to discuss the digital cities in light of the following terms: representation, configuration and social learning processes.

The background for the digital city
The term "digital city" first emerged in connection with the establishment of the digital city in Amsterdam in early 1994 (Van Lieshout, forthcoming). Nonetheless it is possible to trace the visions behind the virtual local community further back. Visions of "The Wired Cities" (Dutton, Blumler & Kraemer, 1987) emerged in the 1960's in the USA, which are reminiscent of contemporary notions concerning the digital city on many points. While the technological foundation for these ideas was the spreading of cable television, the vision concerning the possibility of local communities possibly employing local television to facilitate debate and disseminate information is not significantly removed from contemporary visions concerning the virtual local community. These visions can also be rediscovered in the ideas concerning local television and local radio in many European countries throughout the 1960's and 1970's.

It was already suggested in the 1970's that information technology (IT) could serve as the basis for the realization of the visions described above. While the Internet's cornerstone was already laid in 1972, that which was called ARPANET at the time, many years passed before it was made available to the public. For that reason, the first attempts at establishing an electronic local net were primarily based on Bulletin Boards (BBS).

The visions also repeat themselves in the NII-initiative (The National Information Infrastructure), which Clinton and Gore introduced shortly after they assumed the presidency. In this case there was not only talk about local electronic networks, but about global networks for the benefit of both commercial and private interests. In Europe the American NII-initiative was followed up by a European working group under the leadership of the German EU-commissioner Martin Bangemann. This work resulted in the so-called Bangemann report, which was published in 1994 (Bangemann et al., 1994).

The Danish government took up the challenge from the Bangemann report and established a Danish working group that was to clarify the manner with which the information society was to appear in Denmark. This resulted in the so-called Dybkjær report, which was published in 1994 (The Danish Ministry of Research, 1994).

The Dybkjær report concerns itself with many different aspects of the information society. As concerns the electronic services provided by the public authorities, the report concluded that the entire public administration – state, county and municipality - ought to be connected within a comprehensive service net. This net should provide better service to citizens and commercial enterprises, rationalization windfalls, as well as a more open decision-making process. The principle was to result in the following initiatives:

- All public institutions were to establish an electronic mailbox.
- All ministries were to develop a plan for electronic communication.
- Public institutions were to develop electronic self-service systems and bulletin boards.

- "Statens Information," the state information service, was to establish an electronic map for public instances and institutions as well as an electronic bulletin board with press releases and publications from the institutions of the state.

The report advocates that the electronic infrastructure for this service net should be Diatel[5]. This is repeated in the action report that was issued afterwards from the Danish Research Ministry, but in the following action report from 1996 it is made clear that the Internet is to serve as the electronic infrastructure.

> "The connections between the public nets is to be based on Internet technology, which has become the de-facto standard for communication in the open nets and is increasingly used as the basis for communication in the internal nets of the commercial enterprises, so-called "intranets". As such, the goal is to create "Internet functionality" between the public nets in a public intranet." (Research Ministry, 1996, p. 55)

Table 1: Important events preceding the digital cities

60's	The "Wired Cities" idea emerges in USA - visions about using local tv and local radio for communicating within and between local communities
70's	The first "Wired Cities" projects are established in USA and Japan
1972	First demonstration of ARPANET (the Internet's predecessor)
1974	Establishment of the first "Community network" in Berkeley, USA (Community Memory)
1980	Establishment of the first local community's BBS in USA (Old Colorado City)
1986	Establishment of the first "Free-net" in Cleveland, USA
1989	Establishment of PEN (Public Electronic Network) in Santa Monica, USA
1990	First implementation of World Wide Web Establishment of the first cities' home pages in USA (e.g. Palo Alto)
1993	Publication of "NII: Agenda For Action" in USA
1994	Publication of the Bangemann report in Europe Publication of the Dybkjær report in Denmark
1995	The Danish Government's first plan of action was announced The first municipal home pages were established in Denmark

Source: a more detailed version of table 1 in Bastelaer & Lobet-Maris (forthcoming)[6].

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[5] Diatel was a Danish on-line service similar to American services such as American Online and Compuserve. Diatel consisted of a cooperative venture between TeleDanmark, two national newspapers (Politiken and Jyllandsposten), a bank (GiroBank) and Kommunedata, a large company specializing in supplying software to the Danish municipalities. Diatel was introduced in March 1995 as the electronic network of the future in Denmark, but it was already closed in February 1996 on the grounds that it could not compete with the Internet. The story about Diatel is told in Jæger, 1995.

[6] Bastelaer & Lobet-Maris have taken the table from Marie d'Udekem-Gevers (1998).

Definition of the digital city
As with all new terms, there is not yet a "definitive definition" of what a digital city actually is. An interpretation with roots in the "Wired Cities" sees the digital city as a concrete city that, often via a development project, is to be equipped with an electronic infrastructure. In other words, according to this interpretation it is the infrastructure itself that serves as the basis for the definition.

Other interpretations focus more on the content of the electronic infrastructure. In this case, a distinction can be made between two interpretations: those digital cities that are "grounded" and those that are "non-grounded." The "grounded" interpretation perceives the digital city as a concrete existing city, that offers citizens access to electronic information and communication. The information in such a digital city will be narrowly tied to the existing city. An example of such a digital city is the Copenhagen Base. The "non-grounded" interpretation perceives the digital city as an electronic city where the "citizens" that share the same interests can meet and exchange ideas and experiences. According to this interpretation, there is not necessarily a connection to a concrete city. An example of such a digital city is DDS in Amsterdam, where only 22% of the users in 1996 were actually residents of Amsterdam (Van Lieshout, forthcoming).

2. The Story of the Copenhagen Base
The actors behind the Copenhagen Base (CB) do not define the CB itself to be a digital city. This is somewhat surprising on the grounds that in terms of both content and form, the CB lives up to the definition of a digital city; however, there can be several explanations for this situation. One of these explanations might be that Copenhagen is not a part of any form of cooperative venture with other digital cities, for which reason there is no need to define the city as a digital city. The city is so large that "it can manage on its own," so that it is not dependent on any cooperative partners. Within the regime of the EU an organization with the name "Telecities" has been established, which facilitates the exchange of experiences between digital cities from all over Europe. There are several other Danish cities that are a part of this, but the City of Copenhagen has apparently not prioritized membership in such an organization. Another explanation could be that the CB was initiated long before there was anything called digital cities.

The idea behind creating a database with city information emerged among a number of librarians from Copenhagen around 1987-88. They experienced an increasing number of inquiries from citizens who sought after many different areas of information about the city that the libraries did not have access to. The librarians therefore struck upon the idea that if some kind of an accumulated database with city information was made, they could then be able to answer more of the citizens' inquiries.

In 1989 the Lord Mayor's department (which has the overall responsibility for information provided to the citizens) convened a steering group that was put in charge of developing a technical structure for such a database. All six of the magistrates appointed a representative to the steering group. In the course of the

next couple of years the steering group then developed a database with information from all six magistrates based on the city's internal computer system (a so-called 3270 system) that had the form of a kiosk of information.

The first version of the CB was introduced in January 1994. At that time the employed technology was already obsolete. Additionally, the first version demanded a high degree of technical skill and computer experience to be able to lay new information in and thereby maintain the base. This made the base vulnerable to changes of staff. As such, there were several situations where the base was not maintained because the employee who had the ability to update information had transferred to a different job or had quit entirely.

These factors made it clear that regardless of the fact that the CB was new, it was not particularly functional. Immediately after the introduction of the base, the Lord Mayor's department employed a librarian who was put in charge of building a new and more contemporary database. At that time (1994) the choice stood between laying the database out on the Internet or over to Diatel. This was roughly at the same time as the publishing of the Dybkjær report, which stated that a condition for the establishing of the public network was that it should be placed on Diatel. Nonetheless, the librarian decided in April 1995 to lay the CB on the Internet. Today the librarian (who is hereafter referred to as the web-master) is quite proud of the fact that he made this decision. He is convinced that if he had chosen Diatel at that time, the CB would not exist today - that the CB would have met its demise together with Diatel.

Following the decision to lay the CB on the Internet, the web-master contacted IBM in Denmark, who were granted the task of overseeing the technical transition from the old 3270 system to the Internet standard.

In September 1995, the status of the steering group was modified to that of a user group. Some of the members of the steering group remained in the user group, which thereafter was supplemented with information assistants from the different magistrates on the grounds that they were the ones who knew what citizens usually inquired about. The user group was given orders to coordinate the development of the Internet-based version of the CB. Here it is worth noting that there was also a significant modification of the group's competence. The previous steering group was to *steer* the development of the CB, whereas the user group was to *coordinate* its development. The final decisions were hereafter made by the web-master. The Internet-based version of the CB began operating in February 1996.

The CB's development was influenced by a shift in the perception of the base's target group. According to the original idea, the librarians and other city employees were considered to be the target group; however, when the Internet-based version of the base was introduced, the target group was expanded so as to cover, in principle, all citizens in Copenhagen. The CB was therefore made accessible for the city's citizens on computers set up in the public libraries. They were free to use, but there was no form for training or instructions. It was taken for granted that the users could figure out how to use the computers on their own.

In May 1997 the CB was also made available on text-tv. The background for doing so was that there are many more citizens in Copenhagen with television with access to text-tv than a computer with Internet access (74% of the city's

citizens according to the web-master). It would therefore be possible to significantly increase the number of citizens with access to the CB.

The user group has discussed whether or not CB should provide tourist information. For financial reasons the group decided that the CB should not be translated to other languages. There is nothing more than a link provided to the relevant tourist organizations. However, this decision has the unintended consequence that those residents in Copenhagen who do not speak Danish are excluded from using the base. There is also another group that has been excluded – all of those persons, who either cannot or will not use a computer. A member of the user group explains that if these people are to set the standard for the city's service, it would be impossible to develop any form of electronic service. The challenge is therefore to make sure that there is still information available in other formats than just the electronic forms.

The CB is exclusively financed by the City of Copenhagen. In the first phase of the development, the city attempted to establish a common project together with TeleDanmark (the former national telephone company), PostDanmark (the national post system) and Arte (a private company that sells and distributes tickets for theaters, concerts, and other cultural events). This did not come to be. The Web-master describes the situation in the following:

> "There wasn't talk of a conflict, but we – the City of Copenhagen - were very disappointed. After that we chose to make the base on our own." (Own interview)

The Lord Mayor, Jens Kramer Mikkelsen, has supported the development of the CB from the outset. He personally recommended the project to the City Council, when the decision concerning the CB's financing was to be made. He regards the CB as a means of revitalizing the city's image.

When the new version of the CB had functioned for a year (in other words, at the beginning of 1997), the city decided that the CB was to be evaluated. For that reason they hired the Center for Competence and Media at Denmark's Technological Institute (DTI) to perform an evaluation with particular focus on the structure of information, technology and the users' evaluation. The evaluation concluded that the CB was boring, it failed to differentiate between different user groups, the information was structured in an all too rigid manner, and it failed to reach the users (DTI, 1997) (this criticism is further elaborated in the next section). The web-master decided to modify the layout and search-function as a result of the evaluation. The third version of the CB became accessible to the public on the Internet in December 1997, since which time there have not been significant alterations made to the base.

Table 2: Timetable of the Copenhagen Base

Main Dates	Events
1987-88	The idea of the database arose from the public libraries in Copenhagen
1989	A steering group was set up to develop a technical structure for an internal computer system
January 1994	The first version of the CB was launched
1994	A new leader of the Lord Mayors Department, Information & Communication was hired
April 1995	The new leader decides to re-launch the CB on the Internet
September 1995	A user group was set up to coordinate the development
February 1996	The Internet-based version of the CB began operating
February - June 1997	An evaluation of the CB was carried out
May 1997	The CB was made available on text-TV
December 1997	Based on the results from the evaluation the present version of the CB was launched

The Copenhagen Base's contents
The Copenhagen Base is one of the most comprehensive home pages of its kind in Denmark. More than 2000 pages can be found at the address, www.kbhbase.copenhagencity.dk. The CB has the following menu points:

- News
- Children & youth
- Culture & recreation
- Social services
- The elderly
- Traffic and roads
- Taxation & national registration office
- Addresses, brochures & forms
- The City Council, agendas & decisions
- Health & disease
- Housing & building
- Environment, water, energy & foodstuffs
- Labor market & commerce

It is clear, that the CB was envisioned as a database, which is also apparent from its very name. "Database" or just "base" was the common term in the 1980's, but they are not used that often anymore since the Internet has gained a position of dominance. The perception of the CB as a database has the consequence that it is primarily regarded as a means of disseminating

information to the citizens, as well as the means by which information is structured (more on the latter in the following section).

The user quickly discovers that one can find a wealth of general information, such as the opening hours for the libraries and other public institutions, but information is not targeted towards the individual user. The information is also relatively static. According to the Web-master, approximately 85% of the base's information is updated only once a year. If a user has a concrete need for information concerning a particular public service such as home-care, day-care institutions and the like, the only thing the CB offers is a telephone number to the relevant administrative office. In other words, the user still has to phone the administration and get the right employee within the office's opening hours. It would otherwise be relatively simple to provide the user with the opportunity to be able to find more specific information. If the CB included the opportunity for interactivity, enabling the user to provide her own information to the CB, then she could get more specific information about such things as the school that her children would attend were she to move to another area of the city.

Nor does the CB provide opportunity to make transactions where the user can get things done. For example, it is not possible to have oneself written up for a spot in a day-care institution, modify one's tax-return or make an application for rent-subsidization. These limitations were also touched upon in the evaluation that DTI conducted in 1997, such that the web-master is perfectly aware of it. He says:

> "As of now the CB functions primarily as an information database, but the goal is to create a communicative base. Therefore we are working on making it technically possible to include such things as tax-return forms, just as one will be able to sign up for day-care and that kind of thing. It is logical that it has to be interactive, also when it comes to direct contact to politicians. That is right around the corner." (Own interview)

Nor are there many possibilities for communication in the CB. There are only a few politicians from the City Council and a few civil servants that have e-mail addresses. The web-master does not believe that today's administration is geared such that all employees should have e-mail addresses. There are a number of leaders who are nervous about giving the employees access to the Internet on the grounds that the employees might spend too much time surfing on the Net. At the same time, however, the web-master is convinced that the time will come and that the development is proceeding with "giant steps forwards." It is now possible to send an e-mail to the City of Copenhagen, but the handling of these referrals and the response to them proceeds as it always has been done, in other words, on paper via "snail-mail."

There are individual places on the CB where it is now possible to communicate with other citizens. Such pages include a youth page and the individual home pages of the four experimental neighborhood councils. At these sites the citizens themselves can write remarks and comment on others, and the web-master has received quite a bit of positive response from users who indicate that they value this opportunity very highly.

Evaluation of the Copenhagen Base

The overriding evaluation of the CB, according to the report conducted by DTI, is that the CB has certain potential but is not being utilized sufficiently. In the summary of the evaluation it is written:

> "We ourselves feel that we have been hard in our evaluation. But we also feel that the criticism is warranted.
>
> It is our clear impression that the base has a great potential. It is important that efforts are made to differentiate among the target groups and content: in terms of structure and maneuverability, interactivity, on the user-interface, in the graphics, esthetics and the language used.
>
> There are so many different environments in the city, within the municipality itself, and just as they exist in reality and have their respective users and social conventions, why not then create this difference in the base. With the users as the basis. There IS precisely talk of an almost lexical content that would allow this." (DTI, 1997, chapter 1, p. 3)

The evaluation concludes that it is mandatory that the users are included in the future development of the CB. This can occur in several different ways, such as creating user groups, conducting group interviews or cooperating with institutions that work with education within the IT-area. However, these recommendations have not been followed up upon - not yet in any case.

After the evaluation, the web-master decided, as mentioned above, to modify the search-function and layout. The evaluation had indicated that in terms of layout, the CB appears somewhat official and boring. Other digital cities (such as the one in Amsterdam, for example) use the city as a metaphor to guide the users around, but the CB draws on a menu structure where one – as user – gets the feeling of searching further and further down into the information. In the most recent version of the CB there are several icons that make it possible to jump from one subject to another, but in general the CB still leaves the impression of an old-fashioned perception of such menus in a tree structure. The web-master would like to make the layout more contemporary, but at the same time he feels that it is limited how "fancy" it can be. The CB is the entire city's electronic face to the outside world and a city of this size is a serious authority, as he says:

> "There is still a little bit of 'Pravda' surrounding it." (Own interview)

Another problem that the evaluation touched upon, which also has been discussed in the users group, is the matter of the structuring of the base's information. The information in the CB is structured according to the division of labor among the individual departments within the magistrates and the logic that the departments use for the distribution of tasks is not always the same logic the citizens employ when they are seeking information. For that reason it has been difficult for citizens to find information even in instances when it actually was lying in the base itself.

If one is to rectify this situation it is necessary that the different departments within the magistrates begin to work closely together concerning the structuring

of information. Until 1. January 1998, the structure in the City of Copenhagen had not been subject to a remarkable degree of change in several hundred years. Every magistrate had its mayor as the political leader and the story includes many examples of mayors who were more interested in combating other mayors instead of working together. Towards the end of 1997 the web-master described the problem in the following words:

> "The problem is that the city is divided into five kingdoms and an empire." (Own interview)

As of 1. January 1998 the city's structure was modified. The tasks were distributed differently and a political committee was established to lead the individual departments. Perhaps this modification of the structure will also make it possible to soften the structure of information in the CB. However, it is as yet too early to determine the effects which these changes have had.

The last issue I will address in the evaluation of the CB deals with its consequences for local democracy. A number of the politicians in the City Council are interested in direct communication with the citizens. In conjunction with the municipal election in the autumn of 1997 there were many politicians who established their own e-mail addresses. However, the web-master is somewhat nervous that the politicians will receive a lot of "junk mail", just as they can be subject to threats and harassment from political opponents. Additionally, it is only the mayors who are working full-time with their political work. The remaining members of the City Council have other work on the side and it is far from certain that they will have the time to respond to the mail. The web-master wishes to have these matters resolved before he is prepared to recommend all politicians to establish their own e-mail addresses. In the long run the web-master believes that the CB will change the politicians' view on the citizens. He says:

> "The base will demonstrate that the citizens are active and not just voting fodder who head to the ballot boxes every 4th year. They will become aware of the fact that there is a great number of active citizens who wish to be a part of things but who have a hard time getting through." (Own interview)

The story of the CB is not yet over, but at the present time it can be concluded that the CB is a digital city that serves to provide the concrete city of Copenhagen with a more modern and contemporary image. However, the CB continues to suffer from a number of teething troubles, among them the poor structuring of information, an insufficient utilization of the potential in the technology of the Internet, too little interactivity and too few possibilities for direct communication between citizens and city and between the citizens themselves. Nevertheless there is no doubt that these teething troubles can be overcome within a short period of time as long as the city prioritizes the further development of the CB.

A means of insuring the continued development of the CB would be to take the evaluation's recommendations concerning the involvement of the citizens more seriously. The evaluation includes several ideas as to how this could be done, so it is just a matter of getting things done. Another means of insuring the continued

development could be to seek inspiration from the other digital cities in Denmark and the rest of Europe.

3. European digital cities in a theoretical perspective

In this section the development of the Copenhagen Base and other European digital cities will be discussed on the background of a theoretical perspective. The section will primarily build upon the transverse analysis of the seven selected digital cities that the SLIM-project has included. However, there are only a limited number of selected conclusions that will be discussed here. The full analysis and the conclusions that go with it can be found in Bastelaer & Lobet-Maris (eds.) (forthcoming). The discussions that I have chosen to cast light upon here build on the theoretical terms *configuration, representation* and *social learning processes*.

The term "configuration" was originally developed by Steve Woolgar in an article where he described the manner with which the conception of the coming users of a PC were "built in" to the technology itself (Woolgar, 1991). Implicit in the term is the sense that the conception of the coming users has direct influence on the physical design of the technology. Conversely, the physical design of the technology can serve to determine which users will ultimately use it, as well as the way they use it.

The SLIM-project has proceeded with the term as concerns the configuration of the users. This has led to the term "representation." In other words, the two terms are tightly linked to one another. Where "configuration" primarily deals with the actual design of the technology, "representation" deals with the conceptions that the designers (and here we are talking about all of the actors that are involved in the development of the technology) use as the basis for the configuration of the technology.

The SLIM-project works both with the representation of the users, the city and the technology. Representation of the users indicates the image that the designers have of the potential users and their use of the technology. Representation of the city indicates the image that the designers have of the city. It would be just as relevant to investigate the users' image of the city, but on the grounds of insufficient data, it is only the designers' image that is described. Representation of the technology indicates the image that the designers have of the technology.

Representations of users
A common characteristic of the European digital cities is that the users/citizens (there is no distinction made here between users and citizens) have not had any particular influence on the design of the digital cities. The CB is one of the examples where the users have been involved to the greatest degree. In the CB the internal users from the city's administration were originally involved as a part of the steering group and later within the users group. However, this involvement of users is only partial, as the members in the steering and users groups only represented the employees at the Copenhagen City Hall. In other words, it is merely a small fraction of the 46,000 city employees that are represented. All of the employees in the city's institutions, schools, libraries, centers for the elderly,

etc. are not represented in the steering and users group, even though they also are considered to be among the internal users of the CB.

The external users – in principle all citizens in the City of Copenhagen – have been involved via the evaluation that was conducted in 1997. The evaluation particularly emphasized the investigation of the users' evaluation of the CB. These external users could also have been included in other means. For example, one could have tested the CB as an experimental measure of a test period, but the web-master estimated that it would be difficult to achieve the necessary political support for it. Today the external users primarily express themselves via e-mail, which they send directly to the web-master. He indicates that the users' response is of considerable value, for which reason one must be surprised over the fact that the evaluation's recommendations to involve the external users more directly in the continued development have not been implemented.

When the users themselves are not directly present in the process of development, the designers must design the technology on the basis of their own hypotheses concerning the users. This then is what I refer to as the representation of the users. This representation of the users can to some extent be observed in the concrete design of the technology. Bastelaer & Lobet-Maris then conclude that the representation of the external users in the CB is:

> "To conclude, the external user of the Copenhagen Base is a local inhabitant, well-trained and moderately equipped, mainly interested in city administrative information and a rather passive consumer of this information more than as an active citizen." (Bastelaer & Lobet-Maris, part 3, p. 28).

This representation of the users is not general for all seven of the digital cities. For example, in Amsterdam the users are considered less to be consumers of information and more as citizens who themselves produce information and create social links to other users. This is reflected in, among other things, the fact that DDS provides opportunity for the individual user to lay out various things (information, matters of debate, etc.) in the common room that other users can express their reaction to.

When considering the seven cases together, it is clear that it is the technical expertise and competence that have been made the highest priority, whereas the users' wishes and competence do not appear to have played any significant role.

The representation of the users that the designers employ as their basis when they are developing the concrete technology is far from explicit in all cases. Often the designer himself is not even conscious of it. It is also rare that the representation is tested, for example via the involvement of user groups or social experiments. If new information concerning the users turns up in the middle of the course of development, the representation of the users can suddenly shift. The different groups of actors that are involved in the development of the technology can also have different representations of the users. All of this contributes to a situation in which one can rarely trace a coherent, conscious representation of the users that serves to guide the development over a longer period.

Representation of the city
As mentioned above, the SLIM-project also works with the representation of the city. It is a significant difference whether the city is exclusively employed as a metaphor in the user interface, as in the case of DDS in Amsterdam, without being intended as a service for a concrete, physical city – in other words, an example of a non-grounded digital city. Or whether there is talk of a grounded digital city that is based on a concrete city and its residents as in the case of the CB and the CCIS in Edinburgh. The concept of representation of the city therefore raises the question: Where are the city limits of a digital city?

The representation of the city can to a certain extent also be observed in the concrete design of the digital city. CB and Périclès are examples of representations of cities that are dominated by public authorities and grant very little space to the common citizens. By contrast, DDS is an example of a representation of a city where the citizens play a much more active and direct role.

Representation of technology
Just as in the case of the representation of the users and the city, the technology is also developed on the background of a representation of the technology itself. The general tendency in the SLIM-project's seven cases is that the designers of the digital cities have quite a conservative perspective on the technology. They regard it primarily as a means of distributing information, while the multimedia many-facetted potential – in terms of content, presentation, interactivity and user interface, etc. – are touched upon to a very limited extent.

It has gradually become commonly accepted that there is a special "Internet culture" that is often described on the basis of hacker circles and as a kind of IT-grass roots movement. Within this culture, the Internet is perceived as a kind of free space where everyone is to have the opportunity to speak. In this free space experiments are often conducted concerning the potentials and limits of the technology, and many new applications have been discovered in this manner. It was actually in this very manner that it was discovered that IT could be utilized for communication. When the first French videotex system was introduced (in the mid-1980's), it was exclusively designed for the dissemination of information. It was a group of French hackers who discovered that they could communicate with one another by using the technology in a manner that had not been foreseen by the designers (Feenberg, 1992). This discovery was promptly worked into the technology and became a significant factor contributing to the great success that videotex enjoyed in France (Jæger, 1995).

Another group of actors experimenting with the technology's potential is artists. For example, a number of artists have drawn on video technology to create experimental video-installations. Such artistic experimentation with different media has led to the discovery of many new applications.

The idea behind the first version of DDS in Amsterdam was fostered in a cooperative venture between precisely these two groups of actors, hackers and artists (Van Lieshout, forthcoming), and the first version was distinctly influenced by the so-called Internet culture. As DDS in Amsterdam was the first digital city in the world, it is no exaggeration to say that the very idea of a digital

city can be accredited to these groups that dared to experiment with the technology's limits and potentials.

In the meantime, the Internet culture did not persist to dominate the development of the digital cities. When the first attempts with DDS had been completed it was decided that it should continue on commercial terms and artistic experimentation was halted. Despite the fact that DDS in Amsterdam had been the first digital city, the Internet culture was not carried over to the other European digital cities. The rest of the selected cases (including the CB) have, as already mentioned, been influenced by a relatively conservative representation of the technology.

Configuration of technology and users
While representation deals with the conception of the users and technology (and the city), configuration deals more with the physical design – the configuration itself - of the technology and the users. One can say that the designers can force their representation of the technology and the users upon the users on the basis of the manner in which the technology has been configured. The representation of the users has bearing on the configuration of the technology, just as the configuration of the technology has bearing on the configuration of the users.

The designers often find themselves in a dilemma when they are to configure the technology. They must decide whether the technology is to be configured in a manner so that all types of users can utilize it or whether it is to be configured to certain user groups, well knowing that many of the potential users will be excluded. The result of the former strategy is often that the technology does not reach any users at all. In the second version of DDS they tried to configure the technology for as many users as possible. DDS was to be able to survive on commercial terms, so the designers wished to be able to reach out to the broadest possible number of potential users. This led to a development in which emphasis was placed on technical finesses, but where the users were excluded from the design. This also led to a configuration where many of the possibilities for communication – which had been included in the first version – were omitted (Van Lieshout, forthcoming, s. 97).

It is thought-provoking that the Danish telephone companies (this was prior to the establishment of TeleDanmark) had precisely the same experience in the mid-80's when they wished to develop a videotex system (Teledata) on commercial terms. In order to be able to attract as many potential users as possible they attempted to develop a system that was compatible with all of the existing forms of hardware and software. This led to such a technically complicated system that it was only users with a very high degree of computer competence that were able to use it (Jæger, 1995).

There are different means of configuring the users:
- The user interface has great influence on the configuration of the users. The manner with which the information is presented and the metaphors that are used all lay up to certain user groups and to a certain use of the technology.
- The language used is also of great significance for the configuration of the users. The decision to only use Danish in the CB serves to exclude all

potential users who do not speak Danish, just as the formal language attracts certain users and repels others.

- The content and types of information also have significance for the configuration. For example, DDS offers free e-mail. This attracts some other users than CB's offering of city information.
- The rules in the digital city also play a role in configuring the users. In the CB there are rules that do not permit groups with politically extreme views to speak. In other words, these users are excluded beforehand. No rules can also have the exclusion of potential users as consequence. Such an example occurred when TeleDanmark introduced the so-called 900-telephone numbers in the beginning of the 90's, where one could establish telephone-based services that the users were to pay. TeleDanmark did not wish to make rules for the use of the 900-numbers. They perceived it to be an open market place where all could develop services. From the outset there was a boom in the supply of services offering telephone sex. Almost immediately, most Danes came to equate the 900-numbers with telephone sex and an increasing number of workplaces and private subscribers set up barriers for the use of these numbers. "Nice citizens" did not wish to be associated with telephone sex. In the end, TeleDanmark had to give up their hope that a wealth of different telephone-based services would emerge.
- The opportunities for access naturally also have significance for the configuration of the users. In DDS, for example, computers are not made accessible to the public. In other words, users who do not have a computer in their home or at work are excluded from the digital city in Amsterdam.
- Introductory courses or other forms of training in the use of the digital city can also play a role in configuring the users.
- The users are also configured via advertising. As a result of the significant power that advertising has in our society, there is reason to believe that the manner with which the service is presented in advertisements plays a role in determining who ends up using the service. If all advertisements are directed at a certain target group, other target groups will presumably not be attracted as users to the same degree.
- Instructions and technical guides also play a role in configuring the users. Complicated technical guides speak to a different user group than user-friendly instructions directly presented on the screen with small, funny figures.
- Finally, trials and test periods can also play a role in determining the users. By conducting these, the designers can achieve a more precise and detailed representation of the users, which possibly better corresponds to the users experience of her own needs and desires.

Experiments as learning processes
As the title of the SLIM-project (Social Learning in Multimedia) indicates, the concept of social learning has been of fundamental significance to the project. Our reason for referring to social learning processes is to point out that we are

not focusing on individual learning processes. The SLIM-project has exclusively been interested in investigating societal, collective learning processes.

In the concluding report from the over-all SLIM-project Williams, Stewart & Slack (forthcoming) conclude that the SLIM-project has uncovered two different forms of social learning processes: A so-called "strong" learning that results from social experiments with the technology, as well as a "weak" form for learning resulting from the actors' reflections over their experiences that are not necessarily conscious and are possibly not passed on to others.

The former, which comes as a result of social experimentation with technology, is of special interest in relation to the CB. In the rest of the world Denmark is commonly regarded as a country where there has been a great deal of social experimentation with IT and where ordinary citizens have had the opportunity to try out the technology in their own everyday situations. In the end of the 1980's, for example, a trial program was conducted by the state in which 16 experiments with IT in different peripheral regions in Denmark received support (Cronberg, 1990; Cronberg et al., 1991; Jæger et al., 1990). Both TeleDanmark and Kommunedata have conducted their own experiments and in conjunction with the government's strategy for the Info-society in the Year 2000, ten so-called "spear-head" municipalities were selected that were to test different possible designs for the local information society[7]. In all of these experiments the involved actors learned a great deal about technology, about the manner in which one organizes the local experiments, as well as how precisely their local community can best use the technology. One of the most significant conclusions of the evaluation of the 16 trials in the 1980's was that the experiments had not succeeded in reversing the negative development in the peripheral areas as one had hoped, but that some strong learning processes in the local communities had nonetheless been set in motion (Cronberg, 1990).

These experiments with IT have attracted significant international interest. There is therefore reason to hope that those involved in the development of the Copenhagen Base have learned from these specific Danish experiences. However, In response to the question as to whether they had learned something from the earlier Danish experiences, both the CB's web-master and a representative from the user group replied negatively. Neither of them had ever even heard of the Danish experiments with IT! And that despite the fact that many of them have been evaluated, such that there are research-based evaluation reports available to the public. In these reports it is additionally possible to find descriptions of precisely the same problems that the CB itself has struggled to solve[8].

This discovery is somewhat remarkable and serves to cast light on problems related to the EU's official policy concerning the dissemination of experiences. The EU expects that experimental projects such as the SLIM-project will result

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[7] A comprehensive presentation of experiments with IT in Denmark can be found in Jæger & Hansen (1999). An analysis of the experiences with social experiments in the countries that the SLIM-project covers can be found in Jæger, Slack & Williams (forthcomming).

[8] In Kommunedata's trials with videotex in 1989-91 they also encountered problems related to the structuring of the information. They, like others, had structured the information on the basis of the administration's structure, which resulted in a situation in which the users could not find the right information. The problem and the attempts at solving it are described in Jæger & Rieper, 1991.

in a mapping of "best practice." In other words, a mapping of where one has progressed furthest in such areas as the use of multimedia in the public administration and a description of the conditions that were present in the successful incidents. The idea is then, that the best practice can thereafter be transferred to other cities, countries, or local communities. The SLIM-project serves to sow doubt as to the wisdom of this strategy in the EU (Bastelaer & Lobet-Maris, forthcoming). Firstly, it is rare that one can identify any clearly successful criteria. Secondly, comparative studies indicate that conditions are rarely sufficiently identical such that it is possible to merely transfer such experiences and expect to achieve the same successful result. Thirdly, one can learn just as much from a failure as from a success. Therefore there are good reasons to disseminate the experiences from the projects that failed to reach the mark. With a theoretical basis such as the SLIM-project's, where local relations, particular cultural conditions, the local actors' different abilities, etc. are attributed decisive significance for the concrete development, it is also difficult to argue that one can merely transfer experiences from a successful project to a different local context.

Even though one can't merely transfer aspects of a success story to a different context, nevertheless the experiences from one project can be drawn upon when considering other projects and put to use where it is considered relevant on the grounds of the social context. The SLIM-project also demonstrates that there are several European digital cities that have been inspired by DDS in Amsterdam (particularly in the case of DMA in Antwerp). Just as we know that there has been an exchange of experiences between the members of an organization named above, Telecities. Another means of sharing such experiences can be achieved by making staffing changes. A former project leader will bring her experiences with her to a new project, whereas a project leader without such experience must begin from scratch.

The CB is an example of a project where they started from scratch, without any contact with similar projects, for which reason they have had to accumulate their own experiences. Conversely, there have been many learning processes in the period that has passed within the auspices of the CB itself, and today there is a willingness to share these experiences with others. The web-master told of how other cities that are interested in creating a municipal homepage/digital city have visited Copenhagen and heard about how they have done it.

Social learning processes
The other type of learning process that the SLIM-project has identified is the more diffuse or weak type of learning. These are instances in which one afterwards can ascertain that learning has occurred, even though it is not possible to place a finger on when and how it occurred. If one wishes to investigate such learning processes, it would seem obvious to resort to organization theory, which already has established a recognized area of research concerning learning in organizations[9].

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[9] For the sake of good order it should be mentioned that I am here moving beyond the SLIM-project's theoretical framework.
[10]
These theories are presented and discussed in Jæger (1994).

On the basis of classic studies of organizations' behavior, organization theoreticians such as Levitt & March (1988) define organizational learning as the construction of experience-based routines that thereafter determine the organization's behavior. When they speak of routines, they are referring to rules, procedures, strategies and technologies, but also the way of thinking, paradigms, cultures and knowledge. According to such an understanding, learning can be observed via the modification of the organization's routines. In other words, the organization must begin to act differently than it has in the past in order to be able to say that a process of learning has occurred.

Other, more cognitively oriented theories concerning organizational learning such as Björkegren (1989) define learning as a modification of the predominant means of thinking in the organization. However, such a modification of patterns of thought will also manifest itself in the organization's actions, in which case the learning process can again be observed via in a modification of practices[10].

These (and other) theories about organizational learning can be useful when we will investigate the learning processes that have occurred, for example, in the City of Copenhagen in conjunction with the CB. It would seem obvious that learning has occurred on the basis that the city has modified the means by which it relates to the citizens. Some of the organization's internal routines have been modified, as indicated by the fact that two persons have been employed to coordinate CB, just as some of the employees in the different departments have been assigned the task of updating the information in the CB. But these modifications are of a relatively superficial nature in terms of their significance for the organization. There has been no significant change in terms of the patterns of thinking concerning the manner with which the city shall service its citizens. Even though the citizens can electronically communicate to the city, they still receive their response via a common letter on paper. And even though the web-master predicts that the CB will come to change the city's perspective towards the citizens, this change is not yet evident in any form of a modification of routines.

Within organization theory there is a conception of two different types of learning. Argyris & Schön (1978) write about single-loop and double-loop learning, and Björkegren (1989) writes about learning through assimilation and accommodation. Learning through assimilation (or single-loop learning) is said to occur when the organization adjusts its perception of the world without radically altering its image of the world. Existing knowledge in the organization contributes to this adjustment. Assimilation maximizes the inner stability because it confirms that the organization's fundamental image of the world is in order. At the same time, however, assimilation involves a danger that if an organization is continually able to confirm its image of the world, it then becomes difficult to recognize when the demands of the world around it actually call for a change in this perception of the world around them.

Learning via accommodation (or double-loop learning) occurs when the organization fundamentally changes its perception of the world. Such processes create entirely new knowledge. This type of learning is traumatic and threatening

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[10] These theories are presented and discussed in Jæger (1994).

because it exposes holes and contradictions in the existing knowledge, which necessitates the reconstruction of the organization's knowledge before assimilation can again take over. This type of learning does not occur particularly often, as it involves significant instability in the organization, but when it does occur it maximizes the learning due to the fact that it leads to entirely new perspectives when an organization modifies its fundamental perception of the world.

These two concepts can be employed to describe the City of Copenhagen's learning in conjunction with the CB as learning via assimilation. The organization has come to perceive some new, changed signals from the world around it: The citizens have a greater need for information concerning the city and the technology that has been developed provides new possibilities for the dissemination of such information. By developing the CB the city has changed some of its routines such that they better fit the adjustments to the image of the world, that has occurred. But there is not talk of a fundamental modification of the city's sense of reality.

The aforementioned restructuring of the City of Copenhagen that was made in 1998 will possibly lead to a fundamental modification of the city's image of the world around it. The changes to the structure were not made because the city already had altered its sense of the surrounding world. Rather, they were almost forced upon the city. But since their implementation, it is possible that the modified routines might lead to changes in their perception of the world around them. As to the matter of the connection between these structural changes and the development of the CB, the web-master indicates that there is no immediate connection. The CB cannot be said to have had an influence on the decision to re-structure, however, both things can be described as processes that point in the same direction. In that sense, the changes made to the city's political and administrative structure and the development of the CB reinforce one another in a process that can possibly lead to a decisive modification of the city's perception of the world.

Organization theory can contribute to an understanding of the social learning processes that occur in connection with the development of a digital city. But there is still something missing. As mentioned above, the SLIM-project builds on a theoretical perspective that regards the development of technology as a process, which proceeds within a network of different actors. Some of these actors are organizations (e.g. the City of Copenhagen and IBM), while other actors are single individuals (e.g. the users) or loosely organized groups and associations. Organization theory focuses, by definition, only on organizations. While the world around it might well play a role in the organization's development the theories about organizational learning are inadequate in terms of describing the interplay between organizations and different actors in the world around them. We lack therefore a theory that can serve to explain the learning processes in a network perspective.

In a quest after such a theory I have become acquainted with the so-called "Theory of Situated Learning" (Lave & Wenger, 1991). This theory is based on a study of apprenticeship in different cultural contexts. The empirical studies indicate that learning occurs as a social interaction in a community of practice.

This leads to a perspective on learning as a dynamic that occurs within a specific historical and cultural context.

Lave & Wenger describe learning as a process where an apprentice is granted access to a specific community of practice. Such a community of practice consists of experienced individuals - old-timers - such as journeymen and a master craftsman, as well as other apprentices. The community's knowledge is not the exclusive domain of the master craftsman, rather, it is embedded in the relations between the persons and the activity in the community. On that background, access to the community is decisive for the learning process. On the basis of this access the newcomer is granted a legitimate position in the periphery of the community of practice. Lave & Wenger describe how the apprentice thereafter moves towards the center of the community of practice via legitimate peripheral participation, and eventually join the ranks of the old-timers. Through this process the apprentice acquires knowledge and skills, just as her identity is shaped such that she becomes a member of the community. Lave & Wenger describe this process in the following manner:

> "From a broadly peripheral perspective, apprentices gradually assemble a general idea of what constitutes the practice of the community. This uneven sketch of the enterprise (available if there is legitimate access) might include who is involved; what they do; what everyday life is like; how masters talk, walk, work, and generally conduct their lives; how people who are not part of the community of practice interact with it; what other learners are doing; and what learners need to learn to become full practitioners. It includes an increasing understanding of how, when, and about what old-timers collaborate, collude, and collide, and what they enjoy, dislike, respect, and admire. In particular, it offers examples (which are grounds and motivation for learning activity), including masters, finished products, and more advanced apprentices in the process of becoming full practitioners." (Lave & Wenger, 1991, p. 95)

This approach to learning shifts the focus from the individual to the collective, social level. It is no longer a question of "pouring information into the apprentice" but rather, a question of access to a community of practice. Nor is it any longer a question of cognitive processes in the mind of the single individual, but rather, a matter of participation. This shift of perspective makes the concept of community of practice very important, which Lave & Wenger define as:

> "A community of practice is a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice. A community of practice is an intrinsic condition for the existence of knowledge, not least because it provides the interpretive support necessary for making sense of its heritage. Thus, participation in the cultural practice in which any knowledge exists is an epistemological principle of learning. The social structure of this practice, its power relations, and its conditions for legitimacy define possibilities for learning (i.e., for legitimate peripheral participation)." (Lave & Wenger, 1991, p. 98.)

Lave & Wenger do not consider the community of practice to be a static entity. The community changes over time. These changes are a result of the fact that the newcomers have a different interpretation of the community of practice and its future. Conflicts can arise between the old-timers' and newcomers' respective

interpretations of the community, which in turn can contribute to developments in the community.

If we wish to understand the story of the CB on the basis of the theory of situated learning, questions are immediately raised concerning where we actually find a community of practice. When the political decision was made that the City of Copenhagen was to develop the CB, there was no community of practice in the city that was capable of immediately assuming the task. The first challenge, then, was to develop such a community of practice. This was achieved via the establishment of the steering group that was created to develop the CB. It was within this community that a common interpretation of what an electronic service such as the CB should actually include was developed, as well as a common representation of the users and the technology. As mentioned above, the participants in the steering group were recruited from each of the city's six magistrate departments. Most of them were appointed on the grounds that they were the ones from the department that had demonstrated the greatest interest for the technical challenges. This meant that the common interpretation that was created in the steering group was quite focused on the technical possibilities in relation to creating the CB.

When the CB's web-master was hired to develop the base he was not at all an expert in electronic services. He was merely a librarian with an interest in the subject but without any practical experience. When he contacted IBM in Denmark and they engaged in a joint venture to lay the first version of the CB on the Internet, he became a newcomer in IBM's technical community of practice. He learned a lot from this community of practice: about technical standards and solutions to technical problems. But he did not learn anything about the structuring of the city's information, searching possibilities or proper language in a public electronic service. These elements were not a part of the community of practice that he had been granted access to in IBM.

The web-master's new technical expertise was much in harmony with the steering group's interpretation of the CB. But when the steering group was turned into a users group, it was supplemented with information officers from the different departments. These newcomers to the community of practice brought new approaches to the CB with them. They insisted that the matter of the structure of information and the language in which it was presented in the CB should be taken up for discussion in the group. This led to conflicts within the group concerning the interpretation of the CB, the representation of the users and the representation of the technology. These conflicts have not yet been concluded, but their result can have decisive significance for the configuration of the CB.

An explanation for the fact that neither the web-master nor the other participants in the community of practice surrounding the CB have drawn on the experiences from previous Danish experiments with IT can be found on the basis of the theory of situated learning. None of them have had access to a community of practice where these experiences have been a part of the collective knowledge. Such communities of practice function today within TeleDanmark and Kommunedata (both of whom have been directly involved in the experiments), in the local communities where the experiments occurred, and within the group of

researchers that have evaluated the various experiments. The City of Copenhagen had not had contact with any of these communities of practice when they were to begin developing the CB. It has obviously not been of any help that there were diverse evaluation reports standing on the shelves of the public libraries when there was nobody to make those involved in the CB's development aware of their existence.

While somewhat superficial, this analysis nevertheless serves to demonstrate that the theory of situated learning can uncover other elements of the social learning process than the theories of organizational learning provide occasion to. However, this analysis does not provide adequate background to be able to conclude whether the theory of situated learning also is the answer to the need for a theory of learning processes that is capable of capturing the interaction between various types of actors who engage in a network surrounding the development of a digital city. There is a need for a more precise definition of what lies within the concept of community of practice. Can this concept be used in relation to large, complex networks such as those involved in conjunction with the development of a digital city, or can it only be used in relation to more limited communities such as those that exist within an organization?

While Lave & Wenger base their approach on the apprenticeship system that occurs in a workshop, their examples serve to demonstrate that the theory of situated learning can also be employed in other contexts[11]. But it is still an open question as to the limits for the theory's validity. In which concrete situations does it make sense (or not!) to employ the theory of situated learning?

4. Conclusion
This paper began with some concrete descriptions of the ideas behind the development of digital cities in Europe and a concrete description of the best Danish example, the Copenhagen Base. The concrete descriptions led to some theoretical considerations of the representation of users and the city, the configuration of the technology and the social learning processes. Discussing the public authorities' use of IT in the dialogue with the citizens is not just a matter of describing the most successful examples and encouraging the public authorities in other cities to return home and do the same. We must first understand the processes that lay behind both the successful projects as well as the projects that ultimately are judged to be fiascoes. First when we have a greater understanding for the background will it be possible to utilize this knowledge towards the further development of public authorities' use of IT.

The theoretical reflections shall therefore be regarded as attempts at proceeding towards a greater understanding of the background processes. The concepts of representation and configuration thus contribute to a greater understanding of the fact that the development of electronic services is not merely a matter of technology. There are both conscious and unconscious processes that are in play in the concrete design of the service.

The theories concerning organizational learning brought us a step forward on the path towards achieving understanding of the processes around the

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[11] One of their concrete examples is drawn from the organization Alcoholics Anonymous. They write that AA involves a learning process where alcoholics learn to be non-drinking alcoholics.

development of the digital city. But as we saw, these theories lack a perspective according to which the learning process is understood as something that occurs within a network between various actors, for which reason I have drawn on the theory of situated learning. This theory can serve to uncover other elements in the learning process, though it is as yet too early to conclude to what extent it is the answer to our need for a theory about learning in a network perspective. Further theoretical consideration is necessary, particularly concerning the concept of the community of practice and the manner with which this concept can be related to the network perspective. Just as a clarification of the situations in which the theory can be employed is necessary.

In conclusion it can be written that the comparative perspective has proven itself to be very fertile in this study. By comparing the development of digital cities around Europe, various aspects of the projects have come to light that would not have been possible to analyze on the background of a study of an individual case. By comparing them to one another it becomes apparent that those things which were taken for granted in certain situations, such as in conjunction with the development of the CB, are not necessarily relevant in all contexts. The comparative perspective makes it apparent that the Danish tradition for public administration and the Danish perception of democracy have had decisive influence on the concrete design of a digital city in Copenhagen. These conclusions have helped make us a little wiser concerning the processes that are in play during the concrete development of technological tools in the dialogue between public authorities and the citizens.

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