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Territorialising eGovernment: The Use of Location Aware Technologies in Public Administration

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Abstract - Deterritorialisation of state and society is one of the most striking effects of information and communication technologies (ICTs). However, location aware technologies (LATs) have emerged as ICTs reinstating the importance of place and time. ICTs may thus cause deterritorialisation and territorialisation at the same time. This paper focuses on exploring the territorialisation paradox for public administration. Three aspects of place affected by deterritorialisation are distinguished: power over a place, place as an organising principle and unity of place. Literature and examples of the use of LATs in public administration show that these technologies only partially counter the deterritorialising effects of ICTs. They do not affect the loss of unity of place. However, it is suggested that they help to reinstate place as an organising principle for public policy making and can serve as a tool for government to regain power over a place.

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I Introduction

Information and communication technologies (ICTs) have changed the meaning of place and territory in a radical way. In the virtual world, people can go everywhere without being concerned about crossing national borders. This deterritorialising effect of ICTs causes not only inconvenience for political institutions, but even erodes their legitimacy (WRR, 1998; Frissen, 1999). However, new ICTs have emerged suggesting that there is a counter-movement through reinstating the importance of places and locations. 'The state may be landing again' is what Snellen (2000: 138) concluded pointing to the territorialising possibilities of Geographic Information Systems (GISs). In addition, technologies such as GPS and GSM can deliver detailed location information about citizens to public institutions (Meints and Royer, 2007). These location aware technologies (LATs) may radicalise the territorialising implications of GIS applications for public policy making.

The aim of this paper is to explore the territorialisation paradox in public administration posed by ICTs. The first section of this paper is devoted to the concept of deterritorialisation. How is it influenced by ICTs, and what does this mean in the context of public administration? The second part will focus on the nature and qualities of LATs, thereby discussing some applications in public administration. The final part of this paper will then discuss the extent to which LATs potentially counter the deterritorialising effects of ICTs on state and society.

II eGovernment, a story of deterritorialisation

When ICTs were first introduced in the context of government they were considered as instruments which merely supported existing practices. Only in more recent years, researchers and government practitioners have acknowledged that ICTs can fundamentally transform the organisation and meaning of government as well as its relationship with society. Over the years, eGovernment research has shown that ICTs influence the efficiency and effectiveness of governmental organisations, transform public service delivery, and foster new forms of democracy (Snellen, 2005). Some of the most striking effects of ICTs are virtualisation and deterritorialisation (Frissen, 1996; 1999; 2005). The virtual world becomes ever more important alongside the physical world. As a result, people and processes are less often linked to a fixed location, or specific time. The rise in e-democracy and government e-services demonstrates this. Furthermore, the territorial boundaries which traditionally connect state and society seem to fade, consequently creating problems of a legal and administrative nature. Several authors have, to a large degree, attributed this process of deterritorialisation to the entanglement of ICTs, especially the Internet, with daily activities of both citizens and public organisations.

An understanding of deterritorialisation

In 1998, the Dutch Scientific Council for Government Policy (WRR, 1998) published a report about the administrative consequences of ICT, identifying deterritorialisation as a major ICT-driven development which has to be taken into account. What then is the meaning of deterritorialisation? Deterritorialisation literally means 'to undo territorialisation' or 'removal of territorial features' or maybe even 'anti-territorialisation'. In all cases, the notion of territory loses its meaning or validity. Providing that 'territory' has the meaning of 'an area

under the jurisdiction of a ruler or state' (Oxford University Press, 2008), to deterritorialise could mean that either the designated area or the power of the adhering institution is less significant, or both. Deterritorialisation certainly cannot be attributed to ICT-developments alone; it can be traced back to older times and other contexts. However, ICTs are generally believed to be an important cause of deterritorialisation, which reinforces other causes like internationalisation (WRR, 1998; Frissen, 1999) and increased mobility of people (Pontier, 1997). The accelerating capacities of ICTs can be attributed to the characteristics of dematerialisation (also: virtualisation; see Frissen, 1996) and technological turbulence (Wetgeving voor de elektronische snelweg, 1998: 4). Dematerialisation opens up the possibility of easy copying and distribution of new, non-tangible forms of information. Technological turbulence refers to the speed and unpredictability of technological developments.

When looking at literature about deterritorialisation, three aspects of its meaning for public administration can be distinguished: loss of power over a place, loss of the importance of place as an organising principle, and loss of unity of place.

Loss of power over a place

This aspect of deterritorialisation refers to the power, both internally and externally, that an institution has over a designated area. Regarding the national state its sovereignty constitutes a monopoly on using violence, raising taxes and posing regulation within its national borders. On top of that, the state has an autonomous position, governing independently with regard to other states. In other words, institutions have both the right and the ability to regulate affairs within their territories. This territorially bound power is affected as soon as the scale at which decisions are made changes. ICTs have contributed to the destabilising of traditional, territorially tied, hierarchical scales, thereby creating new subnational and supranational scales (Frissen, 1999; Sassen, 2007).

Loss of importance of place as an organising principle

Another way to understand the deterritorialising effects of ICTs is through an organisational approach (Snellen, 2000: 38). Online communities arise out of the common needs, interests and goals of people and not so much because of physical proximity. The death of distance caused by the Internet, for example, connected activists from all over the world (Capling and Nossal, 2001). This development can be viewed as a radicalisation of the increased mobility of people which already eroded distances (Pontier, 1997). So, functional and temporary criteria rather than location based ones determine how organisations are formed (Frissen, 1999).

Loss of unity of place

The WRR Council describes deterritorialisation as a process in which human activities or interaction between human beings can no longer be univocally attributed to a specific and appropriate jurisdiction (1998: 54). Loss of unity of place means that actor, action and consequence can no longer be attached to a single location. This aspect of deterritorialisation is generally considered as a typical consequence of the Internet. In the virtual world, many of the restrictions of place and time we know in the physical world do not exist. Contrary to their

physical equivalents, such as the town hall information desk or the tax office, government websites can be simultaneously accessed by multiple people from all over the world and don't have office hours or queues. As a result, it is no longer clear where a certain process or interaction takes place.

The historical importance of territory in public administration

Now, why is this process of deterritorialisation so problematic for the state? It is not only that the deterritorialising effects of ICTs threaten the mere existence and legitimacy of the state, but they touch upon its history and customs. The history of mapmaking teaches us that states have evolved out of the human desire to travel, expand knowledge and give meaning to the world (Coessens, 2008). Newly discovered places were given new names and new rulers. Maps were used as a means to describe and claim this new reality. Already in 1595, Mercator, one of the most significant geographers in the sixteenth century, in his *Atlas* draws attention to a new added value of geography: 'it will contribute greatly to the knowledge of political regimes, providing that it describe not only the position of various places, but also their nature or legitimate condition, which the duty of the geographer always demands' (Crane, 2002: 250). The French absolute rulers were one of the first to use the possibility of drawing borders of their territory by putting them on a map. Because *La France* was ruled from a central residence, either in Paris or Versailles, the king had to find new ways of keeping an eye on his territory. The French monarchs discovered that a map was an ideal way of keeping an overview of the territory and, at the same time, they could also shape and define it. In the course of the eighteenth century, the borders of the state territory became more explicit. State rulers assigned cartographers to map their territories and especially the exact location of the state borders. These maps started playing an important role in diplomatic negotiations and disputes. From this time on it became more common to enclose maps as part of treaties. For example, in the Anglo-Dutch treaty of 1718 a map delineated the frontier between the United Provinces and the Austrian Netherlands (Black, 1997: 16).

This quick glimpse at the political history of cartography shows that the core activities of a state consist of mapping and shaping both its territory and the society within that territory. These activities of mapping and shaping are mutually dependent and reinforce one another. As Scott (1998) puts it, states want to make society legible in order to be able to control it. This striving for control is in the very nature of the state. Despite the current rhetoric of serving the citizen, there is no reason to assume that states will give up the desire to steer society. It is part of its history, present and future and it is territorially bound. Now, what can the state do to regain its grip on the deterritorialising society? Paradoxically as it is, the state may find itself turning to ICTs to try and reterritorialise society.

III Territorialising ICTs

How can ICTs reterritorialise society? In order to do that, they must go beyond cyberspace and reconnect with physical places and locations. The technologies which are presented in this paper as location aware technologies may be able to do this. To what extent do they counter the deterritorialising effects of ICTs?

The nature of location aware technologies

The local law enforcement of the Dutch city of Nijmegen used cell phones in March 2006 to find possible witnesses to a criminal act. Three-thousand people received a text message asking them to contact the authorities if they could provide information about the murder of activist Louis Sévèke (Nu.nl, 2006). These people were not selected because they lived in the neighbourhood of the crime scene or because they were acquainted with the victim. They were merely selected because of their location or, to be more precise, the location of their cell phones at the time of the murder which instigated their involvement in the police investigation. The local law enforcement requested these data from the telecom providers and consequently, was able to send the request for information to the given phone numbers, resulting in several reactions.

The Louis Sévèke case demonstrates a way in which citizens' spatial information could be of use to public authorities. There are several technologies which can be used to generate, store and (re-)use location information. These can be considered as part of the ICT family, since ICTs can be defined as 'technologies which are used in order to collect, store, modify and transfer information in a dematerialised way.' (WRR, 1998: 17). The location aware technologies (LATs) which are the focus of this paper do all these things for a specific type of information, location information, and may be used to provide so-called location based services (LBS). LATs usually function within location systems, which typically consist of two or three components:

1. One or more devices sending location information to sensors – in the case where sensors do not operate optically.
2. Sensors to receive and transfer location and time information to static or mobile backend systems.
3. Backend systems interpreting and / or using location information.

(Meints and Royer, 2007: 18)

In the above-mentioned murder case, the first component consisted of people's mobile phones in GSM cells, which sent location and time information to the second component, the provider's antenna, transferring the information to the third component, the provider's backend system with its own database. Subsequently, the spatial information was re-used to generate the selected list of mobile phone devices and send out the call for information.

LATs comprise of more than just mobile phone technology to use spatial information about people. The following technologies can be used to gather location information (Meints and Royer (2007: 15).

- Satellite-based positioning systems (GPS; European Galileo system)
- Cell-based mobile communication networks (GSM; UMTS)
- Other wireless technologies (Radio Frequency Identification (RFID); wireless communication systems, e.g. WiFi or Bluetooth)
- Sensor-based systems (biometrical systems; optical sensors; passive infrared-based systems)
- Chip-card-based systems (ATMs; personalised access cards)

These technologies differ regarding their accuracy, their distance to the object and whether they have fixed or mobile sensors. In addition to these classifications which focus on the technical possibilities for gathering location data (Mountain and Raper, 2001; Meints and Royer, 2007), others list possible information services which are delivered to users on location, such as weather reports or transport information (Wu and Wu, 2006). These types of information services generally originate from private parties pursuing commercial purposes. The use of LATs by public institutions can remain limited to the collection and internal processing of location information and doesn't necessarily involve location based sending of information to citizens.

It can be stated that LATs have some specific qualities which makes their use interesting for governments. First of all, location data can be collected on an individual level thereby providing more detailed information than, for example, from a database organised at neighbourhood level. Secondly, a high level of accuracy can be achieved. GPS can locate a person at a precision of 1 to 15 metres and RFID at less than 1 to 50 metres (Meints and Royer, 2007: 16). A third specific quality of several LATs is the high frequency of measurements, thus delivering dynamic data. Real time tracking of people lies within the possibilities. Fourthly, the quantity of data can be large, since most people nowadays own a mobile telephone and the market for navigation devices with incorporated GPS technology keeps on growing. The European Commission even concluded about the Netherlands that 'Mobile penetration is now more than 100%' (2007: 1). However, all of these qualities regarding the collection of location data do not guarantee that governments are able to use these data for the spatial indexation of the rich collection of data about citizens they have access to. The authorities may increasingly be aware of the locations of individuals, but they do not automatically know (parts of) their identities. For example, if the police were able to determine the exact location of convicted bank robbers at the time of a new robbery, this might contribute to solving the case. Then anonymous dots on the map would get virtual faces.

Policy potentialities of LATs

One of the most interesting possibilities that LATs offer for public administration is the connection of spatial information with personal information, providing the basis for new types of analysis. Where Snellen (2001: 134) indicates that GISs bring '*the life world of people* -in contradistinction to *the system world* of the bureaucrats- on the screen', it can be stated that LATs show us the *live movements of people*. Ahas and Mark (2005) show that the space-time behaviour of society can be investigated when the social identifications of the mobile phone carriers are added to the location data. The authors reveal a number of applications this technology enables in the areas of planning, public participation, and dynamic space. Data on the chronological distribution of movement loads in a city, for example, could be of use in the planning of transportation and infrastructure. In fact, this method has already been applied in the urban planning of some Estonian cities (Ahas and Mark, 2005: 549). Maps were created showing, for example, the movement patterns of different age groups in a city during one week. Regarding public participation, a very direct way of involving citizens' opinions in policy decisions can be established through asking people location based questions by sending them an sms or calling them on location. The dynamic space application Ahas and Mark mention is aimed at acting upon registered changes over time in the human social composition in space, resulting in different functions and meanings of places. 'For example, the language

and message content of certain informative signs may be changed depending on whether there are more tourists or locals in the area' (Ahas and Mark, 2005: 558). Even though the majority of the above mentioned applications is based on mere speculations, the apparent advantages for both governments and citizens make it likely that public institutions will be interested.

LATs may also be used for monitoring and taxing purposes. In December 2007 the Dutch Ministry of Transport, Public Works and Water Management announced the Cabinet's decision to implement a new pricing system for the use of public roads (Ministerie van Verkeer en Waterstaat, 2007). According to the plan, by 2012, car drivers will be charged a price per kilometre. To implement this new system, the Dutch government will be using the latest satellite technology to collect location information about every car. Even though the legal, political and technological specifications have not yet been entirely determined, it is evident that the gathered location information will need to be connected to personal data in order to be able to send the right bill to the right person. Of course, the underlying report mentions that considerations about people's privacy will be taken into account when developing the system. Already, a private company has offered the responsible Minister a technological solution which doesn't measure a person's exact route, but just the number and type of roads he drives on instead, thereby realising a lesser invasion of his privacy (Pieper, 2007). Nevertheless, a rich database with up-to-date, accurate, highly precise information about activities on the Dutch roads will be available. Processing this information with GIS technology opens up possibilities for analysing and monitoring citizens (Snellen 2000: 133). Violators of speeding limits may not be able to escape fines anymore. This is account of Mr Turner which lead to the case 'James Turner v. American Car Rental Inc.' at the Connecticut Superior Court (Brouwer, 2005), proving that this is a realistic scenario. Turner hired a car and paid for it through his credit card. When he wanted to pay for gasoline using his credit card it was refused because he had exceeded his payment limit. It turns out that the rental company had placed GPS equipment in his car, measuring the driving speed. Every time Turner speeded, his credit card was charged in advance with the anticipated fine. This account proves that LATs do not just pose a future threat in this respect, but offer a real possibility to monitor citizens and act upon the rendered information.

An example of the analytical possibilities that LATs offer, is found when looking at the Real Time Rome project. The project reveals movement patterns of users of the Telecom Italia mobile phone network (MIT SENSEable City Lab, 2006). The researchers produced, for example, a dynamic map of the city's connectivity by showing the changing positions of buses and the relative densities of mobile phone users. Another map gives insight in the places where tourists are concentrated. In this case, the mobile phone users could be identified as tourists, because the Italian network registered their phones as visitors originating from foreign networks. So, the data gathering took place without the users' informed consent, which is in violation with the statement by Ahas and Mark (2005: 552) that this is a necessary input for this kind of analysis.

IV The territorialisation paradox

A paradox can be found when looking at the effects of ICTs on the meaning of place for public administration. Where traditionally ICTs are considered to cause deterritorialisation of state and society, now location aware ICTs (LATs) have emerged with territorialising effects.

However, not all aspects of deterritorialisation are countered by LATs. This may not come as a surprise, since Snellen (2000: 138) already pointed out that GISs have territorialising effects in other domains than those which are affected by deterritorialisation. Now, how are the three aspects of place which have been eroded by ICTs, power over a place, place as an organising principle, and unity of place, affected by LATs?

Power over a place

At this point, it is uncertain whether LATs will help government to regain power over its territory. On one hand, LATs enable government to relate functional regulations, such as traffic tax in the Netherlands, to the actual location of citizens, thereby regaining power over its territory. It will be possible for the Dutch government to monitor and bill all users of the Dutch road network. The current road tax system is restricted to registered car owners in the Netherlands. This artificial reality as stated in the Dutch administrative system is replaced by the reality of GPS signals on the road. This greater knowledge about people and places (i.e. legibility of society, see Scott, 1998) constitutes an increase in the institutional power to act. Furthermore, power over activities within the territory increases. On the other hand it is very much dependent on who or which (supranational) organisation will regulate the use of LATs and the gathered location information, how much power will be in national hands.

Place as an organising principle

It can be stated that an individual's place becomes more important now that LATs come into play. If governments use LATs for policy purposes a person's or group's location is a key variable in deciding what action is going to be taken. However, the meaning of place does change in a radical way. The static notion of place which is constituted by the traditional political territory is now challenged by a dynamic form. A variety of changing places instead of a number of traditionally predetermined fixed places will dominate activities in public administration. These are multiple places, both in space and time, which will be formed, based on the meanings users attach to them. Both government agencies and (groups of) citizens can act as users of location information. Local government may, for example, decide upon implementing a new infrastructure for public transport in a particular area based on analysis of mobility data. The actual mobility data, as opposed to the traditional institutional territory, then determine what will be the place for which a change is desirable. This new place may be part of the institution's territory, but it might as well cross its boundaries, thereby urging multiple institutions to cooperate on solving the problem. So, functional and temporary criteria along with location based ones may determine how organisations are formed.

Unity of place

Optimistic thoughts about the territorialising capabilities of LATs may be weakened when reading what the WRR Council already stated in the 'State without land' report: 'The fact that the persons involved may be located, doesn't diminish this problem, as long as laws and regulations are so much tied to the notion of territory' (1998: 55). So, according to the Council, the problem remains that actor, action and consequence are still not in one place. Indeed, LATs do not appear to reinstate the unity of place which is lost in the virtual world. However, these technologies do reconnect the virtual and the physical world. Information in virtual databases may increasingly be linked to people's locations in the physical world. For

example, the location based dating service 'Ollo' offered by the Dutch telecom provider KPN is already a fact. Who knows what public location based services will be developed connecting the virtual and physical world of citizens.

V Concluding remarks

It appears that ICTs can cause deterritorialisation and territorialisation at the same time, thereby creating new meanings of place and time for both citizens and governments. It is likely that this territorialising eGovernment will have an impact on the way in which governments are organised, public policies are created, and governments interact with citizens. In this time, where most people and public institutions have finally familiarised themselves with their identities and activities in cyberspace alongside those in the 'real' world, they will have to get used to a new surprising mix of both.

Citizens may have more influence on public policies through the dynamic places they create. At the same time, they can benefit from government services tailored to their needs at a given place and time. On the other end of the line, more power comes into the hands of government when it is able to monitor and analyse citizens in real time. Therefore, issues concerning citizens' privacy and freedom are likely to play a big role in determining the conditions of use of LATs.

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