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From e-government to m-government: towards a new paradigm in public administration?

Ignace Snellen, Marcel Thaens

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FROM E-GOVERNMENT TO M-GOVERNMENT: TOWARDS A NEW PARADIGM IN PUBLIC ADMINISTRATION?

Ignace Snellen* , Marcel Thaens†

Introduction

In this paper we will discuss which developments have been taking place in e-government and m-government. We will especially emphasize the hopes and expectations evoked by e-government applications, and raise the question whether m-government will fulfill the hopes and expectations not fulfilled by e-government.

For the moment we define m-government as the application of mobile devices, such as mobile telephone, Personal Digital Assistant (PDA) and hand held PCs in the exchanges between officials, citizens (organizations), and public administration as such. Later on in this paper we will raise the question whether a definition of m-government can suffice, if it is limited to devices, and whether it is not extended to different routines and attitudes (a new paradigm?).

The conditions for a massive roll-out of m-Government are very favorable because of 1) the penetration of mobile telephones, which is even larger than the penetration of internet, 2) the simplicity of use of the required devices, 3) the availability of broadband (allowing multimedia and database access), 4) from almost everywhere.

The question has to be raised, what the influence might be of the application of mobile ICTs on the nature of public administration. In a following section of this paper, it will be discussed, whether even a new paradigm of public administration has to be formulated because of the emergence of m-government. Mobile government may inspire a more intensive service (and control) orientation in the relationship between state and citizens. We will see also some examples of a closer participation of citizens in the basic functions of the state, such as the assurance of the safety of the citizenry.

First, we will present e-government as a worldwide phenomenon with the hopes and expectations it brought about. The lessons learned so far in practicing e-government have led to sobering thoughts. The use that is made of e-government facilities for the provision of services stayed behind what was expected. The democratic potentialities of e-government were not exploited either. The question remains: will m-government overcome the deficiencies of e-government?

Secondly, we will discuss the social ecology in which m-government is deployed. This ecology is labeled "the always on society". More and more people can not afford not to be within reach of people, programs, data and processes. Thirdly, we will give a short description of mobile government ICT applications. Successively, examples of the support by ICT applications to mobile administrations, mobile officials, and mobile citizens will be presented. Fourthly, we will focus upon a definition of m-government, and we will try to answer the question, whether a massive use of mobile devices in public administration may lead to the foundations of a new public administration paradigm. Fifth, the benefits and challenges of mobile government, e.g. the requirements of interoperability will be discussed. And finally, some provisional

* Emeritus Professor in Public Administration, Erasmus University.
† Professor in Public Administration, especial assignment in Innovation Through ICT, Erasmus University.

conclusions and recommendations will be formulated with respect to the use of mobile government applications.

1. E-government

1.1 E-Government as a worldwide phenomenon

Besides an instrument that can be used to make policy implementation more effective and efficient, ICT has also innovative power. This refers to the fact that the possibilities of modern technology can be used to initiate, stimulate or develop changes within government. As a result, ICT moves to the heart of public sector organizations and gets connected with primary processes. Not only is ICT used in processes of service delivery, but increasingly also in the formulation and implementation of policy processes, in processes of allocation of means and the accountability for them and in the execution of laws and rules (Thaens, 2006).

In this way, government is slowly transforming itself to an electronic government in which ICTs play an important role. This transformation turns out to be a global phenomenon. During the last years many countries, all over the world, have formulated their dreams, visions and plans for introducing at least some form of electronic government. Consequently, many governments are also working hard on realizing their visions and plans.

This is illustrated by results of the UN Global E-Government Readiness Survey 2005. This annual survey assesses more than 50,000 features of the e-Government websites of the 191 UN Member States to ascertain the state of readiness of the Governments around the world in employing the opportunities offered by ICT, to improve the access to, and the use of, ICTs in providing basic social services. The 2005 survey finds that a large number of countries solidified their online presence further, venturing into higher and more mature areas of e-service delivery. Many introduced further e-participation features. The total number of countries online increased to 179, or around 94 per cent of the United Nations Member States. Twelve countries were not online, compared to thirteen in 2004. According to the E-government Readiness rankings in 2005 the United States is world leader, followed by Denmark, Sweden and the United Kingdom. Also the Republics of Korea, Singapore, Estonia, Malta and Chile are in the top 25 e-ready countries (UN, 2005).

1.2. High hopes and expectations

The promises, hopes and expectations of the benefits that e-government can bring to citizens, companies and even the entire society are set high. An indication for this can be found in a recent study that compares some European modernization initiatives with ICT as drivers (Bekkers and Korteland, 2006). This is relevant to e-government because often e-government is embedded in a reform or modernization program within a country. The comparison shows that the main emphasis of those initiatives lies in the improvement of the quality of public service delivery. ICTs are supposed to contribute to more demand-orientation, more public participation and an improvement of the openness and responsiveness of government.

In Denmark for example, the aim to the use of ICT is to alter the way that work is performed in the public sector. The aim is to provide citizens and businesses with better services and to release public employees for tasks that contribute directly to the welfare of citizens. Moreover, ICT will underpin the creation of a more open, user-oriented and

democratic administration. As e-Government becomes more widespread, it is the government's aim to allow citizens and businesses to monitor the progress of their own cases via the Internet, and to be able to receive information on case procedures, decisions and case processing times. The government also desires that information technology is used to strengthen the level of dialogue between citizens and politicians.

More or less the same goals can be identified in the policy program of the Netherlands, the UK and Germany. In the Netherlands, besides the improvement of the quality and efficiency of public service delivery, al lot of attention has been paid to the role of ICT as an instrument for business process redesign in implementation chains and networks. The exchange and sharing of information between different layers of government and agencies, as well as semi-public and private organizations, is important to improve public service delivery as well as the enforcement of laws and regulations. In the UK, e-Government is seen as an aspect of modernizing government, which has only one purpose: to make life better for citizens and businesses. Finally, in Germany the government adds that it wishes to use ICTs to enhance the transparency of public administration and boost participation by the people (Bekkers and Korteland, 2006).

These examples show that the ambitions for e-government in general are set high. The comparison of them shows that in most programs improving efficiency and getting more value for money are important goals that should be realized (Bekkers and Korteland, 2006: 43). Besides these high ambitions the introduction of e-Government sometimes also involves new hopes for a better future. For instance, in the earlier mentioned UN survey it is stated that "ICTs provide a unique opportunity for achieving higher standards of living and greater economic and social empowerment of the millions around the world". According to the United Nations, governments must therefore fully understand the vast potential of ICTs as a tool, and the benefits and opportunities that can accrue in the current age, if ICTs are effectively applied to human development (UN, 2005).

Finally, an illustration that the hopes and ambitions regarding e-Government are set high, can also be found in a study on e-Citizenship, conducted by Deloitte. In this study e-Government is identified as a vital topic in the contribution of cities in reaching the Lisbon Agenda en thus making Europe the most competitive and dynamic knowledge based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion (Deloitte, 2005: 4).

1.3. Some Award-winning examples

During the last years many interesting e-government projects are carried out in many different countries. In this section some projects that are considered to be outstanding in a certain way, will be described in short. These descriptions make clear the significance of e-Government in everyday practice of public administration. Furthermore, they show the broadness of the e-Government concept. It stretches from transactional systems in a particular policy domain to supportive systems like invoicing.

We have chosen to describe the e-Europe Award winners of 2005. The *e*-Europe Awards are organised by the European Institute of Public Administration with the support of the Information Society Technologies Programme of the European Commission for the years 2003-2005. The awards are divided into different categories and the winners are seen as good and inspiring examples for other government organizations in Europe (see also http://www.eipa.eu/eEurope_Awards/index.htm).

The first category of awards has to do with 'the right environment'. It focuses on creating the best environment to enable government, businesses and citizens to benefit from transformation. The winner in this category is KSI ZUS Poland. It is a Complex Computer System (KSI) for the Social Insurance Institution (ZUS) in Poland. The project focuses on pension reform, with a multi-channel, secure system for filing pension information that involves citizen-to-government, business-to-government, and allows intermediaries to work on behalf of citizens and businesses. Over 250 million documents are processed each year with 90% of them involving e-Filing. This initiative was judged by the jury as extremely impressive, involving "large scale institutional change". Despite the short time period, it has already had a high impact on the agencies, employers and insured persons, and has a high potential for transfer to other sectors and countries. For more information, see http://www.ZUS.pl/english.pdf

The second category is 'Government readiness' referring to transformation of the organization and innovation in the back office. Winner in this category is EID-Electronic Invoicing in Denmark (from the Agency of Governmental Management). The project focuses on Electronic Invoicing. This is a public private partnership, which now has 15 million transactions a year, and which delivers savings of €120-150 million per year. It uses secure technology, with wide-ranging back office innovations. The project is considered by the jury as a good example for all European governments: electronic invoicing was mandated by law and put into practice with an XML based standard. Business processes both in government and business have been improved significantly, since it was introduced in early 2005 achieving 95% take-up rate. An important value-added is that provision was made for SMEs to comply with the e-Invoicing through service providers. For more information, see http://www.oes.dk and figure 1.
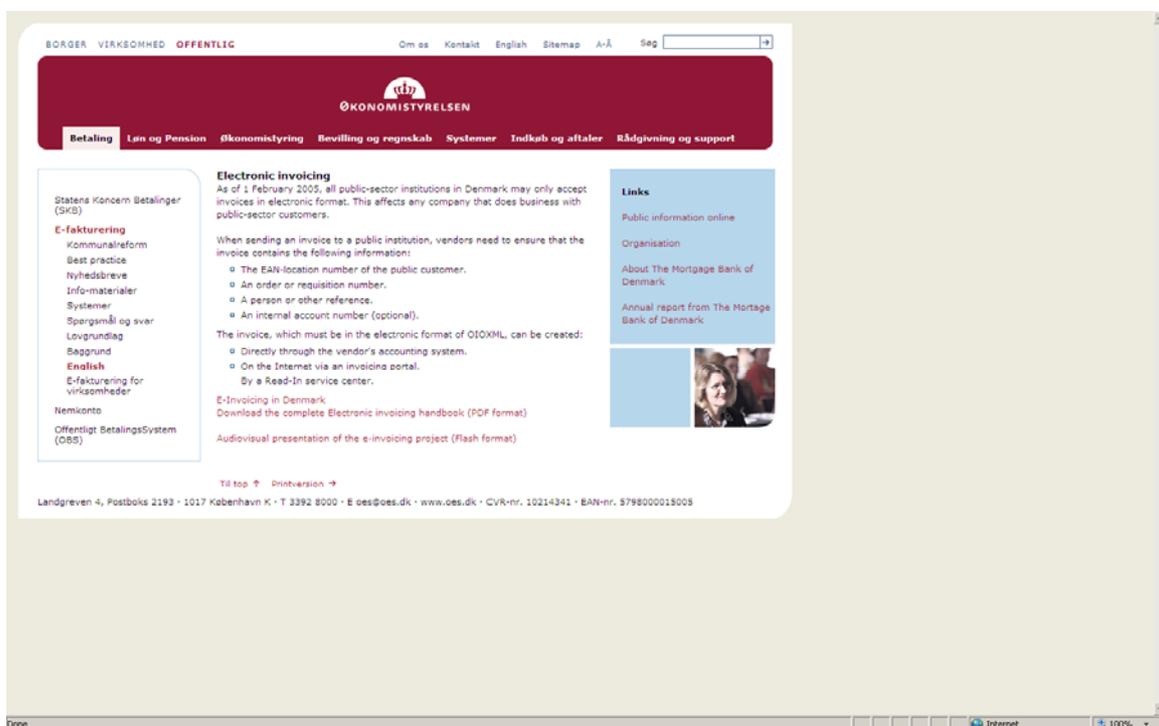

Figure 1. Electronic invoicing in Denmark (www.oes.dk)

'Service use' is the third category. It refers to transformation and innovation in external facing services, putting citizens and businesses at the centre, stimulating use and participation. The winner in this category is Kadaster-on-line from the Kadaster in The Netherlands. This project delivers online access to land registry products through national up-to-date land registry information. It has 6000 registered clients and 45,000 users, and provides significant value-adding service extensions. Kadaster-on-line represents a very good case regarding innovation in the application area through integration of cadastral information and services. The collaboration and interoperability of different systems and entities are convincingly implemented, and there is a strong potential for high take-up by users and replication in different regions and European countries. For more information, see http://www.kadaster.nl.

The last winner is the ROS – Revenue Online Service – from Ireland. This project wins the award in the category 'Impact' which refers to measuring the impact on and benefits to government, businesses and citizens. The ROS is a free, secure, confidential and easy to use facility, available 24/7, which in 2004 saw 1.1 million returns filed with € 8.3 billion in payments. This has allowed staff resources to be moved to important compliance and investigative work. ROS shows documented results in terms of service take-up and process re-engineering. There is an excellent business case that is convincing for both administrations and users. With the high level of interest in e-taxation in many EU and candidate countries, the well-documented processes and lessons learned from this project provide an excellent guideline for both technical development and change management. For more information, see http://www.revenue.ie.

1.4. The concept and development of e-government

A well-known and since then often used definition of e-government was introduced by the Gartner Group (2000). It states that e-Government is about transforming relationships rather than about technology. The relationships transformed in an e-government context are those between providers, enterprises, peers and users. New technologies are the fundamental tools for enabling and facilitating this transformation. E-government relationships are categorized as government to citizen (G2C), government to employee (G2E), government to business (G2B) and government to government (G2G).

According to the Gartner Group survey, the transition from government to e-Government is characterized by four stages. First, there is the presence of government on the Internet. After the presence stage, government will be able to interact with its citizens via the Internet. The interaction stage will be succeeded by a transaction stage. In this stage the communication between government and its citizens via the Internet is connected with public service delivery. Finally, because of the electronic service delivery government will transform its organizations and institutions. The first three stages focus on improving the existing form of government and establishing much of the basic e-infrastructure. The fourth stage focuses on designing a whole new form of government (Gartner Group, 2000: 5).

1.5. State of Affairs and lessons learned so-far

Various international research companies closely monitor the e-Government efforts in many countries. Periodically they release benchmark reports, stating the progress and current state of affairs regarding the development of e-Government worldwide.

Deloitte (2005: 9) concludes that most of the cities that participated in their survey have e-Government policy plans (91%). A much smaller number have an e-Government budget plan (72%). This suggests that in a number of cities e-government policies are not endorsed with budgets. The amount of money spent on e-Government projects is high and appears consistent. The cities which responded in the survey will invest as much money on e-Government in the coming five years as they did in the previous five.

One of the leading benchmarks is from Accenture. Since their first study in 2000 when governments took their first tentative steps by publishing information online in the late 1990s they have seen governments increase their efforts to move more individual services online and build greater transactional capability. In the mid-2000s the paramount objective was take-up. In the past few years, governments have expanded their perspective – aiming to provide truly citizen-centred, integrated one-stop service experiences. This involves making horizontal (and to a lesser extent vertical) cross-government linkages and developing multiple channels of access, allowing citizens to interact with their governments wherever, whenever and however they choose (Accenture, 2006).

In their seventh study Accenture concludes that after years of rapid e-government developments, countries' maturity advances have slowed. As leadership in customer services became more difficult to achieve, the time it took for governments to make noticeable improvements grew. More visionary citizen-centered strategies and cross-cutting initiatives needed time to mature and take hold. In their most recent study Accenture has identified some lessons based on the experiences with e-government of the countries that are leading the benchmark now for some years. *One of the most striking key findings is that leading governments recognize that they are at a critical juncture for service success. They seem to have reached 'the limits' with their current approaches to customer service and must step into the uncomfortable arena of transformation.* First they are re-assessing and re-crafting their customer services strategies. Second, they are veering away from a 'best practice', one-size-fits-all approach. They are putting the 'custom' back in customer services. It is not about simply putting services online, but on creating services that creates value. This implies that governments seek not only to understand what citizens want now, but also what they need in the context of broader social outcomes (Accenture, 2006: 21).

1.6. A closer look: some sobering results

Zouridis and Thaens (2005) have looked at the locus and the focus of e-government: where in government can e-government be found, and what kind of perspective is dominant? This means that they have first looked into questions like: What parts of the organisation are being replaced by information technology? Which phases of the policy process are being carried out by means of computers? How do political actors use computers? Which relationships between government and citizens become digitalized?

A conclusion on these topics is that e-government mainly concentrates on the operational core. This is the result of the focus on customer-services. Most initiatives give little attention to the executive, strategic, and supporting parts of public organizations. In the policy process, e-government primarily relates to policy

implementation, and to a certain degree also to the managerial control of this policy. At present, e-Government plays almost no role in the phases of acknowledgement of problems and agenda setting, as well as the formulation of policy and decision-making. In the realm of politics, e-Government is mainly used to support democratic supervision and representation. It has little or no affinity with propagation and consideration of ideas and political decision-making. Finally, e-Government is particularly geared to citizens as consumers of the products and services of public administration. Little or no attention is paid to citizens in their roles as subjects of policy, as voters or as co producers of policy. The conclusion of Zouridis and Thaens regarding e-Government is therefore that e-services as a term seems more appropriate to describe what is actually happening.

With regard to the focus, the dominant perspective behind e-Government, Zouridis and Thaens concluded that the ideology behind e-Government is one in which governance is seen as a matter of information collection, information processing and information dissemination. For e-Government, information is the core of public administration. Following this e-Government ideology, government essentially becomes a matter of information. Whether this is done manually or by computers, it will be the same process. Because people are imperfect, so will the information be when people process it. Therefore, citizens are better served when the computers process the information, because they are more efficient and more reliable. This results in a tunnel vision that tends to be blind for the richness of the institutions that are being transformed into something informational. Besides being a tunnel, Lash has demonstrated that information tends to function as a prison from which it is difficult to escape (Lash, 2002). The information ideology is not only a perspective or a worldview (Zouridis and Thaens, 2005).

More or less the same conclusion comes forward from recent research on ICT-driven innovations in the public sector. This research shows that many ICT-driven public innovations in different countries have a rather internal oriented driver, namely efficiency. Efficiency seems to be one of the most important goals c. q. political values used to legitimize these kinds of innovations, although it sometimes is hidden behind more political goals, like improving the quality of public services, the openness of government, etcetera. The use of ICT to create a more responsive government, which tries to place the potential of ICT in the centre of societal problems, like the social quality of neighbourhoods, the regeneration of regions or the effects of the aging of the population, is rather scarce. Therefore, we conclude that the modernization agenda of public administration is rather one-dimensional.

A rather mechanistic view prevails because in order for government to be efficient, public administration should be reshaped as 'the machinery of the government'. Furthermore, the analysis shows that ICT in public sector innovations is often viewed as a rather neutral set of tools, which in the hand of the right persons and under the right conditions, can be applied to enhance the efficiency of public administration. ICT makes it possible to redesign the cogwheels within the government's machinery, so that not only their functioning but also the interplay between them may operate more smoothly, more efficiently to produce more effective outputs and outcomes (Van Duivenboden, Bekkers and Thaens, 2006: 230-242).

The conclusions above are underlined in the earlier mentioned comparison, made by Bekkers and Korteland, of different European policy initiatives on ICT and the Innovation Agenda of Public Administration. They observed that, although the institutional embeddedness of the initiatives is quite different, there is a striking

resemblance as far as it concerns the modernization goals and shifts in governance. This is also the case for the way in which ICT has been defined. It is perceived as a set of tools, which can be used to realize the quality of public services (as a goal) and internal and external efficiency (as a goal as well as a public value). They see the emergence of a consumer democracy, blended with ideas about New Public Management, complementary to the existing democratic order. Modernization primarily takes place through a shift of governance towards the citizen as a consumer, who a) should be empowered so that he is able, more than before, to act as a 'homo economicus' who actually has a choice (Denmark), b) can obtain more client friendlier and more cost efficient services (Denmark, UK, Netherlands and Germany), c) can participate as co-producer in the way services should be provided (Denmark, UK) in order to strengthen the responsiveness and need-orientation of the public service delivery process (Denmark, Germany and the UK).

Furthermore they have found that in the policy documents there is a strong belief and trust in the promises of modern ICT. Optimism prevails on the progress of the information society and Internet Technology will bring. The dominant view on technology that lies behind the several policy documents is a combination of determinism and voluntarism. ICT is primarily defined as a tool for achieving public service delivery and efficiency. In relation to these goals the modernization potential of ICT has been narrowed down tremendously. The focus of innovation has been primarily on the role of the citizen as a consumer, while other roles have been neglected. In most cases these are mentioned, but worked out poorly. In line with the sobering conclusions on e-Government so far in this paragraph, Bekkers and Korteland have formulated the hypothesis that the contribution of ICT to the modernization of government in terms of shifts in mode of government up till now will probably reinforce the existing structures, positions and processes within public administration (Bekkers and Korteland, 2006).

1.7. Limited use of services

Despite the sobering results, if looked upon from an academic point of view, the last few years a lot has been achieved regarding e-Government in practice. Many applications are developed and different kinds of services in various areas of government are made available electronically (often at least to some degree). A recent concern however is the deployment of the developed services. Accenture also observed this problem and states that 'despite citizens' relative Internet savvy and familiarity with online government in advanced countries, the telephone continues to be the predominant means they use to communicate with government (Accenture, 2006).

Research shows that the use that citizens and companies make of the electronic government so far, lags expectations (see also Thaens, 2006). In the Netherlands for example, research shows that in 2004 69% of all the interviewed persons have used the internet during the three months before the research was conducted. The percentage of people that in those three months have used the internet for gathering information from government websites was only 17%. Although the figures are only aimed at the use of government websites, the lag of use is not limited to this. Also something like the deliberation within the framework of interactive policymaking is seldom done electronically. If it is done electronically, then it seems as if only the traditional political elite is willing to participate. In the research, many citizens indicate that they prefer the personal channels, like visiting the physical counter or using the telephone, for electronic contacts (Van Dijk and Van Deursen, 2006). In Australia in 2005 only thirty-

nine per cent of adults contacted government via the Internet over the past 12 months. In terms of individual behaviour the most common channel used in Australia is in person (52%) followed by the telephone (26%) and Internet (15%). The mail is the least popular channel used to contact government (Australian Government, 2005).

The earlier mentioned Deloitte research shows that in Europe the traditional counter is still the most intensively used channel for delivering government services to citizens and companies. The traditional counter is closely followed by the telephone (call centre). The Internet follows these two, it is slightly more intensively used than postal services. Television clearly lags behind, thanks to its low level of service supply. In the northern part of Europe the telephone is the most intensively used channel. In other parts the counter leads. It is notable that the Internet is more popular than the telephone in the eastern part of Europe. In the south the Internet and the telephone enjoy the same level of use. With regard to Internet access and access to broadband infrastructure, the northern part of Europe clearly has a higher density, followed some way behind by the west. The southern and eastern parts of Europe lag considerably, while the eastern part has by far the lowest level of access to broadband infrastructure (Deloitte, 2005: 10).

The fact that the use of services is not meeting the expectations is more and more seen as a problem. For services and applications already developed, the limited use of it in practice means that the expected 'return on investment' will not be reached. On the level of society as a whole a limited use of the possibilities offered by ICT means lagging economic growth or productivity. From the perspective of government perhaps the most important problem then, is that expectations that were cherished in advance are not or only limitedly fulfilled. The question remains: if the use lags behind expectations, to what extent does government in practice become more efficient, more effective and more open and transparent for citizens and businesses (Thaens, 2006)?

In their research Accenture saw a number of leading countries struggling with converting even high internet use into genuine enthusiasm for the channel. They have found evidence that some leading countries are beginning to apply effective methods to improve citizens' acceptance of their most efficient online channels. (Accenture, 2006, 35-36). But instead of trying to 'sel' the technology to citizens, government could also pay more attention to the wishes and demands from citizens in developing e-Government services. Often government pretends to know what citizens and businesses want in stead of asking them. Van Dijk and Van Deursen show that this leads to misconceptions. Based on research, they state that the assumption that Internet is (or will be) an accessible channel is actually wrong. Not all the citizens can use this channel at this moment, but more important, there is a group of citizens that do not want to use the Internet or that only want to use the Internet for specific activities. They conclude that the casualness, with which the assumptions about what citizens and businesses want are used within all layers of government, even hinders the further development of e-government (Van Dijk and Van Deursen, 2006).

1.8. Some conclusions regarding e-government

The ambitions regarding e-government (as defined by Gartner) are set high. e-Government, as a four stage transformation process ending with the total transformation of government, is used to reach different goals at the same time. In practice however, the focus is dominantly on raising efficiency and increasing the quality of public service delivery. This is only part of what e-Government is about. And although e-Government consists of changes in different kinds of relations of government, most attention so far is

paid to the relation between government and the citizen as consumer, and between government and business. If we look at the different stages of e-Government, the conclusion can only be that it seems that the transformation stage, in which a new form of government is designed, has not yet been reached. Although a lot has been achieved, the deployment of e-government at this moment lags expectations. This is becoming a serious problem, because if only a minor part of all people that are able to use electronic services from government are really using them, the goals of more transparency, more openness and more efficiency and effectiveness will not be reached.

2. Ecology of m-government
2.1 The "Always On" Society.

We all have the experience of a meeting in which the participants have two or three mobile devices – laptop, mobile phone, Personal Digital Assistant - close at hand. They regularly consult the screens of these devices to see whether new or interesting information is received, or whether contact is sought by relevant, or interesting, people outside the meeting. Time and attention are allotted simultaneously to all partners and parties in the different walks of life of the participants at the meeting.

The whole personal ecology of the participants in the meeting is constantly activated. Every parcel of this personal ecology is competing all the time, and at every place, with all the other parcels of this ecology for the attention of the participants. This simultaneous attention to the entire ecology is facilitated by the mobile gadgets mentioned above, supposed they are interconnected and made interoperable. The mental energy that is required to combine and balance one's simultaneous attention for the different walks of life is spent to a kind of mental multi-tasking. The division between work, family and leisure during the hours of a day is completely blurred, because every of these spheres is linked with every other sphere.

As Ken Camp remarks:

> "As a hyperlinked individual, I sometimes wonder if I'm not joined into a excessive number of rings, loops or reciprocal relationships when it comes to technology and the Net. If a link is a connection, am I …are we becoming hyperlinked (excessively connected) and how does this affect us all?"

This "always on" characteristic of life in a modern digitalized society is not restricted to "sedentary" activities at the desktop but extends especially to "mobile" activities at any conceivable place. "Always on" therefore not only means within reach at any time but also at any place (24/7).

Summary Data		
Total Time (h:m:s)	0:55:14	9:29 pace
oving Time (h:m:s)	0:55:14	9:29 pace
Distance (mi)	5.81	
Moving Speed (mph)	6.3 avg.	14.6 max.
Elevation Gain (ft)	+1,379 / -1,359	
Avg. Heart Rate	165 bpm	Zone 4.9
Temperature (°F)	48.1°F avg.	48.2°F high
Wind Speed (mph)	ESE 6.3 avg.	ESE 8.1 max.
GPS Signal Quality	Excellent	GPS Unit Elevation
Similar Activities	TrailNetwork	
Download	GPS Device	
Export	GPX HST CRS	

An illustration of this is the fact, that even an outdoor activity like for example jogging or cycling can now be integrated in the 'always on' world. Carry a GPS device while you are running or cycling so that relevant data is recorded (for example by a 'watch' in combination with a heart rate monitor), upload these data by connecting the GPS device with a computer using a web application that translates and analyzes these GPS data, and your training activities are supported with functional analysis and online mapping of the route that you have followed during the running period (see for example www.MotionBased.com). In the analysis numerous indicators like speed, distance, route, and cadence, number of stops, elevation, lap data, weather data and heart rate data can be involved (see figure 2).

Figure 2. Example of uploaded data after a training session (www.MotionBased.com)
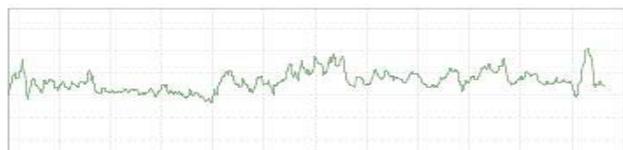

Chart details

Furthermore these data can be used to view the route on street, satellite, topo and elevation maps (for example using google maps, see figure 3). These maps can be used to look at aspects like for example the hearth rate by location of cadence by location. It is also possible to make interactive maps showing real time data. The athlete can use

such an analysis and mapping to improve his or her performance. Furthermore, the web application makes it possible to share data with other people, so other people can 'coach' you to help to improve your performance regardless where in the world they are at that moment. All they need is a computer with internet connection.

As a matter of course, these devices can be used for road pricing, or all kinds of surveillance.

Figure 3. The training route viewed on a combination of satellite and street maps
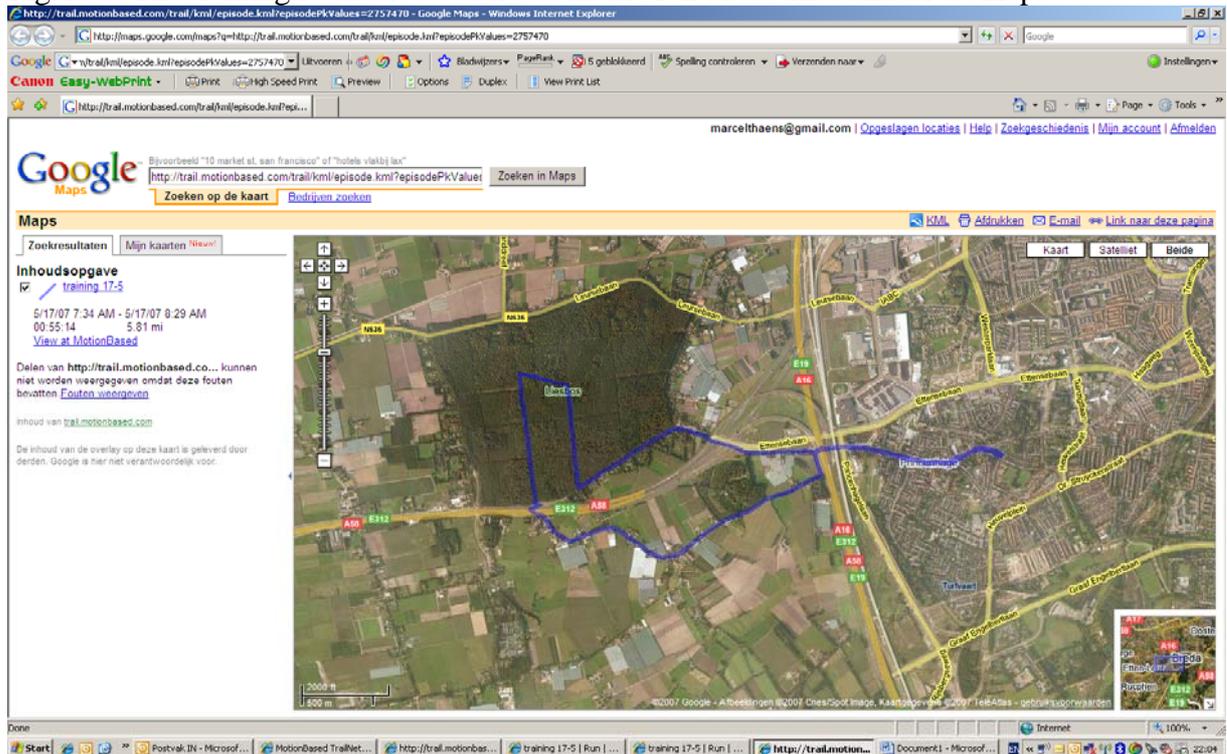
For younger age groups "always on" means that the mobile telephone is used in order to remain updated as to the movements of the peer group and the shifting possibilities for finding an acceptable party. (Ling 2000). A reflection of this kind of use of mobile telephones can be found within political parties and fractions in parliament, the members of which want to be updated all the time in their field of interest. Leaders within the political parties use the m-capabilities to marshal their forces, and to guarantee that representatives of the party – also at lower levels of government – speak unisono. Not to be informed leads to inconsistencies in forming of opinion and to lost ground in policy making.

2.2 Mobile Government in the "Always On" Society.

The parliamentarians and politicians mentioned in the former section are working in an "always on" mode. The mobile digital devices, which are responsible for this "always on" characteristic of modern life, change the mutual relationships between politicians, public administrations, citizens and public officials (especially: "street level bureaucrats").

Although it is often assumed that the digital devices will lead to "empowerment" of citizens as well as public officials, we don't think this can be taken as a self evident

point of departure. The digital devices not only strengthen the positions of citizens and public officials by making all kinds of data available at any time and any place. They are reciprocal communications devices as well, and as such they bring citizens and public officials within reach of the inspection, and of the claims of managers and others. (Being "absent" (not in the office, etcetera) is no more an excuse not to be within reach.) An excellent example of this ambivalent character of the mobile devices, leading to empowerment at the same time as to supervision, is given by the Chinese specialist Song Gang, who describes the situation of service provision and supervision in one of the parts of the city of Beijing.

> "At the Supervision Center, the location of all supervisors at work can be located and displayed on a big screen. All the location information is refreshed every 15 minutes through the GPRS network. The information and working status of the supervisor at work, as well as the information of the communities without a supervisor at work can be checked on the screen. All the reported issues are also displayed in different color and symbols; this makes it easier for checking and following up. The supervision Center also operates a call center to receive phone calls of complaints form the public."

> "With GPRS connection to the supervision center through the mobile handset, supervisors can receive instruction from or make phone calls to the center. They also receive complaints form the residents (or from the call center at the supervision center), confirm it, and send the information back to Supervision Center. If necessary, the supervisor can take photos with the mobile handset and send these back together with the position on the GIS. The Supervision Center then passes the information on to the Command Center. With accurate information about the report and the location of a problem, the Command Center can easily allocate the responsible department. The responsible department can then send out staffs to location and solve the problem. After the problem is solved, the supervisor can visit the place and confirm it."

In this case it is clear that the power relations between the different offices and officials are shifting more in the direction of managers and supervisors than towards the individual officials. This is not specific for countries like China, but can also be observed in the Western part of the world, as the following example illustrates.

With respect to the Florida Keys Mosquito Control District, Lallana (2004)reports:
> "Their challenge is to effectively and efficiently use their 61 vehicles engaged in insecticide control to prevent the spread of West Nile Virus and other mosquito borne diseases in over a million acres of marshland. They are now using a wireless fleet management solution that monitors the locations, heading, speed and insecticide applications of all their vehicles in real time. The information wirelessly provided by their vehicles is displayed on a digital map screen at district headquarters in Key West. The digital map monitors what each vehicle is doing, where it is spraying (or dropping) chemicals, and the vehicle rates of speed. This allows supervisory staff at headquarters to monitor vehicle progress and instruct personnel as necessary. The system also allows them to generate reports both in real time and on a historical basis (for example to demonstrate

spraying activity over a period of time or to calculate cost analysis information)".

In these cases, it is clear that support, service, and control with the help of mobile government devices go hand in hand.

2.3 Elements of Mobile Government.

Mobile Government consists of the interactions between mobile state administrations, mobile citizens, and mobile officials.
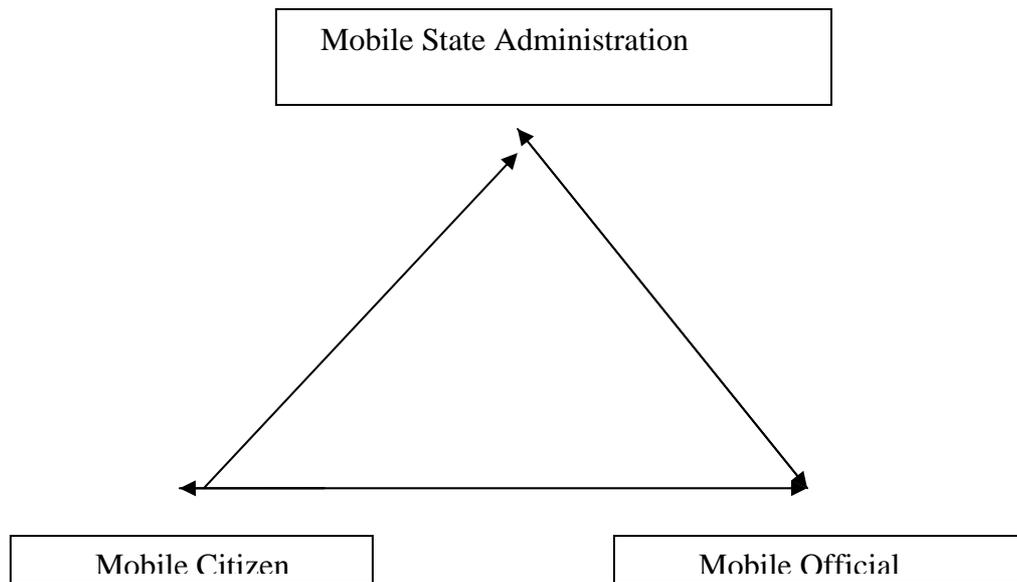

Figure 4. Mobile Government as Interaction between mobile administration, mobile citizens and mobile officials.

The mobility, envisaged here, consists of mobility of partners in communication, of mobility of technical communication devices, and of mobility of applications and processes.

In the following sections of this paper examples will be given of ICT support to the different elements of e-government. This overview of ICT applications can not be exhaustive, as almost daily new applications are introduced in the different parts of the world. As Rossel and others (2006) rightly remark: "The number of cases and experiments fitting the m-government framework already surpasses actual follow-up potential for any observer."

As a consequence, it is impossible to give a complete overview, or generalizations, of the applications of m-government. The information in this paper will be quite anecdotal.

3. ICT support to Mobile Administration.

Public administrations themselves are becoming more and more mobile, and are supported in this respect by mobile communication facilities, through which persons, data, objects

and processes can be reached. Especially as far as public administration is concerned, the subject of "mobile communication" offers many opportunities and challenges. The possible applications are manifold. An important part of public administrations consists of street level bureaucrats, who – independent from time and place - are enabled to keep in contact with the processes, the data and the objects of their organizations, and with their managers. (Franz, 2005: 10) The following mobile applications may be mentioned.

Satellites

Modern governments position themselves even in space to utilize satellite technologies in public administration. Three functions of these technologies stand out: communication functions, earth observation functions and positioning functions.
The Japanese author, Kaneko, distinguishes the following characteristics, and modes of use, of each of these functions:

- Communication.
A communication network, based on satellites, is quickly deployed without huge investment unlike the nation-wide optical fiber network, can be built almost disaster resistant as a back-up network for the ground telecommunication network, and can distribute simultaneously signals to every possible point of interest. Public administration may use communication satellite networks for every kind of simultaneous transmission of information, and as back-up communication lines in case of emergency.

- Earth observation.
A simultaneous observation of wide ranges of the earth surface can be easily done, and the conditions of the earth such as physical state of water, atmospheric/sea-surface temperature, vegetation and density of carbon dioxide can be detected all together.
Public administration can make use of the earth observation data to grasp the current state of agriculture plantation (e.g. sugar beet) and fishery resources, as well as for resource exploration purposes.

- Positioning.
Very accurate position information of ships, aircrafts and land vehicles can be provided, and this position information can be given on a disaster-resistant basis. This positioning function of satellites is of interest also for public administration in case of the production of maps, the implementation of environmental agreements and development issues, and the prediction of earthquakes and volcanic eruptions. Via a software program as "Google Earth" the general public is becoming aware of the great potential of the use of satellites to supervise what is taking place within the jurisdiction of the states.

At this moment Europe is working on developing it's own satellite network, Galileo. This network opens up the possibility for Europe to develop an autonomous safety strategy as well as to develop it's own navigation services, independent of other GPS networks like (GPS from the United States, Glonass from Russia and Beidou from China). Such a network opens up the possibility of road pricing on a individual base.

Within Europe the GMES initiative is undertaken by the European Union in which GMES stands for Global Monitoring for Environment and Security. Goal of this initiative is to

gather reliable and accurate services in the fields of environment and safety. This to support the policy development on the EU-level as well as on the levels of the different Member States. One of the reasons why this initiative is important to Italy is the fact that policy preparation and policy implementation requires a continuous availability of reliable (geo) information on a national, regional and global scale about the state of affairs regarding the environment, the threats for (civil) security, the protection of vital parts of the national infrastructure and the consequences of climate change.

The city of Amsterdam is using Google Maps in handling complaints of citizens about issues in their living environments. Citizens can fill out a digital form and the fact that a complaint is received is then plotted on a digital Map. So it shows immediately on what exact spots in a neighborhood complaints are received (figure 3). By clicking on a complaint the content of it is shown, as well as the action undertaken by government (figure 4).

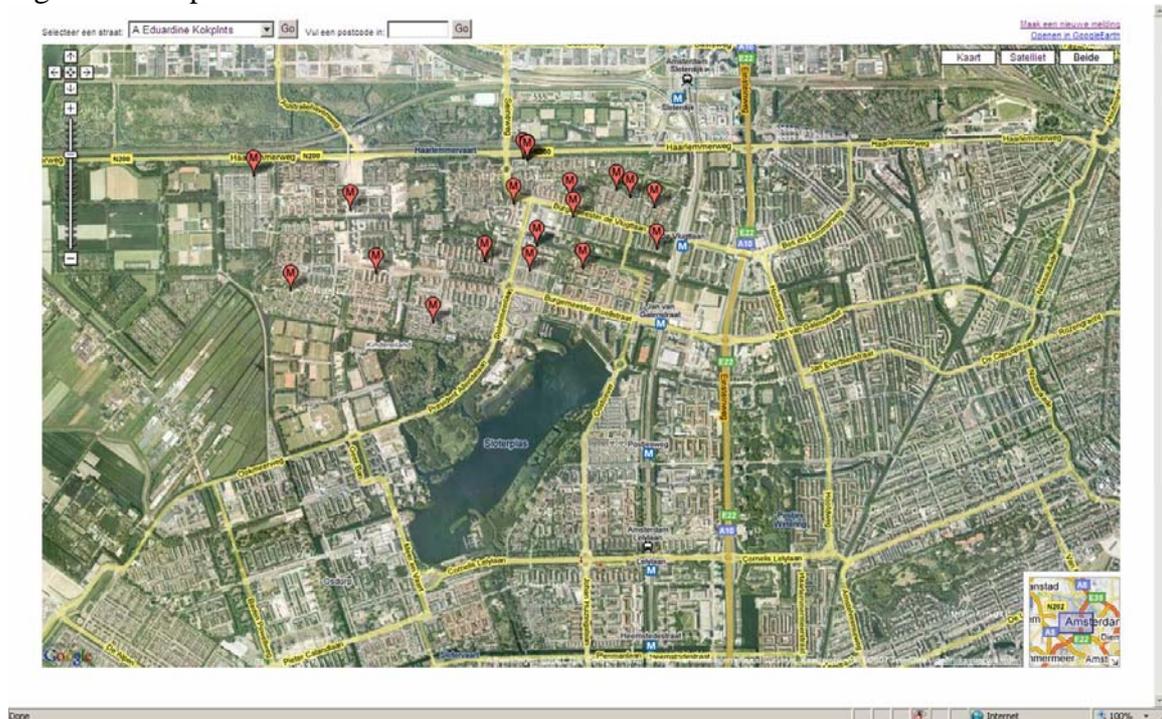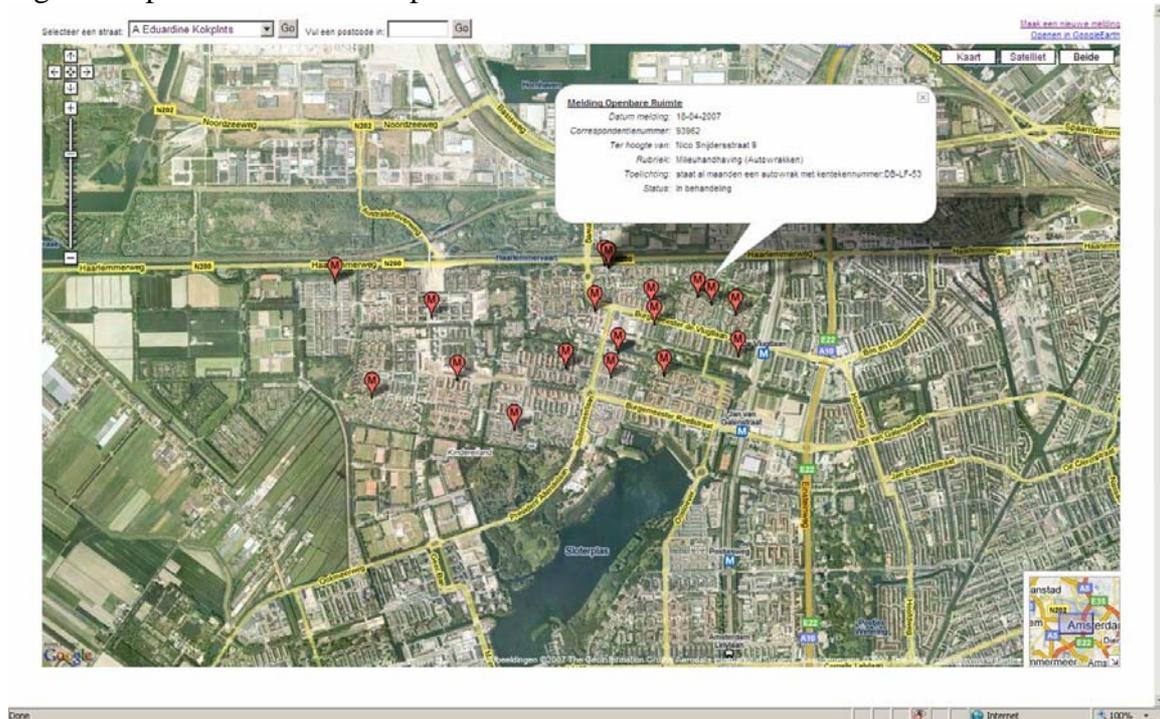Figure 5. Complaints as received from citizens

Figure 6. Specification of a complaint

Closed Circuit Television (CCTV)
The introduction of the first CCTV systems started in the early 1990s. The locations chosen by public administrations for surveillance cameras were very varied and growing in amount: town centers, car parks, schools, hospitals, sports and leisure facilities, museums, housing estates, railway stations, and for traffic management. (Webster) Through the introduction of CCTV systems, CCTV policies are entering different policy arenas, such as education, health care and transport. The capacity of the systems is growing continuously. Automatic image recognition, the automatic use of image databases, and the interconnection between systems are additions to this capacity. A recent addition is that different kinds of trespassers (e.g. polluting the sidewalk), discovered by CCTV, are admonished by a loudspeaker to correct their behavior.

Such a surveillance of whole populations, e.g. through CCTV of all cars entering London, is becoming the rule more than the exception, especially in the sphere of anti-terrorism campaigns. The cameras used around London are an example of so-called "smart cameras". Through their sensors, software programs, and coupling with databases these cameras are able to register deviations of normal behavior, to alarm the control room, and/or to record this behavior. The connection of the camera with a database of e.g. stolen cars or criminals makes it possible to identify cars or suspected persons.

The "Echelon" interception system, through which the governments of the United States, Canada, The United Kingdom, Australia and New Zealand try to get insight in relevant communications between possible terrorists, criminals, and drug dealers is characterized by its aim of quasi-total surveillance. The system works worldwide on the basis of cooperation between the five countries, which place their interception systems at each other's disposal. "Its satellite receiver stations and spy satellites in particular are alleged to intercept any telephone, fax, internet or e-mail message sent by any individual and to

inspect its contents." (It is ,however, questionable whether this ambition can be realized.) (Schmid)

Surveillance technologies as CCTV (and although of a different category: Echelon) have some very important characteristics in common.

1. they surpass physical barriers of distance and darkness as is demonstrated by satellite observations and CCTV.
2. administrative registrations are coupled and act like an indivisible memory.
3. they surpass time barriers, as registrations of images can be saved and later on consulted.
4. the observations of people, objects, processes, and data are taking place surreptitiously through coupling of visual and administrative registrations.
5. observations are taking place without the consent of the people who are observed.
6. the orientation of the applied surveillance technologies is more prevention oriented than repression oriented. (See also next paragraph.)
7. often a kind of categorical suspicion ("profile") is built into the applied observation technology.
8. The technology may evoke or stimulate a kind of self-control of the observed.

Radio Frequency Identifier (RFID)

Radio Frequency Identifiers use radiowaves to identify products, animals, and persons. Tags or transponders are attached to or incorporated into the items to be identified. The identification takes place automatically and without contact of the reading device with RFID cards or with the other items, to which the tags are attached.

The uses public administrations can and will make of RFID are manifold. One can think of:

- passports and other identification documents.
- automatic road pricing and other public transport payments.
- control of food chains and supply chain management.
- fighting shop lifting and other forms of theft.
- profiling different criminals and terrorists.

The tracking and tracing that is in principle possible with the help of RFID approaches a completeness that makes the remarks, made above, about the tendencies in the direction of supervision of total populations and advanced prevention even more pressing.

The possibilities for RFID are endless. Especially Japanese and Koreans are very inventive and innovative in this respect. Partly this has to do with a different value orientation regarding privacy. Some examples are;

- Entry tickets for the world championship football contained rfid-tags. A counterfeiter would have to make an exact copy of the chip.
- Library books are protected against theft, and the tags are used for self service and logistical processes.
- The city of Rotterdam introduces a public transport chip card, which makes it possible to travel without contact with an apparatus in metro, tram or bus. This makes the traditional tickets superfluous, reduces fare dodgers, and improves the circulation.

- In Great Britain a pilot project will be started to put a rfid in license plates for entry control at toll roads, for a tit for tat policy in case of speeding, for road tax, and for insurance. Prevention of theft might be a goal as well.
- The Japanese government considers to spread rfid tags on disaster areas. Through the tags, which contain sensors for heat, infrared radiation, or vibration, possible survivors may be detected.

Other applications are: rfid applications to follow the spread of birds' disease (Thailand), to guide visually handicapped (Japan), identifying information on passports (US), patient data on tags under the skin in hospitals, which can be retrieved via a website (US).

SMS criminal hunt ("Verbrecherjagd"in Germany)

The SMS criminal hunt makes it possible for the police to organize a large investigation in which citizens are involved. In cases of serious crimes mass SMSs are sent from a central point to groups of volunteers and members of the police force. In this way a large investigation can be set up, and different target groups can be informed. In this way, citizens become eyes and ears of the public administration.

According to the Belgian senator Anseeuw, the m-government applications are limitless and will be the norm in Europe within a few years. "Communication via SMS from the administration to the citizen about all kinds of legal and practical businesses will be the next step in the modernization of service provision by public administrations. The citizens may provide a profile of their interests in certain kinds of information or services.

The London Metropolitan Police sends already security warnings to all mobile phones in a certain area of the city in case of security threat.

In case of serious criminal acts, the Dutch police sends SMS messages to all potential witnesses of those facts. So sent the Dutch police 17.000 SMS messages to the people who were present at the stadium during the riots after the football match between Ajax and Feijenoord (17-04-05) to get information from eye witnesses."

In Nieuwegein, a city of 60.000 inhabitants in the center of The Netherlands, a "Burgernet" (Citizen's Net) is created to help the police in urgent investigative actions. The burgernet consists of about 1700 citizens. When a citizen notices a suspicious act he/she will warn the police. The police notifies the members of Citizen Net by SMS to watch out for suspicious behavior in their own neighborhood. The Dutch government will expand this initiative to other parts of the country as well. Burgernet may be used for alarming purposes in case a wave of burglary is flooding a neighborhood, for large-scale neighborhood investigations, as well as for regular watch out activities when they walk their dogs. "Nobody notices suspicious behavior better than an inhabitant of a neighbor-hood" according to the newspaper NRC-Handelsblad (25-02-07).

In a recent publication the Dutch Rathenau Institute, an independent technology assessment organization, created to support the social and political formation of a judgment on questions related to scientific and technological developments, has published a study entitled: "From Privacy Paradise to Control State". In this publication it recognizes with respect to the intelligence and security measures, which are being created in the wake of the fight against crime and terrorism, the following trends:

1. Intelligence gathering is increasingly extending to people, who are not suspects, but are part of the suspect's environment.

1. The research is increasingly adopting an exploratory character, in which potentially suspect groups are being monitored on the basis of risk profiles.
2. Legal restrictions on the use of certain detection methods are being eased or lifted.
3. Intelligence services are acquiring more and more opportunities, both legal and technical, to carry out (independent) investigations.
4. Intelligence services increasingly have access to information from other government and semi-privatized services that has been collected for purposes other than intelligence.
5. Intelligence sevices are increasingly forcing other parties to cooperate in investigations. (Vedder e.a.)

These trends, observed by the Rathenau Institute, are not only a matter of concern and important as such. They bring also forward the question, whether and to what extent the relationship between state and society, or between state administration and citizen, is changing more fundamentally. Is this shift from e-government to m-government a forerunner of a new paradigm of public administration? This question will be touched upon in a later section, where the definition of m-government will be discussed.

Global Positioning System (GPS)
Just an example of the possible applications: an "Offender Wireless Monitoring Partner".
The state of New York announced the first step into NY State Assembly Bill A5424 which requires , in certain instances, when a restraining order is issued, the offender will be required to wear an electronic monitoring device. Omnilink Systems offers according to its sales representative, "the only single unit solution that tracks inside buildings and other places where GPS-only based solutions do not work. Omnilink's solution also tracks off-the-shelf cell phones that victims carry to detect when the offender wearing the court mandated offender devices comes close to the victim. The victim is alerted and the NYPD is alerted simultaneously, thus expediting the dispatch of appropriate law enforcement personnel, and allowing the victims to become active participants in ensuring their own safety".
Law enforcement authorities can also increase or decrease monitoring intensity at any time, ensuring that the technology reflects the latest judicial mandates. Using a combination of cellular technology and Global Positioning Systems sophisticated location awareness information is provided in real time, even when offenders are inside buildings, busses or trains. NYPD staff can easily specify monitoring criteria, including allowed and excluded location zones, travel time routes, and even proximity to other monitored individuals. (http://www.omnilinksystems)

4. ICT support to Mobile Officials.
Only a relatively small portion of the officials of modern public administration are involved with policy developments. More than 80% of the public officials have a role to play in policy implementation, inspections or policy overview. These officials are called "street level bureaucrats" because they do their jobs in direct contact with citizens. As the term "street level bureaucrats" indicates, many of them do their work mainly outside the office: e.g. in police districts. Other activities of street level bureaucrats have to do with social security, labor safety inspections, health care inspections, environmental inspections, etcetera. The way in which the functions of these street level bureaucrats are fulfilled is

changing radically through an ever growing amount of applications of ICT. Especially the influence of the shift from e-government to m-government deserves our attention in this respect. Some examples will be given here.

General Packet Radio Service (GPRS)/Universal Mobile Telecommunication Service (UMTS)
GPRS and UMTS are techniques that are used for transferring data via mobile networks. GPRS uses the same network that is used by mobile phones. This means that everywhere, where a mobile telephone can be used, also GPRS can be used. The speed of datatransfer that can be reached with GPRS is limited to 172 kbps (which is about the same speed as accessing Internet using a analog modem). UMTS is about 6 times faster then GPRS (comparable to broadband access to Internet), but requires it's own network and is therefore not everywhere available for users. Both the techniques use the Internet Protocol (IP) to transfer data.

GPRS/UMTS has made it possible for the street level bureaucrat to use his mobile telephone to download data from a central database located at his "home office". He is also able to send his reports and findings as input to the central database. Direct access to a central car registration or population registration is of utmost importance. Without direct access to these registrations, the facilities to check the situation of the citizen are often completely ineffective.

As the case may be, the official is enabled to add his own data immediately to the database. This facility changes the work of the public official fundamentally. Examples are inspections on the spot about housing conditions, the technical situation of buildings, the labor conditions in enterprises, the safety of the workplace, environmental conditions, etcetera. As the case may be, actual data may be compared with historical data and remarks made at former inspections are readily at hand. Special mentions deserve the new possibilities for the management of public space, such as the maintenance of trees, of roads and sidewalks, to inform the responsible departments about dangerous situations. Accidents could lead to claims of citizens.

In the field of surveying and taxations, e.g. for determining the basis of taxation, GPRS/UMTS is playing an ever growing role. Databases can be consulted on the spot to find out what the relevant price levels of comparable houses and buildings are. The outcome of former inspections about water quality and water quantity are available as well. A large area of applications of GPRS/UMTS is the field of social care, social housing, community health care, and care for the elderly. Clients do not have to visit the office of the public service, and the street level bureaucrat can handle the cases adequately, and without any delay because of possible lack of data at hand. As far as his decisions are concerned, the public official can rely upon the access of protocols in the database, and upon the decision support systems (DSS) available in the database.

Another aspect is that the findings and decisions can be uploaded directly in the database at the office: no separate entry, or copying from visitation report to input in the database is required. A direct data entry is possible as well in electronic patient records, which spares time, improves the actuality of the data, and prevents unnecessary double diagnoses, and other unpleasant experiences for the patient. The prevention of double entry of data by the public official is a general positive aspect of m-government. This kind of integration in the medical field is just an example of the general tendency, which will be created by m-government, to strengthen the relationship between different mutually dependent specialists. Parallel to this development will be the integration of inspection functions in

public administration, e.g. between environmental inspections and traffic, housing, and other inspections.

Special mention may be made of the growing amount of GPRS/UMTS facilities created for tele-working in an assembly building or from home. Security is still a major problem, especially when the content of databases are transmitted, to be worked upon.

Personal Digital Assistants (PDA)
These devices are used by mobile officials, such as police officers, who are active in neighborhoods. When they pass a coordination point that is of interest to them, the PDA will give a signal and information about the kind of situation that deserves their attention. It may be the address of a person free on bail, it may be a stolen car, or other situations of that kind.

Smartphones
Smartphones are integrations of PDA and GPRS/UMTS. The way in which they are applied may be illustrated by the following description of survey of houses for taxation purposes in the city of he Hague. In the middle of the year 2002 the outdoor employees of the municipal taxation office were equipped with a pen-computer through which data-communication with the back-office was facilitated. It was partly seen as a demonstration project for other m-government applications. The results of the project were:

a. quantitative as well as qualitative improvements: less administrative burdens, less corrections, more data available to the outdoor employees.
b. as far as the organizational implementation is concerned: appointments with citizens were easy to change, a replacing surveyor can be contacted easily without necessity to go to the office.
c. as far as the service provision to the citizens is concerned: because of the transparency of the system, the citizen can be informed on the spot about the way in which the survey has taken place.

The project made clear that the m-government approach can be applied on different municipal services, e.g. the plan of attack of the fire brigade in case of fire of dangerous materials. It also made clear that the services, which are envisioned, require integration of the nervous system of public administration, e.g. through synchronization of data. The fire brigade has to know the relevant traffic diversions and traffic jams, as well as about permits with respect to noxious materials, etcetera.

5. ICT support to mobile citizens.

While the ICT support to mobile administrations is concentrated on the expansion of the capabilities of those administrations to check and control developments in society, the mobile officials are supported mainly through expansion of their capability to dispose of and communicate with databases, and to being alerted about situations requiring their attention.

The support to mobile citizens is of interest to them in as far as it makes information available at the place and moment they need this. Mobile citizens may need information, wherever they are, about news according to their specific profile. To say it differently, they want to be informed about news that is "personalized" as well as "context and location aware". Mobile ICT technologies can assure this. Singapore and Malta are most advanced in this respect.

Tourists are a category of mobile citizens, which requires local information about places of interest, opening hours, parking and traffic regulations, public transport, etcetera. The PDAs, mentioned above as support for mobile officials, may be valuable devices in this respect for citizens as well. The moment the citizen passes a place of interest, according to his/her profile, the PDA will inform him/her.

For example, Finland introduced a system to pay for parking via mobile phone in multiple cities, as well as in some private parking facilities and parking facilities owned by public companies (such as the Helsinki-Vantaa Airport). The PARKIT parking payment system allows users to start, end or extend parking time by making a phone call, without even going to the vehicle. The service saves time, trouble and money, as the user need only pay for the parking time actually used. PARKIT accepts diverse payment methods: mobile phone invoice, credit card invoice or a specific itemized bill. Denmark, the Netherlands and Germany, likewise, offer pay-by-phone parking in certain cities (Accenture, 2006).

Another example, coming from the city of Melbourne. Australia wants visitors and residents alike to feel at home there. It has introduced iHubs —kiosks that are, in effect, like mini-chambers of commerce. These will be installed around the city and provide information about events, dining, entertainment, shopping and transport. Users identify where they are in the city on a detailed map and by moving an icon across the screen, locate points of interest or make reservations for events. Information will be shown in the lower quarter of the screen so it is wheelchair accessible, and the city plans to implement voice instructions for the visually impaired (Accenture, 2006, see also http://www.thatsmelbourne.com.au).

Figure 7. iHub in Melbourne

Information available within public administrations may be helpful to let citizens fulfill their duties. Information about a pending license renewal, or the expirence of a passport is in many cases provided automatically by public administration. Other information, available within government, and of more or less vital interest to the citizen, may be related to exam results, obligations towards the social security office, book reservations, job opportunities, leisure activities, etcetera.

Information about weather forecasts, air pollution, road traffic, criminality in a neighborhood, which may affect the decisions of citizens on short term (going to the movies) or long term (buying a certain house), and available within public administration, may be of utmost interest to the citizen. A rather recent application of ICT in this respect, which is highly valued, is the notification of parents about the school absence of their child.

6. Definition of m-government: towards a new public administration paradigm?

According to the generally accepted definition of the state, developed by the German sociologist, Max Weber, a state is "a geographically delimited segment of human

society united by common obedience to a single sovereign". In this definition three essential elements of a state are distinguished:

1. the territorial basis of the state;
2. the population living within the confines of this territory;
3. the paramount control and ultimate power of the state.

Since the massive introduction of Information and Communication Technological applications in state and society the physical, demographic and jurisdictional boundaries of the modern state have been shifting.

The *territorial* basis of the public administration is affected by the installment of tracking, tracing and monitoring applications, such as Global Positioning Systems (GPS), put in orbit, through which all kinds of activities and developments on earth can be supervised.

The *demographic* basis of the state administration – at least in the Western world is affected by a massive influx and outflow of, on one hand, asylum seekers and economically motivated immigrants and cross border workers, and on the other hand sun seeking pensioners. In the Netherlands one million (on 16 million) inhabitants, living in the country, have more than one passport, and one million people, who have a legal relationship with the Dutch state administration, are living abroad. Without the mobility enhancing ICT applications the rights and obligations could not be followed up.

The *jurisdictional* basis of the state – its paramount control and ultimate power basis – is affected by the globalizing developments in the world. Some of the side-effects of globalization are a growing-border crossing international criminality and terrorism, tax-evasion, traffic in women, etcetera. The jurisdictional limitations, nation states encounter, when they fight the negative effects of a globalizing world, are putting them more and more under pressure. Thus, as a consequence of these developments, and facilitated by a fast growing array of ICT applications, modern state administrations are, in their essential dimensions, becoming "mobile state administrations" themselves.

Their territorial basis has been extended into virtual directions, their demographic basis has become extended and more diversified, and their jurisdictional basis has only partly strengthened by the still growing transparency in the relationships between state and society.

7. Towards an m-government paradigm?

Accenture states that the leading countries on the development of e-government meat the limits of their potentialities. A transformation is necessary in which a tailor made orientation comes back in customer service. This is a plea for a more tailor-made personalization and contextualization approach. m-Government probably can provide these and in this way further the development of e-government. Probably m-government is necessary for e-government to become a success. M-Government may lead to a more intensive use of the services and applications which are already developed within the framework of e-government.

One of the most important questions with respect to the way in which the developments to m-government have to be approached is, whether e-government, as we know it now, will be replaced by m-government as dominant mode, or that m-government will appear to be just another access channel to public administration.

In view of the developments taking place around the interaction between mobile state administrations, mobile citizens, and mobile public officials, described in this paper, there is no doubt that the transition from e-government to m-government is not only a matter of a shift in ICT technologies that are applied, but of a more fundamental change. Such a more fundamental change could be the growth of a different relationship between the mobile state and the mobile citizen, and between the mobile state and the mobile public official on one hand, as well as the growth of a different relationship between the citizen and the public official on the other hand.

The basic assumptions on which the m-government applications are founded are mainly related to the citizens' ability in an" always on society" of doing things independently. These assumptions with respect to this ability are:

1. The ability may to a large extent depend on the enhanced transparency of the relationships between citizens, public officials, and the state administration.
2. Initiatives of the citizens are at any place and at any time supported by provision of information by the state administration.
3. Devices are not only developed for public officials, but also, and at the same time, for citizens.
4. Citizens will dispose of horizontal control devices with respect to the performances of the administration and public officials.
5. States will dispose of vertical control devices with respect to public officials as well as to citizens.
6. Diffusion will take place of citizens' ability to do things independently and to replace or fulfill the functions of the state administration and the public officials.

Taken together these developments indicate that m-government may be not just an intensification of e-government, but a fundamentally different set of relationships that is growing between state administration, citizens and public officials. The younger generation may find it self evident, after a while, to get a quick answer on quickly and readily available information.

The demand orientation of m-government with respect to the citizens, which is gradually replacing the still dominant supply orientation of most Weberian bureaucracies and e-governments, may entail a more holistic approach to the clients of public administration. The shift from e-government to m-government may appear to be more than a change of tools, but also a change of work attitudes and strategies (see also Behn, 1995). As far as the work attitudes are concerned, the officials will work out their own routines. As Ling remarks:

> "The specific effects of the mobile telephone are that it allows back channel communications between officers, between officers and other agencies and also between officers and various private individuals. This means that the mobile telephone can change the specific routines associated with (police) work. Where one relied on a central dispatcher to communicate messages to other agencies and organizations, the (police) officer is able to do this by themselves. In some cases this may lead to more efficient work. On the other hand, there is a reduction in the pool of general knowledge provided by the traditional radio communication. This may mean that the information, and perhaps the activities of the agency are more disjointed. This is similar to the tendency (noted above) in connection with factionalization within challenging groups.
>
> The mobile telephone also allows room or direct informal interaction between officers and also between officers and other persons. Thus, it provides a back

channel through which they can agree upon various irregular covert activities. Manning describes how officers conspire to maintain a front vis-à-vis the central organization as represented by the radio dispatcher while carrying out various, often harmless, high jinks.

Thus the development of independent, point to point communication between individuals can have various impacts on the functioning of a bureaucratic organization. On the one hand it can lead to efficiency in that low level and inconsequential interactions do not need the attention of centralized portions of the organization. On the other hand, there is more room for alternative activities that may be at odds with those of the organization."

Another basic aspect of the use of the m-government devices is that they in principle do not approach groups but individuals. Personalization is, next to "location based services" and contextualization the core of m-government.

8. Benefits of m-government.

8.1. Accessibility

A favorable condition for the accessibility of the persons, data, objects, and processes, related to m-government, is that the degree of penetration of mobile telephones is higher than the degree of penetration of internet. The operation of the m-government devices is simpler as well. This furthers the accessibility not only for citizens, but also for the public servants. The officials have a direct access to databases, protocols, registers, and – as the case may be – decision support systems.

As we have seen before, with the help of SMS and other mobile communication devices large numbers of people can be reached, and mobilized, at the same time. M-government provides at least an additional channel for interactions with stakeholders in government activities, such as policy makers, civil society representatives, and service deliverers and consumers.

No boundaries of time and place are obstacles for this direct access. Anytime and anywhere is the basic characteristic of the "always on society". It is, however, not a one way communication between public administration and the citizen. M-government enables public administrations to reach out to relevant sectors of society. In a former section of this paper we have indicated that this possibility may have negative consequences for the privacy of the citizen.

8.2. Quality

Different examples of the way in which the quality of the relationship between the citizen and public administration could be improved by m-government have been presented in former parts of this paper. Basic aspects of the quality improvement by m-government are a consequence of the basic characteristics of m-government applications. M-government offers the unique opportunity to deliver personalized services to citizens. And personalized messages and alerts, and notifications can be sent to citizens in a timely manner. The individual citizens can be reached wherever they are and whenever they need the service. Many new services for citizens and officials are created also.

Another basic characteristic of m-government applications is that they can be contextualized. The specific situation of the targeted person or group of persons can be

taken into consideration also, because their profile of interests can be coupled with the service which is offered. So-called "location based services" have become possible.

Another aspect of quality of m-government service applications is that the required information is "real time" available to the service provider. There is no time lag between the moment a need or situation is observed and the moment the need or situation is notified within the service organization. The mobile official, who observes a situation in which action is needed, does not have to wait till he/she is at the office, but can input the data directly with the public service.

8.3. Economy

From the descriptions of m-government applications in former sections of this paper it will be clear that m-government offers many opportunities to economize on the traditional costs of e-government. In countries where no fixed telecommunication facilities exist, the cost of development and maintaining such facilities can be saved. There is no necessity of wiring buildings either.

Mobile technologies, and the services based on them, promise more efficiency, faster and less erroneous processing of data, and improvement of service through direct contacts with citizens. Most authors about m-government agree on the following financial and economic advantages of m-government:

- growing efficiencies.
- less costs through avoidance of overlaps.
- increased service level and ease of service.
- increased adaptability to future requirements.
- improvement of auditing and control.

We can take the health care institutions, which aim at improvement of the effectiveness of care services, and at the same time at cost reductions as an example. Handheld wireless applications can enable doctors, nurses and other health care professionals to gain access the right information at the right time to prescribe the proper treatment. In addition to saving time for intervention and prevention, using mobile devices can offer great benefits and efficiency with (in the US situation):

- access to patient records
- finding patient's HMO and PCP
- access to lab test results
- request for urgent blood donations
- access to latest drug reference databases
- sending patients' data for a second opinion
- electronic billing for in-home health care workers. (Kushchu & Kuscu 2004)

9. Challenges, Barriers, and Future Prospects

In view of the promising start and the almost daily inventions and innovations of m-government in the different sectors of society, a further growth of m-government may be expected. However, many challenges will be encountered and many barriers will have to be surmounted. Mention may be made of the problems of *security, privacy, digital divide, lack of trust, information overload, keeping the back offices in step with the front offices*, and many more. Discussing them would expand this paper far beyond

its envisaged size. Because of its overriding importance we limit this discussion to *interoperability* as challenge and barrier for m-government.

9.1 The indispensable interoperability

Whenever people or organizations work together, their information facilities have to be attuned as well. The more differentiated the information systems of the parties, who want to work together, are, the more difficult it will be to make them interoperable.

Advance in interoperability is an essential requirement for the further development of m-government. The concept op interoperability has different meanings. By more technical specialists interoperability is defined as the ability of software and hardware on different machines from different vendors to share data. A more general definition of interoperability is the ability of two ore more systems or components to exchange information and to use the information that has been exchanged. Not only a possibility to share data is required, but also to use the data as relevant information. Both definitions are quite narrow as they are limited to communication. A broader definition, relevant for e-government and public administration, extends beyond just communication. M-cooperation requires not only technical interoperability (as defined above), but also semantic interoperability (the partners in the cooperation have to give the same meaning to the terms used), organizational interoperability (the shared information had to fit the organizational routines of the participants) and institutional interoperability (the shared information systems must fit into the legal, cultural and professional codes of all participating parties). The requirements of all these kinds of interoperability have to be fulfilled for a cooperative deployment of ICT applications to be successful.

On the basis of a study of the barriers and challenges that managers of ICT projects experience, when they attempt to create conditions for fruitful m-cooperation inside and between organizations, the importance of interoperability for the functioning of inter-organizational systems can be demonstrated.

9.2. Technical Barriers and Challenges.

Everybody who has experience with the introduction of sizable ICT innovations into public administration knows, that it progresses with great difficulty and runs high risks. To fully realise m-cooperation measures have to be implemented at three levels: 1) intra-organisational and intra-sectoral with respect to sharing of information; 2) intra-sectoral with respect to service delivery and client registration; 3) inter-sectoral with respect to overall information architectures.

The first level is about electronic sharing of data related to clients and societal situations. (Negotiations about) the following aspects are then at stake:

    a) the definition of the shared data (which are often further defined in local regulations);

    b) the definition of messages required for the execution of tasks (operational work processes, about which administrative departments want to maintain a certain autonomy);

    c) technical standards and protocols (to which administrations are accustomed and wish to stick);

    d) the quality of data in terms of actuality (which may differ quite substantially between the parties);

e) safeguarding the security of shared data by technical and organisational measures and autorisations (the importance of security for the continuity of the business or for privacy may differ for the parties);

f) the establishment of a control authority on the observance of the set of agreements with respect to data and messages;

g) the bearing of costs of the common facilities (often the unbalance of benefits and costs for some of the parties leads to protracted discussions and much delay);

h) object identification and numbering (of major importance for statistical research and prevention of fraught).

Commitment to the same objects, a common sense of direction, for a longer period of time, is often lacking in m-Government initiatives. Too many different functionaries, each with their own specialty and "trained incapacity", are participating in larger m-Government projects. Without a strong management, too many partial decisions are taken, which are on cross purposes with the common design. The staffing is often discontinuous, the dependency on outside specialists intensive, and the documentation of the projects failing.

The second technical level is about the transformation of service delivery, the client orientation, the portal functions and the registration of clients and citizens. When the functional bureaucratic orientation is replaced by a client orientation, different agreements have to be reached concerning:

a) public services, which move in the direction of becoming parts of one stop shops, will have to agree on the portal-functions they will develop in common. Where will the common boundaries of the network of connections with other organisations be drawn?

b) the management of the content of the website has to be organised as to: information about rights and obligations, procedures, contacts with sister organisations and independent experts, "what-if" questions, calculations of the entitlements with respect to provisions.

c) content management systems have to be developed e.g. with respect to standardisation and possible changes at one of the partners in the network.

d) the required levels of identification and authentication for the different transactions via the net have to determined. Questions about e.g. electronic signature, encryption, Public Key Information Structure present themselves.

e) differences between the participants at a one stop shop arrangement as to freedom of information and active disclosure of policy initiatives and existing databases have to be balanced.

The third technical level is about exchange of information between different sectors of public administration. If different sectors 'feed' databases which are managed and used by other sectors, a need arises for overarching information architecture over the whole public administration, as well as separate architectures for each of the sectors. In this overarching architecture has to be established: where registrations will be kept, what kind of infrastructure will be built and maintained for the routing of the data, and how this infrastructure will be positioned. Every time regulations in one of the relevant sectors are changed, the effect on the architecture will have to be checked. On the basis

of the architecture, the most practical solutions as to introduction, costs and administrative burdens can be chosen.

These technical problems are extra consequential when international forms of m-cooperation are at stake.

9.3. Organisational Barriers and Challenges

In former sections some forms of re-organisation, prompted by the introduction of m-government, are discussed. The barriers which are involved in those re-organisations will be treated only shortly. Many of them are of a general nature and well known from the literature on organisations. Loss of autonomy, a feeling of "ownership" with respect to data, information and knowledge within repositories of the own organisation, a one-sided view on societal problems specific for the "trained incapacity" of experts, and general inertia, are some of the barriers to m-Government to be encountered.

Extracted from a German study (Reinermann& von Lucke, 2002), the following, more specifically ICT oriented, organisational barriers can be distinguished. The size and complexity of the existing governmental structures limit their adaptability to new situations, such as the emerging m-Government. Cooperative behaviour is hindered by the separation of powers, the tier structure of public administration and the right of self-determination at the different levels of government. The necessity to come to an agreement leads to compromises at the level of the lowest common denominator. The flexibility which is required by m-Government is square to the immobility of existing public authorities. The legal necessity to maintain off-line facilities (for a-digibets) makes on-line m-Government facilities extra expensive. Many organisational changes, inspired by m-Government, relate to horizontal cross-boundary processes, while public administrations, in general, are mainly interested in vertical jointed jurisdictions. And finally, the m-Government measures are too much directed at cost savings in the existing departments, instead of at interconnected chains of activities.

9.4 Institutional Barriers and Challenges

Persistent institutional barriers with respect to m-Government have mental, legal and cultural backgrounds. From a mental point of view, public servants, especially those at street level, are incited to resist the downgrading of their jobs through "infocratic" structures, and through a knowledge management which does not leave them any form of discretion. A source of legal resistance comes from the fact that ICTs lead to blurring of boundaries between organisations. The moment information is shared between parts of public administration, responsibilities for the authenticity, accuracy and integrity of the information becomes blurred also. What is even "worse", the boundaries of the jurisdictions of public organisations as the constituent parts of public administration become blurred too. Jurisdictions can be defined as "the exclusive authority of an actor as a unified entity to determine rights and obligations of citizens in a task domain with (a certain degree of) discretion for which this actor is legally and politically accountable". (Bekkers, 1998) In some countries information may not be shared between ministerial departments, that belong to different sectors of society. (Reinermann&von Lucke, 2002) For reasons of privacy such boundaries for the sharing of information are also advocated by ethicists. As far as information sharing is concerned, m-Government might thus have a negative effect on the reliability of public administration. Other elements of m-cooperation may have the same kind of effect. Uncertainty may still exist about the validity of administrative acts via internet, of

electronic signatories, or of electronic transactions. Apart from that, many laws have to be adjusted to the introduction of m-cooperation.

Finally, cultural resistance to m-Government as such may come from a lack of confidence in the new technologies. The traditional carefulness as bureaucratic virtue may turn to risk-avoidance, and a lack of innovation.

10. Tentative conclusions and strategic recommendations

The considerations in this paper lead to the following interconnected statements:
- the amount of m-government applications in public administrations, all over the world, is growing extremely rapidly;
- these applications enhance especially the efficiency and effectiveness of the activities of the "street level bureaucrats" in the implementation of policies;
- at the same time, the services to the citizens tend to be adapted to the requirements of a personalized, contextualized, and location based approach;
- in these respects, the m-government applications may fulfill the still unfulfilled promises of e-government (for example, raising the uptake of electronic services by citizens and businesses);
- as far as interactive policy making and democracy are concerned, the applications of m-government are still wanting;
- it is too early to speculate about a paradigm shift in public administration as a consequence of the transition from e-government to m-government;
- m-government applications will, however, evoke fundamental changes in the implementation and supervision of policies, and in the role of citizens in these;
- m-government can support governments which recognize that they have reached 'the limits' with their current approaches to customer service.
- m-government can help to make the step from the interaction phase to, what Gartner calls, the transformation phase in realizing electronic government;
- citizens are increasingly involved in the fulfillment of basic functions of the state, such as safety policy;
- the "always on" relations between citizens, officials, and public administrations lead to a blurring of the boundaries between state and society;
- the empowerment of citizens and officials, furthered by a growing amount of m-government applications will be kept in check by the control relationships, created by the same m-government applications;
- the "real" bases of the Weberian state will be replaced by a "virtual" territorial basis, a "virtual" population basis, and a "virtual" jurisdictional basis;
- the future policy competition between countries will, to a large extent, take place through attractive competitive m-government applications.

On the basis of the analyses made in this paper the following strategic actions are advocated (see also Jae Moon, 2004):
1. Governments should develop strategic m-government plans in which a coherent view will be presented on the priorities of the functions to be fulfilled by m-government in the different sectors of society.

2. These plans should be framed in the context of an overall policy, in which policy competition between countries, with respect to burden alleviation, smooth operation of government towards national and international citizens and businesses, etcetera is the dominant focus.
3. Interoperability through standardization between different m-government applications is indispensable for the success of m-government. For this purpose, not only technical, but also organizational and institutional barriers have to be cleared.
4. In view of these requirements, strong sustained leadership will be required to implement m-government.
5. m-government, if implemented in the right spirit, can realize a demand orientation in public administration, which is mostly missing. Public bureaucracies are more focused on policy system categories of the public service, than on life world aspects of the citizens. The proximity of m-government applications (personalization, contextualization and local based services) to the life world of the citizens creates unique chances to strengthen the demand orientation of public services.
6. m-government applications may revive the qualities of active citizenship and the growth of governance and of the civil society.

References

ACCENTURE (2006), *Leadership in Customer Service. Building the Trust*.

AUSTRALIAN GOVERNMENT (2005), *Australians' use of and satisfaction with e-government services, Department of Finance and Administration.*

BEHN, R.D. (1995), *The Challenge of Evaluating M-Government, E-Government, and I-Government: What should Be Compared With What?*, Kennedy School of Government.

BEKKERS, V.J.J.M (1998), *Grenzeloze Overheid. Over informatisering en grensveranderingen in het openbaar bestuur,* Samsom, Alphen a/d Rijn.

BEKKERS, V., E. KORTELAND (2005*), Governance, ICT and the Innovation Agenda of Public Administration,* chapter 2 in: Bekkers, V. H. VAN DUIVENBODEN AND M. THAENS (2005), *Information and Communication Technology and Public Innovation. Assessing the ICT-driven modernization of Public Administration*, IOS Press, Amsterdam, pp. 22-50.

CELENSÜ, S. ET AL. (2003), *Mobile Government*, Universität der Künste Berlin, Berlin.

DELOITTE (2005*), eCitizenship for All. European Benchmark Report 2005*, November, Brussels

DIJK J.A.G.M. VAN , A.J.A.M. VAN DEURSEN (2006), *Van aanbod naar vraag, onderzoek uitgevoerd in opdracht van de Alliantie Vitaal Bestuur en het Ministerie van Binnenlandse Zaken*, Enschede

DUIVENBODEN, H., V. BEKKERS AND M. THAENS (2006), *Creative Destruction of Public Administration Practices: An Assessment of ICT-driven Public Innovations*, chapter 14 in: BEKKERS, V. H. VAN DUIVENBODEN AND M. THAENS (2005*), Information and Communication Technology and Public Innovation. Assessing the ICT-driven modernization of Public Administration*, IOS Press, Amsterdam.

FRANZ, A. (2005), *Mobile Kommunikation: Anwendungsbereiche und Implikationen für die Öffentliche Verwaltung*, Speyer.

GARTNER GROUP (2000), *Western Europe Government Sector: IT Solution opportunities.*

GEMEENTE DEN HAAG (zj), *Eindrapportage Mobile-Government (m-government).*

JAE MOON, M. (2004), *From E-Government to M-Government? Emerging Practices in the Use of Mobile Technology by State Governments*, IBM Center for the Business of Government.

KANEKO, Y. (2005), *The Use of Space Technologies for More Effective and Efficient Public Administration*, in: PETRONI, G. AND F. CLOETE, *New Technologies in Public Administration*, IOS Press, Amsterdam, pp. 90-104.

KUSHCHU, I., HALID KUSCU (2005), *M., From E-government to M-government: Facing the Inevitable.*

LALLANA, E.C. (2004), *eGovernment for Development. mGovernment Applications and Purposes* Page (see www.egov4dev.org)

LASH, S. (2002), *Critique of information, London/Thousand Oaks/New Delhi*

LING, R. (2000), *The impact of the mobile telephone on four established social institutions,* paper presented at the ISSEI2000 Conference in Bergen-Norway.

RAO, V.M., RAO, P.S., MOHANTY, P.K., ALI, S.M.R. (2005), *M-government: Can it work wonders?,* in: eGovonline, see http://www.egovonline.net, December.

REINERMANN, H. AND LUCKE, J. V. (2002), *Electronic government in Deutschland, Speyerer Forschungsberichte*, Speyer.

ROGGENKAMP, K. (2004), *Development modules to unleash the potential of Mobile Government. Developing mobile government applications from a user perspective.*

ROSSEL, P., M. FINGER AND MISURACA, G. (2006), *Mobile e-Government Options: Between Technology-driven and User-centric,* The Electronic Journal of eGovernment, volume 4, issue 2, pp. 79-86.

SCHMID, G. (2001), *Der offizielle Echelon-Bericht von Gerhard Schmid an das EU-Parlament*, 07-11-2001.

SONG G. (2005), *Transcending e-Government: a Case of Mobile Government in Beijing,* paper presented at the First European Conference on Mobile Government Brighton, July.

THAENS, M. (2006), *Verbroken verbindingen hersteld?,* Oratie EUR, Lemma, Den Haag.

UNITED NATIONS (2005), *UN Global E-government Readiness Report 2005. From E-government to E-Inclusion*, Department of Economic and Social Affairs, Division for Public Administration and Development Management, New York.

VEDDER ET AL.(2007*) Van privacyparadijs tot controlestaat,* Rathenau Institute, Den Haag.

ZOURIDIS, S. AND M. THAENS (2005), *Reflections on the Anatomy of e-government,* In: Series Informatization Developments and the Public Sector, volume nr. 9, IOS Press, Amsterdam, ISSN 0928-9038, p. 21-36.