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Special Issue: Public Management Now and in the Future: Does Technology Matter?

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NISPAcee
THE NETWORK OF INSTITUTES AND SCHOOLS OF PUBLIC ADMINISTRATION IN CENTRAL AND EASTERN EUROPE

University of Ljubljana
Faculty of Administration

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Introduction

Wolfgang Drechsler, Rebecca Moody, Christopher Pollitt, Mirko Vintar

The Trans-European Dialogue (TED), the annual scholarly, workshop-like conference organized jointly by the two key professional associations of Public Administration (PA) in Europe – EGPA and NISPAcee –, is a high-level, focused conference on a timely topic in PA that will profit from bringing together senior experts from different regions, thereby facilitating interchange and discussion across Europe and including Central Asia and the Caucasus, which also belongs to NISPAcee's area. (On the history of TED, see Drechsler 2010; the TED website: http://ted-dialogues.org/) Practitioners and graduate students from the host country and institution are always included, as well.

The selected, edited and refereed proceedings from TED are published in the even numbers of this *Journal*, as joint publications by EGPA, NISPAcee and the respective host institution, this time the Faculty of Administration of the University of Ljubljana.

The TED concept was developed by Geert Bouckaert and Wolfgang Drechsler after a meeting in Ljubljana in May 2006 on the former's suggestion, both as an interesting venue in its own right and as a means to facilitate and further the cooperation between EGPA and NISPAcee, and so it is very fitting that for its third workshop, the first in the NISPAcee region after the founding meeting in Tallinn in 2008, it should take place in the city of its conception.

The topic, suggested by Mirko Vintar, who took over the responsibility for the local organization, was "Public Management Reform Now and in the Future: Does Technology Matter?" – almost the title of the current publication, which is *Public Management Now and in the Future: Does Technology Matter?*, because the discussion and papers in Ljubljana showed a focus not on the reform, but rather on public management as such. Discussion and papers also converged on Information and Communication Technologies (ICT), rather than technology as such, which at least in Ljubljana proved less an attractive topic than the former. However, the papers by Drechsler and Pollitt, and the subsequent discussion, deal with the topic of other, future technologies, such as nanotech, and its implications for PA.

For more than two decades, we have been witnessing waves of public management reforms. Sometimes they turn out to be "tsunamis" with very diverse outcomes. During the same period an intensive process of implementation of new technologies, in particular ICT, was taking place at all levels within the Public Sector, which culminated in the development of e-government a decade ago. Although e-government is bringing about profound changes in processes, services, communications and structures, it is very rarely regarded as a public management reform. In classical texts on public management reforms, technology in general is considered to be neither an instrument of reform nor an influencing factor, let alone the key driving and enabling force behind them. Whether technology determines the direction in which public management reform moves, or whether actors employ technology to move reforms into their proposed direction is a debate which has not yet been concluded.

Hence the public sector is confronted with two different kinds of change processes; both aim to promote better government and governance but they run on very different principles and drivers. The notion of public management reform is by and large reserved for the politically driven top-down directed large-scale projects of changes in public administration systems. While computerization has only recently culminated in e-government, until the end of last century, it was predominantly a bottom-up driven process that brought technological change to the public sector. However only in this decade have these technological changes attracted the attention of politicians and become a strategic issue.

The field of PA and public management is predominantly driven by principles stemming from "classical" administrative or New Public Management doctrines. In the debate, there is rarely mention of ICT, let alone technology in general. The field of e-government is dominated by a different set of professionals and academics, coming from computer science, informatics, organizational sciences and business administration.

Although these two professional groups share the same "subject of discourse" in their approaches, principles and language, aims and objectives are often different. Both EGPA and NISPAcee conferences attempt to narrow the gap and bring these two arenas closer together, by organizing working or study groups focusing on ICT in PA and e-government. The objective of TED3 was to narrow the gap between "classical" administrative science and the newer field of technology-based and -driven change in the public sector.

A number of questions have come up, questions which can be debated though often not yet answered; questions of whether technology should be regarded as deterministic or as a social construct; questions of whether technology actually reforms or changes the field of public administration or not; and questions of where technology will lead us. All this can be studied in the pages to follow, which we hope will be of some interest to the reader.

From the dialogical aspect, one of the results of TED so far has been that the perspective of the two organizations and its members as regards PA is strikingly similar and that an East-West divide is hardly visible. Perhaps TED1 showed a clearer refutation of the New Public Management on the part of NISPAcee participants because the havoc it created in the recently independent or freed countries of Central and Eastern Europe was particularly visible here ("house-cleaning without a house"). (See Pollitt et al. 2009) But as regards e-Governance as discussed in Ljubljana, there was no difference whatsoever – perhaps a dash less concern with privacy and more interest in embracing new technologies on the side of the NISPAcee participants, if that.

Finally, the editors would like to thank, both for themselves and for NISPAcee and EGPA, the local organizers at the University of Ljubljana, who greatly contributed to the success of TED3. First and foremost, thanks are due to Mirko Vintar, and also to Stanka Setnikar-Cankar, Dean of the Faculty of Administration and member of the Organizing Committee (OC) of TED3. Further thanks go to György Jenei, likewise a member of the OC and then President of NISPAcee, and to Geert Bouckaert, then President of EGPA. The *NISPAceeJPAP* is funded generally by the Open Society Institute's Local Government Initiative in Budapest, a George Soros foundation and the main sponsor of NISPAcee, which is gratefully acknowledged as well.

References

Drechsler, Wolfgang. 2010. "TED: Trans-European Dialogues between NISPAcee and EGPA." In *The European Group for Public Administration: Perspectives for the Future*. Brussels: Bruylant, 247–249.

Pollitt, Christopher, Geert Bouckaert, Tiina Randma-Liiv and Wolfgang Drechsler. 2009. *A Distinctive European Model? The Neo-Weberian State*, *The NISPAcee Journal of Public Administration and Policy* 1(2) (2008/09).

Current and Future Public Management Reforms: Does Technology Matter?

Mirko Vintar

Abstract

This paper focuses on the evaluation and critical analysis of the *relationship* between explosive implementation and the use of new technologies, in particular ICTs and public management reforms and tries to explore what the "transformational potential" of new technologies in the PA/PM domain is and what should be done to make optimal use of it. The paper argues that we have been witnessing very divergent views on this issue among some leading researchers in the past and a lack of in-depth analysis of this important relationship for the future of the PA/PM domain. However, the leading assumption in the paper is that *technology does matter* in the current PM reforms and will do so even more in the future. In the second part, the paper tries to identify the main drivers/barriers of technology-driven organisational changes in the public sector in the e-government era and to define the changing role of technology in the future.

1. Introduction

When about a year and a half ago I received an offer from the presidents of both leading international European associations, i.e. EGPA (the European Group of Public Administration) and NISPAcee (the Network of Schools and Institutes of Public Administration from Central and Eastern Europe) to organise their third specialised joint event, the Trans-European Dialogue (TED3), I was also given the privilege of proposing a general theme for the event. With this, I was provided the rather unique opportunity to propose a theme which had been on my mind for many years, i.e. the evaluation, assessment and critical analysis of the *relationship* between explosive implementation and the use of new technologies, in particular ICTs and public management reforms. Or to put it more precisely, to explore what

the "transformational potential" of new technologies in the PA/PM domain is and what should be done to make optimal use of it.

This topic is, on the one hand, linked to my background, which is in informatics and technologies, and, on the other, with my professional and research interests, which in the last two decades have been focused on the informatisation of public administration, e-government and public management reforms. I have been trying to follow some of the mainstream events and publications in Europe and more widely in the field of public administration/management, as well as most e-government research and professional conferences, etc. What had been evident to me for quite some time was, if I may put it bluntly, a kind of ignorance among scholars in both fields to try to better understand the other side. Public administration scholars very seldom, if at all, have regarded "technological development" in the broadest sense as a relevant if not important driver of change in PA/PM reforms. On the other hand, scholars and researchers in the field of e-government, very often lacking an understanding of basic PA/PM principles and practices, sometimes tend to develop their doctrines as if they were context (i.e. public-administration)-independent. We would argue that this unilateral, one-dimensional approach does not provide optimal solutions to the problems which most public administration systems are facing today, and this approach will be even less appropriate in the future for governing the ever more complex technologies of tomorrow. In particular, this "lack of understanding" of the potentials, opportunities and barriers of new technologies within the mainstream public administration/management doctrine calls for an open debate on these issues. TED3 was an excellent opportunity to start on this.

Hence, in this discussion we will try to touch on some of the following questions, which would then need further, much deeper examination and study:

- Does technology (in the broadest sense) matter in current and future PM reforms, and if it does, why has there been relatively little theoretical observation of these phenomena in the mainstream PA/PM scholarship thus far?
- Do we already understand the main drivers, relevant factors and variety of implications of new technologies regarding PA/PM (organisational changes, transformations, potentials, benefits, barriers, etc.) and hence are we able to manage their optimal implementation and use?
- What implications might new and emerging technologies have on the future theoretical and practical development of PA/PM disciplines, organisational patterns, management models, and governance paradigms?

2. Divergent views on the transforming potential of new technologies

The first issue which we need to say something about is the notion and framework of "technology" itself and whether we should limit our discussion to the currently prevailing ICT solutions or take into the discourse many other forms of new technologies which already in many ways influence the work and functional development of the public sector, such as CCTV cameras, scanners, DNA testing devices, GPS devices, or even go further into the future and highlight some emerging technologies, such as bio- and nano-technologies. We decided to take a broader view of technology in general and its impact on the PA/PM domain.

Our initial assumption was that *technology does matter* in the current PM reforms and will do so even more in the future. However, this statement needs some deeper analysis and clarification. There is very little doubt that the new technologies which have been developed and implemented in the public administration in all modern countries in the last decades have brought about many profound changes in the ways public servants and public organisations operate and perform their functions. In particular, in the fields of information collection, processing, storing, communicating and sharing, we have experienced tremendous changes and the average public office today looks and functions completely differently from its predecessor of one or two decades ago. But we would like to set our target a bit higher and examine how much ICTs have contributed to administrative reforms in general, how much they have contributed to the transformation of governmental organisations, the basic principles on which their functions are based, their structures, organisational paradigms, the changes of organisational boundaries, etc.

According to Pollitt and Bouckaert (2004), "'public management reform' consists of deliberate changes to the structures and processes of public sector organizations with the objective of getting them (in some sense) to run better". In this context, we understand that "structural changes" refer to changes at the institutional level (merging, splitting, closing, etc. public organisations or departments and the relationships between them), while "process changes" are related to the ways internal (G2G) as well as external (G2B, G2C) processes and operations or services are carried out.

We suppose that there is a strong intersection and interdependence between "technologies" on the one hand and governmental "machinery" on the other. As Nye (2002, 2) puts it:

> *Technology affects society and government, but the causal arrows work in both directions. Technological change creates new challenges and opportunities for social and political organizations, but the response to those challenges depends on history, culture, institutions, and paths already taken or forgone.*

Hence, along this line of reasoning, if technology does matter in PA/PM reforms, it should affect or provoke "*structural changes*" or "*process changes*" – or both – in one way or another. An overview of the literature and studies focusing on this challenging relationship, that is "causal arrows" between ICTs in particular and governmental transformations, does not yield uniform answers. On the contrary, the theoretical as well as empirical results of such an analysis are very divergent, sometimes even confusing. Among the leading PA/PM scholars and researchers in Europe, this issue has been marginalised if not overlooked completely (see also Pollitt 2010, 31). However we can find numerous works and studies focusing on this question. One of the first institutions which addressed this field at the practical/empirical level was OECD, which published several studies and reports already in the 1990s and in this decade (OECD 1998; 2003; 2005) focused on different dimensions of IT influence on PA/PM reform and transformation. One of the earliest studies (Information technology as an instrument of public management reform: a study of five OECD countries, OECD 1998) tried to define changes in vertical and horizontal structures of government in five EU countries as a direct consequence of e-service development. Of the more theoretically based and empirically co-evaluated studies, we will outline two very divergent views on the transformational power of ICTs.

2.1 Sceptical views

Two of the most prominent authors in this field, Kraemer and King (2005; 2006) summarised the findings of a number of empirical studies carried out in the late 1980s and 1990s at US governmental organisations centred around the following four very plausible reform propositions (Kraemer and King 2006, 5):

- Computers have the potential to reform public administrations and their relations with their environments.
- Information technology can change organizational structures, and thus is a powerful tool for reform.
- Properly used, information technology will be beneficial for administrators, staff, citizens and public administration as a whole.
- The potential benefits from information technology are under-realized due to a lack of managerial understanding of what the technology can do, and the unwillingness of managers to pursue the potential of the technology when they do understand it.

The authors thoroughly analyse all five propositions on the basis of, as already mentioned, a number of empirical studies made in the US and came to the conclusion that there is very little empirical evidence to support all five propositions. Further they argue that:

- Claims that E-Government will fundamentally alter governmental structure, performance, citizen engagement, and so on (National Performance Review 1993; Executive Office of the President 2003) are likely to be dashed, given that IT in and of itself has consistently proven to have little bearing on those kinds of government reforms.
- The reform hypothesis is fundamentally misguided because it assumes that organizational elites want their organizations to change, and that they are willing to use IT to accomplish such change. The empirical evidence suggests that IT has been used most often to reinforce existing organizational arrangements and power distributions rather than to change them.

We can find many similar arguments, in particular in the works published in the 1990s and early in this decade (North 1990; Fountain 2001; Gasco 2003), which state that there are many different factors that influence the trajectory of organisational change related to ICT projects and e-government implementation. Fountain and Osorio-Urzua as well as Gasco classify three categories of the most important factors: *technological variables, managerial variables* and *political variables*. In their discussion, they conclude that only when all three are in place and interrelated may institutional and organisational changes take place. Nevertheless, which direction these changes will go is again very much dependent on the interests and expectations of the key, in particular political, stakeholders.

We can assume that this kind of "scepticism" concerning the transformational power of ICTs and e-government projects can be reinforced for at least two reasons. One was that most of these studies were carried out before the internet era or at least before the point after which the internet became a leading driver of technological change, which in most public administrations happened only in the early years of this decade. And the second reason is that it might well be that political stakeholders in ICT-driven projects or so called "political variables" who definitely play a very important role in defining the route of ICT implementation in the past have not been active enough. If this assumption holds, we should take care of this "variable" concerning e-government development today as well as in the future.

2.2 Optimistic views

Let us now turn our attention to an analysis of more optimistic views which have believed in the reforming capacities of ICTs and other new technologies. One of the very early pro-reform-oriented thinkers and authors, Heinrich Reinermann, started as early as in the 1980s and then later on in the 1990s (Reinermann 19985; 1991; 1995) to carry out numerous studies that focused on the influence of ICTs on public administration processes and structures as well as on managerial principles and politics. This "new school of thought" (see also Heeks 1998) was followed by numerous authors active within EGPA's Permanent Study Group on Informatization in Public Administration, such as Ig Snellen, Wim van de Donk, John Taylor

and Victor Bekkers, to mention just a few. New concepts like "Information Polity" (Taylor and Bellamy), and "Information Ecology" (Davenport, Bekkers and others) were developed in order to have some theoretical framework within which it would be easier to anchor the development of new ideas. During this decade, a lot of work has been done in order to examine the notion of the "virtual organisation" (Burn, Bultje, Marshall and others) as a potentially very interesting organisational form for modern governments. One ICT-driven concept which probably most directly attacks and confronts the classic Weberian hierarchical bureaucratic organisation of government is the notion of "networked government". Let us outline one of the "optimistic" views on the further development of PA/PM systems towards networked structures (Eggers and Goldsmith 2004, 1), which argues:

- The era of hierarchical government bureaucracy, the predominant organizational model used to deliver public services and fulfill public policy goals for a century now, is coming to an end.
- Emerging in its place is a fundamentally different model – one that we call governing by network – in which government executives redefine their core responsibilities from managing people and programs to coordinating resources for producing public value.
- Government agencies, bureaus, divisions, units, and offices are becoming less important as direct service providers, and more important as levers of public value. This new model is characterized by the web of multi-organizational, multi-governmental, and multi-sectoral relationships, which increasingly constitute modern governance.

They continue with the statement: "technology is the glue that can hold networked government together, allowing network partners to share knowledge, business processes, decision making, client information, workflow, and other data."

There are also several studies reflecting the reforming capacities of ICTs among mainstream e-government researchers (Scholl 2005; Jansen and Lovdal 2009; Nielsen et al. 2009 and others). In particular, Jansen and Lovdal attempted to re-examine three out of four of Kraemer and King's propositions regarding ICT reform capacities by empirically examining the development and outcomes of the NUCAS (Norwegian Universities and Colleges Admission Service) project, through which the whole process of admission to Norwegian higher education has been reorganised and informatised. They came to the conclusion that their findings are more or less in line with all three propositions examined (they support them), but added that again, ICTs alone are not enough to trigger expected organisational changes; political and managerial factors are equally important. Nielsen et al. also came to very similar optimistic conclusions while examining the role of ICTs in Danish municipalities.

We can wrap up this overview by concluding that transforming governments is definitely not an easy process and that technology itself, although a key driving force, is not powerful enough to drive major transformations in public administration. In order to make use of all potentials which new technologies can offer and contribute to the long-term effectiveness of governmental activities, political and managerial leadership is needed, and social and cultural issues must be taken into account.

3. The main drivers/barriers of organisational change

It is not our intention nor do we have the capacity to embrace the whole complexity of technology-driven organisational transformation going on in contemporary PA/PM systems. In addition, Christopher Pollitt (2010) has already analysed this relationship and developed a kind of framework in which he has identified and nicely illustrated some key attributes of technology-induced change, such as shift in time, shift in space, changes in tasks, etc. We will rather try to focus on the identification, analysis and role of the main actors and drivers who play an important role in making new technology-driven projects a "success" story.

Most Information Systems-related literature suggests that organisational issues are the key factor which in most cases determines the success/failure rate of ICT projects. It is true that most of the studies in this field have been done in the business sector (Doherty et al. 2003; Lucas and Baroudi 1994). Lucas and Baroudi have identified four groups of variables which are related to organisational change, i.e. structural, process-related, communicational and inter-organisational, while Doherty classifies organisational issues related to IS implementation as organisational alignment, organisational contribution, human issues and transitional issues. Furthermore, focusing on e-government projects, the EU commission suggests, in particular in the annual Cap-Gemini Reports (Cap-Gemini Benchmark 2009), that one of the key factors in the further successful development of e-government is the reengineering of administrative processes.

Our analysis of the arguments and findings of numerous authors leads us to the conclusion that there is no clear interrelationship between the "inputs", e.g. e-government projects, on the one hand and the "outputs", i.e. the organisational changes which they provoke in the administrative environment, on the other hand. Although this organisational transformation as a consequence of the implementation of ICTs has been predicted, expected and desired by many authors, we still do not exactly know what matters in the successful implementation of e-government projects at the national level as well as at lower levels of administration. (see also Bavec and Vintar 2007)

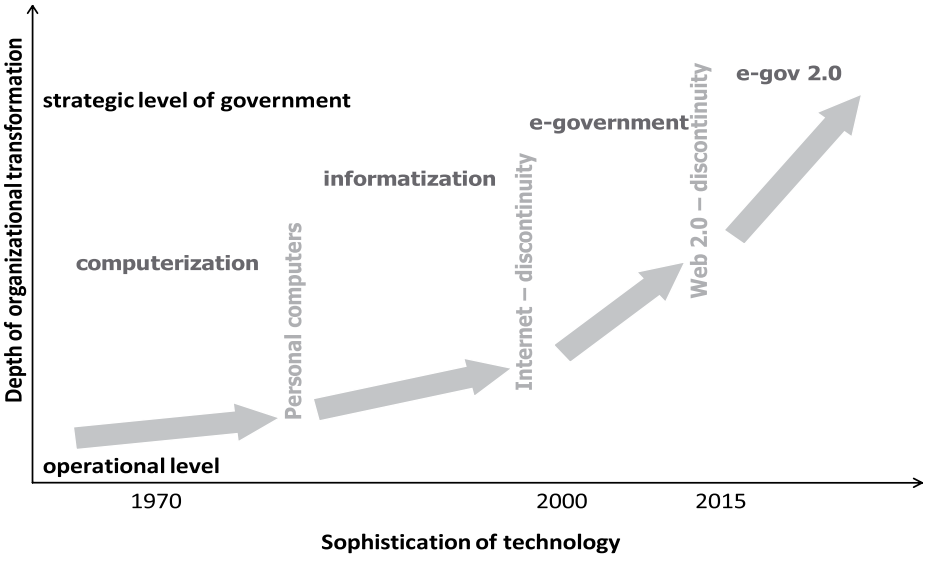
This – we will call it the "transformational function" between the implementation of ICTs and organisational transformation – is still very much unknown. But

what we do know is that apart from technology, which itself is no longer a dominant factor, there are other very important variables coming from the sphere of politics, management and administrative culture which should be taken into account.

3.1 The changing role of technology in PA/PM reforms

We now have nearly half a century of experience regarding the implementation of ICTs in the public sector in most developed countries (Figure 1). Hence, e-government, as we have called this process for the last approximately 10–15 years, has its roots in the phase of so-called "computerisation" and later on in the advent of personal computing in the so-called informatisation phase. The first two phases were predominantly "bottom-up" processes driven by the operational needs of public organisations (the mass processing of numerical data, the routine repeated operations of administrative procedures and standard documents); very minor if any organisational changes took place. Technology was used primarily to make existing processes faster or more efficient with less manual work, and in this sense, we would agree with the arguments that ICTs were more likely to reinforce existing organisational structures and processes (see Kraemer and King 2005) rather than being an agent of organisational change and transformation. In the PA/PM reform literature and projects, technology was regarded, if at all, solely as a "tool" to achieve higher political goals.

Figure 1
Phases of technological development in public administration



With the transition to the e-government era, which gained momentum around the turn of the millennium when the internet and world wide web began to rapidly conquer public administration, the whole process of further technological modernisation became a strategic issue for the first time, addressed by most governments through different targeted policy documents. In terms of the reforming potential, the phase of e-government is pointedly different from previous phases. Via the development of a variety of e-services for citizens and companies, e-government enabled completely new possibilities and paradigms in terms of executing administrative tasks and service provision, as Pollitt (2010) has very clearly illustrated with a number of cases. The successful development of e-government simply requires a profound reorganisation of front-office as well as back-office operations. In particular, the introduction of so called transactional services, for instance in the fields of issuing personal documents or issuing building permits, normally requires the integration of several back-office information systems, direct access to public databases and integration with the public portals which are replacing classic front-office operations. And last but not least, it requires at least functional cooperation if not the formal reorganisation and integration of several horizontal departments which are included in the provision of the required services.

So far we have mainly dealt with changes related to the implementation of ICTs as we know and use them today. But the public sector is increasingly dependent on the use of numerous new technologies which are derivatives of ICTs or completely new breeds of technology which are emerging and which will influence the work of public organisations in the future. For instance, the integration of GPS systems with automatic identification systems and CCTV cameras will make a total reorganisation of traffic control possible. The police are already able to control traffic, follow individual cars, identify drivers who violate traffic rules and fine them from remote control centres; police cars on the highways will become almost obsolete in the near future (see also Pollitt 2010, 31).

The next example is the reorganisation of tax offices in Slovenia. It has been requested that companies in Slovenia communicate with the administration only electronically. Businesspeople can establish and register new companies via a special e-portal, they can register new employees, arrange social insurance for them electronically and pay all taxes to the state electronically. All these activities were actually centralised and can be executed from one central office for the whole country. Because of these e-services, the tax office was able to reorganise its local branches. The same happened regarding the issuance of personal documents. Citizens of Slovenia can submit a request for new or the renewal of personal documents (passports, personal identity cards, driving licences) electronically via a central public portal regardless of their residence address; through this service, the classic "domicile principle" with regard to the provision of public services was abolished. The actual processing of these applications was also centralised and moved to a remote administrative unit which had free manpower capacities.

Until today, the main driver of organisational changes in the e-government era were ICTs and their derivatives. But research is very intensive in many new fields of hardware and software, as well as regarding some new technologies, such as bio- and nano-technologies, which will also become very important for the development of the government of the future. There are several types of new technologies (see Table 1) which in the near future will meld together and open up a variety of new innovative options and solutions regarding the development and provision of public services.

Table 1

Types of new technologies that will influence the governments of the future

Identity management solutions: • Automatic identification technologies, biometrics, DNA testing, RFID • Pattern recognition solutions, surveillance solutions, social sorting • E-identity cards, e-passports, e-signatures, etc.
Location management solutions: • Global positioning systems, tracking solutions, geographic information systems, digital mapping, geo-tagging • CCTV cameras, monitoring, street view, etc.
Social Networking: • Social networking applications, blogs, glogs, cyber-stalking, collaboration, data mining, data merging, mobile communications, context-aware applications, etc.
Bio- and nano-technology: • Biomedical solutions, diagnostics, drug delivery, bionics, nanotechnology, microchip implants, robots, cyborgs, etc.

All these new technologies will not only provide a variety of new solutions for the reorganisation of public services in fields such as public health-care systems, social services, crime prevention, urban planning, environment control, inspection services, traffic control, etc., but will also result in great challenges for administrative theory and administrative law. It will require a completely new approach to the regulation of human rights, data protection, intellectual property, social equity, trans-border flows, etc.

We can even go one step further and follow the route which Wolfgang Drechsler (2010) presents in his excellent journey to the future of public management concerning emerging new technologies like bio- and nano-technology.

The public administration of the future will definitely be even more "technology contaminated". Some governments (for instance, the Australian government)

are already launching projects which will help ease their transition to the newly coined Gov 2.0, the emerging new type of government based on the latest innovations in technology.

If we allow ourselves a bit of speculation regarding future developments in the field of public governance systems, there are at least four important factors which will further influence the development and provoke more or less significant changes in governmental machinery.

1. "New technologies (in particular, the integration of existing ICT islands of technology and the implementation of full interoperability between existing systems, Web 2.0, Cloud Computing, bio- and nano-technologies).
2. Social changes generated by new social networks (such as Facebook, Twitter, blogs, Wikis, LinkedIn, etc.).
3. The internet generation of users of public services (grown up digital) (the new generation of participants in interactive public services and e-participation).
4. Economic changes in the world after the crisis (controversal expectations; on the one hand, the demand for an increased role of the state in regulating financial markets, environment protection, social affairs etc, on the other, a much more restricted public-finance framework and spending)."

All these developments will steer the further development of e-government into the next phase, let us call it e-government 2.0.

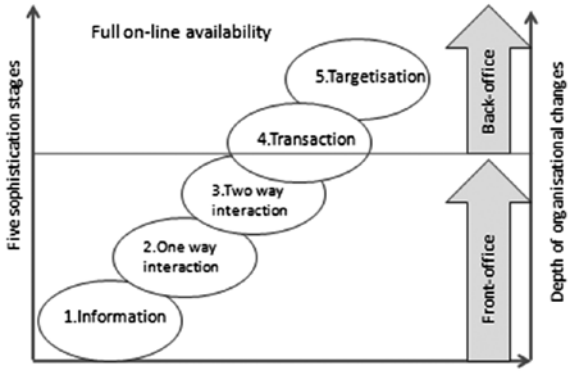
3.2 The growing demand for mature and effective e-services

Although e-services are not and should not be the only vital dimension of e-government development, they have nevertheless been one of the main driving forces of e-government development thus far. Most governments feel in particular that investment in e-services development pays off in terms of better public appearance and popularity, hence we have been witnessing very rapid development of e-services in most EU countries. However, in terms of pushing towards organisational changes, these services are very different. Here we can lean on the well-known CapGemini model (CapGemini Benchmarking 2009) for the evaluation of the maturity of e-services (Figure 2). We do not have enough room to describe this model in detail, we will merely outline the main features of it. The model attempts to classify the maturity of e-services into five stages, starting with the stage of "information" (stage 1) as the simplest one, all the way to the stage of "targetisation" (stage 5) as the most demanding one. Maturity of services is one of four indicators which have been measured annually within the so-called CapGemini Benchmarks since 2001. This model is far from ideal, in particular the final, 5th stage, in our estimation, is not very well defined. We believe that it would be much better to define the 5th stage as the stage of the "integration" of services around the live events which are important for

citizens and businesses. Nevertheless, this model has played an important role in pushing the development of e-services towards higher maturity levels.

The maturity level of services is very strongly related to the amount of organisational change in public organisations which provide services. Low-level maturity, for instance information and "one-way interaction" services require practically no change in the way public organisations are organised and how they perform their business activities. The third stage of maturity, i.e. "two-way interaction", requires the reorganisation of front-office operations. While the introduction of stage 4 requires the reorganisation of front-office activities as well as the reorganisation and integration of back-office activities, it requires full e-business without paper documents in internal or external communication, direct access to public data bases and the integration of information systems. This demanding level of transformation not only in processes but also in structures is the main reason why in most countries the development of transactional services lags behind the plans and expectations of politicians.

Figure 2
Adapted CapGemini Benchmark five-stage maturity model



In most countries, widespread supply and use of transactional services is still at the very beginning. The development of these services is delayed in most countries by the rigidity of the current organisation of administrative processes, the division of authority between the public bodies involved (structures) and the legal setting not yet adjusted to the needs of electronic commerce. Since transactional services are those which bring the most added value for users as well as for administrations, we can in particular expect that these services will put the strongest pressure on rapid organisational changes in the future.

3.3 E-government as a new policy area and political playground

It seems that, at least in terms of political involvement, e-government as the present phase of technological change in public administration has attracted an unprecedented level of political attention at the national and supranational (EU) levels. The EU is already working on the third EU E-Government Action Plan 2015, which will be the key strategic document steering further development of this field in the next five years. In most EU countries, we can trace a flood of strategic documents, strategies and e-government action plans, etc. in the last decade. The EU commission itself has introduced such plans for five-year periods (2000–2005, 2005–2010, 2010–2015 under preparation), organised several ministerial conferences and issued ministerial declarations on the further development of e-government. All these political activities and documents at the highest level of national/supranational administrations are the best proof that new technologies have already made a huge jump upwards regarding garnering political attention and decision-making. In the past (before the e-government era), decisions related to technological issues were as a general rule left to lower and mid-level management in public organisations. With the development of e-government, these issues were promoted to the highest managerial and political levels, i.e. new technologies became a strategic issue. In terms of the organisational transformation needed for the successful implementation of new technologies, these trends are very important and positive. It is true that thus far, this attention has been focused primarily on ICT implementation in the public sector, but we believe that in the future this attention will broaden to encompass all new types of technology. Through the involvement of the highest managerial and political levels (political and managerial variables, see Gasco 2003) in the development and implementation of new technologies, we are gaining the necessary critical mass of authority and support for the inevitable organisational changes.

3.4 Towards a clearer view of technology-induced organisational transformation

We can argue that there is no deterministic correlation between the implementation of new technologies and organisational transformation, and it seems that in this sense, theory regarding technological determinism does not hold completely. The same inputs can produce different results and different inputs can produce the same output (Scholl 2005). This argument is based on the study of numerous examples of e-government projects in different countries, where it seems that initially, very similar projects can result in very different organisational perturbations and vice versa. That would somehow fit into the "chaos theory" which was presented by Bavec (2010) and which might help to explain the high level of unpredictability of ICT-driven projects in general and in the public administration sphere in particular.

Christopher Pollitt (2010) developed an excellent framework that defines the changes that have been brought about by new technologies thus far, and there is very little to add. He also examined the relationship between technological change and organisational and political change. A more formal and holistic "theory" of technology-driven organisational transformation in the public sector has yet to be developed.

In summarising our discussion of the previous chapters, we would outline three points which seem to be important considering the future role of new technologies in the PA/PM Reform domain.

The **first point** is related to the changing role of technologies in governmental operations, which can be classified, with some simplification, into three stages:

- **Technology as a tool**. First of all, new technologies are rapidly changing their role in the PA domain and we can definitely no longer regard new technologies simply as useful tools that help us in executing existing tasks and which are irrelevant for the course of public management reforms. That was the case in the past.
- **Technology as an enabling infrastructure.** Today, new technologies, in particular ICTs and the internet, offer governments numerous new options, channels, and opportunities internally in terms of organising departmental and inter-departmental communication and operations, as well externally, i.e. how to deliver services to citizens and businesses. As Pollitt defined it (2010, 31), technologies are enabling shifts in time, shifts in space, changes in tasks, etc.
- **Technology as a "trend setter".** In the near future, the development of new technologies and innovation in many sectors and fields in the public domain will direct optimal shapes and organisational forms of public intervention and control. Furthermore, future government will have to be very actively involved in guiding R&D activities related to the new technologies. As we have already illustrated, in many governmental department it will be possible to organise the structures along the lines of new technological development.

The **second point,** technology-provoked organisational transformation, will inevitably continue (although so far, it has not been sufficiently empirically evaluated yet). From the present level, where the predominant administrative processes and procedures at the operational level of governments have been affected, transformation will progressively attack structures which entail the division of departments and their authorities and their inter-organisational communication. Three intertwined processes are already at work: *virtualisation, deterritorialisation*, and *networking*. Virtualisation can be attributed to the fast development of e-services and e-portals on the one hand and to intensive "outsourcing" of administrative functions to outside providers as a result of the intensive use of ICTs on the other. The deterritorialisation and abolishment of the classic "domicile principle" is also a

result of e-services and the introduction of "one-stop-shop" principles in the provision of e-services. The intensive networking which has developed in the public sector since the introduction of the internet is a particularly important process which gradually erodes classical hierarchical structures. We know that public administration hierarchies are very rigidly formalised and hard to change. In that sense, ICT-enabled networking has already greatly contributed to softening hierarchies and blurring organisational boundaries (see Bekkers and Homburg 2005, 65) through direct information flow and information-sharing services. For instance, issuing building permits requires the public servants working in this field to have direct access to the several databases which are under the jurisdiction of other departments or ministers.

The **third point** is related to the fact that the innovative use of new technologies and their effective and successful deployment in the public sector became an independent policy area and strategic issue. As Drechsler put it, "to be adequately prepared for the nanotechnology paradigm, a state is required that employs a long-term perspective, has enough capacity at its disposal and tolerates mistakes" (Drechsler 2010). This statement can probably be generalised to the future involvement of governments in all fields of technology and innovation.

5. Conclusions

In the past we have witnessed two very divergent approaches to the study, research and observation of the relationship between PA/PM reform processes and the role of new technologies in these processes. On the one hand, we have to deal with the "minimalistic" attention of the leading PA/PM scholars to this important subject for the further development of public administration, while on the other hand, regarding some e-government "gurus", we have often been confronted with a too mystifying picture of a technology-driven future. Both extremes are very much a consequence of the lack and inadequacy of a theoretical background as well as in-depth empirical research. One of the main aims of this as well as other correlated works presented at the TED3 conference was to "demystify" the "technology-driven government transformation", to initiate serious discussion and to develop some starting points which can serve as a point of departure for further theoretical and empirical research.

Nevertheless, the debate that has been opened is highly relevant for practice as well. The whole world is confronted with the economic crisis of the century, which will have tremendous consequences for further PA/PM reforms in most countries. Perhaps with this discussion, we can increase the awareness of practitioners and politicians that new technologies are not part of the problem but rather part of the solution.

Acknowledgement

This paper was finalised after reading the papers of Pollitt, Drechsler and Bavec, if I limit myself to mentioning just the contributions of the three keynote speakers at the TED3 conference, and after listening to the lively discussion at the TED3 conference in Ljubljana.

References

Bavec, C. 2010. "The Impact of Technology on the Public Administration of the Future." *NISPAcee Journal of Public Administration and Policy* 3 (2), 55–67.

Bavec, C. and M. Vintar. 2007. "What Matters in the Development of e-Government in the EU?" *Lecture Notes in Computer Science* 4656, 424–435.

Bekkers, V. 2000. "Information and Communication Technology and the Redefinition of the Functional and Normative Boundaries of Government." In Oscar van Heffen, Walter J. M. Kickert and Jacques J. A. Thomassen (eds). *Governance in Modern Society*. Dordrecht: Kluwer Academic Publishers, 257–278.

Bekkers, V. and V. Homburg. 2005. *The Information Ecology of e-Government*. Amsterdam: IOS Press.

Bellamy, C. and J. A. Taylor. 1998. *Governing in the Information Age.* Buckingham: Open University Press.

Bultje, R. and J. Van Wijk. 1998. "Taxonomy of Virtual Organizations, Based on Definitions, Characteristics and Typology." *VOnet Newsletter* 2 (3), 7–21.

Burn, J. M., P. Marshall and M. Wild. 1999. "When Does Virtual Have Value?" In C. T. Romm and F. Sudaweeks (eds). *Doing Business on the Internet: Opportunities and Pitfalls.* London: Springer, 21–34.

Cap Gemini. 2009. *Smarter, Faster, Better e-Government.* Report of the 8th Measurement. European Commission, Directorate General for the Information Society and Media.

Davenport, T. H. and L. Prusak. 1997. *Information Ecology*. Oxford: Oxford University Press.

Doherty, N. F., M. King and O. Al-Mushayt. 2003. "The Impact of Inadequacies in the Treatment of Organizational Issues in Information System Development Projects." *Information and Management* 41 (1), 49–62.

Drechsler, W. 2010. "Nanotechnology, Governance and Public Management: A Techno-Economic Paradigms Perspective." *NISPAcee Journal of Public Administration and Policy* 3 (2), 69–85.

Eggers, W. D. and S. Goldsmith. 2004. *Government by Network: The New Public Management Imperative.* A Joint Study by Deloitte Research and the Ash Institute for Democratic Governance and Innovation at the John F. Kennedy School of Government at Harvard University.

Fountain, J. E. 2001. *Building the Virtual State: Information Technology and Institutional Change*. Washington, DC: Brookings Institution.

Fountain, J. E. and C. A. Osorio-Urzua. 2001. "The Economic Impact of Internet on the Government Sector". In R. E. Litan and A. M. Rivlin (eds). *The Economic Payoff from the Internet Revolution*. Washington, DC: Brookings Institution and Internet Policy Institute, 235–268.

Gasco, M. 2003. "New Technologies and Institutional Change in Public Administration." *Social Science Computer Review* 21 (1), 6–14.

Heeks, R. 1999. "Reinventing Government in the Information Age". In R. Heeks (ed.). *Reinventing Government in the Information Age*. London: Routledge, 9–21.

Jansen, A. and E. Lovdal. 2009. "Can ICT Reform Public Agencies?" *EGOV 2009, LNCS 5693*. Berlin, Heidelberg: Springer, 88–102.

Kraemer, K. and J. L. King. 2006. "Information Technology and Administrative Reform: Will E-Government Be Different?" *International Journal of Electronic Government Research* 2 (1), 1–20.

Kraemer, K. L. and J. L. King. 2005. "Information Technology and Administrative Reform: Will the Time After E-Government Be Different?" Paper for the Post-Graduate School of Administration Speyer, Germany.

Lucas, H. C., Jr. and J. Baroudi. 1994. "The Role of Information Technology in Organization Design." *Journal of Management Information Systems* 10 (4), 9–23.

Marshall, P., J. McKay and J. M. Burn. 2001. "The Three S's of Virtual Organisations: Structure, Strategy and Success Factors." In Stuart Barnes (ed.). *E-Commerce and V-Business*. Oxford: Butterworth Heinemann, 171–192.

National Performance Review. 1993. *From Red Tape to Results: Creating a Government that Works Better and Costs Less*, *and Reengineering through Information Technology*. Accompanying report of the NPR. Washington, DC: US Government Printing Office.

Nielsen, J. A. et al. 2009. "Time to Give In: Firm Belief in Administrative Reform as a Driver for Delivering Benefits from IT." *EGOV 2009, LNCS 5693*. Berlin, Heidelberg: Springer, 103–114.

North, D. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge, UK: Cambridge University Press.

Nye, J. 2002. "Information Technology and Democratic Governance". In R. A. Goldwin (ed.). *Governance.com: Democracy in the Information Age*. Washington, DC: Brookings Institution, 1–16.

Organisation for Economic Cooperation and Development. 2005. *E-Government for Better Government*. Paris: OECD.

Organisation for Economic Cooperation and Development. 2003. *The e-Government Imperative*. Paris: OECD.

Organisation for Economic Cooperation and Development. 1998. *Information Technology as an Instrument of Public Management Reform: A Study of Five OECD Countries*. Paris: OECD.

Pollitt, C. 2010. "Technological Change and Public Service Management: Towards a Conceptual Framework." *NISPAcee Journal of Public Administration and Policy* 3 (2), 31–53.

Pollitt, C. and G. Bouckaert. 2004. *Public Management Reform: A Comparative Analysis.* Oxford: Oxford University Press.

Reinermann, H. 1995. *Neubau der Verwaltung: Informationstechnische Realitäten und Visionen*. Schriftenreihe Verwaltungsinformatik 11. Heidelberg: R. v. Decker's.

Reinermann, H. 1991. *Führung und Information: Chancen der Informationstechnik fur die Politik und Verwaltung.* Schriftenreihe Verwaltungsinformatik, vol. 8, Heidelberg: R. v. Decker's.

Reinermann, H. et al. 1985. *Öffentliche Verwaltung und Informationstechnik: Neue Möglichkeiten, neue Probleme, neue Perspectiven*. Informatik-Fachberichte, vol. 98, Berlin: Springer.

Scholl, H. J. 2005. "Organizational Transformation through E-Government: Myth or Reality?" *EGOV 2005, LNCS 3591*. Berlin, Heidelberg: Springer, 1–11.

Snellen, I. 2000. "Flache Hierarchien im Staatsaufbau: Von der hochdifferenzierten Verwaltung zur zweistufigen Verwaltung? Regieren und Verwalten im Informationszeitalter." Schriftenreihe Verwaltungsinformatik, vol. 22. Heidelberg: R. v. Decker's, 156–166.

Taylor, J. and H. Williams. 1991. "Public Administration and the Information Polity." *Public Administration* 69 (2), 171–190.

Technological Change: A Central yet Neglected Feature of Public Administration

Christopher Pollitt

Abstract

This overview paper has two aims. The first is to indicate that technological change has been a somewhat neglected, or at the least esoteric, topic within the academic field of public administration. The second is to argue that this neglect is damaging for the PA community, because technological change is actually fundamental to developments in public administration, in a variety of ways.

In order to demonstrate these two points, a wide range of literature is called upon, across many sectors.

In conclusion a framework is offered to encourage the kinds of analysis of technological change that should ensure strong links with the central concerns of public administration scholarship.

1. Introduction

> *"If the experience of modern society shows us anything…it is that technologies are not merely aids to human activity, but also powerful forces acting to reshape that activity and its meaning." (Winner 1986, 6)*

The central argument of this paper is that technological change is a powerful shaping influence on public administration, but one which is seldom directly addressed by most public administration scholars. The paper sets out a spectrum of ways in which – to parallel Langdon Winner's words – technological change in the public sector changes activities and changes meanings. In doing so it also offers a broad set of conceptual categories which can be used to analyze the processes of technological evolution.

2. The neglect of technology in public administration scholarship

Few if any of the major works on public administration and public management published over the past decade give prominence or explicit space to "technology" (e.g. Bovaird and Löffler 2009; Christensen and Lægreid 2007; Ferlie et al. 2005; Kickert 2008; Hood 1998; Osborne 2010; Pollitt and Bouckaert 2004). Indeed in many PA books, the term does not even appear in the index, or, if it does, then only in connection with information and communication technologies (ICTs).

Of course this does not mean that technological change has been totally ignored. While the majority of scholars proceed with their usual business, making few, if any references to technological change, alongside them, a specialist minority have long focused on "e-government" and "e-governance" (e.g. Bekkers and Homburg 2005; Bellamy and Taylor1998; Fountain 2001; Snellen and Van de Donk 1998). Some of these works have certainly generated useful theories and/or conceptual frameworks. Taken as a whole, however, there are two important limitations to this work. The first is that, very important though ICTs are, they are far from being representative of the full spectrum of technologies to influence public administration (as we shall see a little later). The second is that communications between this pioneering minority of e-government enthusiasts and the majority have been limited. It is only recently that a few mainstream scholars have begun to accommodate e-government issues within the central ideas and frameworks of the field (e.g. Dunleavy et al. 2006; Hood and Margetts 2010). This "ghetto-ization" of e-government has been noted by a number of observers (Hood and Margetts 2010; Lips and Schuppan 2009), and was described by Dunleavy et al. as "theoretical neglect" (2006, 9).

There is another way of identifying the relative neglect of technology in academic public administration – a less scholarly but more direct way. The reader can simply ask him-/herself how often the recent public administration writing they are familiar with engages with – to take a small sample – technologies for greenhouse gas emission reduction, or for the application of genetics in medical care, or for mobility for the disabled, or for sub-lethal weaponry for the police, or for the construction of high-speed mass-transit systems, or for domestic heating and insulation, or for the electronic archiving of government records, or for automatic facial recognition at borders or in any other public place, or for spatial data infrastructures, or (last but not least) for registering births, marriages and deaths? I suspect the answer is either "never" or "rarely". But now the reader should answer a second question: how do they assess the consequences of these technologies for the management of major public services and for government regulatory policies? My answer is – "enormously important, and enormously complex". They will have major impacts on, *inter alia*, budgets, jobs, accountability and transparency, security and public order, efficiency, effectiveness and relations with citizens.

3. Defining technology

Before going any further, it is necessary to try to define "technology". It is a large and plastic concept, and one could easily spend a lot of time probing its many definitions. That is not, however, the purpose of this paper, so I will shortcut by opting for a broad definition.

> *A distinction can be made between a **technical device**, conceived of as a material or immaterial artifact, and a **technology**, a concept which refers not just to a device in isolation but also to forms of knowledge, skill, diagrams, charts, calculations and energy which make its use possible (Barry 2001, 9 – original italics)*

Note, therefore, that:

> *The idea that a non-human device or instrument can somehow work autonomously of its multiple connections with other (human and non-human) elements (language, bodies, minds, desire, practical skills, traditions of use) is a fantasy. (Barry 2001, 9)*

Thus technologies are not just objects, divorced from human skills and relationships. Neither can technologies ever be entirely separated from politics (certainly not by handing them over to "experts", although for other reasons, that may be, at certain points, a sensible thing to do). They consist of assemblies of *practices* as well as components (Arthur 2009, 28–31). They are inextricably embedded in political, organizational and economic relationships. Bekkers and Homburg put it succinctly: "the introduction of ICT in public administration is a social intervention in a policy network, which influences the position, interests, values and (information) domains of the actors involved" (2005, 9). Winner, following Wittgenstein, even refers to technologies as "forms of life" (1986, 11–16).

4. The relationship between technological change and organizational and political change: overview

We can now turn to the central question – what is the relationship between technological change and administrative and political change? In this section, I will attempt to offer a short, general, theoretical answer. Subsequently, in the remainder of the paper, the question will be answered in a more extended, illustrative way by reference to a series of studies and examples.

There is, of course, a rather popular and direct answer to this question. It is, in essence, that *technological change, by enormously increasing both the speed and the volume of communications and computations, has shrunk both space and time, and made them less important, while at the same time opening up the possibility of mass access to public decision-making.* Such claims are usually followed by examples of

how, if suitably equipped, one can now access vast amounts of data, 24/7, by mobile communication devices, and can communicate in real time with one or many similarly equipped persons anywhere in the world (or, for that matter, in "outer space"). The literature is also full of rather strident claims about what new technologies – usually ICTs – are going to do to politics and the public sector. Modern ICTs will undermine and sweep away bureaucractic hierarchies, say some enthusiastic commentators (e.g. Thompson and Jones 2008). Others see the internet as ushering in mass, participatory direct democracy (see Graham 1994, quoted in Bellamy and Taylor 1998, 110). My argument here will be that such "cyber-optimist" prescriptions are much too simple. Sometimes organizing *will* be much quicker and easier; sometimes hierarchies *will* be weakened; sometimes new forms of participation *may* flourish. Often, however, other things seem to get in the way of these simple visions – either delaying them or derailing them altogether. Quite frequently, far from revolutionizing the ways in which decisions pertaining to public affairs are taken, new technologies simply reinforce pre-existing patterns and divisions, such as those between those who are already civically active and those who are not (Norris 2001; Smith et al. 2009). The impact of technological change therefore varies with the particular activities under consideration, the institutional context and culture, legal rules and financial considerations, and many other factors. There is usually interaction – not a one-way flow – between these factors, so that each leaves their mark and none are simply determined by or dependent upon any of the others.

The theoretical literature exhibits a spectrum of theoretical positions, ranging from technological determinism (in which technological change drives organizational change) to a kind of cultural determinism (in which technologies have no independent force, but always depends on how they are interpreted in relation to local and current cultural norms and/or political priorities). Neither of these extremes seems tenable (Bellamy and Taylor 1988, 151–152; Borins et al. 2007; Winner 1986, 19–39). Neither does some of the socio-technical systems literature – full of worthy but distant abstractions – seem to be particularly useful for the examination of concrete government policies (e.g. Geels 2004). A first step, therefore, is to allow for an "emergent" perspective in which "the uses and consequences of information technology emerge unpredictably from complex social interactions" (Markus and Robey 1988, 588). A second step is to recognize that the very act of drawing a clear line between (on the one hand) "technology" and (on the other) "the organization" is highly artificial. As Barry pointed out:

> *To say that a technology can be political is not to denounce it, or condemn it as a political instrument, or to say that its design reflects particular social or economic interests. Technology is not reducible to politics. Nor is to claim that technical devices and artefacts are 'social constructions' or are 'socially shaped': for the social is not something which exists independently of technology. (Barry 2001, 9)*

Thus we find, for example, that the leading network theorist, Castells, proposes that "[T]he internet is the technological basis for the organizational form of the Information Age: the network" (Castells 2001, 1). If this at first sounds deterministic (i.e. the existence of the internet forces us to switch to network organizations) further reading of Castells shows that this is not his meaning at all. Indeed, he is quite explicit that:

> *The point of departure of this analysis is that people, institutions, companies and society at large, transform technology, any technology, by appropriating it, by modifying it, by experimenting with it. (Castells 2001, 4)*

It follows that there are no easy formulae. Students looking for the big theory that fits all circumstances; popular academics competing for their places on the airport bookstands; textbook authors looking for the boxed half page summary – all will be disappointed by this contextuality. For it rules out the generic, global generalizations and the simple arrow diagrams. It insists that "making clear distinctions between the technical and the social is always problematic, because each has elements of the other embedded within it" (Sahay 1997, 235). Many case studies of particular technologies have shown how complex and indeterminate the interactions between the technical, the cultural and the organizational frequently are (e.g. for citizens and politics generally, see Norris 2001; for the police in particular, see Chan 2001). Both technologies and institutional/organizational arrangements "function … as dependent and independent variables" (Fountain 2001, 12). Exactly the same technology can have very different results when introduced to different social contexts, while, equally, a social context can be significantly changed by the introduction of a new technology (see also Bekkers and Homburg 2005, 9).

A number of different theoretical approaches attempt to deal with the importance of context, but the focus of this paper is not on picking a winning theory but rather on making the general case for the importance of technological change. Relevant context-sensitive theories include, for example, "critical realism" (Pawson and Tilley 1997; Pawson 2002), the evolutionary approach to policy studies (Kay 2006); historical institutionalism (Pollitt and Bouckaert 2009), actor network theory (Latour 2005) and, specific to the study of e-government, "information ecology" (Bekkers and Homburg 2005).

There is one further, crucial element that has not yet been discussed, and that is human initiative, creativity and leadership. Even when a context is favourable for a given mechanism, successful technological change will still require some kind of leadership or, at least, sensible stewardship. Bad management can mess up even a promising set of circumstances, and, occasionally, good management may achieve something against the contextual odds. The successful politician or manager is "in the right place at the right time". This "human factor" (or, more pretentiously, "voli-

tional conduct" – Barzelay and Gallego 2010, 211) is another reason why the adoption of a given technology does not always produce the same result.

Thus technology, as indicated earlier, is not a separate entity: it is embedded in the social (and political), and vice-versa. Fountain (2001) draws a distinction between what she terms "objective technologies" and "enacted technologies". The former represent the full potential of the particular technology and the latter what it actually gets used for. Thus, for example, "objectively" my PC is capable of many, many things for which I actually never use it, including some which I do not even know how to use it for. The enacted PC is a much more limited, but socially embedded thing than the objective PC. And institutions play a huge role in shaping what is "enacted". Would I have taken up email in the early 1990s if I had not been a dean at a university where the directorate decided to use that as its medium of communication and to pay for staff to be trained and have it installed? Probably not.

5. Shifts induced by technological change: specifics

Having discussed the definition of technology, and having briefly considered the relationships between technological change and organizational change, we can now focus more closely on the *effects* of technological change, envisaging these as shifts across a number of key dimensions. We begin with the fundamentals – time and space – and then move on to other important aspects such as activities and rules, thus gradually building a conceptual framework within which to categorize and analyze the impacts of technological change on public services. In taking this approach, I am building on the much earlier work of Taylor and Bellamy. In a number of publications, they developed the idea of an "information polity" which consisted of several key relationships between stakeholders. My framework is different from theirs, but it partakes of the same concern to ensure that the study of technological change in public administration promotes "engagement with the complexities of the political and social world in which technologies are being adopted" (Bellamy and Taylor 1998, 150). Within each category I try to give examples that illustrate something of the variety and scale of technological effects (always bearing in mind that these are not the deterministic "effects" of impersonal devices and artefacts, but rather the outcomes of interactions between devices and individuals, organizations and practices).

5.1 Shifts in time

The most obvious effect here is that, in many (but not all) cases, citizens and public officials alike become accustomed to much *faster* service than in the pre-digital era. We tap in the details and expect to get a reply almost straight away – certainly for information requests, and often for more interactive contacts also. We also get used to being able to engage with government at any time of day or night – we are no lon-

ger confined to "office hours", nine to five. This is one factor helping to blur the older dividing lines between "working time" and "leisure" or "private" time. For many, but not all of us, the "pace of life" seems to be speeding up, and the traditional divisions of the calendar are under pressure (Pollitt 2008, 59–63, 180–184). We may fill in our on-line tax form at home on Christmas afternoon or sit in the office emailing our Christmas greetings with electronic cards from the office, confident that, although we are sending them all round the world on 23 December, they will nevertheless arrive "on time". Changes in basic perceptions of time (such as the attenuation of the distinction between "worktime" and "hometime") may seem to be of primarily sociological or even philosophical interest. Yet there is a good deal of research to show that they also have significant consequences for the making, implementation and evaluation of public policies (Pollitt 2008).

In a more direct way, modern technologies simply change the time scale for much administrative work. One development that is much commented upon among older practitioners is the way in which word processing has allowed bureaucracies to produce, multiply and modify documents so much more quickly than in the days of the typing pool. At the top of large public bureaucracies, this can create a maelstrom of paper in which strict rules are needed about the format and labeling of different "editions" of the same document – to avoid chaos and confusion. Alternatively, where record-keeping rules are slack, policy-making can disappear behind a welter of unarchived SMS messages and emails, making it almost impossible to reconstruct the decision-making process for subsequent accountability purposes (Select Committee on a Certain Maritime Incident 2002; Weller 2002)

Technologies have also changed time scales for citizens – with strong implications for their interactions with public authorities. One of the many worrying features of the Hurricane Katrina disaster in New Orleans was the vulnerability of sections of the population to even the shortest interruption to "normal services". "The expectation that federal resources would not be needed for seventy-two to ninety-six hours was disastrously wrong. The scale of the disaster and the vulnerability of the population required a much faster response" (Waugh 2006, 21). In a modern, high-tech, consumer society, many people needed to be able to make daily trips to the supermarket for food and the pharmacy for drugs, not to speak of being metaphorically (and in some cases literally) marooned as soon as their cars would not work or could not make headway on the chronically jammed highways. The Second World War ideology of privation and rationing that led my own parents always to keep "stocks" of almost everything we could possibly need in the cellar had long since disappeared. In effect, many modern households practice "just in time" purchasing, which means that any interruptions in supply have immediate effects.

Yet modern technologies do not all point in the direction of greater speed. There are also paradoxical effects when organizations find themselves "locked in" to major technologies which, although no longer anywhere near optimal, are too com-

plex or too expensive to change. In their book on digital-era governance, Dunleavy et al. point out how some public administrations are trapped within old "legacy" ICTs, such as the enormous computer systems which in most countries now run social security, healthcare, air traffic control or population registration. "This dynamic can easily create a five- to ten-year 'big bang cycle' approach, in which short-term policy changes are frozen out and almost all change hangs on renewals of major ICT infrastructures" (2006, 27). One might also think of the urban motorway – often jammed and heavily polluted, but representing so much investment and operational commitment, both public and private, in a particular transport technology, that it is impossible to change quickly.

5.2 Shifts in place

In one adult lifetime, the whereabouts of government has shifted considerably. [I use "government" very loosely here – in the English fashion – to include central and local government and other major public services such as the healthcare, education, social care and police services.] In England, for example, Whitehall is still Whitehall, but since 1960, it has undergone at least four major "deconcentration" exercises, each one intended to shift thousands – tens of thousands – of civil servants out to "the regions". Thus, for example, the central records of birth, marriage and death have moved from Somerset House in central London to Southport in North West Lancashire, my car is licenced in Swansea (Wales), and my English currency is controlled by the Royal Mint at Llantrisant (also Wales), which moved there in 1968 after 900 years or so in London. The latest relocation exercise has moved more than 20,000 civil service jobs out of Greater London since 2004 (Lyons 2004). Such moves are supposed to achieve several objectives: to reduce costs (both buildings and staff are cheaper outside the South East), to improve recruitment (certain types of staff are more easily recruited outside London), to boost employment in areas that suffer from relatively high unemployment and also, it is sometimes claimed, to offer staff a higher "quality of life". Relocations are crucially dependent on the quality of transportation and communication technologies – how long does the train/plane take to get to the capital for meetings with the minister; are there good motorway links; can one use videoconferencing to save time and travel, are there secure, encrypted links for message and data transfer?

One large-scale, widely publicized set of changes has been the closure of small post offices (I use the example of the UK here, but there have also been large numbers of such closures in other countries). In 1979, there were more than 22,000 UK post offices. By early 2009, this number had been reduced to fewer than 12,000, and many still remained under threat. Behind this decline lay a number of factors, but one important one was the decline in postal volumes as more and more communications and transactions shifted to the internet. Even if many post offices clearly lost money, closures on this scale attracted enormous public protest and continuing parliamentary interest and scrutiny (e.g. Business and Enterprise Committee 2009).

It was frequently pointed out that local post offices had important social and community functions which did not register on their financial accounts. Particularly in rural areas, the closure of the post office sometimes also meant the closure of the last local shop and the loss of a prime meeting place for local residents. The government committed itself to elaborate access criteria (National Audit Office 2009, 16) but even so, the chances that, in my old age, I will be able to walk to my local post office will be less than those for my parents' generation.

In many countries, another highly significant shift has been the disappearance of hundreds of smaller hospitals. Professional logic, financial logic and technological logic have intertwined to produce a concentration of acute services at large hospitals, each with a substantial local, regional or national catchment area (McKee and Healy 2002). Professional logic has demanded the co-location of a critical spread of different specialists on one site, so as to be able to provide an integrated, 24-hour service. Financial logic has argued against the duplication of services in several smaller units, seeking economies of scale and higher intensities of use with respect to overhead services and high cost medical equipment. Expensive new technologies such as MRI scanners or computer-controlled radiographic equipment are beyond small hospitals both financially and in terms of the skilled teams needed to operate them. The overall result, both in England and other European countries, has been the gradual attrition of many small hospitals (For Belgium and England see Pollitt and Bouckaert 2009). As indicated, this shift has been supported by a powerful set of official arguments, but that has not prevented it from being, on the whole, deeply unpopular with the citizenry. Many bitter battles have been fought by local residents to save the smaller local facilities, although only a few of these rearguard actions, in the long run, seem to have been successful.

Some public services, or parts of public services, have moved outside the country altogether. If I had been a student taking UK National Curriculum tests – SATs – in 2008, I might have been one of the 1.2M for whom the important results arrived late or not at all. That would have been because, although the tests were national tests, and although I had taken them in a state school, the organization of the marking had been contracted out to a specialist American educational company – Educational Testing Services – which a subsequent independent inquiry by Lord Sutherland found to carry the biggest responsibility for the technical and logistical failures (Sutherland Inquiry 2008). ETS had declined to submit evidence to the Inquiry, but there was a good deal of evidence available from other parties to show that the systems installed by ETS had been inadequately tested and were subject to cumulative failure. The government subsequently terminated the ETS contract.

Yet physical relocations and contracting-out have not necessarily been the most striking place changes, at least from the perspective of an individual citizen. Even more noticeable has been the recent shift to web-based systems of citizen/state interaction for many if not most of the public agencies with which the average citi-

zen has to deal. Thus my tax returns, driving licence application, passport renewal and US visa application – all these and many more no longer require my physical presence in a public office anywhere at all. I can deal with it all from home, or from my office, or from my laptop on a train, or from an internet café in the high street.

As soon as services can be provided mainly or exclusively online rather than face-to-face, there is a powerful fiscal logic to moving offices away from expensive locations and re-siting in cheaper accommodation. Then there is the question of databases. Huge databases are required to support major public services such as social security or healthcare, but when these are computerized, they can be sited almost anywhere. As indicated earlier, when "family records" meant large paper ledgers, they needed to be somewhere central, but once they can be put online, who knows where the electronic storage devices may be? Further, the advent of mobile communication devices means that all sorts of activities which would once have required an office *somewhere* are no longer fixed in that way. Mobile data terminals in police cars can immediately access a growing range of national databases, giving a single car access to far more quick information than a whole police station would have had a generation ago (Sørensen and Pica 2005).

One interesting feature of the general shift to net-based services is that the actual physical location of many government offices has now virtually disappeared. "Contact us", the websites say, but when a citizen hits that button, s/he often gets not a (postal) street address, but a telephone number and an email enquiries address. Postal correspondence, it seems, is actively discouraged, no doubt for reasons of cost and efficiency. Indeed, one of the recently discussed ideal models for e-government has been the "single portal" – a sole electronic window for the whole of government. In this arrangement, the entire government (or large sections of it) appear as though they were a unity, a single agency. But this is a virtual agency, behind which the "real" organizations are as multifarious as ever – and are certainly not in one place.

5.3 Changes in tasks/activities

We begin this section with the basic observation that often a change in technology may alter the range of tasks which those providing the service are called upon to perform. This is trivially true in the case of, say, the arrival of police patrol cars in the 1960s, when, within a space of years, virtually all police officers had to learn how to drive, or in the 1980s and '90s, when most public officials stopped sending their letters to the typing pool and started tapping keyboards themselves. However, it is also true in a more profound sense. Consider the advent of forensic DNA testing, photonics and other forms of high-tech crime scene investigation (now glorified in numerous TV series). These transformed the tasks to be undertaken at the crime scene and, to a significant extent, who was going to undertake them. Now the generalist uniformed police officer, or even CID officer, has to share the limelight with

an array of specialists, each deploying their own particular technologies (see, e.g., http:www.npia.police.uk/, accessed February 2010)

Few would have expected that the invention of the humble home burglar alarm would have much effect on the activities of the police. Yet, in 1996, an Audit Commission study of English and Welsh police forces noted that:

> *The activation of an intruder alarm is treated as an immediate response call because it may mean that a crime is in progress, but the vast majority are in fact false alarms. This is a particular concern to police managers seeking to make the best use of their officers' time, and ACPO [Association of Chief Police Officers] recently reviewed its policy of attending alarms that repeatedly malfunction. In 1994 1.1 million activations of remote-signalling intruder alarms were checked by the police, typically by a double-crewed response unit. Some 92 % of these activations – just over one million – were false alarms. It takes between 15 and 40 minutes to check a false alarm and thus the minimum opportunity cost to the police was in the region of 500,000 hours. (Audit Commission 1996, 25)*

This is one part – but only one small part – of the long-running story of "bobbies on the beat" (police officers walking the streets). Public opinion surveys consistently show that a majority of the population place a high value on the visibility of police on patrol – uniforms walking past. However, for a whole variety of reasons – including distractions from malfunctioning intruder alarms –, satisfying this public wish is problematic in several ways. First, in terms of catching criminals, deploying police on general foot patrol is not at all effective. Second, as the police force itself has become more specialized, the number of police needed for these specialized duties (computer crime, anti-terrorist squads, child protection, management and planning and so on) has grown. When the Audit Commission did its study in 1996, it estimated that in a typical police force of 2,500 officers, only 125 constables would actually be on the street at any one time (Audit Commission 1996, 9–11). More recently, we find that the police as a whole are spending more and more time in front of computer screens and less and less walking the streets – or, at least, that is the impression of both Belgian and English senior police officers questioned during recent research (Pollitt and Bouckaert 2009). Official figures showed that by 2007–2008, English police officers spent only 13.8 % of their time on patrol (Whitehead 2009, 1).

Our example of the post office network also displays clear interactions between changing technologies and changing tasks. In the UK, most state pensions and benefits used to be handed out, in cash, at post offices. Over the years, these payments both became electronic and mostly migrated to the commercial banks. Car tax discs were another source of post office business, but most of these are now

obtained online. The attempt to save the post office network has included the development of new forms of financial service and the substitution of mobile post offices for fixed buildings in some rural areas (National Audit Office 2009).

However, the picture is not simply that of new technologies "raising the game" and requiring new breeds of expert. It is more complicated than that:

> *The aggregation of tasks, in which operators are given more responsibilities … using computer-based information processing and 'decision support tools', is often described as 'empowerment' or 'job enlargement' … But the range of potential choices the 'empowered' operator can make is often limited by the software, thus embedding control formerly exercised by supervisors. Moreover, an operator's decisions are visible to those in charge, and the system may automatically report deviations from standard procedures (Fountain 2001, 37–38).*

Thus, for example, Belgian police who consult certain national databases now know that their identities are recorded each time they access the data and that a new set of tasks has been created around monitoring the patterns of access of the many police officers using these sources. This can be a powerful tool for monitoring and accountability. In the event of subsequent enquiries, it can show if an investigating officer has failed to look up things s/he *should* have looked up. It can also show if officers have been accessing data that does *not* appear relevant to their responsibilities – possibly for personal or even corrupt motives. New posts have been created with the responsibility of monitoring these patterns of access for accountability purposes.

Perhaps one of the most important aspects of task-changing is to be found in the role of ICTs in achieving "joined-up government" or "cross-cutting services" (6, 2004). ICTs hold out the potential for various kinds of "joining up", ranging from putting a new joint face on related services (a single portal or gate on the net) to the progressive linking-up of back-office operations and databases (Brown 2007; Kernaghan 2007). One-stop shops or single windows on the Web have been a growing trend in many countries and seem to be popular with the citizens and firms that use them. Almost by definition, they create new tasks, because they require public servants to bring together, standardize and co-ordinate activities that were previously separate. To borrow the jargon, they require boundary-spanning skills.

5.4 Changes in rules

As first-year public administration students are usually taught, a prime characteristic of public sector bureaucracies is that they are rule-following organizations. Some of those rules are embodied in hard law, some in "soft law", and some are merely internal administrative procedures. Quite often, new technologies enable new ways

of doing things, and the new ways of doing things fit very uncomfortably with the old rules. So the old rules have to be changed, and new rules substituted.

Record-keeping is a very basic requirement for public bureaucracies, and they commonly have many rules concerning what records count as "official", how they are to be kept and who is to have access to them. The advent of new communications technologies – especially email, SMS and mobile phone conversations – have led to reconsiderations of these rules in many countries. In some cases, major controversies have arisen over the lack of order in record-keeping, due partly to the multiplication of media being used (Weller 2002, 89; Select Committee on a Certain Maritime Incident 2002, ch. 7). In a number of countries, weighty reports have been produced proposing new rules for record-keeping in the digital age (Pollitt 2009).

In the case of the police and security services, there have been and continue to be many detailed rule changes in many countries concerning police access to both computer systems and mobile phone records. In Belgium, it was the infamous Dutroux pedophile case that had been instrumental in persuading politicians to change the rules and allow the construction of a national criminal database. In the UK, the 7/7 London terrorist attacks stimulated the government to introduce various pieces of new legislation incorporating new rules for the police and security services.

Rule changes may affect even the most personal aspects of our identities. Since 1974, the Finnish Population Register has issued each newly born Finnish resident with a personal identity code (PIC). This was a centralized computerized system that was generally regarded as ahead of its time. The PIC now serves a variety of purposes, including social security and pension entitlements. One of the characters in the code indicates whether the individual is female (even number) or male (odd). Recently, however, advances in medical technology have made possible more sex changes. This has led to a small number of cases in which gender-reassigned citizens want their PICs changed – against existing rules that the PIC was an unchanging, life-long identifier. More generally, several studies have shown how IT developments can affect basic aspects of citizenship and identity (e.g. Taylor et al, 2007, 2009).

More generally, the creation of more and more web-based public services, one-stop-shops, multi-organizational portals and gateways and other kinds of "joining up" inevitably leads to the questioning of pre-existing jurisdictional boundaries between organizations and of traditional lines of accountability (Fountain 2001). New linkages and new inter-relationships rub up against old rules defining organizational borders. The blurring and redefining of jurisdictional borderlines may not have attracted much public attention – it is often seen as a purely technical issue – but in fact it can easily have significant implications for the practice of "separation of powers" or federalism or bureaucratic accountability (Bekkers 2000).

5.5 Effects on resource flows

Technological change affects flows of resources in both public and private sectors. Technologies are bought and sold. They can make profits for those who sell or maintain them, and they can also make savings for public sector organizations which use them to achieve higher levels of efficiency.

There is perhaps a tendency for some scholars to become so entranced with the technological possibilities and implications of new devices that they forget the fundamental importance of the *economics* of technological development. New technologies are, however, big business. Advanced industrial states typically spend over 1 % of their GDPs on public-sector information technology alone – a very substantial resource flow (Dunleavy et al. 2006, 1). So one prominent actor in the dramas of change is usually the contractor or supplier and, as Dunleavy et al. have shown, governments have become increasingly – sometimes dangerously – reliant on the big corporations of the global IT industry. Some of the stories of computer consultancies continuing to win large government contracts after being wholly or partially responsible for expensive failures make for uncomfortable reading (Craig 2006; Dunleavy et al. 2006).

There are reasons why large scale government IT contracting is especially difficult – and sometimes very profitable for the contractors (Borins et al. 2007, 29–30). To begin with, the systems are sometimes very large – social security or police or identity systems to cover whole populations, supporting millions of daily transactions. Then there is the tendency (regretted by some commentators) for governments to have "special requirements" in terms of systems that must be able to be used by anyone, including the most unlearned, and which must incorporate very high standards of security and privacy. Such tailor-made systems are understandably more expensive than off-the shelf, standardized software. Size plus "specialness" equals complexity, and projects of this kind are so complex that often only a few (usually multinational) companies can realistically bid for them. What is more, once such a project is underway, it is extraordinarily difficult to back out or change contractual horses. All these factors point towards the possibility of big money and substantial profits for the winning companies.

From the perspective of public authorities, however, new technologies may hold the promise of savings rather than profits. Governments, always under budgetary pressures, are often drawn to this promise of expenditure reductions. "Cheaper" is often just as important as "faster" or "better". And it is true that there are many cases where a new technology enables savings to be made. If a new technology enables staff to complete a given task more quickly, the management can either do more tasks for the same money or possibly reduce the size of the workforce (thereby making budget savings) without reducing the level of service provided. A recent example would be the Lantern system of mobile identification, tested experimentally by the English police. It enables on-foot police to check identification databases and

therefore avoid having to take suspects back to the station unnecessarily. On the trial, Lantern saved an average of 87 minutes per case in 50 % of the cases in which it was deployed (National Policing Improvement Agency, http://www.npia.police.uk, accessed January 2010)

Unfortunately there are two rather important qualifications to the expenditure-saving potential of new technologies. The first is that making savings later on usually requires investment up-front. With some of the biggest systems (e.g. in social security; healthcare), the initial investment is very large and the period before the innovations pay for themselves and begin to save is quite extended. These initial investments are particularly vulnerable in times of fiscal stress (Borins 2007). When ministries of finance are looking for cuts, expensive future projects, as yet unknown to citizens, become natural targets. It is politically less painful to postpone or cancel a big computer project than to take existing benefits or programmes away from citizens.

The second qualification is that, even when the investments are made, money is not always saved; indeed, it may be lost. Internationally, the list of major government IT projects which have either failed to work or worked only after enormous, unforeseen budget increases is distressingly long (see, e.g. Craig 2006; Dunleavy et al. 2006, 172–173; National Audit Office 2000). There are many difficulties for governments in managing large-scale IT (or other technological) projects, including lack of internal expertise (the contractors pay higher salaries and are able to commandeer most of the real "talent"), poorly-designed contracts, constant changes of specification coming from the political or senior official level and the hard-to-avoid risks of being locked into an extended piece of technological development where, after a certain point, it is more expensive to back out than to stay in, even with rising costs and under-performing technology.

5.6 Effects on individuals

Since changing technologies change tasks, it is hardly surprising that they eventually change the public officials who perform those tasks. Less obviously, it can argued that they also help to change the citizens who need or want to access state services. Let us begin with the officials.

As tasks become more complex, higher levels of education and training may be required of personnel – this would be true, for example, of police, nurses and school teachers, if looked at over the past half century. Interestingly, in each case, as the police officer/nurse/teacher has become a more highly trained, expensive item, new, less trained, cheaper staff have emerged as ancillaries (at least in the UK) – Police Community Support Officers, Nursing Assistants and Learning Support Assistants. In parallel with this, each profession has also become more dependent on "experts" from outside their cadre altogether. This is visible in medicine, with the burgeoning variety of para-medical specialists, but perhaps the most spectacular

case is the police, who are increasingly reliant on a range of experts in the various diagnostic and surveillance technologies which they now routinely employ.

Staying with the police for a moment, we can also observe that, thanks to burgeoning communications and surveillance technologies, the control room has become a more important location within the police service. While researching the police in mid 2007, I was shown round the operations room and CCTV centre for the Brighton police force (Pollitt and Bouckaert 2009). Here, high up in a tower block in central Brighton, mainly civilian staff were able to watch many of Brighton's streets on CCTV, simultaneously communicating with foot and vehicle patrols to direct them to any observed incidents. Already, the screens incorporated automatic vehicle recognition software that signaled as soon as any vehicle with a registration plate logged on the Police National Computer as being of interest passed a camera. Under the overall direction of a Chief Superintendent, civilian staff sat in a semi-darkened room, in effect moving police officers around the town like pieces on a chess board. Additionally, in the event of a fight or assault, the control room had a visual record against which the statements and claims both of involved citizens and of the police themselves could be checked. Not that CCTV cameras always work or are well-maintained. And not that would-be criminals are passive pawns in this new system of surveillance: they have developed a variety of ways of defeating the cameras, ranging from wearing hoods to breaking the cameras (as any devotee of the wonderful Baltimore TV series *The Wire* will remember) to redirecting their activities to other parts of town, where the cameras do not pry (see also Nunn 2001). Nevertheless this brief portrait suggested several technologically facilitated transitions for the individuals concerned: police on patrol being monitored and to some extent re-directed by civilian staff sitting a mile away in a control room and citizens in public places constantly exposed to the gaze of CCTV. Furthermore, at a higher level, top police managers could subsequently be held to account against very detailed electronic records of exactly what decisions had been made at what time and on what evidence in "their" control room.

Technological change may therefore lead to changes in who is recruited to public service jobs. This is not only a matter of the civilianization of certain aspects of police activities. When modern ICTs permit functions to be "deconcentrated" from the capital to regional cities or even rural locations, one result is that the relocated function then draws on the local labour market, not the one in the capital. Indeed, one of the express aims of such geographical moves is to profit from the lower wage levels and higher availability of certain skills in less "overheated" labour markets (Lyons 2004).

A further point is that certain types of public officials who used to be very common have now virtually disappeared – the typist, the filing clerk and even the conventional secretary. Typically only very senior staff now qualify for secretaries,

and they are called "executive assistants", or something like that, rather than secretaries, and they perform a changed mix of functions.

Now we turn to changes for citizens/public service users. Most obviously, as discussed above, the ability to access the internet is now needed if a citizen is going to obtain a wide range of public services, at least in a convenient way. Even if the "digital divide" is said to be lessening (Castells 2010, xxvv), it still exists, which means that some sections of the population are increasingly disadvantaged. Others, however, are positively advantaged. For example, those wholly or partly confined to their homes through sickness or disability no longer need to find other people to represent them in many of their dealings with central and local governments. They can do it themselves, from their home internet connection. They are – to use a frequently abused term – "empowered". So are those UK citizens who need urgent medical or nursing advice but who, for whatever reason, cannot get to a doctor's office and instead access the very popular "NHS Direct" website.

Less obviously, the rapid spread of remote surveillance devices, especially closed-circuit television (CCTV) – both public and private – has changed the way many people feel about being in public spaces:

> *Emotionally there is a big difference between being looked at by someone directly and being looked at through the lens of a surveillance camera. The variety of feelings surveillance evokes is enormous: those being watched may feel guilty for no reason, embarrassed or uneasy, irritated or angry, or fearful; they may also feel secure and safe (Koskela 2000, 257)*

Some citizens react to remote surveillance technologies with actions intended to defeat them. These can range from simply wearing a hood or mask to buying devices that will warn their owners when and where they come under surveillance or will even interfere with the normal working of the surveillance technology. There is a never-ending technological race between the police and the criminals – with the expenditures of both sides benefiting those companies who develop the relevant technologies.

How far does the use of the internet actually change the level and/or type of "civic engagement" undertaken by citizens (Norris 2001)?. One "cyberoptimist" position is that the amazing new possibilities of the internet will encourage all sorts of people to mobilize and participate in public affairs in new ways. A more cyberskeptic view is that "online resources will be used primarily for *reinforcement* by those citizens who are already active and well-connected by traditional channels …" (Norris 2001, 218). In this scenario, the internet facilitates a deepening of the divide between the civically engaged and the civically excluded or disenchanted. Some evidence can be deployed on both sides of this argument, and it is also possible that there is a temporal sequence, with reinforcement being the predominant

response in the early phases of e-government and more widespread and creative citizen involvement gradually accumulating as systems mature and the younger, internet-savvy generations grow up. One recent piece of U.S. research concluded that the main effects to date had been to reinforce pre-existing patterns of civic engagement, but that it was possible (no more) that the recently ballooning social networking tools could come to support the discussion of public-affairs issues across a wider constituency than would previously have engaged with this agenda (Smith et al. 2009).

6. Adding actors to effects

The foregoing discussion suggests that the effects of changing technologies may usefully be analyzed under a number of headings, where each heading concerns a particular type of impact (on tasks, on resources, etc.). However, it is also clear that a particular effect impacts differently on different actors in the process. Thus (for example) a new ICT may give a faster 24/7 service to citizens who can use the internet, while at the same time leading to job losses for staff and to a "second-class service" for users on the wrong side of the "digital divide". Therefore, if one wishes to use the categories developed here for constructing an analytic framework, then we need a second dimension that distinguishes, for each type of effect, between the main public administration actors. Table 1 (below) takes a first step in this direction by plotting the main actors along the horizontal axis, while the types of effect are shown on the vertical axis. Of course different classifications of actors can be made for different purposes – the one shown here is simply a conventional listing of the main "interests" involved in providing a major public service such as healthcare, education or public transport. This dimension merits much more discussion, but that must await another paper rather than this one.

The most important point is that most technological change usually generates effects in many of these cells, not just in one or two. Therefore to focus on only one or two of them may be to miss something important about the "big picture".

Table 1
A matrix of the effects of technological change and the actors involved

EFFECTS	Citizens / users	Public sector staff	Contractors / suppliers	Executive politicians	Legislative politicians
Time					
Place					
Task/activity					
Rules					
Resources					
People					

7. Conclusions

The paper has made the argument that technologies – understood as devices, associated practices, and the norms and meanings these generate – have a pervasive but hitherto largely unacknowledged influence on public administration. Many examples have been offered, and it would be easy to offer many more. These include, but go well beyond, the impacts of contemporary ICTs. Technological changes influence the time and place at which citizens interact with government, the nature of public-service tasks, the rules that are supposed to regulate public sector decision-making, resource flows (including profits) and, last but not least, the kinds of people we need to employ in the public sector and, ultimately, the kind of citizens we are able to be.

In sum, technological change has an enormous influence on public management. It is too important – too central to our field – to be left to a few specialists. It deserves a more central position in our studies, and hopefully the framework proposed in this paper may be of some assistance in facilitating the required shift of academic attention.

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References

6, P. 2004. "Joined-up Government in the Western World in Comparative Perspective: A Preliminary Literature Review and Exploration." *Journal of Public Administration Research and Theory* 14 (1), 103–138.

Arthur, W. B. 2009. *The Nature of Technology: What it is and how it Evolves*. New York: Free Press.

Audit Commission. 1996. *Streetwise: Effective Police Patrol*. London: HMSO.

Barry, A. 2001. *Political Machines: Governing a Technological Society*. London and New York: Athlone Press.

Barzelay, M. and R. Gallego. 2010. "The Comparative Historical Analyses of Public Management Policy Cycles in France, Italy and Spain: Symposium Introduction." *Governance* 23 (2), 297–307.

Bekkers, V. 2000. "Information and Communication Technology and the Redefinition of the Functional and Normative Boundaries of Government." In O. Van Heffen et al. (eds). *Governance in Modern Society.* Dordrecht: Kluwer, 257–278.

Bekkers, V. and V. Homburg (eds). 2005. *The Information Ecology of e-Government.* Amsterdam: IOS Press.

Bellamy, C. and J. A. Taylor. 1998. *Governing in the Information Age.* Buckingham: Open University Press.

Borins, S. 2007. "What Keeps a CIO Awake at Night? Evidence from the Ontario Government." In S. Borins, K. Kernaghan, D. Brown, N. Bontis, P. 6 and F. Thompson. *Digital State at the Leading Edge.* Toronto: University of Toronto Press, 69–101.

Borins, S., K. Kernaghan, D. Brown, N. Bontis, P. 6 and F. Thompson. 2007. *Digital State at the Leading Edge*. Toronto: University of Toronto Press.

Bovaird, T. and E. Löffler. 2009. *Public Management and Governance.* 2nd edn. London and New York: Routledge/Taylor and Francis.

Brown, D. 2007. "The Government of Canada: Government on-line and Citizen-Centred Service." In S. Borins, K. Kernaghan, D. Brown, N. Bontis, P. 6 and F. Thompson. *Digital State at the Leading Edge*. Toronto: University of Toronto Press, 37–68.

Business and Enterprise Committee. 2009. *Eighth Report, Session 2008–09: Post Offices – Securing their Future*. 23 June. Available at http://www.publications.parliament.uk/pa/cm200809/cmberr/371/37102.htm (Accessed 11 September 2009).

Castells, M. 2010. *The Rise of the Network Society.* 2nd edn. Chichester, West Sussex: Wiley-Blackwell.

Castells, M. 2001. *The Internet Galaxy: Reflections on the Internet, Business, and Society*. Oxford: Oxford University Press.

Chan, J. 2001. "The Technological Game: How Information Technology is Transforming Police Practice." *Criminology and Criminal Justice* 1 (2), 139–159.

Christensen, T. and P. Lægreid. 2007. *Transcending New Public Management: The Transformations of Public Sector Reforms*. Aldershot: Ashgate.

Craig, D. 2006. *Plundering the Public Sector: How New Labour are Letting Consultants Run off with £70 Billion of our Money*. London: Constable.

Dunleavy, P., H. Margetts, S. Bastow and J. Tinkler. 2006. *Digital Era Governance: IT Corporations, the State and e-Government*. Oxford: Oxford University Press.

Ferlie, E.; L. Lynn, Jr. and C. Pollitt (eds). 2005. *The Oxford Handbook of Public Management*. Oxford: Oxford University Press.

Fountain, J. 2001. *Building the Virtual State: Information Technology and Institutional Change*. Washington DC: Brookings Institution.

Graham, S. 1994. *Free-nets and the Politics of Community in Electronic Networks.*

Geels, F. 2004. "From Sectoral Systems of Innovation to Socio-Technical Systems: Insights about Dynamics and Change from Sociology and Institutional Theory." *Research Policy* 33, 897–920.

Hood, C. 1998. *The Art of the State: Culture, Rhetoric and Public Management*. Oxford: Oxford University Press.

Hood, C. and H. Margetts. 2010. "Cyber-Bureaucracy: If it is so Central to Public Administration, why is it so Ghetto-ized?" In J. Pierre and P. Ingraham (eds). C*omparative Administrative Change and Reform: Lessons Learned.* Montreal and Kingston, McGill-Queen's University Press, 114–138.

Kay, A. 2006. *The Dynamics of Public Policy: Theory and Evidence.* Cheltenham: Edward Elgar.

Kernaghan, K. 2007. "Beyond Bubble-Gum and Goodwill: Integrating Service Delivery." In S. Borins, K. Kernaghan, D. Brown, N. Bontis, P. 6 and F. Thompson. *Digital State at the Leading Edge.* Toronto: University of Toronto Press, 102–136.

Kickert, W. (ed.). 2008. T*he Study of Public Management in Europe and the US.* Abingdon: Routledge/Taylor and Francis.

Koskela, H. 2000. "The Gaze without Eyes: Video-Surveillance and the Changing Nature of Urban Space." *Progress in Human Geography* 24 (2), 243–265.

Latour, B. 2005. *Reassembling the Social.* Oxford: Oxford University Press.

Lips, M. and T. Schuppan. 2009. Editorial: Transforming e-Government Knowledge through Public Management Research. *Public Management Review* 11 (6), 739–749.

Lyons, M. 2004. *Well Placed to Deliver: Shaping the Pattern of Government Service.* Independent Review of Public Sector Relocation. London: H. M. Treasury.

McKee, M. and J. Healy (eds). 2002. *Hospitals in a Changing Europe.* Buckingham: Open University Press.

Markus, M. and D. Robey. 1988. "Information Technology and Organizational Change: Causal Structure in Theory and Research." *Management Science* 34 (5), 583–609.

National Audit Office 2009. *Department for Business, Enterprise and Regulatory Reform: Oversight of the Post Office Network Change Programme.* HC 558, Session 2008–2009. Norwich: The Stationary Office.

National Audit Office 2000. *The Cancellation of the Benefits Payments Card Project.* HC 857, Session 1999–2000. London: The Stationary Office.

Norris, P. 2001. *Digital Divide: Civic Engagement, Information Poverty and the Internet Worldwide.* Cambridge: Cambridge University Press.

Nunn, S. 2001. "Cities, Space, and the New World of Urban Law Enforcement Technologies." *Journal of Urban Affairs* 23 (34), 259–278.

Osborne, S. (ed.). 2010. *The New Public Governance?* London and New York: Routledge/Taylor and Francis.

Pawson, R. 2002. "Evidence and Policy and Naming and Shaming." *Policy Studies* 23 (3/4), 211–230.

Pawson, R. and N. Tilley. 1997. *Realistic Evaluation*. London: Sage.

Pollitt, C. 2009. "Bureaucracies Remember, Post-Bureaucratic Organizations Forget?" *Public Administration* 87 (2), 198–218.

Pollitt, C. 2008. *Time, Policy, Management: Governing with the Past*. Oxford: Oxford University Press.

Pollitt, C. and G. Bouckaert. 2009. *Continuity and Change in Public Policy and Management*. Cheltenham: Edward Elgar.

Pollitt, C. and G. Bouckaert. 2004. *Public Management Reform: A Comparative Analysis.* 2nd edn. Oxford: Oxford University Press.

Pollitt, C. and E. Op de Beeck. 2010. "Hyper-Stability in an Age of Hyper-Innovation: A Comparative Case Study." *Public Policy and Administration* 25 (4) (in press).

Sahay, S. 1997. "Implementation of Information Technology: A Space-Time Perspective." *Organization Studies* 18 (2), 229–260.

Select Committee on a Certain Maritime Incident. 2002. *Report*. Canberra: Senate Printing Unit, October.

Smith, A., K. Schlozman, S. Verba and H. Brady. 2009. *The Internet and Civic Engagement*. Pew Internet. September 2009. Available at http://www.pewinternet.org/ (Accessed 3 February 2010).

Snellen, I. and W. Van de Donk (eds). 1998. *Public Administration in an Information Age: A Handbook*. Amsterdam: IOS Press.

Sørensen, C. and D. Pica. 2005. "Tales from the Police: Rhythms of Interaction with Mobile Technologies." *Information and Organization* 15, 125–149.

Sutherland Inquiry. 2008. *An Independent Inquiry into the Delivery of the National Curriculum Tests in 2008*. Report to Ofqual and the Secretary of State for Children, Schools and Families. HC62. 16 December. London: The Stationary Office.

Taylor, J., M. Lips and J. Organ. 2009. "Identification Practices in Government: Citizen Surveillance and the Quest for Public Service Improvement." *Identity in the Information Society* 1 (1), 135–154.

Taylor, J., M. Lips and J. Organ. 2007. "Information-Intensive Government and the Layering and Sorting of Citizenship." *Public Money and Management* 27 (2), 161–164.

Thompson, F. and L. Jones. 2008. "Reaping the Advantages of Information and Modern Technology: Moving from Bureaucracy to Hyperarchy and Netcentricity." *International Public Management Review* 9 (1), 148–192.

Waugh, W. 2006. "The Political Costs of Failure in the Katrina and Rita Disasters." *Annals of the American Academy of Political and Social Science* 604, 10–25.

Weller, P. 2002. *Don't Tell the Prime Minister*. Melbourne: Scribe Publications.

Whitehead, T. 2009. "Bobbies on Beat for Just 6 Hours a Week." *The Daily Telegraph*, 3 October, 1.

Winner, L. 1986. *The Whale and the Reactor: A Search for Limits in an Age of High Technology*. Chicago and London: University of Chicago Press.

The Impact of Technology on the Public Administration of the Future

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Abstract

The paper is based on the keynote speech and discussion at the Third Trans-European Dialogue in Ljubljana, 2010. It discusses the potential impact of information technology on organization and operations of public administration in the future. We focus on the business sector's experience that could be valuable for public administration and some ideas that are coming from the academic community. Current concepts of virtual governments are largely oversimplified, consequently overlooking many aspects that are crucial for virtual organizations in the private sector. We refer to Mowshowitz's theory of virtual organization. We also present some dilemmas and arguments for the changed perception of outsourcing and tighter involvement of public administration in business ecosystems. Finally, we address the influence of information technology on the decision-making ability of administrations and governments and expose the strategic impact of metaphors that originated in chaos theory. We expose some limitations in decision-making consistency and the illusion of management and controlling in complex social systems.

1. Introduction

When we predict technological development and its potential impact on public administration, we face two main challenges. One is the still relatively unpredictable development of new technologies and our linear thinking when we project to the future our present believes and experiences. The second is public administration itself. It is a constantly changing system, influenced by the socio-political environment and citizens' awareness. Looking into the future, we could paraphrase Kraemer and King's (2005) question, "Will the time after e-government be different?" Certainly, it will be different, we just do not know how and where.

Our predictions would be more convincing and grounded if we studied analogies with other systems, particularly business systems. Let us start a short discussion with a question: Where are the potential sources of new ideas and paradigms for the public administration of the future? Definitely, the main source of innovative ideas will still be the public administration itself. However, technological development is generally independent even from users as big as public administrations. Consequently, public administrations, accidentally or intentionally, import many innovative ideas together with technology. Particularly interesting experience originates in the business community. Many would argue that public and business sectors are fundamentally different, and it is difficult to exchange experiences. It is true to some extent that their missions are essentially different, but many organizational and technological issues are surprisingly similar. From this point of view, the most valuable expertise that comes from the business sector is not limited to the implementation of technology. It includes the invention of new business models related to the virtualization of organizations. In the last decade, we could notice radically new ways of doing business, based on intensive use of information and particularly communication technologies. From this analogy, we can foresee that we will witness radically new business models in public administration in the future.

In some public administrations, for example in the UK (Schuppan 2009) or Nordic countries, this business expertise and experience is already welcomed. Many others, e.g. Central European countries, are far less enthusiastic. There are many historical reasons why they perceive the public sector as system considerably different from the business one. There are also different groups of legal systems and consequently different types of public administrations, which demonstrate different attitudes towards public services and political priorities. This mixture of historical and cultural aspects is too often missing in our discussions on the role of technology in public services at the European level (Kamarck 2004, Bavec 2007). Quite often, we try to compare things that are essentially not comparable. Obviously, there is not one assessment that will fit all. However, the current economic crisis puts an additional stress on the public sector. As we see, European countries are trying to reduce their public expenditures. They are in a similar position as the business sector, which is desperately lowering operational costs and looking for more efficient business models. We could just guess that this situation would bring business and public sectors closer.

We could enrich our vision on the future of technology in public administration with ideas that come from the academic community and different scientific fields as well (Leben and Vintar 2003). Sometimes they look distant and too abstract to be applied in public administrations, but they could expand our understanding of particular problems. Let us just mention the complexity and chaos theories that could significantly deepen our understanding of behaving and decision-making in complex systems. They would provide additional arguments that would help us to abandon the still deeply rooted perception of public administration as a determinis-

tic and bureaucratic system (Plaza and Regis 2006). We have to be cautious with the transmission of concepts from natural to social sciences, but many times it works well and it is an eye-opening experience. In addition, many other paradigms originated in academia, like business ecosystems or virtual organizations, could play an important role in our perception of the future public administration and technology. They have already proved to be valuable concepts in the business sector, where information technology changed management, organization and business models beyond recognition. Public administrations can considerably benefit from these new paradigms and enlightening business examples.

Besides operational efficiency, information technology would improve public administration's decision-making ability. Information technology has already proved to be a valuable tool, but it is questionable if technology can fulfill over-optimistic predictions. Quite often we can hear that more data and more information technology automatically lead to higher administration "intelligence", making its decisions faster and more objective. As a result, we can notice an enormous hunger for data, which has crossed all acceptable limits in some administrations. However, this trend is questionable even at the theoretical level. For example, the current economic crisis has disposed the unpredictability of global events that have serious consequences on public administrations and governments. Should they be prepared for such situations, can they predict them; can they lead us out of them? Governments will always claim the credit for our salvation, but it is obvious that they have been taken by surprise and that all their responses to the crisis have been invented along the way. This situation just illustrates the legitimacy of chaos theory in the social environment as well.

Dealing with unpredictability is a lesson that the business community has already learned the hard way. Intuitively, they have realized that flexibility was the only workable solution. But rigidity is the main characteristic and sin of our public administrations. I would strongly argue that in the future, public administrations would have to follow the trends in business, where flexibility is becoming the primary organizational goal. The challenges and potential benefits of highly flexible public administrations are still a purely academic debate without influence on policy makers. Until now, information technology has not significantly increased the flexibility in the majority of public administrations in Europe. Even worse, public administrations are often balancing higher operational efficiency with lower flexibility. Computer applications and services supported by information technology actually canonized information channels and procedures, making them even more inflexible. Again, the only long-term solutions for these challenges are new business models in public administration and in-built organizational flexibility.

2. Assessing e-governments

The romantic and often naïve phase of technology introduction into public administrations is over, and we are not discussing basic presumptions any more. We all agree that technology significantly increases the efficiency of public services and public administration as a whole, while it makes public administration more transparent, and it offers some new services that make the life of citizens and businesses easier and more efficient. But, how improved are public administrations? In business, it is relatively easy to assess how successful companies are. There are some hard-solid indicators. In public administration, the issue of assessment is significantly more complex, due to many parallel goals. One solution is benchmarking, which is a "multidimensional" tool for assessment by different criteria. Particularly benchmarking public administrations in different countries can give us some impression of their level of success. It is not a surprise that the European Commission and some other international organization regularly assess e-governments at national levels.

However, we should take this benchmarking with extreme caution. Current measuring scales and different aggregate indexes of e-governments concentrate mainly on technology, investments and quantity of services (Kraemer and King 2005). They are not perfect and they offer an oversimplified vision of technological and organizational aspects of public administrations, but they are still important indicators for policy-makers. For example, we can notice a correlation between national wealth or GDP and readiness for e-government (UN 2008). There are also statistically significant differences between European regions, where the clear leaders are West and North Europe, while East and South Europe lag behind. In addition, we can notice a higher readiness for e-government in countries with Anglo-American (Common Law) families of legal systems, and so on. What should make us uncomfortable with these indexes, including different EU rankings, is their implicit message that the name of the game is money that can buy technology. More investments buy more technology; more technology leads to more e-applications, and more e-applications would lead to a higher utilization of services by citizens and businesses. At the end, the public administration looks better.

The logic looks quite plausible, but it hides many problems. Too often, it is a just an alibi for politicians who avoid or misunderstand real changes in the public administration. They simply invest into technology, receiving political credit by raising the rating of their country in the EU or UN ranking. In addition, they have "objective" arguments to silence warnings which say there is something else to be done, too (Bavec and Vintar 2007). Despite all imperfections, we have to give credit to the EC and particularly UN efforts to develop concepts of the Second Generation e-Government Paradigm and even subtitling their latest e-government report "From e-Government to Connected Governance" (UN 2008). At least it demon-

strates a vision and opens some interesting questions. Are we assessing something that is relevant for the future? Can we foresee the future from these indicators?

Comparing e-business and e-governments, we can notice that the implementation of information technology in business clearly focuses on three issues: business efficiency, operational flexibility and new business models. E-governments are still in the phase where internal and external efficiency is the primary goal. Flexibility and new business models are not a high priority. However, looking into the future, these two issues will eventually have to come to the surface. In this paper, we will limit the discussion just to the following three issues:

1. virtualization of public administration and its implications;
2. participation of public administrations in business ecosystems;
3. public administration and decision-making in complex environments.

The three topics do not look related, but in fact, they are. Understanding virtual governments in a context similar to virtual organizations in the business leads to new business models in public administration that could radically redefine public services. As a result, administrations could play a more active role in the business ecosystems and could seize the advantage of technologies and outsourcing, thus consequently introducing more and more efficient business models. This development looks exciting from the EU point of view, because we could foresee inter-European outsourcing of national public services or even the internationalization of some services. We can already find some evidence of such services. Besides operations and services, public administrations should also strengthen their strategic functions as decision-makers in a more and more complex and unpredictable world. The business community understands the issue of uncertainty and complexity much better than public administrations and governments because it is a part of their everyday life. Administrations in general have yet to learn it.

3. Virtualization of public administration and its implications

In discussions related to information technology and public administrations, we often refer to virtual governments (Bekkers 2003). Yet the concept of virtualization in public administration is oversimplified, and it consequently loses its strategic sharpness, which is present in the business environment (SCF 2009). For that reason, we could understand Drechsler's statement in his paper (Drechsler 2010) that "virtuality is an obsolete concept in 2010." The concept of virtuality is losing its ground if we try to divide our world into "real" and "virtual". In reality, both worlds form our real world and are just two sides of the same coin. To associate virtual government with just online, web or internet applications means that we are overlooking many aspects that are crucial for virtual organizations in the private sector. In the future, the paradigm of virtual organization would potentially have the same impact on the public administration that it had on the business community. If we want to imple-

ment this concept in public administration as well, we will have to broaden our perspective and study the interplay of different issues.

Regardless of the diverse definitions of virtual organizations, the majority agree that they are the result of three worldwide megatrends:

- intensive use of information and communication technologies in internal and external operations,
- local and global outsourcing (often stripping organizations to their core competence),
- implementation of totally new business models.

The introduction of virtual organizations in business has started with online and web applications for marketing and selling. Comparing this stage with the development in public administration, it would correspond to online governments. In the business sector, an intensive collaboration with business partners and particularly outsourcing quickly followed this initial phase. We can notice similar trends in public administrations, but they are proportionally incomparable with the business environment. However, truly dramatic steps in the development of virtual organizations are new business models based on the combination of online applications, cooperation and outsourcing (Cagnina and Poian 2009).

Reading papers on virtual governments, we can notice that for the majority of authors, virtuality means the use of the internet and the replacement of physical (real) citizens' contacts with the public administration with "virtual" ones. However, this is just part of the story. For example, Mowshowitz's attempt to define a theory of virtual organizations includes, among others the Switching Principle (Mowshowitz, 2000). The basic idea behind the Switching Principle is that organizations should never link activities to performers in the phase of planning. In the design phase, they have to define all necessary activities and identify possible performers for each activity. Not until the implementation phase do we dynamically allocate or reallocate (switch) optimal performers to particular activities. It looks trivial, but it defies our understanding of good planning and organization, particularly in public administrations. In the administration environment, it would mean that the legislation, which regulates particular government competence and activity, should not define who exactly must perform these tasks. Legislation should identify outcomes, leaving to the public administration or government organization the opportunity to find an optimal performer or to replace an existing one. We can sense this principle in public administrations in countries with the Anglo-American family of legal systems. However, in the Central European countries, the situation is nearly opposite. The legislator tends to regulate implementation details that consequently make government organizations very rigid.

As an illustration, let us imagine some new business models for the public administration, based on the paradigm of the virtual organization. It is relatively easy

to develop this suggestion for the services that we can deliver using information technologies and the internet. It would be a much harder task to apply this idea to services that require the physical presence of public servants.

Geographical dispersion of public administration

Location and distance are less and less important in the delivery of public services. It means that the administration can select optimal locations from which it will operate. It does not look like very much, but it can dramatically change the organization of public administrations just by radical geographical decentralization of offices and civil servants. The concept of large administrative centers is just a consequence of communication limitations and data processing in the past. We do not even question this concept, and we automatically accept it as the only possible way of doing business in public administrations. However, homogeneous geographical distribution of public administration could contribute to a more harmonic regional development, a better use of natural and human resources, reducing environment loads, and so on.

Outsourcing and public services

With extensive outsourcing of public services, we can reduce administration costs and potentially increase its quality and accessibility. There are many political and social reasons that limit outsourcing in administrations, because we too often link this issue with privatization. But outsourcing in public administration could be a much wider concept, even by not including private business. Implementing the Mowshowitz's Switching Principle in practice, we can theoretically outsource everything that is not a "core competence", if we use business terminology. In public administration, it is not always evident what the core competence is, and consequently it is not "outsourceable". Theoretically we could go very far. There are no technological or organizational limits. A distinct characteristic of new business models is their tendency to become global. If we follow business logic in the public administration, we could go to the real extremes (Dunleavy 1994). One of them would be outsourcing services beyond national borders. Could we imagine international outsourcing of public services? This is definitely the public administration beyond our imagination, but there are no technological or organizational obstacles to that! Even language issues can be relatively easy to solve. Another nearly unimaginable development would be multinational public services. Maybe it is even not so unimaginable. Following institutional development in the EU, we can notice indications of such an evolution (for example, some police and custom services). We would even guess that this is a premeditated long-term strategy for EU integration.

Public administration as part of business ecosystems

Another motivating concept for public administrations is the business ecosystem (Peltoniemi 2005). In his paper, Moore (1993) suggested a new perception of competition and business alliances in business ecosystems, where organizations "co-evolve" in a mixture of competition and cooperation to satisfy customer needs. The metaphor of ecosystems indicates that every organization can find its living space in the equilibrium state of the system, as long as it is competitive. Could public administration be a part of such ecosystems? The first guess would be that a part of public administration, particularly its public services could definitely participate in business ecosystems. The virtualization of administration is a step towards such systems. The transformation of traditional public administrations to the virtual ones is based on two general presumptions:

- there is a sufficient number of public or private organizations that can competitively and efficiently take over outsourced activities;
- public administration could effectively implement Mowshowitz's switching principle, reassigning (switching) performers in a reasonably short time and with acceptable costs.

Public administration would act as an active member of the business ecosystems and co-evolve with business organizations in a cooperative and competitive manner. It would make public administration more efficient and flexible. If we use Mowshowitz's terminology, we could say that the main role of public administration would be metamanagement (Mowshowitz 2000) of public services. We could go into a deeper discussion of the role of public administration in business ecosystems, but my intention was just to give an additional view on outsourcing and to show that there is no virtual government without it. We are just openly discussing technological and organizational possibilities. However, the question of public administration outsourcing is sensitive and is easily misinterpreted or politically misused.

Some of these concepts are intuitively difficult to accept and they may look too remote from our real world. Many defy our basic perceptions of public administration. The first argument against any radical organizational changes is our perception of attributes of state sovereignty and the role of public administration. There is no sovereign state without an independent administration. But what do "sovereignty" and "independency" actually mean? It means freedom and the possibility to decide on and implement everything that is relevant for the citizens and for the state. In this case, it has little to do with the organization of services and their delivery. For smaller and medium businesses, it is normal to outsource financial services as an example. On the other hand, autonomous finances are attributes of any enterprise. Obviously, business can separate the problem of autonomy and decision-making from data collection and processing. Such a pragmatic view collides with the concept of public administration (Bekkers 2000). There are also other

more acute obstacles. One of them is the professional independency of public administration that needs knowledge, which cannot be "outsourced". There are also issues with data protection, particularly personal, and so on. Obviously, there are still many dilemmas.

4. Public administration and the illusion of management

An interesting issue to discuss is governance and decision-making in public administration. How much can technology help? We would briefly discuss these issues from the perspective of the complexity theories and their applications in social sciences (Thietart and Fourgues 1995, Rosenhead 1995). These theories usually refer to chaos theory, which originates in natural sciences, but they have proved to be a valuable metaphor in other sciences that face nonlinear, instable and uncertain systems that change over time. Many characterize the chaos theory as a search for order in apparent disorder. The most known features of this theory are sensitivity to initial conditions, sudden transition from order to disorder and bifurcation points where the system starts to exhibit various states, possibly at the same time. The final message of chaos theory is that the future is unpredictable because of the inherent nature of complex systems and not because we do not know enough about the present state to "calculate" the future. The application of chaos theory in social sciences is still in its infancy (Kiel and Elliot 1997), and we use it more as a metaphor than a real modeling tool. Nevertheless, chaos theory changes some deeply rooted deterministic perceptions in social sciences, which are mainly ruled by statistically based research.

In the government environment, chaos theory implies that it does not matter how accurate the data is that we have; the future is still mainly unpredictable because of the nature of complex systems. The long-term planning too often gives just a "macho" impression of controlling and managing, but in fact, it is an illusion. We are familiar with this management illusion of controlling the future in business (Schwenk 1985, Shefrin 2008), but we very rarely mention it in the context of public administration. I would argue that in governments, this illusion is even more pronounced and even damaging. If we limit our discussion to the use of information technology (Lohman, Sol and de Vreede 2003), we can notice many cases where politicians or public servants intentionally give the impression that they control the situation by having all information. Technology and an enormous amount of collected government data support this illusion and provide grounds for political infallibility. Many things that look managed and controlled are happening of their own accord, and management had imposed the impression of responsibility for their happening.

But we should not go into extremes. The majority of short- and middle-term decisions are predictable if one has accurate data, so they are no illusions. Many

data and consequent decisions are very real. Stacey (1992) nicely illustrated this relation between predictability and unpredictability with the division of management into ordinary and extraordinary (Rosenhead 1995). The ordinary (mainly operational) management can heavily rely on technology and the predictability of events at their level. On the other hand, the extraordinary (mainly strategic) management has to use technology mainly to make organization knowledgeable, flexible and ready to seize and implement new opportunities, without offering a false sense of managerial control. Technology could help in both cases, but with very different emphasis. We are closing the circle by repeating the call for higher flexibility in public administration.

5. Conclusions

We should agree with Bekkers (2000) that we need a "political theory of government in the information age". Without rethinking many deeply rooted perceptions of public administrations and governments, we cannot make significant breakthroughs in the future (Fountain 2005, Pollitt 2010). In the information age, technology can change nearly everything, but it is limited by the rules established in the industrial society. Historically the transition to industrial society radically changed old governments' concepts, and we can be sure that the transition to information society will cause equally radical changes. Administrations can learn many lessons from business, but they have to stay within the scope of their politically and socially defined boundaries. However, the current boundaries are becoming too tight, at least from the technological point of view, particularly for many developed countries, which have already stepped into information society (Cordella 2007, SCF 2009).

According to the chaos theory, can we predict the future? Can we anticipate changes in initial conditions that would move the public administration system from a predictable to un unpredictable state? Obviously, we cannot. We can just conclude that the last radical technological change which rocked public administration happened 15 years ago with the explosion of the internet. Since then, we have been in the relatively steady and predictable technology-development phase. From the public-policy point of view, the Central European countries radically changed their governments 20 years ago, the tragic events on 11 September 2001 changed many public-administration concepts around the world, and the current economic crisis is again an event that will induce many changes in our public administrations. How dramatic the consequences of these events will be is a matter of personal opinion. However, a suggestion from complexity theories is that we should not unconditionally rely on rigid long-term planning or beliefs in public administrations, but rather seize any predictable or unpredictable opportunity to change things in our favor. It looks that for the future, the name of the game will be flexibility and innovativeness.

We should also rethink the broader concept of outsourcing in public administration in light of virtual organizations (Bekkers 2000). Outsourcing is not automatically privatization (Schuppan 2009) or the loss of control over policies, services or data. We could argue that the business experience with new business models would be extremely valuable for public administrations, too. The concept of business ecosystems with a more active role of administrations is one of them. We should go beyond cost, efficiency or transparency. We should search for new ways of running public administrations using information technology. It offers limitless opportunities. Finally, I would like to repeat a phrase said so many times that information technology is just a tool and we can use it in a right or a wrong way. It could make the public administration more transparent and democratic, but it can also do the opposite. However, this is an issue for some other discussion.

References

Bavec, Cene. 2007. "On the Current Environments for e-Government Development in the Enlarged European Union." *Information Polity* 11 (3). 1–11.

Bavec, Cene and Mirko Vintar. 2007. "What Matters in the Development of the e-Government in the EU?" *Lecture Notes in Computer Science* 4656, 424–435.

Bekkers, Victor. 2003. "E-Government and Virtual Organizations in the Public Sector: About the Interplay between Organizational Networks and Technology." *Information Polity* 8. (3/4), 89–102.

Bekkers, Victor. 2000. "Information and Communication Technology and the Redefinition of the Functional and Normative Boundaries of Government." In O. Van Heffen et al. (eds). *Governance in Modern Society*. Dordrecht: Kluwer Academic Publishers, 257–278.

Cagnina, Maria Rosita and Michele Poian. 2009. "Beyond e-Business Models: The Road to Virtual Worlds." *Electron Commer Research* 9, 49–75.

Cordella, Antonio. 2007. "E-Government: Towards the e-Bureaucratic Form?" *Journal of Information Technology* 22, 265–274.

Drechsler, W. 2010. "Nanotechnology, Governance and Public Management: A Techno-Economic Paradigms Perspective." *NISPAcee Journal of Public Administration and Policy* 3 (2), 69–85.

Dunleavy, Patrick. 1994. "The Globalization of Public Services Production: Can Government be 'Best in World'?" *Public Policy and Administration* 9 (2), 36–64.

Fountain, Jane E. 2005. "Central Issues in the Political Development of the Virtual State." Paper prepared for The Network Society and the Knowledge Economy: Portugal in the Global Context Lisbon.

Kamarck, Elaine C. 2004. "Government Innovation around the World." Harvard University. KSG Working Paper No. RWP04-010. Available at http://ssrn.com/abstract=517666 (Accessed January 2010).

Kiel, L. Douglas and Euel W. Elliot. 1997. *Chaos Theory in the Social Sciences: Foundations and Applications*. Ann Arbor: University of Michigan Press.

Kraemer, Kenneth L. and John Leslie King. 2005. "Information Technology and Administrative Reform: Will the Time after e-Government Be Different?" Paper for the Post Graduate School of Administration. Speyer. Germany. Available at http://jlking.people.si.umich.edu/IJEGR-Final.pdf (Accessed January 2010).

Leben, Anamarija and Mirko Vintar. 2003. "Life-Event Approach: Comparison between Countries." *Lecture Notes in Computer Science* 2739, 434–437.

Lohman, Fred A. B., Henk G. Sol and Gert-Jan de Vreede. 2003. "The Illusion of Effective Management Information: A Critical Perspective." *Proceedings of the 36th Annual Hawaii International Conference on System Sciences* (HICSS'03) 8, 266–277.

Moore, J. F. 1993. "Predators and Prey: A New Ecology of Competition." *Harvard Buiness Review* 71 (3), 75–86.

Mowshowitz, Abbe. 2000. "On the Theory of Virtual Organization." *Systems Research and Behavioral Science* 14 (6), 373–384.

Peltoniemi, Mirva. 2005. "Business Ecosystem: A Conceptual Model of an Organisation Population from the Perspectives of Complexity and Evolution." e-Business Research Center. Research Reports 18. Tampere. Available at http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.96.3377&rep=rep1&type=pdf (Accessed January 2010).

Plaza, Joan Pere and Dandoy Régis. 2006. *Chaos Theory and its Application in Political Science*. IPSA – AISP Congress. Fukuoka. Available at http://www.sciencespo.site.ulb.ac.be/dossiers_membres/dandoy-regis/fichiers/dandoy-regis-publication18.pdf (Accessed January 2010).

Pollitt, C. 2010. "Technological Change and Public Service Management: Towards a Conceptual Framework." *NISPAcee Journal of Public Administration and Policy* 3 (2), 31–53.

Rosenhead, Jonathan. 1995. "Complexity Theory and Management Practice." *Strategic* Management *Journal* 16, 477–495.

SCF. 2009. *A Green Knowledge Society: An ICT Policy Agenda to 2015 for Europe's Future Knowledge Society*. A study for the Ministry of Enterprise. Energy and Communications. Government Offices of Sweden by SCF Associates.

Schuppan, Tino. 2009. "Reassessing Outsourcing in ICT-Enabled Public Management." *Public Management Review* 11 (6), 811–831.

Schwenk, Charles R. 1985. "Management Illusions and Biases: Their Impact on Strategic Decisions." *Long Range Planning* 18 (5), 74–80.

Shefrin, Hersh. 2008. *Ending the Management Illusion: How to Drive Business Results Using the Principles of Behavioral Finance*. New York. McGraw-Hill.

Stacey, Ralph D. 1992. *Managing the Unknowable: Strategic Boundaries Between Chaos in Organizations.* San Francisco: Jossey-Bass.

Thietart, R. A. and B. Fourgues. 1995. "Chaos Theory and Organization." *Organization Science* 6 (1), 19–31.

UN. 2008. *United Nations e-Government Survey 2008. From e-Government to Connected Governance*. Available at http://unpan1.un.org/intradoc/groups/public/documents/ UN/UNPAN028607.pdf (Accessed January 2010).

Nanotechnology, Governance and Public Management: A Techno-Economic Paradigms Perspective

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Abstract

This essay investigates, from the perspective of Carlota Perez' theory of Techno-Economic Paradigms, the possible impact of a specific technology, nanotechnology, on governance and public management. Based on this example, it argues, i.a., that techno-economic paradigms do come with their own optimal (and less optimal) forms of governance and indeed public management, but that both the attitude towards the state and thus public management and the need for good public policy and its institutional prerequisites are a matter of the period within the paradigm, not of the paradigm itself.

1. Task and background

The final paragraph of the call for TED3 stated:

> *In its last segment, TED3 will discuss the possible impact of non-ICT technology on Public Management and its reform, especially of new emerging bio- and nano-technologies. How might – although this is highly speculative – future technologies impact PA/PM? What are the optimal PA/PM structures for supporting the development of future technologies? The focus on these future technologies will also allow us to look at ICT in context, because it implies 'post-ICT' times. It will also enable us to discuss more clearly the relationship of technology and (the PA/PM aspect of) governance, and particularly of mutual interdependence and indeed dependence, thereby going back to the key elements of the ICT-PA-debate.*

The current essay tries to do so – contrary and at the same time complementarily to Christopher Pollitt's all-encompassing conceptual framework for studying the relation of technological change and public service management (2010), by setting out to investigate the impact both of a specific technology, nanotechnology (as one of the possible paradigm-setting post-ICT technologies), on governance and public management (PM), and by doing so from the perspective of a specific theory, Carlota Perez' Techno-Economic Paradigms (TEPs).[1] It will argue that those paradigms come with their own optimal (and less optimal) forms of governance and indeed PM.[2] Such an approach potentially provides a broad framework for understanding the relationship of technology and PM, and it may also highlight some of the counter-intuitive impacts of technological change on PM and of the need for a wider, multi-disciplinary approach. (And as all projections into the future, it may also serve to elucidate the present, more specifically the current ICT paradigm and its importance for PM.)

Perez herself builds on Kondratieff (see 1926), Schumpeter (see 1924, 1939) and Freeman (see Freeman and Louçã 2001), forming what Brian Arthur has called "the Schumpeter-Perez-Freeman story." (2002)[3] Thus, this is a theory which – in spite of substantial differences – hails from the context of Long Waves, which are generally controversial and, in the context of some economics paradigms, unverifiable, but which are one foundation of innovation theory and innovation economics, particularly of the Schumpeterian kind.[4] The theory is introduced here as the framework for discussing a mutually recognized problem (the connection of technological change, especially future technologies, on the one hand and governance and public management on the other), not as a truth of which one would have to convince the skeptics. The use of this theory in the current context is therefore primarily heuristic, i.e. not to argue that this is the only possible approach, nor to defend the theory as such, but I assume it to be both valid and helpful.[5] Overall, this

1 Perez 2002, also 2007, 2006a, 2006b, 2004a, 2004b, Perez and Freeman 1988.

2 It could be said that the larger research context of the TEP approach is the thesis of the co-evolution of technologies and institutions (cf. Nelson 1994), which would generally argue that the trajectories of PM are influenced both by explicit technological change and by more indirect impacts (such as on organizational structures, modes of production or networks) which may demand fundamental reconsideration of PM practices.

3 Arthur's recent attempt at a comprehensive theory of technology as such (2009) has not quite received the attention such an effort would seem to deserve.

4 That, too, is of course contested, but Schumpeter himself surely saw it this way; see McCraw 2007.

5 On the importance of the theory, which is i.a. a key basis of the European Union's Lisbon Strategy and of the corporate development strategy of IBM, see now comprehensively Drechsler, Kattel and Reinert 2009.

essay is eventually a contribution to what Pollitt has called "Theories of Cycles or Alterations in Administrative Fashion" (2008, 51) based on technological change.

Simplifying I therefore assume with Carlota Perez that long-term economic development at first glance looks like the relentless progress of technology, but that it actually takes place in the form of overlapping surges, based on specific technological revolutions.[6] There were five such revolutions, and five surges, in the last 250 years, and we are now in the middle of the fifth, namely the age of information technology, knowledge and global telecommunication (Perez 2002, 10–12, 14) – in brief, ICT (information and communication technology, sometimes also referred to as just IT) – which started in 1971.

> *[Next to] the new products, industries and technologies that characterize it, each technological revolution gives birth to a new set of generic all-purpose technologies and a new organizational common sense, or techno-economic paradigm, capable of modernizing all the existing economic activities. Thus, the entire economy is gradually brought to a higher productivity level (and not just the new industries). (Perez 2004b)*
>
> *Technological revolutions change the 'commonsense' criteria for engineering and business behavior across the board. In fact, in my view, each technological revolution merits that name, not only for the importance of the new industries it ushers in and the new technical possibilities it opens but also – and perhaps mainly – because it radically modifies the 'best practice frontier' for all sectors of the economy. (Perez 2004a, 227.)*

Not only the economy is transformed, however, but so are state and society. This is due to the more general nature of TEPs, for they generate "a set of best practice principles which serves as a conscious or unconscious paradigm for steering institutional change and for designing the social tools with which to master the new

6 These surges correspond to what is otherwise called cycles or (long) waves, i.e. they are a form of the Kondratieff waves. The specific term "surge" serves both to avoid the often unpleasant bickering about long waves and, more importantly, to underline the difference from them which consists primarily in a much broader perspective, including social and political elements, and in that we are not talking about waves in the general sense but about overlapping surges which break but do not "swing down"; Perez 2002, 23 FN 30, 60–67; on the difference between surge and wave, 2006b.

techno-economic potential." (Perez 2004a, 217) "These principles can be said to conform to a techno-organizational paradigm."[7]

And as a theory such as this is also intended to "help see ahead to the next phase of the sequence, in order to design timely actions to make the best of the impending opportunities" (Perez 2002, 7; see 163), one is also compelled to look beyond the end of the ICT paradigm and to speculate about the sixth surge and thus about the technology (or technology cluster) that will lead it. According to Perez, it "has often been suggested that biotechnology, bioelectronics and nanotechnology might conform the next technological revolution." She states that all these fields are developing; however, she purports that the "key breakthrough" is far from even being predictable. (Perez 2002, 13) Also, it is possible – as is often said – that the sixth surge might be governed by a convergence of bio- and nanotechnology, or a larger convergence that also includes ICT (regarding convergence, see only Roco und Bainbridge 2003) – and of course, it might just as well be none of the above.

As we are in the middle of the fifth TEP, probably – since the Fall of 2008 – at the "beginning of the end" of its turning-point, we can tentatively assume on account of the inner structure of the TEP that the next paradigm will make its breakthrough and begin to diffuse roughly by 2025–35, not earlier.

2. Nanotech as a TEP

> *Nanotechnology is the creation of functional materials, devices, and systems through control of matter on the nanometer (1 to 100+ nm [one billionth of a meter]) length scale and the exploitation of novel properties and phenomena developed at that scale. A scientific and technical revolution has begun that is based upon the ability to systematically organize and manipulate matter on the nanometer length scale. … nanotechnology actually represents a revolutionary super-field that will eventually become a foundation for such currently disparate areas as inks and dyes, protective coatings, medicines, electronics, energy storage and usage, structural materials, and many others that we cannot even anticipate. … The new concepts of nanotechnology are so broad and pervasive, that they will influence every area of technology and science, in ways that are surely unpredictable. We are just now seeing the tip of the iceberg in terms of the benefits*

7 Perez 2004a, 238; see 218, 223, 229, 236–238; 2002, 16–19, 24–25, 153; see also Gehlen 1970, 36, 76–77. Thus, the TEP model certainly is a form of technological determinism, albeit "in a mild form," Perez 2007; see generally in this context Smith und Marx 1994; also Dolata and Werle 2007, esp. 9–104. The author of this paper is happy to diagnose some mild technological determinism for himself as well.

> *that nanostructuring can bring. (Los Alamos National Laboratory 2004)*

We are focusing on nanotechnology here because of its potential as the post-ICT paradigm-leading technology (and the purpose of the respective segment in TED3 is to go beyond ICT) and to reflect from there both upon ICT itself and upon technology and PM as such, especially because of – and not despite – the fact that nanotech and PM seem infinitely less related than ICT and PM. But what are the reasons for assuming that it is nanotechnology which will be the paradigm-leading technology in the sixth surge to begin with, rather than biotechnology or convergence? Cons include

1. the existence of alternatives such as the highly dynamic field of biotechnology and a placatory model of inclusive convergence so that it is by no means certain that nanotechnology will indeed "win the race";
2. the fact that before the big bang, it is always uncertain which technology will lead the next paradigm – in the 1960s and 1970s, as can be seen from the classical indicators, such as contemporaneous visions of the futures and science fiction, the designated next leading technology was nuclear power, not any kind of ICT;
3. the fact that according to Arnold Gehlen's philosophy of technology – which is not the foundation for Perez's theory, it is true, but which does seem to exhibit numerous parallels with it and to partially share its understanding of economy and society, and thus to provide an additional foundation to it (Gehlen 1970, 9)[8] –, nanotechnology does not represent a further abstraction, a further disengagement from the human body, when compared to ICT, which means that in effect, it would not constitute logical progress.[9]

Arguments in favor of nanotechnology as the leading one of the next TEP include

1. the conceivability of nanotechnology as a paradigm, i.e. its potential to radically change and transform the *Lebenswelt* of mankind, not just the economy;[10]

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8 I hope to shed further light on the Gehlen-Perez relationship some time soon; for the time being, it must remain a mere assertion – one, however, that has been discussed with Perez (discussion of 27 September 2007).

9 According to Gehlen, the history of technology in the sense of "organ replacement" is a result of a growing movement away from the body, from the organic to the inorganic; 1970, 9–11.

10 Nano-scenarios that have been suggested by industry, governments or in the context of technology assessment (see e.g. the otherwise excellent Elsner 2009) are frequently rather restrained and thought out for a short-term scope; thus, they take the further potential of nanotechnology only into account to a limited degree.

2. the unattractiveness of the alternatives: in effect, convergence is a "weasel word", evading the necessity to settle on one technology (and today rendering it possible to smuggle good old ICT into the new paradigm in a prominent or co-leading role, rather than as part of the infrastructure – a comfortable and comforting and thus tempting idea). Biotechnology, on the other hand, is much more limited than nanotechnology because in principle, any problem that can be solved by the former can also be handled with the latter – and a large amount of further problems on top of that (see, albeit with caution, Drexler 2007, Roco and Bainbridge 2003);[11]
3. the fact that the idea of nanotechnology as the leading technology is a realistic one, i.e. present solutions, patents, technologies, etc. make it seem possible from today's perspective (see most recently Elsner et al. 2009);
4. finally nanotechnology's potential of solving the problems of the fourth surge, the paradigm of mass production – namely the problems of material and energy (which could not be solved by the fifth wave) –, and also some of the problems of the fifth surge itself; for that reason, it represents logical progress.[12]

In sum, it may be said that the chances of nanotechnology indeed being the leading technology of the next TEP are fairly high, so that it at least seems sensible to focus on it and to ponder how to react to that scenario and what the consequences could be, from the perspectives of technology, economy and state and society.

3. nanoGov

This insight takes us to the main question of the current considerations at last, the connection of TEPs and governance (we will later get to PM; for a definition of governance, see Drechsler 2003). What could or should governance look like in the nano-paradigm, the sixth TEP, an era which only begins in 20–30 years? To ask such a question, to even suggest an answer for it, may strike one as frivolous from many a perspective, but in light of the TEP model, the question can be discussed at least in the realm of speculation.

What are the odds of nanotechnology influencing governance at all, even if it will indeed "take over" in a quarter of a century? According to the TEP model, the answer is that it is highly likely, for as we know, it is in the nature of the leading

11 The beginning of a TEP is always based on the preceding paradigm and develops from it, resulting in a kind of convergence; the important aspect regarding the new TEP, however, stems precisely from the specific elements of the leading technology, and the aspect of convergence rather makes it harder to recognize the latter. From today's perspective, it is hardly possible to envision a nano-paradigm without the enabling role of ICT. Perez herself, in fact, opts more for a convergence model (discussion of 30 November 2008).

12 See Perez and Freeman 1988, as suggested by Perez (discussion of 27 September 2007).

technology to influence and shape organization per se, general best practices and processes – this has to carefully be set apart from characteristics which are specific to the respective phases and periods. The current ICT paradigm is the best example, not only, but also with respect to the catchphrase "e-Governance" (eGov); the situation was the same in the previous paradigm of mass production. Judging from the theoretical basis of TEPs, it would be impossible that there was no influence of this kind during the sixth surge.

What sort of influence could it be though? Taking up Gehlen's argument again, we can attribute to nanotechnology a return to the physical, for what is central here is substance, material, things, everything that belongs to the "real world", including the human body. This is precisely what ICT – and several theories from the ICT era – distanced itself from by overcoming space, privileging ideas and communication; the key word was frequently "virtuality" (an obsolete concept in 2010, when the – always imagined – walls between the "virtual" and the "real" worlds have very obviously crumbled). The randomness of space, substance, the body and its dwelling-place, all but defining to ICT, would be revoked or even supplanted in a paradigm that centers on matter and the body. This would speak for the formation of physical clustering of production as well as of life, for the necessity of gathering at specific places, and thus for matters of space and in effect their power, for bigger problems in the context of migration, demographic shifts, etc.[13] The relevance of a governance structure which coordinates, balances but also conserves, in other words that of a classical state of an Aristotelian conception (Arist. Pol.), is thus likely to grow remarkably.

Is it necessary though to know today, or at least to think about, what governance might look like in the nano-paradigm? "No" appears to be the proper answer here for – apart from the lack of recognizability – no precautions must or can be taken right now for this distant age; there is no impact on today. It shall be said, however, that precisely because of the similarities with biotechnology, which also heavily focuses on the body, speculations regarding the nano-paradigm are certainly suitable at present to serve as a corrective for the absolutization of ICT – in other words, ICT also has an expiration date on it, at least as regards its dominant role. (cf. Drechsler 2002) This is all the more necessary because the difficulty even for those whose profession entails dealing with future, change, strategy and innovation, to imagine a world in which the net world, communication and information are not *as* important anymore as they are today is immense (important they surely will

13 In such a case, Carl Schmitt's philosophical philosophy, contested as it well may be, seems to offer itself as an appropriate tool to grasp the paradigm; cf. Drechsler 1997.

remain).[14] It is all the more difficult, perhaps almost impossible, for those aware that we are only at the beginning of the impact ICT will have, not only on governance and PM, but on people and their identities as such, in the years to come because of the truly radical transformation of human interaction caused by the Web 2.0 (for some good journalistic accounts, see Stone 2010; Rieger 2010; Schirrmacher 2009), which means that the proper focus on what was once eGov must today be on Facebook, Twitter, Google or Skype. (Castells 2009)

4. The State and TEPs

But how about the role of the state in the TEP model generally? The idea of governance is an ICT approach per se, i.e. an approach significantly inspired and shaped by the ideas of networks, communication and information (see Castells 2001, Drechsler 2005); thus, it might not be a permanent "acquisition" but rather a temporary phenomenon linked to the current paradigm. However, the following considerations are mainly concerned with govern*ment*, in other words with the role of the state in its actual narrow sense (Drechsler 2003, 2004, 2005, and government persists within governance and remains relevant or even grows regarding its tasks. (Kattel 2004) In addition, it is always a central feature of a paradigm-leading technology that it achieves a political unity of the first, second and third sectors, i.e. classical governance, by influencing all of them in a significant way. So, the potential temporality of the phenomenon may be considered harmless for our purposes.

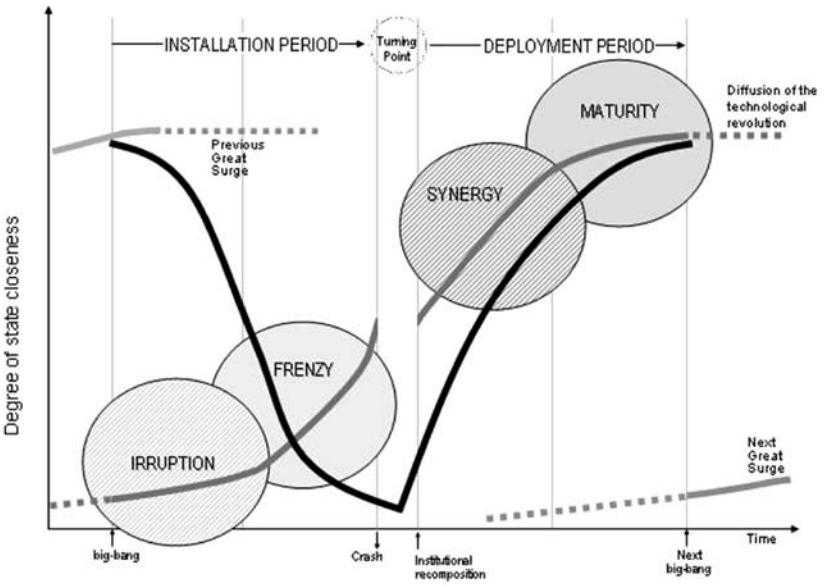
These thoughts direct our considerations towards the role of the state in the gestation period of the next paradigm during the deployment period of the current one, i.e. its phases of synergy and maturity, at the end of which the preparations for the next surge and, soon after, the big bang of the new leading technology occur. How does, or should, the role of the state look during this time?

It is highly relevant at this point to figure out which features belong to the paradigm, the period and the phase respectively. I would like to suggest that the regard in which the state and its power are held, the attitude towards the state *and thus* its power and standing – well beyond the state's engagement in the economy – and which I will call "state closeness" (i.e. closeness to the state, *Staatsnähe*, for current lack of a better word), both on account of empirical evidence and the inner logic of the model, is indeed a matter of the period, not the paradigm. In the installation period, there is "state distance" (*Staatsferne*) – there is general critique, indeed rejection of the state and its possibilities, which leads to a critique of the tasks of the state

14 Perez herself thus sees ICT as "likely to be the platform for a knowledge-based society for many decades to come" and "as 'manufacturing' was for the first four surges; the underlying logic of several sets of technologies of increasing complexity and going deeper into the dynamics of matter." (Discussion of 30 November 2008)

and their reduction, or at least an attempt thereof –, while the deployment period is denoted by state closeness. (See Drechsler et al. 2006, 15–20)

As the following graph[15] will show, I suggest that this is less so in the sense of stability but, as was to be expected, in a dynamic form. Contrary to the surges themselves, which as Perez has noted and indeed discovered are precisely not waves or cycles (Perez 2006b), the degree of state closeness seems, by way of a hypothesis that I herewith offer, to change in a fairly genuinely wavelike trajectory that shows a sharp decline during installation, an often swift reversal with the crash, and a steady but weakening ascent during deployment.



Of course, this graph is not "scientific" in the sense of empirical validation, nor of a precise denotation of the y-axis; it only expresses a certain dynamic that can be less quantified than experienced, as is appropriate for the TEP theory – however, some further corroboration is surely required (and also intended). Most certainly, the curve will look differently in different surges, as well as in different countries (the present one is altogether based on the development in the core

15 Original graph supplied by Perez for Drechsler 2009b (23 November 2007), based on Perez 2002, 48, adapted by the author. Again adapted by the author for 2009a and adjusted after discussions with Perez (29–30 November 2008). © Carlota Perez 2002, 2007; this version © Wolfgang Drechsler 2007, 2008. Perez herself did agree with the dynamics of the curve but sees a slightly different shape, especially longer plateaus of state closeness and more steep descents and particularly ascents (discussion of 1 December 2008).

country or countries), and as always, its smoothness is only an ideal, but the general trajectory should hold if the hypothesis were to be judged as correct or at least heuristically useful.

The active, competent, appreciated state would actually be an obstacle in the period of installation, which is characterized by focusing on the economy (and new technology), being speculative and having almost an "anti-societal" stance and which *must* (both in the sense of "will" and "should") lead to a "faulty result", while state distance is needed in the frenzy phase both for phasing out the old leading technology and for supporting and establishing the new one.

Yet not only the end of the current paradigm requires the state in the sense of creative destruction management,[16] but also – and this is a key aspect for the entire considerations regarding state closeness –, even especially, the implementation of the deployment period demands this, particularly in the non-economic realm, which for the most part is the foundation for whether the synergy phase really gives rise to a "golden" or merely a "gilded" age. (See Perez 2002, 53, 76, 167; 2007) Recent developments, unfortunately, seem to indicate that precisely this might be the case right now, partially because the current crisis was mastered "too well" by the state side both in Europe and the United States and thus only led to a temporary change of mind of the protagonists of the old mindset of *Staatsferne*; the upswing of the curve, in some respects, seems halted. (See Drechsler forthcoming; cf. Cassidy 2010)

Especially concerning the development of the new leading technology, however, it is the state's responsibility not only to support but also to help shape it because hardly anything happens "just like that"; the market does not do so automatically. Some sort of risk socialization appears to be necessary if one does not want the new technology to pass one by, and economic, industrial and indeed innovation policy has always been the hallmark of the successful state (including, as we now would add, state-like organizations). (See Wade 2003; Reinert 1999; Rochet 2007.) Indeed, as has apparently been the case so far, every time a new paradigm is launched, the state's specific role is to reduce the risk that the state in question misses out on progress or that its position is not sufficiently suitable for the new phase. Because of the central importance – in the context of innovation and surges – of the reorientation of the national economy towards the new leading technology, any other outcome would mean falling behind, with all its dire consequences.

16 In the TEP model, creative destruction takes place both in the collapse before the turning-point and in the transition from one TEP to the next, i.e. roughly every 20–30 years; in different shapes, but in both instances as part of the installation period.

5. nanoPM

What does this mean for the role of the state regarding nanotechnology? If, as I have argued, the odds that it will turn into the new leading technology are high, it must not be neglected, even now. The state's task now would be to make big investments in the sector (both research and development); of course, other sectors and other technologies (e.g. biotechnology) must also be kept in mind. It is relevant though that investments of this kind do take place, and especially in niches that the economy has shied away from (at least so far), i.e. investment in basic research on the one hand and in a range of products on the other that sound illusory and do not seem usable in any way – thus, by no means e.g. investment in paint and varnish or medicine, areas where a crowding-out effect could be expected. What is relevant here is precisely the possibility for the state *not* to let its behavior be governed by the urge to be lucrative, or rather: only lucrative in the long run, and that the state can shoulder a high risk level.

Investments which might have a larger effect on economic growth and employment in maybe 20–30 years can only be made if its timeframe is clear and if there are no expectations of faster extensive effects (and, as an aside, if the present focus is on the current TEP, namely ICT). (Perez 2006a) On the part of the state actors, three fundamental – and by no means new – qualities are again necessary, which were neglected or even disparaged in the context of state critique and state pessimism typical of the installation period that prevailed in the last few decades:

1. a long-term strategy, which also includes long-term perspective, employment and responsibility, according to the given timeframe;
2. a high level of competence among the actors, concerning both management abilities and the grasp of innovation and new technology;
3. the permission to make big mistakes and bad investments, for what is important is precisely the support for developments that might turn out to be dead ends – otherwise, the state would not be needed.

Thus, to be adequately prepared for the nanotechnology paradigm, a state is required that employs a long-term perspective, has enough capacity at its disposal and tolerates mistakes. At this point, therefore, the question regarding nanotechnology and PM in the TEP context comes up, i.e. the question of which model of organizing PM is ideal for the establishment of nanotechnology (for instance, such as it were) as a TEP. As I have claimed previously (e.g. Drechsler 2009a; 2009b; Drechsler and Kattel 2009), among the options we have today, this clearly is the Neo-Weberian State (NWS) as conceived by Pollitt and Bouckaert. (2004, 96–102; see Pollitt et al. 2009) Taking up the positive elements of the New Public Management (NPM) but on a Weberian foundation, so that both are asymmetrically *aufgehoben*, the NWS reaffirms "the role of the state as the main facilitator of solutions to the new problems

of globalization, technological change, shifting demographics, and environmental threat … [and] the idea of a public service with a distinct status, culture, and terms and conditions." (Pollitt and Bouckaert 2004, 99) The NWS thus can reintroduce precisely the features of long-term thinking, administrative capacity and tolerance for mistakes to a PM that was crushed into expensive agony by the NPM, which was exactly the kind of PM theory matching the *Zeitgeist* of the installation period and its *Staatsferne* – suitable, perhaps, then; certainly obsolete today.

Since the NWS was the topic of TED1 (see Pollitt et al. 2009 and, in it, Drechsler and Kattel 2009), I will refrain from going into further details here. (I have summed up the NWS most recently in Drechsler 2009b and 2009c), I will just point out two things: First, it is interesting that in the field of PM and its scholarship – internationally and specifically in Europe – a reorientation away from the NPM and towards the NWS was already taking place slightly before the crash, as TED1, which as it seems was the first high-level conference dedicated to the concept, took place in January-February 2008, when there was only some faint writing on the wall.[17] Thus, it was already in the turning-point itself that the PM perspective changes from the state distance characteristic of the installation period to the state closeness of the deployment period; the forms of the last paradigm are not simply replicated, however, instead they are reshaped, also particularly by components supported or even rendered possible by the leading technology of the current paradigm, ICT, such as complex civil involvement in processes of decision and control.

At this point, it might be worth reiterating, secondly, that eGov (or iGov or however it will turn out to be called in the decades to come) is a function of the ICT paradigm, not the period and thus independent of the question regarding state closeness or distance. NPM was specifically not unique to ICT, but intrinsic to installation periods; e-governance is in no way, empirical or other, related to NPM. (See Dunleavy et al. 2005, 2006) Hardly any categories, even the Weberian ones, are rendered obsolete by ICT (potentially that of exclusive employment, which is more of a problem in core areas of civil service anyway), some – such as the written principle or the division of labor – are even enhanced or at least exhibit reverse processes, e.g. the principle of hierarchy, which is weakened by models of network organization on the one hand but which can only realize its full potential by means of ICT's possibilities of extreme control and coordination on the other. (Drechsler 2005) How the Web 2.0 will change that remains to be discussed and to be experienced.

17 On the NWS as the most suitable PM model for the current times of crisis and the period thereafter, see Drechsler 2009c and, more generally, Drechsler forthcoming.

6. Conclusion

In sum, while I hopefully have shown, based on the TEP theory, that a nanotechnology-dominated age will almost certainly lead to other forms of optimal PM than the ones we have today, those forms are too elusive for us to say much about them now. However, a push-pull effect can be detected from the perspective of the relationship between nanotechnology and governance regarding the path towards such an age: Nanotechnology requires a well-working state to establish itself appropriately; in return, it supports state closeness by its implicit demand for state competence, a long-term focus and tolerance for mistakes. The same can be said for all paradigm-leading technologies, including biotechnology if it were to "win"[18], and therefore *in extenso* for the role of the state, including PM, in the TEP model, which seems to be wave-like with the nadir in the turning-point and thus the zenith between the maturity of one and the irruption of the successive paradigm. If this were so, it would significantly add to our understanding of why the state and PM are evaluated differently at different times, and what the implications of this are. The significance of the paradigm shift for governance and PM also presents a further argument in favor of a sensible development towards the NWS at this moment. As to the question of TED3, "Public Management Reforms Now and in the Future: Does Technology Matter?", from the TEP perspective, the answer is an unqualified yes.

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References

Arthur, W. Brian. 2009. *The Nature of Technology: What It Is and How It Evolves*. New York: Free Press.

Arthur, W. Brian. 2002. "Is the Information Revolution Dead? If History is a Guide, it is not." *Business 2.0*, March 2002. Available at http://www.business2.com/articles/mag/ 0,1640,37570,00.html (Accessed 15 November 2010).

18 Again, as was stated *supra*, there is not and cannot be conclusive agreement on what the next paradigm-leading technology will be, but the current analysis would also hold true when applied to biotechnology, which is likewise faced with similar challenges, both scientific and policy-related, that require extensive policy and administrative capacity on the part of the state; cf. most recently Rothmayr Allison 2009 (which I have not seen yet).

Cassidy, John. 2010. "After the Blowup: Laissez-faire Economists do some Soul-Searching – and Finger-Pointing." *The New Yorker*, 11 January, 28–33.

Castells, Manuel. 2009. *Communication Power*. New York: Oxford University Press.

Castells, Manuel. 2001. *The Internet Galaxy: Reflections on the Internet, Business, and Society*. New York: Oxford University Press.

Dolata, Ulrich and Raymund Werle (eds). 2007. *Gesellschaft und die Macht der Technik. Sozioökonomischer und institutioneller Wandel durch Technisierung*. Frankfurt/Main, New York: Campus.

Drechsler, Wolfgang. Forthcoming. "Public Administration in Times of Crisis." Keynote address, 18th NISPAcee Annual Conference, Warsaw, Poland, 12 May 2010, to be published.

Drechsler, Wolfgang. 2009a. "Governance in and of Techno-Economic Paradigm Shifts: Considerations for and from the Nanotechnology Surge." In Wolfgang Drechsler, Rainer Kattel and Erik S. Reinert (eds). *Techno-Economic Paradigms. Essays in Honour of Carlota Perez*. London, New York: Anthem, 95–104, 410–412.

Drechsler, Wolfgang. 2009b. "NanoGov – Nanotechnologie, Innovation, Governance und Verwaltung aus der Perspektive der Techno-Ökonomischen Paradigmen." In Arno Scherzberg and Joachim Wendorff (eds). *Nanotechnologie – Grundlagen, Anwendungen, Risiken, Regulierung*. Berlin, New York: de Gruyter Recht, 307–325.

Drechsler, Wolfgang. 2009c. "The Rise and Demise of the New Public Management: Lessons and Opportunities for South East Europe." *Uprava – Administration* 7 (3), 7–27.

Drechsler, Wolfgang. 2005. "eGovernment and Public Management Reform." Plenary lecture, eGovernance Catalonia Forum '05: "Public Administration in the age of the Internet." Barcelona, 13 June 2005. Available at http://www.gencat.net/forum-egovernance/2005/cat/ponencies.htm (Accessed 15 November 2010).

Drechsler, Wolfgang. 2004. "Governance, Good Governance, and Government: The Case for Estonian Administrative Capacity." *Governance and Good Governance*, *Trames* 8 (4), 388–396.

Drechsler, Wolfgang. 2003. "Good Governance." In Hanno Drechsler, Wolfgang Hilligen and Franz Neumann (eds). *Gesellschaft und Staat. Lexikon der Politik*. 10th edn. München: Franz Vahlen (C. H. Beck).

Drechsler, Wolfgang. 2002. "Darin Barney: *Prometheus Wired: The Hope for Democracy in the Age of Network Technology*, and Hubert L. Dreyfus: *On the Internet*." *Philosophy in Review/Comptes Rendus Philosophiques* 22 (2), 86–89.

Drechsler, Wolfgang. 1997. "Carl Schmitt: *The Leviathan in the State Theory of Thomas Hobbes*." *Perspectives on Political Science* 26 (2), 125–126.

Drechsler, Wolfgang and Rainer Kattel. 2009. "Conclusion: Towards the Neo-Weberian State? Perhaps, but Certainly adieu, NPM!" In Christopher Pollitt et al. (eds). *A Distinctive European Model? The Neo-Weberian State*. *The NISPAcee Journal of Public Administration and Policy* 1 (2), 95–99.

Drechsler, Wolfgang, Rainer Kattel and Erik S. Reinert (eds). 2009. *Techno-Economic Paradigms. Essays in Honour of Carlota Perez*. London, New York: Anthem.

Drechsler, Wolfgang et al. 2006. "Creative Destruction Management in Central and Eastern Europe: Meeting the Challenges of the Techno-Economic Paradigm Shift." In Tarmo Kalvet and Rainer Kattel (eds). *Creative Destruction Management: Meeting the Challenges of the Techno-Economic Paradigm Shift*. Tallinn: PRAXIS Center for Policy Studies, 15–30.

Drexler, K. Eric. 2007. *Engines of Creation 2.0: The Coming Era of Nanotechnology – Updated and Expanded*. WOWIO Books (www.wowio.com).

Elsner, Nils et al. 2009. *Meta-Roadmap Nanomaterialien: Zukünftige Entwicklungen und Anwendungen*. Düsseldorf: Zukünftige Technologien Consulting.

Freeman, Christopher and Francisco Louçã. 2001. *As Time Goes By: From the Industrial Revolution to the Information Revolution*. Oxford: Oxford University Press.

Gehlen, Arnold. 1970 [1957]. *Die Seele im technischen Zeitalter: Sozialpsychologische Probleme in der industriellen Gesellschaft*. Hamburg: Rowohlt.

Kattel, Rainer. 2004. "Governance of Innovation Policy: The Case of Estonia." *Governance and Good Governance*, *Trames* 8 (4), 397–418.

Kondratieff, Nikolai D. 1926. "Die langen Wellen der Konjunktur." *Archiv für Sozialwissenschaft und Sozialpolitik* 56 (3), 573–609.

Los Alamos National Laboratory. 2004. "What is Nanotechnology?" Nanoscience and Technology website. Available at http://www.lanl.gov/mst/nano/definition.html (Accessed 15 November 2010).

McCraw, Thomas K. 2007. *Prophet of Innovation: Joseph Schumpeter and Creative Destruction*. Cambridge, MA, London: Belknap (Harvard).

Nelson, Richard R. 1994. "The Co-evolution of Technology, Industrial Structure, and Supporting Institutions." *Industrial and Corporate Change* 2 (1), 47–63.

Nordmann, Alfred, Joachim Schummer and Astrid Schwarz (eds). 2006. *Nanotechnologien im Kontext: Philosophische, ethische und gesellschaftliche Perspektiven*. Berlin: Akademische Verlagsgesellschaft.

Perez, Carlota. 2007. "Technological Revolutions, Paradigm Shifts, and Social Goals." The 2007 Marie Jahoda Annual Lecture, SPRU, University of Sussex, Brighton, October 2007 (ppt).

Perez, Carlota. 2006a. "Re-specialisation and the Deployment of the ICT Paradigm: An Essay on the Present Challenges of Globalization." In Ramon Compañó et al. (eds). *The Future of the Information Society in Europe: Contributions to the Debate*. [Sevilla:] IPTS, Luxembourg: OOPEC, EUR 22353 EN, 33–66.

Perez, Carlota. 2006b. "The Turning Point: An Open Stage for Socio-Political Choice." Lecture, 40th Anniversary of the Research Policy Institute/CIRCLE, Lund University, Lund, September 2006 (ppt).

Perez, Carlota. 2004a. "Technological Revolutions, Paradigm Shifts and Socio-Institutional Change." In Erik S. Reinert (ed.). *Globalization, Economic Development and Inequality: An Alternative Perspective*. Cheltenham, Northampton, MA: Edward Elgar, 217–242.

Perez, Carlota. 2004b. "The Context for Innovation Policies and Strategies after the Financial Frenzy of the 1990s." Keynote address, 4th European Forum for Innovative Enterprises, Stuttgart, 6 December 2004 (ppt).

Perez, Carlota. 2002. *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages*, Cheltenham, Northampton, MA: Edward Elgar.

Perez, Carlota and Chris Freeman. 1988. "Structural Crises of Adjustment, Business Cycles and Investment Behaviour." In Giovanni Dosi et al. (eds). *Technical Change and Economic Theory*. London: Pinter, 38–66.

Pollitt, Christopher. 2010. "Technological Change and Public Service Management: Towards a Conceptual Framework." *NISPAcee Journal of Public Administration and Policy* 3 (2), 31–53.

Pollitt, Christopher. 2008. *Time, Policy, Management: Governing with the Past*. Oxford: Oxford University Press.

Pollitt, Christopher and Geert Bouckaert. 2004. *Public Management Reform: A Comparative Analysis.* 2nd edn. Oxford: Oxford University Press.

Pollitt, Christopher et al. (eds). 2009. *A Distinctive European Model? The Neo-Weberian State*. *The NISPAcee Journal of Public Administration and Policy* 1 (2).

Reinert, Erik S. 1999. "The Role of the State in Economic Growth." *Journal of Economic Studies* 26 (4/5), 268–326.

Rieger, Frank. 2010. "Der Mensch wird zum Datensatz." *Frankfurter Allgemeine Zeitung*, 16 January.

Rochet, Claude. 2007. *L'innovation, une affaire d'état*. Paris: L'Harmattan.

Roco, Mihail C. and William S. Bainbridge (eds). 2003. *Converging Technologies for Improving Human Performance: Nanotechnology, Biotechnology, Information Technology and the Cognitive Science*. Dordrecht: Kluwer.

Rothmayr Allison, Christine (ed.). 2009. *The Impact of the Biotechnology Revolution on Comparative Policy Studies*. *Journal of Comparative Policy Analysis* 11 (4).

Schirrmacher, Frank. 2009. *Payback: Warum wir im Informationszeitalter gezwungen sind zu tun, was wir nicht tun wollen, und wie wir die Kontrolle über unser Denken zurückgewinnen*. München: Blessing.

Schummer, Joachim and Davis Baird. 2006. *Nanotechnology Challenges: Implications for Philosophy, Ethics and Society*. Singapore: World Scientific.

Schumpeter, Joseph A. 1939. *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process*. New York, London: McGraw-Hill.

Schumpeter, Joseph [A.]. 1924. "The Instability of Capitalism." *The Economic Journal* 151, 361–386.

Smith, Merritt Roe and Leo Marx. 1994. *Does Technology Drive History? The Dilemma of Technological Determinism*. Cambridge, MA: MIT Press.

Stone, Brad. 2010. "The Children of Cyberspace: Old Fogies by their 20s." *The New York Times*, 10 January.

Wade, Robert. 2003. *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*. Reprint. Princeton, NJ: Princeton University Press.

Interorganizational Information-Sharing as a Driver of Change in Public Administration

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Abstract

Information and Communication Technologies (ICTs) are used by public agencies to collect, process, manage, use and share information. Due to their widespread use and the ongoing development of new technologies, the question arises to what extent these technologies will change or reform public administration. Whereas some scholars see ICT as a driver of transformation in the public sector, other scholars argue that the impact of these technologies on the public sector is rather limited. In order to gain a better understanding of this debate, it should be noticed that the study of ICT use in the public sector encompasses a wide range of technologies, including a wide range of different channels and services, distinct processes and structures and many involved parties. While the use of ICT in public administration is often conceived as placing governmental services and products online, it can be argued that the most promising feature of ICT in public administration involves the ability to share information across organizational boundaries. This paper discusses interorganizational information-sharing as a crucial element in e-government and as a driver of change in public administration. A case study of the Belgian social-security sector illustrates how information-sharing enabled several transformations in the Belgian social-security administration.

1. Introduction

During the last decennia, information and communication technologies (ICT) have found their way into public administrations. These new technologies are used by a growing number of public administrations in support of their internal operations and relations with external partners. They facilitate the collection, processing, management, use and sharing of information, which can be considered one of the basic resources of public administration (Mayer-Schönberger and Lazer 2007; Bellamy

and Taylor 1998). With the introduction of ICT into public administration, the question arose whether these technologies could cause dramatic transformations in the public sector. Their widespread use and the ongoing development of new technologies made this question even more pertinent. For many years, the debate on the transformative potential of ICT has been one of the key discussions in e-government literature (Snellen and van de Donk 1998; Danziger and Andersen 2002; Bellamy and Taylor 1994). While some scholars regard ICT as an important enabler of transformation in the public sector (Fountain 2001; Bellamy and Taylor 1994), other scholars argue that the impact of these technologies on the public sector is rather limited (Kraemer and King 2006; Gauld and Goldfinch 2006).

The discussion concerning the – potential – impact of ICT on public administration often happens on an abstract level with general statements about the impact of ICTs. However, we might not ignore the multi-dimensionality of the ICT concept as there are many different types of ICT that can be used for many purposes. There still exists a widespread misunderstanding that the use of ICT in public administration is only restricted to the online presence of public administrations through governmental websites (Homburg and Bekkers 2002; Crompvoets et al. forthcoming). These websites are just one expression of the use of ICT in public administrations besides many others. A growing number of scholars argue that the main contribution of ICT to public administration is its capability to facilitate interorganizational information-sharing (Dawes 1996; Pardo and Tayi 2007). Benefits of information-sharing are considered to be high and diverse, and the ability to share information between organizations is often seen as a pre-requisite for successful use of ICT in public administration (Gil-Garcia et al. 2009; Bekkers 2007b). However, obstacles to information-sharing are proportionally high, and thus great efforts are needed to make information-sharing happen (Landsbergen and Wolken 2001). Taking into account the benefits that information-sharing can provide and the challenges to achieving these benefits in practice, information-sharing can be considered an essential driver of change in the public sector. As information-sharing affects the distribution of one of the key resources in public administration, it likely affects the structure and functioning of public administration.

The main objective of this paper is to introduce interorganizational information-sharing as a key element of the use of ICT in public administration. In addition, this paper also discusses the transformative potential of information-sharing in the public sector. The debate on the transformational power of ICT is used as a starting point for our discussion. The paper starts with a short overview of the ongoing debate (Section 2). In order to bring more clarity into this debate, we introduce and discuss the multi-dimensionality of the use of ICT in public administration (Section 3). Subsequently, the capability of ICT to facilitate interorganizational information-sharing is introduced as the key contribution of ICTs to the public sector (Section 4). Finally, a case study of the Belgian National Employment Office is presented to illustrate how interorganizational information-sharing can be an enabler of change

in public administration (Section 5). The paper ends with some conclusions and a few words on the generalization of the research findings (Section 6).

2. ICT as driver of reform in public administration

The presence of ICT in public administration can no longer be neglected. Public administrations make more and more use of these new technologies for internal activities as well as external service provision to citizens, companies and other partners. The question comes up to what extent these technologies will change or reform public administration. Will the existence of ICT in public administration lead to a new type of government? Or is the idea of ICT-based reform nothing more than an illusion? Although academics agree to the widespread use of ICT in public administration, less agreement exists regarding the ability of these technologies to change the public sector (Danziger and Andersen 2002). The massive introduction of ICT into public organizations led to the expectation that these technologies could be a driver of transformational changes in public administration. Several academics affirm that ICT has the potential to transform the public sector in a dramatic and enduring way (Fountain 2001; Heeks 1999). These academics state that the contribution of ICT to public administration is not restricted to an increase in the quality, productivity and efficiency of public-sector activities and argue that the introduction of ICT might result in radical changes in public administration. The basic reasoning behind this belief is that information is a key resource in public administration. As new technologies change the way in which this resource is distributed and used within and between public organizations, they also will change government institutions (Bellamy and Taylor 1994).

Concerning the direction of this transformation, three main trends can be distinguished (Frissen 1998). First, the introduction of ICT in public administration leads to a horizontalization of the public sector. Hierarchical bureaucratic structures will be replaced by network types of organizational configurations, and horizontal relationships within and between organizations will be more important. Second, new technologies also lead towards "deterritorialization" as time and space become irrelevant factors. Constraints of time and space to manage and organize the public sector are weakened by the development of new technologies. Third, these technological developments introduce virtualization in the public sector. Virtualization refers to the increasing ability to simulate existing realities by using technologies as well as creating new virtual realities.

While some authors argue that ICT will dramatically transform public administration, there are many other authors that do not believe in the transformational potential of ICT. In their opinion, ICT can contribute to transformations in the public sector, but will never be the main driver behind these transformations. ICT is considered one resource besides many others. Some authors even state that ICT

will rather confirm or even strengthen existing structures, processes and positions in public administration (Kraemer and King 1987; Pratchett 1998). Claims that ICT is an enabler of transformation in the public sector are seriously undermined by the lack of evidence to support these claims (King and Kramer 2006). After reviewing empirical studies concerning the impact of ICT on public administration, Danziger and Andersen (2002) conclude that evidence supporting the transformational power of ICT in government is still limited. In most of the studies they examined, the impact of ICT on public administration was restricted to making existing operations and services more efficient and more productive and improving the access and quality of data. However, little evidence was found that ICTs enabled major changes or transformations in the public sector. O'Neill (2009) drew the same conclusion in her case study on the transformative impact of ICT on the New Zealand public administration. Transformations were primarily instrumental in character, meaning that they brought changes to existing processes and procedures. There was no evidence that the use of ICT in public administration had led to systematic transformations, or changes in key relationships within public administration. These findings underlined that e-government is "about doing the same things differently, but not about doing different things" (O'Neill 2009).

Taking into account the lack of general empirical support for the transformative potential of ICT in public administration, Bekkers (2007a) argues that the effects of ICTs are limited to specific contexts in which these technologies are introduced. Changes in public administration that are effected by ICT are in most cases specific and context-driven. The main reason is that the introduction of ICT in the public sector cannot be considered a neutral event, but in fact a political intervention. The introduction of ICT is a value-driven intervention in a policy and organizational context that influences the position, interests and values of all involved parties. The impact of ICT can only be understood in relation to a specific context.

It is worth noting that the debate on ICT as an enabler of change in public administration is mainly situated within a specific group of scholars (Margetts 2003). Until now, research on the way how ICTs are introduced and used in the public sector and how ICT could change this sector is to a large extent only conducted by an isolated group of academics. Unfortunately, these scholars hardly succeed in bringing their work and insights into the mainstream debate concerning public administration. In mainstream public-administration literature, ICTs are rarely considered potential drivers to change (Margetts 2003). While in public administration practice, the awareness of ICT opportunities and challenges is high and still growing, in public-administration research, this awareness still needs to be raised.

The same observation is made by Meijer (2007), who justifies his observation by an analysis of some peer journals and some handbooks in public-administration research. His analysis showed that the degree of attention for ICT was extremely low. In addition, Meijer tried to identify the main causes for this situation. For in-

stance, a possible cause might be the rise of new topics such as globalization and multi-culturization, pushing the topic of informatization to the background. Responsibility for the limited attention for ICT in public-administration research can also partially be placed on scholars in the field of ICT and government themselves. In many cases, these scholars are too careful in stressing the effects of ICT on public administration. Moreover, these scholars can also be criticized for their primary focus on ICT as a dependent variable. Most of their studies focus on explaining the emergence or adaptation of ICT in the public sector. These studies are designed to explain the use of ICT in public administration on the basis of several other variables. However, from a public-administration perspective, it is more interesting to know how changes in public administration (as a dependent variable) are driven or enabled by the emergence of ICT (as an independent variable). The fast and continuous developments in the domain of ICT also offer a possible explanation why it is difficult to provide a good judgment on the value and impact of these technologies on public administration. Scholars often have the tendency to focus on the latest developments. Empirical research is often based on the exceptional cases, and the development of general theoretical frameworks is hindered (Meijer 2007).

The fast and ongoing technological developments contribute to expand this research arena. New forms of technologies that are introduced and adopted in public administrations also become subjects of studying ICT in public administration. It is important to notice that the study of ICT involves a wide range of technologies, with specific characteristics, specific purposes and a specific – potential – impact on public administration.

3. E-government as a multi-dimensional concept

The concept of e-government is often used as a generic term for the use of ICT in public administration. However, conceptual confusion is created by the lack of an agreed definition of this concept. For instance, West (2004) defines e-government as "the delivery of government information and services online through the Internet or other digital means". This narrow interpretation of e-government strongly emphasizes the use of ICT for delivering information and services online. In contrast with this narrow view on electronic government that focuses on citizen-government transactions online, many academics have recommended a much broader definition of e-government (Mayer-Schönberger and Lazer 2007). E-government in broad terms covers the entire use of ICT in the public sector. The difference between both definitions is striking and illustrates the vagueness of the e-government concept (Yildiz 2007). This vagueness is partly caused by the tendency of both practitioners and academics to emphasize a particular aspect of the use of ICT in e-government. However, it should be stressed that e-government is a multi-dimensional concept, including a wide range of ICT systems and architectures, different access channels and services, distinct process structures and many involved parties (Traunmüller

and Wimmer 2003). A broad perspective to e-government is needed to take into account this multi-dimensionality referring to the use of ICTs in public administration in general.

In e-government literature, several subdivisions are made on the basis of these different dimensions of e-government. Discussing these subdivisions helps us to gain insight in the e-government concept. First, a distinction could be made between front-office and back-office systems and activities. Front office refers to the information and services provided and the interaction between government and both citizens and businesses. Back office refers to the internal operations of an organization that support core processes and are not accessible or visible to the general public (OECD 2003). This separation of the back office (where a service is produced) from the front office (where it is handed over to the citizen or customer) makes it possible to concentrate on the production of a service while at the same time bringing the service closer to its recipient. A key factor for the success of e-government will then be the integration of front and back office (Traunmüller and Wimmer 2003).

Second, subdivisions within e-government are often made in terms of the various types of relationships and partnerships that are enabled or affected by the use of ICT. For example, a distinction can then be made between Government-to-Citizen (G2C), Government-to-Business (G2B) and Government-to-Government (G2G) relationships (Reddick 2004). Subsequently, specific concepts can be used to describe each of these relationships: e-citizen (G2C), e-commerce (G2B) and, somehow confusingly, e-government (G2G) (Fang 2002). This subdivision in three categories can be refined or extended in several ways. For instance, new types of relationships can be incorporated (e.g. Government-to-Civil Society Organizations and Citizen-to-Citizen relationships), or the direction of the relationships can be specified (Government-to-Citizen and Citizen-to-Government).

Third, e-government can be categorized in terms of the type of services that are provided (Bekkers 2003). Five types of services can be distinguished: 1) information services, 2) contact services, 3) transaction services, 4) participation services and 5) data-transfer services. Information services are related to the disclosure of government information. Contact services offer the possibility to contact public administrations, to ask questions or to make a complaint. Transaction services are focused on the intake of certain requests or applications and the completion of these requests. Participation services provide citizens (and organizations) a channel to get involved in processes of policy formulation and policy evaluation. Finally data-transfer services are related to the exchange and sharing of information within and between (public) organizations.

In the view of several authors, e-government should be seen as an evolutionary phenomenon (Layne and Lee 2001; Andersen and Henriksen 2005). In this perspective, e-government and its development is studied by designing models

of stages in e-government. Layne and Lee (2001) distinguish four stages towards full e-government. In stage one, the electronic cataloguing stage, governmental organizations create their own website to provide government information online. Electronic transactions between governments and their customers become possible in stage two. At this second stage, citizens can fulfil their government requirements online. The third stage is the stage of vertical integration when government operations within functional areas in government are integrated. The focus thus moves from the automatization and digitization of existing processes towards a transformation of public administration. The full potential of e-government is achieved in the fourth and final stage, where electronic services are horizontally integrated across functional areas. Heeks and Bailur (2007) found that most research in the field of e-government is model-based, and variants on the stage model are applied as a model the most. However, the stage-based perspective to e-government development is often criticized, as stages of e-government do not necessarily follow each other in a linear order (Yildiz 2007). Moreover, it can be argued that organizations or countries that still need to develop their electronic activities have the chance to learn from the successes and failures of past e-government initiatives. This might enable them to proceed through the different stages of e-government in a less linear order.

A final distinction that is often made in e-government literature is the distinction between pre-internet technologies on the one hand and post-internet technologies on the other hand. Before the arrival of the internet and web-based technologies, public administration made use of ICT to support and improve their internal processes and communications (Ho 2002). Web-based technologies constituted a great breakthrough as they opened up public organization to external entities. This distinction between pre-internet and post-internet technologies is partially related to the distinction between ICT use for internal processes/structures and ICT use in relation to other actors (Gasco 2003). In the pre-internet period, ICTs were adopted in public administration to facilitate internal processes and activities. The internet shifted the focus of public administration to its external customers, like citizens, companies and civil organizations. However, it should be noticed that ICTs also make a large internal contribution (Moon 2002). These web technologies are also used as managerial tools to collect, store and manage an enormous volume of data and information. In addition, their potential to share and integrate information between different public organizations is even more important.

The distinction between pre-internet technology and web-based technology is also relevant in the context of the debate on the transformational power of ICT in the public sector (Margetts 2003). Before the introduction of web technologies, ICT systems existed independently of each others, and connections or transfers between systems were limited. Electronic relationships with citizens and external organizations were also absent, so the transformational potential of ICT was extremely low. The arrival of the internet and web-based technologies brought a dramatic change

as public organizations were able to be closely connected to each other and to external partners. These technologies presented the opportunity to reshape existing relationships and give shape to new relationships. The ability of these ICTs to transform the public sector was exceedingly higher.

4. Interorganizational information-sharing

Being aware that certain developments are happening, e-government is still often regarded by practioners and scholars as just placing governmental services and products online (Homburg and Bekkers 2002). In other words, it is the front office that gets the full attention. However, many scholars argue that realizing some of the most promising e-government benefits relies upon the sharing of information across organizational boundaries (Pardo and Tayi 2007). Sharing public-sector data can provide numerous benefits to governments and the public. Citizens should see less red tape, less complex and inconsistent forms and less repetition of processes, such as authentication. Sharing data between and within governments provides more efficient use of public funding through a reduction in repetition of tasks associated with data management such as: collection, authentication, validation and storage (see e.g. SEIS Shared Environmental Information System (European Commission 2008)). Fostering an environment of access to a better quality and comparable data will help improve evidence-based decision-making and better informed cross-jurisdictional initiatives. This will result in providing more seamless access to government services. Citizens will benefit from improved services across many public-service sectors, better management of natural resources, more effective and efficient emergency services and health services and improved policy and planning for communities.

Benefits of information-sharing are diverse and will vary from organization to organization and from situation to situation. Dawes (1996) groups these benefits into three categories: technical, organizational and political. First, information-sharing has a positive impact on the management and processing of information itself as duplications in data collection, processing and storage are avoided. Technical benefits of information-sharing also include the promotion of better standards and shared technical resources (Gil-Garcia et al. 2009). Second, some benefits of information-sharing are related to the enhancement of organizational capabilities and the solution of organization-wide problems. Examples of these organizational benefits are reducing costs, improving decision-making and increasing the quality of services. Third, information-sharing also leads to political benefits as it contributes to a better understanding of government-wide objectives and an integrated planning within government. Other examples of political benefits are more public accountability, more comprehensive public information and better service delivery. A somehow different perspective on the benefits of information-sharing is offered by Landsbergen and Wolken (2001), stating that information-sharing contributes

to efficiency, effectiveness and responsiveness in the public sector. Efficiency gains are achieved through the reduction of the paper burden and the improved access to information by all stakeholders. Gains in effectiveness are achieved by the exchange of information, knowledge and expertise across public administrations in order to provide an integrated response to complex problems. The responsiveness of public administration is increased by the large availability of up-to-date information.

Interorganizational information-sharing can also be regarded as an instrument to enhance coordination between organizations. Bouckaert et al. (2010) identify (systems for) information exchange and sharing as a coordination instrument with an increasing reliance on solidarity and cooperation. Information-sharing may induce organizations to take into account actions of other organizations by processes of mutual adjustment. Through information-sharing, organizations are better informed regarding the latest developments and activities by other organizations that help them to adjust their activities to those of other organizations.

It is also interesting to note the potential of information-sharing as support to other practices of e-government. Sharing information can be considered a key prerequisite for successful e-government (Gil-Garcia et al. 2009) as both internal and external practices of e-government benefit from interorganizational information-sharing. In the context of policy formulation and policy evaluation, several types of ICT are used to collect, manage and analyze information. Here, information-sharing contributes to both the access to and use of information as it enlarges the amount of information that is available and improves the quality of this information and the accessibility of this information. In the context of online service provision to citizens, the single collection of information is often considered a basic principle. The use of ICT must avoid identical information being collected each time a citizen makes contact with the public administration. Therefore, information needs to be shared and re-used, both within and across organizational boundaries. In order to reach the goals of e-government, information-sharing appears essential (Scholl and Klischewski 2007; Gottschalk 2009).

As policy makers become aware of the need of sharing information, initiatives to coordinate and facilitate information-sharing are developed at different levels (e.g. European, national, regional, local) and in different areas (e.g. the criminal (e.g. Europol), social security (e.g. crossroads bank social security), and spatial sectors (e.g. INSPIRE)). Despite the growing awareness and efforts made, numerous barriers exist which hinder or prevent interorganizational information-sharing. Dawes (1996) categorizes these barriers into technological, organizational and political. Technological barriers include incompatible hardware and software and inconsistent data structures, meanwhile organizational barriers include the self-interest of organizations and the lack of mutual trust, sharing experiences and awareness of opportunities to share (Landsbergen and Wolken 2001). Examples of political barriers are privacy concerns, ambiguity about statutory authority and the drive to

protect established procedures against external influence and scrutiny. In addition, Landsbergen and Wolken regard economic barriers as a fourth category, referring to the lack of financial resources to make information available for the benefit of other organizations.

The barriers that organizations face when developing sharing initiatives increase proportionally with the increase of boundaries to be crossed, the number of information resources to be shared and the number of processes to be changed or integrated (Pardo and Tayi 2007). In order to grasp this changing complexity of information-sharing, Gil-Garcia et al. (2005) developed their information-integration complexity matrix. Two dimensions are considered to be relevant for determining the level of complexity of information-sharing initiatives: the focus of the initiative and the level of organizational involvement. Information-sharing initiatives can focus on solving a specific problem as well as on building systemic capacity. Sharing initiatives are more complex when the focus of the initiative is broader. As information-sharing happens within organizations, between organizations and between different levels of government, three levels of involvement can be distinguished: organizational, inter-organizational and inter-governmental. The information sharing initiatives become more complex when the level of organizational involvement is higher.

Bekkers (2007b) uses the concept of "information domains" to help to understand the complexity of information-sharing. An information domain is a unique sphere of influence, ownership and control over information, its specification, format, exploitation and interpretation (Bellamy and Taylor 1998). Information domains exist where significant control over access to information is established, in the sense that information is withheld or surrendered on terms negotiated by dominant actors. Bekkers mentions four symptoms that signalize the presence of an information domain: 1) a break in information flows; 2) compartmentalization of information resources; 3) idiosyncrasy of information specifications; and 4) the hegemony of specific discourses that shape information and influence its creation and interpretation. Initiatives to promote interorganizational information-sharing need to be considered as challenges to existing information domains. Boundaries between information domains are changing. Sometimes new information domains emerge implying changes in the control over information.

Taking into account the key role of information in public administration, information-sharing can be considered an essential driver of change in the public sector. Information is both the primary input to and the primary product of government activity (Pardo et al. 2008). From the perspective of information as an input of government, information-sharing helps to enlarge and improve the accessibility and quality of this input. From the perspective of information as an output, information-sharing helps to increase the availability of this output for other parties, both within and beyond public administration. The transformative power of

information-sharing is also related to the distribution of this key resource of public administration. As information-sharing changes this distribution, it also changes public administration's functions and institutions. In order to illustrate the importance as well as the transformative potential of interorganizational information-sharing in the public sector, a case study concerning the information infrastructure in the Belgian social-security sector is presented. This infrastructure is developed to organize and coordinate the sharing of information between social security administrations, citizens and employers.

5. Information-sharing in the Belgian social-security sector

The development of an information infrastructure in the Belgian social security is often regarded as the best practice of e-government in Belgium (Robben et al. 2007). This infrastructure organizes and structures the sharing and integration of information between the social-sector administrations, employers and social secured persons. This section introduces and discusses the background, the efforts taken, the benefits of the social-security infrastructure and some changes in the social-security policy and administration. A general analysis of the infrastructure is complemented with an analysis from the perspective of one specific administration, the National Employment Office.

5.1 Background

On the one hand, the *Belgian social security* consists of three insurance systems (workers, self-employed workers and civil servants) covering a maximum of seven social risks (incapacity for work, industrial accident, occupational disease, unemployment, old age, child care and holiday pay – the so-called branches of social security). On the other hand, it also includes four assistance systems (subsidies for the disabled, guaranteed family allowance, minimum income and income guarantee for the elderly) that grant people specific minimum services after checking their subsistence resources. About 3,000 institutions in total are responsible for the execution of the Belgian social security. More than 10,000,000 socially insured persons and 230,000 employers have regular contacts with those social security institutions to assert their rights, provide information or pay contributions (Robben et al. 2007).

The *National Employment Office (NEO)* is one of those institutions in the Belgian social security. Its primary task is to enforce the unemployment regulation (NEO 2010). Each month, the NEO provides about 700,000 unemployed persons with a substitution income. For each substitution income, several actions are required: a substitution income needs to be granted, paid, verified and sometimes reclaimed. The NEO highly respects the rights and obligations in implementing the unemployment regulation. Preventing and fighting fraud are considered to be important tasks of the NEO. Within the Belgian social security, ±19 % of the funds

are allocated to the NEO, which is the third highest budget of all institutions. The social security "big spenders" are the National Health Care and Invalidity Insurance Institute (±42 % of the expenditures) and the National Pensions Office (±31 %).

Until the late 80s, the Belgian social-security sector was a classic example of fragmented and supply-oriented public-service delivery (Snijkers 2004). Many administrations were responsible for a specific task of service delivery and collected their needed information from citizens and employers. As a result, the social-security institutions frequently asked citizens and employers in order to request information that was already available in another institution, rather than exchanging the information directly among themselves. In total, some 80 different paper forms were applied for data exchanges among citizens and employers on the one hand and social institutions on the other hand. Since the exchange of information happened on paper, processing was expensive and time-consuming (Robben et al. 2007).

5.2 Efforts

In order to improve and reorganize the service delivery to the socially insured people and the companies, and to minimize administrative formalities and costs made by the involved parties, an e-government programme in the Belgian social-security sector was developed in the early nineties. The overarching vision behind this programme was the consideration of information as a strategic resource for public administrations. Key elements in the e-government programme were the adoption of common principles regarding the modelling, collection, management, exchange and protection of information (Robben and Maes 2004). In the Belgian social-security sector, all information was modelled in a coordinated way fitting the model as closely as possible to the real world. All information was collected only once, as close to the authentic source as possible. Functional task-sharing was established, indicating which institution stored and managed which kind of information and making the information electronically available to all authorized users. Security, integrity and confidentiality of information was ensured by integrating ICT measures with several other security measures according to agreed policies (Robben et al. 2007).

The current information infrastructure consists of two main components: 1) a network connecting all Belgian social-security institutions (primary network) and cooperating institutions concerning a specific social-security system (secondary system); and 2) a clearinghouse, the Crossroads Bank for Social Security (CBSS), for managing all information flows (Kubicek 2005). The NEO is one of the members of the primary network and administrator of the secondary network concerning the unemployment insurance. Within the overall network, information exchange takes place at several levels. First, the NEO as a member of the primary network can consult information from other institutions of the social-security network. Second, the NEO itself is in charge of the management and maintenance of all information

regarding (complete and temporary) employment and the exchange of this information to other organizations within the social security network. Third, information within the secondary network is exchanged between the NEO and other institutions within the sector of unemployment insurance, such as the regional bodies and payment bodies (Schollen and Vancauwenberghe 2008).

5.3 Benefits

Robben et al. (2007) distinguish two key results of the development of the information infrastructure in the Belgian social-security sector. First, all social-security institutions are connected to a network for electronic information exchange. They are obliged to request all information available in the network and can consult databases and exchange electronic messages. Second, all socially insured persons and their employers now need to make only a single declaration in the cases when they start or end an employment relationship. When a social risk happens, persons or employers need only to declare information about that particular risk. The introduction of this system has resulted in many more concrete results. About 181 types of paper documents have been abolished and replaced by direct electronic data exchanges between the institutions in the social security sector. Yearly, ±500 million electronic messages are exchanged. Moreover, ±50 types of social security declaration forms have been abolished. The remaining types of declaration forms have been simplified. The number of contacts between citizens and their employers on the one hand and the social security institutions on the other hand has been significantly reduced resulting in enormous time gains (Robben et al. 2007).

From the perspective of the NEO as an institution within the social-security network, benefits of this network are mainly related to the availability of large amounts of information from other institutions within the network. The NEO uses this information for deciding whether a substitution income can be granted and verifying whether the payment of this income was made according to regulation. For instance, for deciding whether an unemployed person will be provided with a substitution income, information is consulted about the delivered achievements. This information is collected, managed and distributed by the National Social Security Office. The NEO also controls whether the person that applies for a substitution income is allocated to another section of the social-security system, such as the health-insurance system or the old-age pension system. Therefore, databases are consulted by each of the organizations responsible for this sector. In general, the re-use of information from other organizations can take two shapes: certificate transfers or online database consultation. In 2008, the NEO received about 5 million electronic certificates from other sectors of the Belgian social security. In the same year, more than eight million consultations of external databases were registered. In this way, the social-security network leads to an increase in the efficiency, effectiveness and responsiveness of the NEO. Efficiency gains are reached as the NEO does not have to collect or manage a wide range of information itself, but can

re-use this information from other institutions. Efficiency is also increased because all information is digitally available and can easily be processed. The effectiveness of the NEO is increased as all decisions are made on the basis of accurate and complete information. The responsiveness is increased since information regarding the chances in the social status of employees and employers is immediately available.

5.4 Changes

The development of an information infrastructure in the social-security sector to organize interorganizational information-sharing has led to many significant benefits, both for the social-security sector in general as to the NEO in specific. Besides these benefits, the information infrastructure was also the driving force behind a number of transformations in the Belgian social-security policy and administration. At least three fundamental transformations can be recognized: changing organizational boundaries, a changed public-service delivery and changes in the basic functions of public administration.

One of the most apparent changes in the Belgian social-security administration due to increased information-sharing are the *changing organizational boundaries*. However, it is worth noting that the nature of these changes is heterogeneous. It is often argued that ICT leads to fading organizational boundaries. To a certain extent, the Belgian social security can be seen as an example of fading organizational boundaries. Due to the interorganizational sharing of information, organizations within the social-security sector are increasingly considered as nodes of the social-security network, instead of completely isolated institutions. However, Bekkers and Zouridis (1999) strongly emphasize that blurring organizational boundaries are just one scenario in the changing nature of organizational boundaries. ICTs can also be used to reinforce existing boundaries between organizations. The Belgian social-security network also provides evidence for this scenario, as a clear task allocation is introduced regarding the collection, validation and management of certain types of information. As this task allocation was in line with the legal allocation of tasks and competences between institutions, existing boundaries were strengthened. So, boundaries between organizations are fading and strengthening at the same time. This illustrates that within one organization or within one information infrastructure, several scenarios or combinations of scenarios can occur (Bekkers 1998).

The development of an information infrastructure in the Belgian social security also realized some fundamental changes in the *delivery of social-security services*. A very high number of social benefits and subsidiary rights are now automatically granted without citizens having to contact their service deliverer anymore. In addition, citizens and employers need to report information only once to the social sector as a whole. As a result, the number of contacts between citizens and the social-security institutions are drastically reduced. Contacts between citizens and institutions still needed are changed in several ways. For instance, the citizens'

unemployment files can now be partially consulted online. Moreover, all files are electronically accessible in all offices of the NEO. Citizens can be informed about their unemployment file in each office of the NEO and thus not only in the office at their place of residence. In a similar way, a decentralized call-centre system is developed so that telephone contacts are automatically distributed to all offices of the NEO. Both examples highlight the deterritorialization of the multi-channel service delivery of the NEO.

Regarding the *basic functions* of government and its use of tools, Hood (1983) introduces the basic distinction between effecting tools on the one hand and detecting tools on the other hand. Public administrations use effecting tools to try to influence the world, while detecting tools are used to take in information about this world. Margetts (1998) argues that the introduction of ICT in public administration may change the way these tools are applied. Moreover, ICT also may change the relationship between government use of effecting tools and detecting tools. The NEO provides a good example of changes in the detecting function of governments as well as changes in the relationship between the effecting and detecting functions. Fighting fraud has always been one of the key tasks of the NEO. The most serious cases of fraud in the (un)employment sector are accumulation of substitute incomes, undeclared employment, illegal employment and use of false declaration. Until the beginning of the 90s, these types of fraud were hard to detect by the social-security administrations. Their searching for cases of fraud was mainly steered by complaints, intuition and field controls. Due to the coupling of databases and the sharing and integration of information, a large number of (potential) fraud practices are automatically detected.

It is also interesting to notice the relationship between the detecting function of the NEO and its other functions. First, the enhanced detection capability of the NEO can be considered a side-product of the use of ICT in the effecting functions of the NEO. In essence, information is shared between social-security institutions in order to improve and reorganize the service-delivery processes. However, the interorganizational information-sharing also allowed the improvement and reorganization of the detection of fraud. Second, the enhanced detection capacity of the NEO has also led to changes in the effecting functions of the NEO. Due to the enhanced control capacity, a higher number of fraud practices are detected, and a higher number of substitution incomes are contested. As a result, properly trained employees are needed for the interrogation of fraudsters and the reclamation of wrongfully awarded incomes.

6. Conclusion

The objective of this paper was to introduce interorganizational information-sharing as a key element of e-government. In literature as well as in practice, e-govern-

ment is often interpreted as the use of ICTs to provide online services. This paper underlines the importance of looking upon e-government as a multi-dimensional concept, including a wide range of technologies, services and relationships. In addition, it is argued that the most promising benefits of e-government are situated in the domain of interorganizational information-sharing. Information-sharing increases the quantity, quality and accessibility of public-sector information, which leads to a more efficient, more effective and more responsive public administration. Information-sharing also supports other forms of e-government and can be considered a requisite for successful e-government. Finally, information-sharing can enable transformations in the public sector as it causes changes in the distribution and use of one of the key resources of public administration.

The case study of the e-government programme in the Belgian social-security sector demonstrated how information-sharing led to great benefits both in the internal operations of the social-security administrations and their service delivery to citizens and employers. Moreover, interorganizational information-sharing was also a key driver behind several transformations in social-security administration in Belgium. Sharing information brought significant changes in the organizational boundaries, service delivery and basic functions of social-security administration. Research on the effects of ICTs on public administration has demonstrated that these effects are generally limited to the context in which ICTs are introduced. Therefore, caution must be exercised in generalizing the benefits and transformations that appeared in the Belgian social-security sector to other settings. Our findings suggest that information sharing has the potential to reorganize and transform the public sector in several ways. Whether this potential can be realized is, however, strongly dependent on the context in which information-sharing is pursued.

References

Andersen, Kim Viborg and Helle Zinner Henriksen. 2005. "The First Leg of e-Government Research: Domains and Applications Areas 1998–2003." *International Journal of Electronic Government Research* 1, 26–44.

Bekkers, Victor. 2007a. "Modernization, Public Innovation and Information and Communication Technologies: The Emperor's New Clothes?" *Information Polity* 12, 103–107.

Bekkers, Victor. 2007b. "The Governance of Back-Office Integration." *Public Management Review* 9, 377–400.

Bekkers, Victor. 2003. "E-Government and the Emergence of Virtual Organizations in the Public Sector." *Information Polity* 8, 89–101.

Bekkers, Victor. 1998. "Wiring Public Organizations and Changing Organizational Jurisdictions." In Ignace Snellen and Wim van de Donk (eds). *Public Administration in An Information Age*. Amsterdam: IOS Press, 57–77.

Bekkers, Victor and Stavros Zouridis. 1999. "Electronic Service Delivery in Public Administration: Some Trends and Issues." *International Review of Administrative Sciences* 65, 183–196.

Bellamy, Christine and John A. Taylor. 1998. *Governing in the Information Age*. Buckingham: Open University Press.

Bellamy, Christine and John A. Taylor. 1994. "Introduction: Exploiting IT in Public Administration – Towards the Information Polity?" *Public Administration* 72, 1–12.

Bouckaert, Geert, Guy B. Peters and Koen Verhoest. 2010. *The Coordination of Public Sector Organizations: Shifting Patterns of Public Management*. Hampshire: Palgrave Macmillan Ltd.

Crompvoets, Joep, Glenn Vancauwenberghe, Geert Bouckaert and Danny Vandenbroucke. forthcoming. "Practices to Develop Spatial Data Infrastructures as Support to e-Government." In Saïd Assar, Imed Boughzala and Isabelle Boydens (eds). *Practical Studies in e-Government*. New York: Springer.

Danziger, James N. and Kim Viborg Andersen. 2002. "The Impact of Information Technology on Public Administration." *Journal of Public Administration* 25, 591–627.

Dawes, Sharon S. 1996. "Interagency Information Sharing: Expected Benefits, Manageable Risks." *Journal of Policy Analysis and Management* 15, 377–394.

European Commission. 2008. Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions – Towards a Shared Environmental Information System SEIS.

Fang, Zhiyuan. 2002. "E-Government in Digital Era: Concept, Practice and Development." *International Journal of the Computer, The Internet and Information* 20, 193–213.

Fountain, Jane E. 2001. *Building the Virtual State: Information Technology and Institutional Change*. Washington, DC: Brookings Institution Press.

Frissen, Paul H. A. 1998. "Public Administration in Cyberspace: A Postmodern Perspective." In Ignace Snellen and Wim van de Donk (eds). *Public Administration in An Information Age*. Amsterdam: IOS Press, 33–46.

Gasco, Mila. 2003. "New Technologies and Institutional Change in Public Administration." *Social Science Computer Review* 21, 6–14.

Gauld, Robin and Shaun Goldfinch. 2006. *Dangerous Enthusiasms: E-Government, Computer Failure and Information System Development*. Dunedin: Otago University Press.

Gil-Garcia, J. Ramon, Soon Ae Chun and Marijn Janssen. 2009. "Government Information Sharing and Integration: Combining the Social and the Technical." *Information Polity* 14, 1–10.

Gil-García, J. Ramon, Carrie A. Schneider, Theresa A. Pardo and Anthony M. Cresswell. 2005. "Interorganizational Information Integration in the Criminal Justice Enterprise: Preliminary Lessons from State and County Initiatives." Paper presented at the 38th Hawaii International Conference on System Sciences (HICSS), January 3–6. in Mānoa, Hawaii.

Gottschalk, Petter. 2009. "Maturity Levels for Interoperability in Digital Government." *Government Information Quarterly* 26, 75–81.

Heeks, Richard and Savita Bailur. 2007. "Analyzing e-Government Research: Perspectives, Philosophies, Theories, Methods, and Practice." *Government Information Quarterly* 24, 243–265.

Heeks, Richard. 1999. *Reinventing Government in the Information Age*. London: Routledge.

Ho, Alfred Tat-Kei. 2002. "Reinventing Local Governments and the e-Government Initiative." *Public Administration Review* 62, 434–444.

Homburg, Vincent and Victor Bekkers. 2002. "The Back-Office of e-Government." In Robert Hamilton Sprague (ed.). *Proceedings of the 35th Hawaii Conference on System Sciences (HICSS)*. CD-ROM.

Hood, Christopher. 1983. *The Tools of Government*. London: Macmillan.

Kraemer, Kenneth L. and John Leslie King. 2006. "Information Technology and Administrative Reform: Will EGovernment Be Different?" *International Journal of Electronic Government Research* 2, 1–20.

Kraemer, Kenneth L. and John Leslie King. 1987. "Computers and the Constitution: A Helpful, Harmful, or Harmless Relationship?" *Public Administration Review* 47, 93–105.

Kubicek, Herbert. 2005. *Social Security Benefits for Citizens in Belgium*. eGovernment Interoperability Observatory.

Landsbergen, David and George Wolken. 2001. "Realizing the Promise: Government Information Systems and the Fourth Generation of Information Technology." *Public Administration Review* 61, 206–220.

Layne, Karen and Jungwoo Lee. 2001. "Developing Fully Functional e-Government: A Four Stage Model." *Government Information Quarterly* 18, 122–136.

Margetts, Helen. 2003. "Electronic Government: A Revolution in Public Administration?" In Guy B. Peters and Jon Pierre (eds). *Handbook of Public Administration*. London: Sage, 366–376.

Margetts, Helen. 1998. "Computerising the Tools of Government." In Ignace Snellen and Wim van de Donk (eds). *Public Administration in An Information Age*. Amsterdam: IOS Press, 441–459.

Mayer-Schönberger, Viktor and David Lazer. 2007. *Governance and Information Technology: From Electronic Government to Information Government*. Cambridge: MIT Press.

Meijer, Albert. 2007. "Why don't they Listen to us? Reasserting the Role of ICT in Public Administration." *Information Polity* 12, 233–242.

Moon, M. Jae. 2002. "The Evolution of e-Government Among Municipalities: Rhetoric or Reality." *Public Administration Review* 62, 424–433.

NEO. 2010. *Abridged Annual Report 2010*. Brussel: RVA.

O'Neill, Rose. 2009. "The Transformative Impact of e-Government on Public Governance in New Zealand." *Public Management Review* 11, 751–770.

OECD. 2003. *The e-Government Imperative*. Paris: OECD Publishing.

Pardo, Theresa A., J. Ramon Gil-Garcia and G. Brian Burke. 2008. "Sustainable Cross-Boundary Information Sharing." In Hsinchun Chen, Lawrence Brandt, Valerie Gregg, Roland Traunmüller, Sharon S. Dawes, Eduard Hovy, Ann Macintosh and Catherine A. Larson (eds). *Digital Government: E-Government Research, Case Studies, and Implementation*. New York: Springer: 421–438.

Pardo, Theresa A. and Giri Kumar Tayi. 2007. "Interorganizational Information Integration: A Key Enabler for Digital Government." *Government Information Quarterly* 24, 691–715.

Pratchett, Lawrence. 1998. "Technological Bias in an Information Age: ICT Policy Making in Local Government." In Ignace Snellen and Wim van de Donk (eds). *Public Administration in an Information Age*. Amsterdam: IOS Press, 207–221.

Reddick, Christopher G. 2004. "A Two-Stage Model of e-Government Growth: Theories and Empirical Evidence for U.S. Cities." *Government Information Quarterly* 21, 51–64.

Robben, Frank and Peter Maes. 2004. "Best Practice in e-Government." *Informatie* 15, 52–57.

Robben, Frank, Peter Maes and Emmanuel Quintin. 2007. "E-Government Program of the Belgian Social Security." In Ari-Veikko Anttiroiko and Matti Mälkiä (eds). *Encyclopaedia of Digital Government*. Hershey: Idea Group, Inc, 564–570.

Scholl, Hans J. and Ralf Klischewski. 2007. "E-Government Integration and Interoperability: Framing the Research Agenda." *International Journal of Public Administration* 30, 889–920.

Schollen, Theo and Glenn Vancauwenberghe. 2008. "De impact van het netwerk." *Vlaams Tijdschrift voor Overheidsmanagement* 13, 33–39.

Snellen, Ignace and Wim van de Donk. 1998. *Public Administration in an Information Age*. Amsterdam: IOS Press.

Snijkers, Kris. 2004. "Digital Administration and the Role of Trust." *Information Polity* 9, 205–215.

Traunmüller, Roland and Maria A. Wimmer. 2003. "E-Government at a Decisive Moment: Sketching a Roadmap to Excellence." In Roland Traunmüller (ed.). *Proceedings, EGOV 2003*. Berlin: Springer, 1–14.

West, Darrell M. 2004. "E-Government and the Transformation of Service Delivery and Citizen Attitudes." *Public Administration Review* 64, 15–27.

Yildiz, Mete. 2007. "E-Government Research: Reviewing the Literature, Limitations, and Ways Forward." *Government Information Quarterly* 24, 646–665.

Discussion I:

Technological Change and Public Management Reform: Revisiting Theory and Context

C. William R. Webster

Abstract

This article presents a brief overview of the dialogue which took place in the first session of the Third Trans-European Dialogue. The focus of the session was the theoretical issues surrounding the development of new information and communication technologies in public administration and services, and specifically in relation to contemporary public management reform. During this session the dialogue covered a range of issues; an underlying theme was the importance of developing conceptual models which cater to the intertwined nature of technological diffusion and the evolution of the structures and processes of public administration. In this respect, the dialogue stressed the need to place technology at the heart of public management reform.

1. Introduction

This short article offers a brief overview of the discussions which took place during the first session of the Third Trans-European Dialogue (TED3) in Ljubljana, Slovenia, on 12 February 2010. During this session, Christopher Pollitt's keynote contribution entitled "Technological Change and Public Service Management: Towards a Conceptual Framework" (Pollitt 2010) was presented and discussed by a select group of academics and experts. This article covers key issues raised by the keynote presentation, the discussant and the subsequent "dialogue". In particular, this session addressed theoretical issues surrounding the development of new information and communication technologies in public administration and specifically public management reform. It has now been over ten years since the internet became the dominant platform for delivering e-government services; in this respect, the dia-

logue offered a timely opportunity to revisit and explore emergent theory and practice. It should be noted at the outset that a wide range of issues and observations was made during the session and that this report merely highlights the main themes raised.

2. Towards a conceptual framework

The keynote presentation for this session had grand ambitions, to reflect upon what is known about technological change and public management reform and to develop a conceptual framework for understanding these developments. In doing so, the keynote drew on a raft of academic ideas and a "long" history of academic thought emerging from groups such as the "Permanent Study Group on e-Government" (previously "Information and Communication Technologies in Public Administration") of the European Group of Public Administration (EGPA)[1]. At the heart of the keynote were two key areas of investigation; (1) an analysis of the effects of technological change on public services and (2) a desire to establish a stronger link between theories of technology and theories of public management. Pollitt argues that this is especially desirable because traditionally public management academics have studied public management reform and the introduction of new technologies as separate phenomena. So, here the ambition was to take e-government out of the "ghetto" and to make technological change a central feature of administrative and organisational change. Such an approach is to be applauded and reminds us – public management scholars – that our modern-day familiarity with new technology often masks the depth of change associated with their introduction.

Pollitt's model, which is best seen as a simple heuristic device, takes a lead from STS (Socio-Technology Studies) by placing "context" and "relationships" at the heart of the analysis. This approach is referred to as "critical realism" and combines facets of technology *with* facets of organisational life. In this way, the model avoids the simple "trap" of technological and/or sociological determinism. The central analytical feature of the model is a series of dimensions which identify key shifts/changes in public services emanating from the integration of new ICTs in public-service organisations. Amongst others, they include shifts in the citizen's perspective of public services and changes in the tasks, rules and activities of public-service providers. In this way, the approach highlights the significance and the deep-rooted changes in public services that are linked to the introduction and use of new technologies and also changes in relationships for service users, providers and everyone else in society. It also stresses the importance of context – that the introduction of new technology takes place in organisational settings and is often

1 European Group of Public Administration (EGPA): www.iias-iisa.org/egpa; EPGA Permanent Study Group on e-Government: www.tcd.ie/Statistics/egpa/.

shaped by those settings. This is especially important for public services and their strong historical and institutional contexts.

Following the keynote presentation, the discussant (William Webster) raised a number of points about the proposed conceptual framework. It was recognised that refocusing public management reform to include a more sophisticated approach which integrates technologies into organisational life allowed for a more nuanced understanding of how technologies shape public services and *vice versa*. In this respect, the framework proposed by Pollitt offers leverage to place technological change at the heart of public-service change without being overly deterministic. Also, it was noted that the conceptual framework being proposed pays homage to two significant e-Government perspectives, the "Information Polity" and "Information Ecology" perspectives.

Significantly, the model harks back to the "Information Polity" perspective promoted by John Taylor and Howard Williams twenty years ago (1990, 1991). Taylor and Williams argued that "A new public administration is being forged and new information flows, and the computer networks which facilitate and mediate them, are fundamental to the innovations process" (1991, 172) and that the adoption of these technologies is producing "new rationales for the restructuring and changing focus of government" (1990, 151). This is a significant point, because the term "information polity" is intended to offer a synthesis of the changes occurring within public services. These changes are profound and far-reaching and are promoting different principles and practices within governmental and democratic settings. The changes are manifest in a series of evolving relationships within the polity, changes in relations between citizens and the state, betweens agencies of the state, between contactors and suppliers, between professional groups and between officials within agencies. The parallels between the Information Polity and Pollitt's model are plain to see; significantly for both, new technology is central to public management reform and to shifts in the principles and practice of public administration.

In addition to the Information Polity, Pollitt's model draws on ideas associated with "Information Ecology". Building on the work of Davenport (1997), the Information Ecology perspective, seen also in the work of Bekkers and Homburg (2005), emphasises complexity, power relations, institutional settings and that different parts of the ecology co-evolve, constantly changing together according to the relationships in the system. This is very important for Pollitt's proposed conceptual framework, where the (evolving) context of public-service reform is key to understanding shifts in the nature of public services. This is because the public-service environment is highly institutionalised and because there are a number of long-standing rules, norms and practices which shape public-service reform. In this respect, we should not see new information and communications technologies as *new* any longer – as the writings of Taylor and Williams and Davenport show –; the introduction and use of these technologies is now deeply embedded and part of

normal organisational life in contemporary public services. The point being made here is that these technologies are now so ingrained in organisations that they are part of the very fabric of society. So, public-service reform is shaped by its context, and this context incorporates new technologies.

3. Themes and issues raised by an integrated approach to conceptualising public management reform and the diffusion of information technology

Building on the points raised by the discussant, the subsequent dialogue included a number of interesting interlinked observations about the interdependent relationship between public management reform and the diffusion of new technologies. Here I have grouped these comments around a series of themes.

Firstly, and in relation to the context of public services, it was noted that public management reform (and e-government) is best viewed as an evolution as opposed to a revolution. The point being made here was not to deny the significance of new technologies in public administration, but that the world of public services is always changing, that these changes tend to be incremental and that with each incremental change, public management and new technologies become ever more closely intertwined. Linked to this line of argument was a discussion about the dominant technological paradigm. Here it was suggested that society is currently embedded in an information (and information-technology) paradigm and that this provides the context for subtle, profound and significant changes across society, including public services. Moreover, it was noted that this paradigm was now maturing, and in the future, a different paradigm may/will emerge.

A second line of discussion sought to explore the degree to which new technologies are seen to "impact" upon public management reform, especially in relation to changes in the rules, nature and tasks of public services, and why technological deterministic perspectives remain popular. Two explanations for the latter were brought forward. Firstly, that politicians, policy-makers and practitioners typically invest in IT projects with a general belief that the technology will result in "cheaper", "better" and "faster" public services. Because the technology is "new", there is limited evidence of the outcomes of its use and therefore these beliefs shape the perceived impacts of the technology. A second explanation was that e-government initiatives are often conceived and managed at the operation level, as opposed to the strategic level, and are therefore seen to have very narrow service-oriented consequences. In this respect, new information systems are often seen to merely replace existing administrative procedures, for example replacing a paper-based application process for a driving licence with an electronic internet-based system. Often this takes place without any consideration of broader consequences or the reasons for the design of the original administrative process.

Thirdly, the dialogue explored the changing nature of public services. New information and communication technologies were perceived to be empowering service users and citizens in combination with a profound shift in focus from providing services designed by officials to providing services that were convenient and useful for those using them. Through new technologies, public services were perceived to be more "user friendly" and "bottom-up". A second point about the changing nature of public service relates to the "skills set" of public-service providers and users. Public officials and service users were increasingly required to be IT-literate and to have a good understanding of how to use new technology on a day-to-day basis. In this respect, the future skills and core competencies of public officials were/are changing. It was also noted that the IT profession was becoming increasingly influential and today played a significant role in service and organisational reform. Interestingly, as a profession this group had its own knowledge domain and a unique set of interests – which are presumably to protect and enhance the importance of the profession.

Fourthly, and also in relation to context, it was noted that the public-service environment differed in different countries and that this had a bearing on the delivery of e-services. On one level, e-services were constrained by the spread of appropriate infrastructure and IT skills. On another, e-services were constrained by public-service obligations, for example the obligation to provide fair and universal services, and issues associated with public accountability. It was suggested that these obligations and responsibilities meant that the public sector was less flexible in the way it could develop e-services than the private sector. Related to this point, it was noted that the nature of the public sector and its relations with the private sector and the "third sector" differed considerably across Europe, and this, too, had a bearing on the development of e-services. This observation led to a discussion about the "role" of government in developing e-services and in particular whether it was the responsibility of government to provide the technological infrastructure for businesses to flourish in the information age. This led to an interesting discussion about how to increase the use of e-services and whether citizens and service users should have a choice about whether to use e-services or whether their use should be obligatory.

A fifth area of discussion focused on the effectiveness of e-government and e-services. Questions were raised about the performance of such systems, especially given the vast sums of money spent on their introduction. Here the key question addressed was whether e-government services led to better services or not. It was noted that the usual way of assessing the effectiveness of systems was via a formal evaluation, but that the rigour of these evaluations was usually compromised because they were commissioned and/or conducted by the practitioners responsible for introducing systems, very little independent in-depth robust assessment was completed. It was also noted that in the current global recession, large IT projects may be cancelled and "invest to save" schemes may be disbanded. Moreover, it was

anticipated that the recession would place a sharper focus on the economic benefits accruing from e-government activities.

The dialogue moved on to consider the role of "information" and personal data in the information/IT paradigm. It was noted that the processing of information was a core activity for many public services and therefore it was not surprising that they were being reshaped by new information and communication technologies. Furthermore, it was noted that because the state created and processed so much information about us, issues about surveillance and privacy should be brought to the fore. It was recognised that currently privacy concerns were not well reflected in public debate about e-services and that many of us are "naïve" about the extent of information exchange and the privacy regulations that exist. To reinforce this point, it was noted that existing legislation about personal data gives individuals a degree of control over the "personal" data but that this is compromised because the majority of personal data is created by the state (for example, passport and ID numbers) and is therefore not "personal" at all. Additionally, it was suggested that governments have encouraged the exchange of information in a desire to create an information economy and to deliver joined-up government. In this respect, greater awareness of what information exists about us and where it goes would lead to a more informed public debate and potentially a refocusing of debates about e-government.

4. Concluding comments

Despite the time constraints surrounding the dialogue, a series of significant theoretical observations were made. Any theory which attempts to capture the nature of information technology and public-service reform has to pay careful attention to context and relationships. Although the information/information-technology paradigm can be seen to be dominant, it incorporates and interacts with previous paradigms, such as the managerial paradigm. This interactive context means that reform or change should be seen as an evolutionary process fusing the paradigms together. In this way, public services are the subject of constant change, and over time, the essence of government changes subtly. Such changes may not seem massively significant at the time, but evolving citizen-state relations emerging from the intertwined developments of technological diffusion and institutional change impact upon the nature and activities of government and public services. Clearly, following this line of argument technology *matters* and should be placed at the heart of conceptual models which seek to understand public management reform.

5. References

Bekkers, Victor and Vincent Homburg (eds). 2005. *The Information Ecology of e-Government: E-Government as Institutional and Technological Innovation in Public Administration*. Amsterdam: IOS Press.

Davenport, Tom. 1997. *Information Ecology: Mastering the Information and Knowledge Environment*. New York: Oxford University Press.

Taylor, John and Howard Williams. 1991. "Public Administration and the Information Polity." *Public Administration* 69, 171–190.

Taylor, John and Howard Williams. 1990. "Themes and Issues in an Information Polity." *Journal of Information Technology* 5, 151–160.

Discussion II:

Approaching Public-Management-Inspired e-Government Research

Tino Schuppan

The questions raised in the kick-off discussion of TED3 generally addressed the relationship between ICT and public management. Specifically, participants sought to determine what ICT has to offer public management and public administration in general. The subject of ICT has barely entered the public management debate, something which stands in contrast with the fact that at public administration conferences such as the European Group of Public Administration (EGPA), study groups have been dealing with the subject since the beginning of the 1980s. Since the rise of e-government, the subject has occasionally entered the public management discussion, so that it has gained increasing attention in the last few years. However, compared to other subjects on the public management research agenda, e-government still leads a marginal existence. In particular, e-government is often limited to "e", with much less attention being paid to the "government". Yet, e-government is especially relevant for public management-oriented research.

Following the rise of e-government phenomena and intensive efforts to define and measure them, typically with a focus upon online maturity, new research approaches which go beyond the study of websites are necessary. For the field of public management, an institutional research perspective on e-government is important. Yet for this, we must look deeper, which requires a certain understanding and knowledge of government work. Traditionally in the field of public management, ICT, if it has been considered at all, has been considered an instrument to support NPM instruments such as accounting or controlling. Yet this NPM informatisation perspective is not sufficient if we are to understand the transformative potentials of ICT, i.e. if we are to take a transformative perspective upon e-government. In taking such a perspective, we need to consider that the "raw material" of government work is immaterial, in the form of information. This, in turn, means that administrative and policy processes can be carried out in very, often fundamentally, different ways using ICT. Despite this potential, government methods and procedures often pres-

ently still function as they always have in the "material world". Conducting research on transformation in the context of public management requires that we first understand ICT's relationship to government, including its embeddedness in formal as well as informal institutions.

A basic understanding of ICT as it relates to institutional change can be summarised in the following points, which are not exhaustive and which overlap to some degree:

- **ICT is less a driver than an enabler.**

This means that ICT itself does not have a direct impact on institutions but is more complex and mutual between organisational change and ICT. Concepts, beliefs and myths often have a strong influence upon existing organisational structure and the adaptation of ICT.

- **ICT is less a tool but is increasingly becoming a medium.**

Our second understanding of ICT is related to new organisational models. Today, ICT has achieved a stage of development in which "anything goes" allows new organisational models. Especially, new network structures – and hence governance structures – are possible which can only be implemented by ICT, such as virtual organisation.

- **ICT is not a black box but has many functions.**

There is not just one ICT "package" but rather, ICT has many different functions which can be used to support very different activities in government. For example, tracking and tracing or controlling is something very different than a system for archiving files.

- **ICT is less neutral than it is itself a social artefact.**

Studying ICT in the public sector means considering software applications themselves as a result of social processes, which were often developed to solve certain problems in the private sector, rather than in the public sector. This means that certain techniques and assumptions are included in software which limit and widen the frame of action in government.

Secondly, when applying this broader understanding of ICT to transformative research in e-government, a different perspective on public management is required. Typically in public management, a pure institutional perspective is dominant, in which formal (e.g. contracts, organisational structure) and informal (e.g. trust) institutions are in the main focus. However, institutional related e-government research explores the changes in working process and information flows and draws upon these to consider institutional change.

Therefore, when studying the potential of e-government, it is also necessary to study many non-ICT related factors, but to see them through another lens. Knowledge and insight into government are necessary to explore the nature of government work. For example, we need to understand how the various government fields and themes such as public planning, labour-market administration, policy-related ministerial work etc. operate to understand how each field can change in the context of e-government.

Third, it is important to recognise the institutional implications of e-government. In general, it can be said that ICT has achieved such an advanced stage of development that many public management and modernisation topics are or will be affected. Themes such as network governance, outsourcing, responsibility, accountability or the meaning of citizenship are, in the context of e-government, changing or can be rethought. Here we can observe that the mechanism of government and governance is changing through ICT, indicating a new convergence. Thus, as a consequence, e-government, public management and governance can no longer be separated and have to be considered together. This also has implications for how we conduct research. Therefore, it can be argued that e-government and ICT have a transformational power for public management which redefines and changes its instruments.

Yet we would rather conclude that we can rethink and often re-conceptualise (new) public management instruments which take different forms.

At this point, we cannot say with certainty where e-government is heading and what the future trends are. However, we can see some new e-government-related institutional mega-trends, such as de-territorialisation, i.e. less dependency on physical location; industrialisation, meaning increasing work-sharing and specialisation; and horizontalisation, meaning increasingly horizontal network arrangements, such as between municipalities.

These trends can already be observed and are often new in their quality and function. However a solely empirical approach is not sufficient for e-government research, because ICT makes more things possible than that which we can currently empirically observe. Therefore in the context of e-government, design-oriented research is needed to make new options, their consequences and their possible side effects visible. This design-oriented research is necessary to explore how we can make things different when using ICT, or to identify what we should not change. That said, empirical research is just as important as looking ahead. To date, there has been a lack of knowledge of how ICT is changing the public sector and what the implications of this are. It is important that we go beyond policy rhetoric and the promises of ICT providers. We have to explore what happens in practice when ICT is applied in the framework of the public sector and in so doing take a strong focus on unintended effects. Unintended effects are not new and have always been a problem of public management instruments, but this is even more the case when using

ICT. This is because so many variables and expectations influence the adoption of ICT solutions in practice, including the interplay between existing institutions, actors' beliefs, strong external interests and various forms of ICT tools. A theory based on empirical observations which addresses how e-government is adapted is needed to better understand informatisation in the public sector. Understanding the result of the interplay between ICT, actors and institutions is especially important. To round up this perspective, culture, structure and actors are more important when adapting ICT und e-government models than ICT itself.

Up to now, the argument is that we do not have sufficient knowledge of potentials and realities in the context of e-government. Much current e-government research work is still at the stage of describing or defining the phenomenon, evaluating websites or ICT-dominated design, approaches which are often far removed from the tasks, processes and general work carried out in government.

Discussion III:

New Technologies and New Governance: Exploring the Link between Technology and Public Management Reform

György Hajnal

1. Introduction

In writing these brief notes, my objectives are twofold.[1] First and foremost, I wish to report on the main directions and patterns of the discussions among the members of the selected small panel of experts/researchers of the field who met at the Third Trans-European Dialogue (TED3) in Ljubljana. Second, I will give some brief and rough reflections regarding the directions and outcomes of these discussions. However, these – rather journalistic – reflections will admittedly lack any rigorous foundation or systematic method and thus will be kept at a modest level.

On the basis of the two keynotes and the agenda built upon them, the second day of TED3 was centered around the technology-public management link. More specifically: the keynote presentations sought to identify the ways in, and the extent to, which emerging, new technologies influence how government organizations and the system of governance as such is organized and functions.

Possible views on the effect of technology on public management reform/PMR (or, in a broader perspective, governance) range, understandably, on a very broad spectrum. At the one extreme on this spectrum, we find what might be called a "full deterministic approach". According to this view – frequently encountered especially in the burgeoning mainstream technical literature on e-government –, nearly all major developments in PMR are driven by revolutionary changes in technology, most of all by ICT. By turning organizational processes and functions online, integrated and interconnected on an ever larger scale, ICT has the capacity to eventu-

1 The factual basis of the notes are the discussions that took place on the second day of the Third Trans-European Dialogue in Ljubljana, Slovenia, on 12 February 2010.

ally transform the entire system of governance and creating, for example, an "on-demand government" (Ramsey 2004).

At the other extreme of the continuum, we find the various "techno-neutral" (or, rather, skeptical) perspectives. Technology may be conceived of as a fundamental tool of what Mann (1984) calls "state infrastructural power". Throughout the various historical epochs, technological advancements – such as specialization and coordination of state and military activities, literacy or the means of rapid communication and transport – kept on revolutionizing the depth and effectiveness of the state penetration of societal life. But, as Mann put it, "none of these techniques are specific to the state. They are part of general social development … thus none of these techniques necessarily changes the relationship between the state and its civil society" (cf. Pollitt's ideas on the "never-ending technological race between the police and the criminals" in relation to using vs. defeating police surveillance systems; Pollitt 2010). Thus technology in general, in and by itself, cannot be expected to alter the basic state-society relationship. Mann – along with other scholars of state capacity (Skocpol 1992) – goes on to identify the conditions under which technological or, more broadly speaking, logistical inventions strengthen state infrastructural power, thus altering the basic setup of the state-society relationship. But these factors – such as the necessity, the multiplicity of functions and the territorial centrality of the state – lie far outside the conceptual realm of technology.

As I will try to show below, during the discussions among the participants of TED3, much of this broad scope of views was represented. Although the discussants were, naturally, far from being able to achieve a common platform, an important precondition of meaningful debate – the diversity of opinions and worldviews – was thereby fulfilled.

2. New business models in the public administration?

Viewed from the perspective of the discussion's master narrative – centering around the causal link between technology and PMR – the first keynote by Bavec (see also Bavec 2010) emphasized the importance of gaining inspiration from two major sources:

- One major source is related to the developments in the business ecosystem of organizations. These include trends towards an (ever) increasing reliance on ICTs and outsourcing and, as a result, a change in the business models dominant in the business ecosystem. In the realm of public administration, similar changes would materialize, such as the geographical dispersion of public administration, a decline of "assembly-line production" of public services and the stripping of PA to its core competence by extensive outsourcing – all this even leading to such extreme outcomes as multinational public services, as it also did in the business ecosystem.

- Second, certain natural-science models can be (and indeed are) used as heuristic devices to describe, analyze and foresee developments in the societal realm. Chaos theory, in particular, suggests that system characteristics may dramatically change even as a result of marginal changes in the initial conditions. This, contrary to the "received view" of public management and policy, makes future developments inherently unpredictable, irrespective of the amount of information gathered and the intelligence with which they are processed. Consequently, the virtues of flexibility and adaptation gain importance while prediction and long-term planning become increasingly obsolete.

The subsequent reflections of the expert panel took a somewhat narrower focus and were mostly concerned with describing and evaluating the virtualization and outsourcing patterns in public organizations.

The first set of comments and questions centered around the question of the applicability and desirability of the emerging business model involving such elements as (i) a strong, sometimes extreme reliance on contracting-out, (ii) thereby stripping public organizations to their core competence.

Schuppan and Drechsler both emphasized the limits to outsourcing and virtualization as these trends definitely may have negative consequences. Instead of the oftentimes "quasi-religious" view of "militantly contracting out everything outside the [organization's] core competence", one should carefully disentangle and examine such questions as (i) what kind of contracting-out ICT enables and (ii) whether and under what conditions such contracting-out is desirable or undesirable. Moreover, analyzing PMR in terms of a single dominant business model may oversimplify the complexity characterizing the field.

In response, Bavec stressed that there is not a single but rather a multiplicity of business models emerging on the horizon of PMR (although he did not make a reference to what these different models entail). Moreover, the possibly questionable trend to outsource everything until only the core competence of the organization remains intact is far from being a normative target; the core competence of public-administration organizations should rather be viewed and explored as a theoretical limit to contracting-out.

Building upon this idea, the next set of contributions centered around the core competence of public administration as a theoretical limit to contracting-out and virtualization in public administration. Hajnal noted that many elements of change characterized by the keynote presentation as hypothetical extremities of the (distant) future – such as internationally outsourced public-administration services stripping public-administrative organizations of much of their *par-excellence* core competence – are already there. For example, Blackwater (now Xe) and other private security and surveillance organizations in Iraq and elsewhere perform, on an international scale, coercive functions that have for long been conceived of as the

monopoly – or core competence – of the state. Likewise, contracting out key policy-making functions (including the whole process from policy design to law-drafting) by Hungarian ministries to private entities – a phenomenon which, according to Vintar, is strongly and damagingly present in Slovenia too – may be seen as another example of "extreme outsourcing" affecting core government functions. In the view of these patterns, it is difficult to see any hard limits to outsourcing, either theoretical or practical.

In a similar vein and referring to the Scottish experience, Webster noted that if anything, then information processing should be seen as a core competence of public administration. Still, in Scotland and elsewhere, it is precisely ICT services that form the first and foremost target of contracting-out initiatives. Relying on this same example, he highlighted another potential problem of outsourcing; namely, long-term ICT contracts are "usually not healthy" since they make the suppliers too oriented towards the status quo. As a counter-reaction to such problems, the emerging trend in Scotland is sharing services instead of outsourcing them: for example, a common archiving service is created and used by a multiplicity of public organizations, thereby creating economies of scale.

Schuppan tried to re-frame the debate by suggesting that that "core competence" is less than an optimal conceptual tool to analyze and evaluate contracting-out and virtualization. It may happen, for example, that at a certain point, a new task emerges for which the government does not have the appropriate capacity. In such cases, it makes little sense to categorize it as either "core" or "non-core" competence. Instead, it is the "steerability" of government processes – that is, the government's ability to control and steer them so as to ensure socially desirable outcomes – that should be used as a central evaluative criterion.

Glassey, drawing on Swiss cantons' experience, exposed the possibility of relying on an "open source", as opposed to "outsourcing", philosophy: up until recently, Swiss cantons outsourced the development and operation of their different ICT systems independently from one another, one by one. This has led to the perverse consequence of (i) cantons not being able to share their systems, thus creating economies of scale but (ii) many of them having to buy the same – often not interoperable – system from the same provider. This practice is increasingly being replaced by a reliance on the open source philosophy in the development and deployment of ICT infrastructure, which, in addition to reaching interoperability and economies of scale, has a better potential to fulfill such key requirements as long-term document preservation in archives.

3. Public management reforms and techno-economic paradigms

The second and last keynote presentation of the day was made by Drechsler (see also Drechsler 2010). From the perspective of the overall discussion, the core ideas seem to be threefold.

First, the dominant practice as well as the perceptions of what is acceptable, "rational" and state-of-the-art in public management can be conceptualized and analyzed in the framework of techno-economic paradigms (TEP's; cf. Perez 2004). Each TEP – of which there have been five since the beginning of the industrial revolution –

- is concurrent with a corresponding Kondratieff long wave of economic development;
- is characterized by the revolutionary formation and worldwide proliferation of a particular new core technology (or set of technologies); and
- "[next to] the new products, industries and technologies that characterize it, each technological revolution gives birth to a new set of generic all-purpose technologies and a new organizational common sense" (Perez 2004 cited by Drechsler 2010).

Second, along with Perez and others, Drechsler makes the assumption that following the previous TEPs centered around, for example, steel and heavy industry (starting in 1875), oil/car industry and mass production (1908) or ICT (1971), the next one will be based on nanotechnology.

While the previous ideas are borrowed from a much broader conceptual framework in order to conceptualize and explain the causal link between technology and PMR, Drechsler added a third, novel idea to it. Namely, that TEPs have a systemic and at the same time profound effect on the state-society relationship. In particular, the initial phase of TEP cycles – the so-called installation periods – are characterized by a growing extent of what Drechsler terms "Staatsferne (state distance) [that is] a general critique, indeed rejection of the state and its possibilities, which leads to a critique of the tasks of the state and their reduction, or at least an attempt thereof –, while the [second,] deployment period is denoted by state closeness". This hypothesis implies that, contrary to much current theorizing, the "state distance" generally associated with NPM is not a function of ICT but, rather, a "standard" element of the installation period of all TEPs.

Stepping to some extent away from this line of argument, the second part of the keynote presentation focused on identifying the possible ways in which governments could capitalize on the ensuing techno-economic surge – for example, socializing/pooling risk by public investments into "question mark" rather than already

established technologies and allowing for trial-and-error processes in the design and implementation of policies, particularly in the R&D field.

Given the time and technical constraints, the subsequent discussions could, understandably, reflect specific and isolated aspects of this bold and indeed ambitious theoretical attempt only.

Much of these discussions centered around the concept of state closeness and its hypothesized relationship with techno-economic cycles. Hajnal noted that while the Staatsnähe/Staatsferne hypothesis is very ambitious as well as provoking, it seems to lack, as far as the presentation is concerned, sufficient grounding – either theoretical or empirical. (However, it might be added that arguments put forward by, for example, Erik S. Reinert (2007 125 ff.) provide substantial support for this idea. Reinert, on the basis of comparative and historical analysis of economic policies, creates a convincing causal link between TEPs on the one hand and the role to be played by the state in economy and society on the other.)

Going further on this track, Rosenbaum questioned the hypothesis on an empirical basis. Drechsler's model, he argued, is based on the alleged observation that the increasing trend of Staatsferne has recently reversed and we are witnessing a rapid strengthening of Staatsnähe. However, according to Rosenbaum, this v-curve of perceptions might be there among the academics, but "the real perceptions of the broader public are a different story. Underlying the V-curve is class politics; in the past 20 years wealth was redistributed from the middle and the poor to the wealthy […] Whether government does a good job at reinstalling the car industry or the financial sector is not the real topic; thus the upswing in the curve [presumed/predicted by the model] may be not there."

Schuppan's reflection was in regard to Drechsler's conclusions on technology policy. Such normative recommendations as long-term orientation, emphasis on competence and accepting the possibility of mistakes, he argued, are far from being new to the world of public administration and policy. The central question is, rather, how one can implement all this in public administration. In response, Drechsler maintained that these normative statements do have some provoking implications for public administration, especially for the institutional design of the civil-service system. "Forget performance-related pay in the senior civil service; install mandarins" could be one of those provoking implications (although as he subsequently made clear, the term "mandarin" referred to the pre-NPM British senior civil service rather than to the original referent of the term).

4. References

Bavec, C. 2010. "The Impact of Technology on the Public Administration of the Future." *NISPAcee Journal of Public Administration and Policy* 3 (2), 55–67.

Drechsler, W. 2010. "Nanotechnology, Governance and Public Management: A Techno-Economic Paradigms Perspective." *NISPAcee Journal of Public Administration and Policy* 3 (2), 69–85.

Mann, Michael. 1984. "The Autonomous Power of the State: Its Origins, Mechanisms and Results." *Archives européennes de sociologie* 25, 185–213.

Perez, Carlota. 2004. "Technological Revolutions, Paradigm Shifts and Socio-Institutional Change." In Erik S. Reinert (ed.). *Globalization, Economic Development and Inequality: An Alternative Perspective*. Cheltenham/Northampton, MA: Edward Elgar, 217–342.

Ramsey, Todd. 2004. *On Demand Government: Continuing the e-Government Journey*. Lewisville, Texas: IBM Press.

Reinert, Erik S. 2007. *How Rich Countries Got Rich … And why Poor Countries Stay Poor*. London: Constable.

Skocpol, Theda. 1992. "Bringing the State back in: Strategies of Analysis in Current Research." In Peter B. Evans, Dietrich Rueschemeyer and Theda Skocpol (eds). *Bringing the State back in*. Cambridge: Cambridge University Press, 3–43.

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The title should be a brief phrase adequately describing the content of the paper.

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An abstract is a summary of the information in a document. The abstract should not exceed 250 words. It should be designed to clearly define the contents of the paper. The abstract should: (i) state the principal objectives and scope of the research; (ii) describe the methodology employed; (iii) summarise results and findings; and (iv) state the principal conclusions. References to literature, bibliographic information, figures or tables should not be included in the abstract.

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Few key words that characterize the topic of the article.

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The introduction should supply sufficient background information on the topic and also provide the rationale for the present study. Suggested guidelines are as follows: (i) the introduction should first clearly present the nature and scope of the problem that was researched; (ii) it should provide an overview of the pertinent literature used; (iii) it should state the research methodology employed and, if necessary, the reasons for using a particular method.

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This section depends on the character of the paper. In the case of empirical studies, it should contain an overall description of the topic and present data gathered during the research project. The manuscript should utilise representative data rather than repetitive information. Data that will be referenced several times in the text should be provided in tables or graphs. All data, repetitive or otherwise, should be meaningful. Results must be clearly and simply stated as the section

comprises innovative research findings for an international community of academics and practitioners.

Discussion/conclusions

This section presents the researcher's findings and suggestions, if applicable. It should not restate information present in the core section, but may (depending on the type of the paper): (i) point out any exceptions or lack of correlation; (ii) define unresolved issues; (iii) show how the results and interpretations agree (or contrast) with previously published work; (iv) discuss the theoretical implications of the work, and any possible practical applications; and (v) summarise the evidence for each conclusion. The primary purpose of the discussion section is to show the relationships among facts that have been observed during the course of research. The discussion section should end with a short summary or conclusion regarding the significance of the work.

Acknowledgements

Assistance received from any individual who contributed significantly to the work or to the interpretation of the work and/or outside financial assistance, such as grants, contracts or fellowships, must be acknowledged.

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Navigation: Example of the Standard Components of an Empirical Policy Analysis Paper

Presentation of the Issue
What is the problem that requires action?

Scope of the Problem
What is the history and current context of the issue? How did it become an issue?
Who is affected and how severely?

Consultations
What are the views or positions of groups who will be significantly affected? What are the concerns of other ministries/agencies who will be affected?

Options for Consideration
What three or four distinct options should be considered? What are their implications? What are their advantages and disadvantages?

Additional Issues:
Consistency with the government's priorities; the effectiveness of available options in addressing the issue; the economic cost-benefit; the effects on taxpayers; the impact on the private sector; environmental impacts; the fiscal impact on the government; the disproportionate impact on various groups or regions; the complexity and timing of implementation; public perception; and constraints raised by legal, trade, or jurisdictional issues.

Recommendation(s)
What is the proposed course of action? Why was it chosen over other possibilities?

Implementation Issues
What are the financial impacts of the proposed course of action? What are the implications for government operations? Will the proposal require regulatory or legislative changes? What is the proposed means of evaluation?

Communications Analysis
What is the current public environment? What are the key issues of contention, and how can they be addressed? What is the position of key stakeholders, both inside and outside the government, on the proposal, and what communication vehicles should be used for each? How does the proposal relate to government reform priorities? What is the objective of communication on this issue? What is the key message?

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