

Digital Government: overcoming the systemic failure of transformation

DIGITAL TRANSFORMATION THROUGH POLICY DESIGN
WITH ICT-ENHANCED INSTRUMENTS

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ABOUT THIS DOCUMENT

This Working Paper contains propositions regarding the use of digital technology to “transform” government that significantly conflict with received wisdom in academia and governments across the world. It counters assertions made in countless political, official and commercial statements and reports produced over past decades.

It is published via open access prior to forming part of a book, in order to allow wider discussion of the ideas it contains. Comments are welcome at the contact address below.

This is the second version. The first, written in 2015, was not published but shared for comment with a selected group of individuals, with a wide variety of extensive experience in the subjects covered. They included former and current very senior central and local government officials from the UK and elsewhere, academics, and representatives of think tanks and the ICT industry. Many of them then attended a one-day workshop (“t-gov 2015”) in November 2015 at Brunel University London to discuss the paper and the way forward to address the research issues raised by it.

The collective and individual comments, both critical and supportive, served to greatly sharpen the thinking and the analysis behind the working paper. In particular, they resulted in a much tighter focus on the concept of transformation. This second paper assimilates the comments, adds material relating to the transformation theme, and excludes original sections peripheral to the main argument.

Acknowledgements

Our work builds on, in particular, the work of Professor Michael Howlett on policy design (in many papers and his 2009 book “Designing public policies: Principles and instruments”) and Professor Christopher Hood on policy instruments (in his 2007 book with Helen Margetts “The Tools of Government in the Digital Age”).

The authors are extremely grateful to all those who gave their considerable time and thought to reading, commenting on and discussing the first paper, and in particular to Professor Christopher Hood for chairing the workshop.

Keywords: e-government, online services, policy, public administration, instruments

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PREFACE

The “transformation of government” has often been proposed as an objective of e-government; frequently presented as a phase in stage models following the provision online of information and transactions. Yet in literature or official documents there is no established definition of transformation as applied to government. Implicitly or explicitly, it mostly refers to a change in organisational form, signalled by the terms “joining-up” or “integration”, of government. In some work, transformation is limited to changing processes or “services” — though “services” is a term unhelpfully applied to a multitude of entities.

There is in academic or other literature little evidence of any type of “transformation” achieved beyond a change in an administrative process, nor a robust framework of benefits one might deliver. This begs the questions of what it actually means in reality and why it might be a desired goal.

In essence, what we aim to do in this paper is to develop a structured frame of reference for making sense of how information and communications technologies (ICT), in all their forms, really fit within the world of government and public administration — exactly the challenge set by Professor Christopher Hood in his 2007 paper:

But we need to have a way of assessing current developments in administrative technologies with those of other eras, such as development of telephones, cars, radios, and fingerprinting in police work in the early part of the twentieth century, or of exact methods of measurement on excise tax collection in the eighteenth century. And if the analysis of the changes such developments bring is to amount to anything more than a breathless tour d’horizon of the latest technological gizmos in public policy (much though governments themselves have a liking for that sort of approach), it needs to be related to some foundational analysis that is, in some way, technology-free and rooted in the nature of government as a social and legal phenomenon.

After a brief historical review, the paper starts by considering what governments and public administrations actually do: specifically, policy design and implementation through policy instruments. It redefines transformation in terms of changing the policy instrument set chosen to implement policy and sets out broad rationales for how and why ICT can enable this. It proposes a frame of reference of terminology, concepts and objects that enable the examination of not only such transformation, but e-government in general as it has developed over two decades. This last is done, with suggestions on several areas where more research or development of the detail is required. In an annex, there are tabulations of the components of policy design, types of policy instrument, and potential aspects of instrument selection, tuning and administration that might be enhanced through using ICT or data.

Our way of viewing the issues supports a review of past e-government practice and research, which critiques the predominant approaches that are based on flawed models of government as a service industry and thus have stymied progress. The paper points to ways forward for practice and further research. It draws mainly on UK illustrations with which we are familiar, but its principles are applicable across most nations.

– Paul Waller and Vishanth Weerakkody, London, June 2016

EXECUTIVE SUMMARY

Digital technology undoubtedly has huge potential to contribute to the functions of government and public administration, but so far the building of information portals and putting transactions on government web sites have not realised the great expectations for it in terms of “transforming government”. This Working Paper explores why the ambitions for transformational e-government (however it has been labelled) over the last 20 years have not been realised. It provides a critical analysis to offer a diagnosis of the problem and its causes. In the hope of a better future, it develops a structured frame of reference for making sense of how information and communications technologies (ICT), in all their forms, really fit within the world of government and public administration.

To actually achieve a transformation of government through the use of digital technologies, governments will require a complete reversal of the current way of looking at the challenge. Instead of viewing the problem from the point of view of the internet, they must start with the political process of policy design. In particular, they must look at how technology can change the range and characteristics of policy instruments — the tools that governments choose from to intervene in the economy, society and environment to make change, such as taxes, benefits, licences, information campaigns and more tangible things like public services and infrastructure. These are the practical results of government, and only when technology changes those can we say it has transformed government.

Before the Internet no one would have set out to transform government and public administration by redesigning forms and guidance pamphlets. They would do that to make life easier for people, and save time in administration, but that's all: they wouldn't expect to alter anything else. That is all that has happened with e-government and digital government: electronic forms and pamphlets. Once there were forms design and “Plain English” units in government departments; then web site teams and e-government units; now Digital Transformation teams: each doing, again and again, more complicated and expensive variations of the same thing: putting lipstick on pigs.

Digital Government: good but not progressing

Our research shows that the expectations for digital technology applied to government and public administration have not been realised – by a very large margin. This especially applies to the notion of “transformation” — something that sounds important but no-one seems clear exactly what it means. In so-called stage models of e-government, it always followed information, interactions and transactions in the pictures, but in practical reality it never did. Many good things have happened, but two or three phases of trying to “make government digital” over the last 20 years — mostly re-inventing the previous programmes with new labels — have not really taken us beyond information provision and a few online transactions. The logic has been that government equals services equals web sites — but none of that is true.

Indeed, there have been no new ideas for over a decade and what we see now is just an assortment of propositions about technology, data, platforms, agility, users and so on that don't really connect into the practicality of what governments and public bodies actually do in the real world. To move on from this stagnation, our story starts with what government and policy delivery actually entails and constructs a new way of thinking about digital government that draws on the best thinking in political and administrative sciences. We give a new set of ideas for actually achieving real benefits and real transformation in future. They are a distinctively new way of approaching the issue and actually very challenging to worldwide received wisdom, but seem to us to be coherent and showing a way out of the endless loop.

Governments do policy, not services

The purpose of a government is to make, implement and administer policy decisions on behalf of the community for which it has responsibility, for example a nation or a city, on matters that affect the lives of that community as a whole. Such matters may, among many things, be rules of conduct, the spending of community funds on infrastructure or looking after people, or the rules for taxing people to raise those funds.

However, in relation to digital government, the dominant assumption has been that “government is a service industry”, with a private sector model in mind. This is dangerously misleading. In the case of the application of technology to the public sector, it has led to attempts to overlay the processes of newspapers, banks, and retailers on to public functions — the result is a model based on broadcasting information and simple transactions. Yes, some of that does apply to the public sector, but it isn’t what it is really about. Citizens are not customers.

The existence and functions of the majority of the public sector arise directly from the choice of policy implementation instruments, determined at the moment of a politician’s decision on policy design. The range of instruments available to achieve policy goals is vast, covering methods of taking money, giving money, giving permission, registering, criminalising, regulating, contracting, and acting directly through state organisations. The choice of instrument may be influenced by factors political, economic, social, cultural, or simply by habit or dogma.

Once the chosen instrument (or more likely, set of instruments) to implement a policy is encoded in law by Parliament, Congress, Council, or whatever is the relevant national or regional legislature, the public administration sets about creating and executing the necessary functions. The officials do what the law tells them to do (it can even tell them how to do it): sometimes that is called bureaucracy. Looking closely we can see that most parts of the public sector can be classified as either being instruments in themselves (like a healthcare, transport or prison service), or organisations administering instruments like taxes and benefits. In an administrative system that works under the Rule of Law, that gives predictability, equality of treatment, lack of corruption, and accountability to the public.

So public sector reform is about changing a set of policy instruments. Digital technology (including how it can manage data) can change the economics —thus feasibility — of instruments and open up possibilities for new ones. The London Congestion Charge illustrates how a combination of number plate recognition, electronic payment systems and data matching has transformed the enforcement of a toll-and-permit instrument from roadside booths, cash, and paper tickets that would make congestion worse. There would be other ways (i.e. instruments) for managing congestion of course, using technology or not, and that’s the point: the options for design are changed.

There are some broad concepts on which to build. The first relates to direct state-provision instruments. Users of a directly-provided public service or public good will typically experience a benefit, such as medical care, a bus ride, use of a park, or a visit to a museum. They may or may not pay for such an experience. The provision will have a capacity (usually limited), whereas demand will fluctuate. Where the benefit is great (or the price at the point of use is low or zero), demand may put pressure on the public provision capacity — this is particularly noticeable in Western countries’ health and elderly care systems, and even in urban road congestion. In other cases, the policy goal may require driving up demand, such as immunisations in developing regions. The practice of balancing demand and provision to optimally meet the policy objectives, is termed *Demand Management*, and how ICT can aid this is a major and important topic.

The interactions between a government and a citizen or a business in support of many rule-based instruments are at best an inconvenience and at worst a large consumer of time and effort imposed, in the eyes of the recipient, by an impersonal bureaucracy. At the public administration end of the processes, the volumes can be massive and consume significant resources. At both ends, the time and effort taken up by these activities is economically unproductive with potentially substantial

opportunity cost to citizens, businesses and the nation. Hence in this context, the aim in policy design is to reduce the impact as much as possible, through the practice of *Administrative Burden Reduction*, and ICT significantly increases the options available. The traditional e-government approach to transactions had this philosophy, but was implemented simplistically through a web-site-centric approach rather than through policy design.

Thirdly, in any area of public policy that affects individual people or businesses, it is essential that they are fully aware of, and understand, the impact on them: they need information relating to the policy instruments in use. Without that, the policy is unlikely to succeed in its objectives. A government must therefore provide the necessary information in a form, language, time and place that achieves the necessary awareness and understanding. This is a key part of the rationale for government web sites, but raises crucial issues of *Availability* if they become the primary source of information as opposed to a supplementary one. First, the information must be fully accessible including to those with disabilities, which is why designing for disabled people and their electronic aids has been a major issue with e-government web sites. Second, in the light of the significant proportion of the population that does not access the Internet, it is not the only medium we need: “multi-channel strategies” are still important. Third, a primary source must be comprehensive, accurate and up to date: errors and omissions in statutory guidance are not acceptable. These are three key aspects that further distinguish government practice from that of service businesses.

It has often been said that civil and public servants need digital skills. Maybe so, but more important is that their digital expert colleagues better understand the specialised and often complex policy development, legislative and administrative world within which they are attempting to enable transformation. Then they can have the right conversations with the politicians, policy designers, lawyers and administrators that own the challenges.

And a conversation not just about web sites and associated technical concepts, but a whole range of possibilities related to technology and data, with a good grasp of the political, social and behavioural implications attached to them. So we aren't talking about hiring in commercial web site developers here.

There is an implication for government projects. A part of the public service has the demanding task of implementing policies and reforms. Moving a tax, regulatory, benefits, healthcare or energy policy system from a complex mix of inter-related instruments to a reformed set is a hugely complex task, requiring programme and project management skills of a high order, and fresh capability in the front line to make a new scheme work. A large programme (such as a reform of social benefits) might have streams for policy evolution, legislation, stakeholder management, procurement, communications, finance, construction, people, IT... If you add in novel technology to the mix, things are no easier and an even wider set of skills is needed. But that doesn't make it a technology project: it is still policy implementation and it is a huge error to focus on the digital component — worse to allow that to drive the project.

All this in fact applies to any government, regardless of structure or regime, because policy instruments are the same universally — but used differently by different governments even to achieve the same policy goals, in line with the local political, legal and social context. And that's a problem for international comparisons of digital government.

Conclusion: world-wide wrongness

Our findings throw into a lot of doubt many of the things that have been said and done about e-government, digital government, transformational government and so on, mainly by researchers and international benchmarks but also in the plans of governments around the world. They show that all of the plans, studies, research, comparisons and so on, and even the very terminology that has been used, have been based on a commercial model for public administration that not only is inappropriate but has led to a vast amount of confusion, wasted effort and ill-spent public money.

The implicit but dominant “government as a service industry” paradigm has led e-government (digital government, or whatever is the current term) down a blocked path. It is increasingly apparent that the end of that path was reached a few years ago – no new approaches have emerged recently to really deliver positive results sustainably. The solution does not lie in moving on to the next technological fashion, be that big data analytics, algorithmic regulation, platform government or whatever, without recognising the distinct context given by political and governmental institutions.

All the common techno-centric approaches miss the point that to transform public administration means changing the set of policy instruments delivering the overarching policy goals. Reviewing the policy instrument set in the light of the potential of digital technologies is likely to produce far more fundamental and effective results. A barrier to this is the challenge of how to bring into the policy design process, at any moment in time, current knowledge of what is technologically possible and relevant to the achievement of the policy goal through instrument choice and implementation. Resolving this has major implications for strategy, measurement, public servants’ skills in policy design and ICT development, multi-disciplinary working between ICT, policy and legislative teams, and policy implementation project design and execution.

After extensive study of both the real world and academic research, we have concluded that even the latest efforts are, in the words of Russell Ackoff, just “doing the wrong thing righter” and therefore “making things wronger”.

Coding existing administrative processes into hardware and software, no matter how elegant, standardised or sharable that code might be, can thus waste time and money, create legacy systems to give future inertia, and miss transformational opportunities. This is however not as problematic an outcome as the underlying constitutional and political effects of a social trend towards a population thinking of its government in the same terms as a supermarket, an airline, or a reality TV game show, as opposed to a means by which collective decisions are made about the lives and life chances of it and its children.

1. INTRODUCTION

Over the first two decades of e-government, countless assertions have been made that ICT, in particular digital or internet-related technologies, would ultimately transform government. The meaning of “transform” in this context has been varied. Any English dictionary defines it as “to change form, or shape”, which begs the question of what is meant by the shape of a government and thus what is changed. Many academic and practitioner papers implicitly or explicitly define it in terms of integration or joining-up of functions, services or organisations (e.g. Weerakkody et al., 2011; Klievink and Janssen, 2009; Irani et al., 2007; Layne and Lee 2001). But the organisational form and functions of public administration are determined by constitutions and political decisions — for example the functions of each UK government department and how they are distributed across any executive agencies is decided by the Prime Minister and the Cabinet. So exactly what are we looking for with e-government-enabled transformation, or “Transformational Government” as the UK’s own 2005 strategy was titled? Those who have looked have so far found little evidence of e-government leading to transformation, much beyond process efficiency, suggesting a systemic failure to achieve the broader vision (Bannister and Connolly, 2015; 2014; Weerakkody et al., 2011; Irani et al., 2007).

This paper will address that issue, and in doing so will establish a more grounded rationalisation and evaluative frame of reference for the historic progress of e-government. While the authors note that many government information web sites and on-line transactions are highly-rated and undoubtedly deliver value to their public administrations and users, as yet there remains little evidence of how much net value has actually been realised (Weerakkody et al., 2015). The frame of reference suggested in this paper may help future work address that lacuna.

In this paper we will use the single term “e-government” but this should be read as covering all other historic and more recent terms used in this context (usually containing one or more of the words “electronic”, “online”, “digital”, or of course “transformational”). There have been many definitions and scopes of e-government in literature and in wider use (Yildiz, 2007), within which there is a common web-centric subset of scopes linked to the theme that “the Internet will transform government”.

We only draw on such thinking in order to try to make sense of the past, as our key argument is that to understand transformation and to create our intended frame of reference we need to adopt a completely reverse perspective, addressing the impact of ICT on public policy administration in a technology-neutral way. We say public policy administration with reason, as we are spotlighting the failed ambition of transforming government and so must focus on what it is that governments and public administrations do that are their core purpose: policy making, policy implementation, legislation and administration. In this paper, we therefore leave aside for later study — noting also that they are not specific to the public sector — information systems within governmental bodies used for management purposes (e.g. case and records management, procurement, finance and personnel management), and ICT infrastructure and related matters (e.g. shared systems, common platforms, security, legacy systems). Sector-specific technology used in medicine, transport and the military is also excluded.

The paper starts by briefly reviewing how transformation has been addressed in academic and practitioner work. It then steps back to consider what governments and public administrations actually do (in contrast to commercial businesses) to create a new frame of reference that is used to define transformation, reassess e-government and establish a basis for moving forward. The wider implications of these propositions are addressed, in particular for research in the field in general. The final conclusion is that an implicit commercial, business model has been applied to both the research and practice of e-government, leading to a dead end, and that this has to change in order further to realise and evidence its benefits.

The authors are based in the UK and draw on local illustrations, but work internationally and are confident that the arguments and proposals in the paper apply across the world.

2. E-GOVERNMENT AND TRANSFORMATION: A REFLECTION ON RESEARCH SO FAR

Government statements such as by the USA and China early in the century spoke of e-government transforming public sector operations and functions for efficiency (Seifert & Chung, 2009), drawing parallels with the organisational and process change undergone in the commercial sector as a result of the disruptive effects of the internet and related technology (Hood, 2007). This continued the theme established in the 1990s in the UK (Cabinet Office, 1996). However, by 2005, in practice the term transformation had taken on an enduring meaning relating to organisational structure. The UK extended it to cover processes being redesigned around citizens or businesses (such as their “life events”, or “journeys” across parts of public administration), shared services, and IT professionalism in the public service (Cabinet Office, 2005), referring also to the crossing of organisational boundaries. Subsequently most vision statements of transformation by e-government relate to integration, or joining-up, of the structure of government (Bannister & Connolly, 2013; Yildiz and Saylam, 2013; Nograšek & Vintar, 2014; Parisopoulos, Tambouris, & Tarabanis, 2014).

Well-defined or not, transformation appeared as a phase of e-government development succeeding information provision and online transactions, in so called stage or maturity models (Layne and Lee, 2001; Siau & Long, 2005; Lee, 2007). A typical such model (European Commission, 2015) has four levels: information provision, simple interaction, administrative process automation, and finally “Transformed government” where administration is automated end-to-end across organisational boundaries. Bannister and Connolly (2015) and De Bri and Bannister (2015) present an extensive review of stage models but report that even within them the term transformation is used ambivalently and there is a limited research exploration of transformation in government as a result of such models. Nograšek and Vintar (2014) report that e-government’s effect on structures and processes is weakly defined and understood. Prior work (Bannister and Connolly, 2014) grappled with the term’s meaning, exploring whether public sector values might be used to help define it. Nevertheless, such models commonly underlay international benchmarking, discussed later, and re-appear in recent reports (e.g. United Nations, 2014, p113, Figure 5.12).

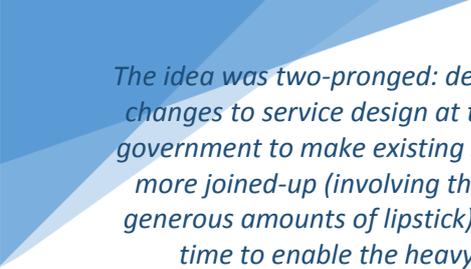
The limited research is largely negative about the reality of transformation. A study by O’Neill (2009) in New Zealand found that although e-government introduced a new look and feel which gave an illusion of change and some operational benefits did accrue, there was no transformation in underlying institutional structures. Similar observations were made by Benyon, Davies and Martin (2004), Tan and Pan (2004), Irani et al. (2007) and Bannister (2012). Bekkers & Homburg (2007 p374) “spotlight the chasm between rhetoric and reality in e-government”. In this respect, Yildiz (2012) offers an explanation for the limited material, pointing out that e-government research has predominantly had a technical focus and has not connected to or been influential in public administration research. He argues that studies in the field should be based on “the administrative core of government and governance (read, public administration)” and poses a “big question” of how this can be done.

The natural attraction of many information systems researchers into the e-government field during its emergence in the mid-1990s has been partly responsible for this technical focus. To date, there is lack of clarity among the majority of the research community about its roots and theoretical underpinnings resulting in researchers drawing predominantly from imported theories from information systems and social sciences to study the implementation, adoption and diffusion of e-government (Bannister and Connolly, 2015).

The trajectory of e-government research has taken a path where early effort was focused on understanding the implementation challenges, followed by putting more emphasis on adoption and diffusion issues that were naturally influenced by technology centric ideas and theories (Lee et al., 2011; Hu et al., 2009; Carter and Weerakkody, 2008; Carter and Bellanger, 2005). Research questions and guiding theories have followed a technology-adoption, process change or institutional change theme (Heeks and Bailur, 2007; Yildiz, 2012; Bolívar et al., 2012; El-Haddadeh et al., 2013). While this is to be expected with any innovation, and e-government is no exception, the heavy emphasis on technology and private sector service-oriented thinking have distorted the e-government research community from appreciating the political and policy-making context in which e-government projects are introduced.

Issues emerging from this approach are predominantly managerial and technological (Bannister and Connolly, 2012). They include lack of take-up of transactions (Carter and Weerakkody, 2008), difficulty in joining-up across organisational boundaries (Kamal et al., 2011), failure to transform organisations or processes (Benyon-Davies and Martin, 2004; Irani et al., 2007), identity management (Al-Shafi and Weerakkody, 2010), data sharing (Gi-Garcia, 2009; Janssen, 2012), data and transaction integration (Janssen and Tan, 2014), mobile access (Shareef et al., 2014), privacy, and security (Al-Shafi and Weerakkody, 2010).

Although nearly two decades have passed, both the conceptual and practical focus has remained on evaluating e-government using private sector measures such as costs, benefits and efficiency from an institutional perspective (El-Haddadeh et al., 2013), and satisfaction and trust from an adoption



The idea was two-pronged: deliver innovative changes to service design at the front-end of government to make existing services appear more joined-up (involving the application of generous amounts of lipstick) in order to buy time to enable the heavy lifting changes required at the back-end (the pig). Yet these back-end changes failed to happen... As a result, instead of meaningful service transformation... This obsession with websites has become to digital government as paper forms were to analogue government.

*Jerry Fishenden, 2 September 2015
<http://mobile.cio.co.uk/blogs/political-debate/of-lipstick-pigs-in-government-3624488/>*

and use perspective (Carter and Weerakkody, 2008). The contributions of these past research efforts have had little impact on e-government projects or their outcomes across the world. From an institutional perspective, scholars such as El-Haddadeh et al. (2013), Yildiz (2012), Weerakkody et al. (2011), Currie and Guah (2007), Heeks and Bailur (2007) have all covered institutional gains as well as complexities and challenges that influence e-government implementation using technology or management concepts.

Similarly, great emphasis has been placed on the front-end interfaces of e-government (or web sites) comparing their impact on service

satisfaction and adoption (Osman et al., 2014). Systematic literature reviews conducted by the authors (e.g. Irani et al., 2012; Weerakkody et al., 2014; Weerakkody et al., 2015) confirm that these studies have often been done by scholars whose own research is influenced by management or technology backgrounds and not those with political science or public administration backgrounds who can better appreciate the complexities surrounding e-government.

The focus on web sites has been a self-perpetuating phenomenon, stimulated and spread globally by “best practice” exchanges and benchmarking by international institutions (for example United Nations, 2005). Bannister (2007) makes the strong point that flawed but influential benchmarking may have steered countries in wrong directions to meet the benchmark — achieving only to turn the benchmark reports into self-fulfilling advice.

We argue that there are (at least) three delusions associated with this approach to deploying digital technology in government and public administration. These delusions are that:

- it is about slashing administrative costs: in fact it raises needs for resources for development, maintenance, security, cyber-defence, dealing with scam imitations (UK HM Revenue and Customs acted to shut down 1,740 illegal sites in 2013¹), extension/redesign to meet new channels e.g. mobile platforms, and complete redevelopment every 5-10 years,
- everything has to be user-focused: but not much of a government or public administrative function directly involves citizens so a focus on the interface misses the point about “transforming government processes”,
- technology can “rationalise” government and public administration: but both are rooted in nations’ constitutions, in policy and in law, and are in constant flux.

Differently to most, Zwahr et al (2005) looked at the transformative potential of ICT more specifically on the functions of the state “governance” (regulation, service-delivery and policy making) rather than operational efficiency, and this is the line of thinking that this paper develops.

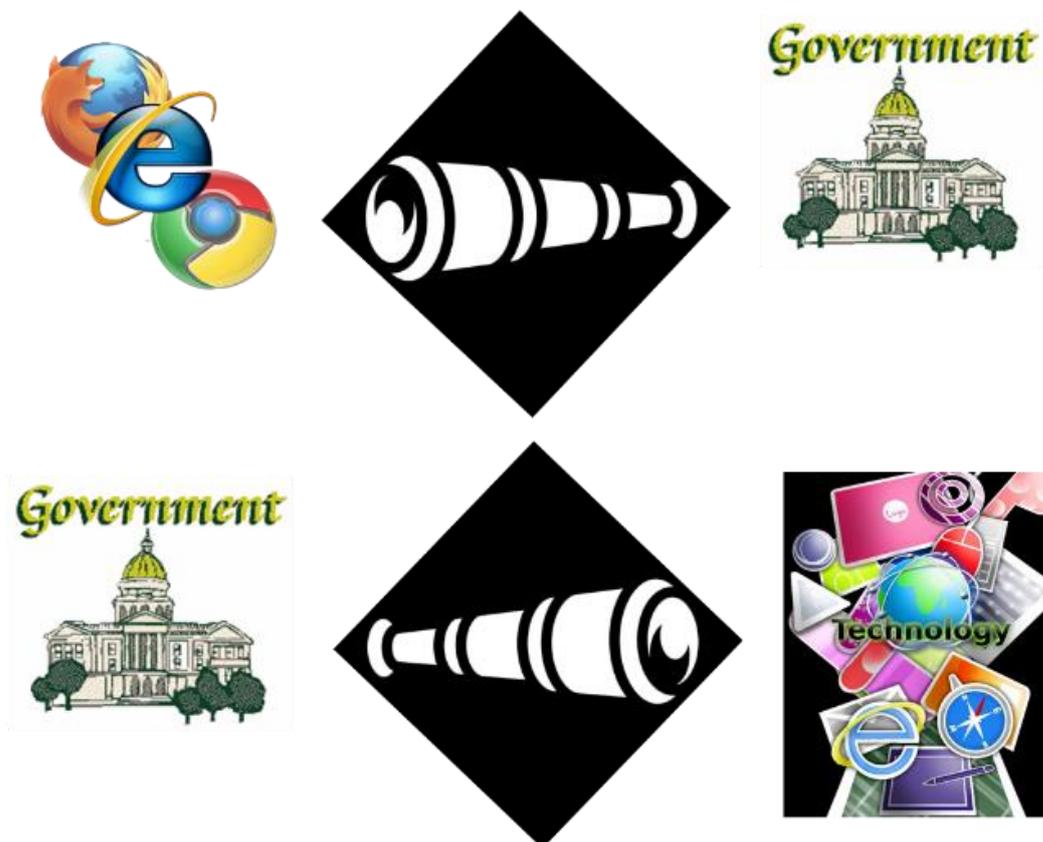


Figure 1. We have all been looking through the wrong end of the telescope

¹ <https://www.gov.uk/government/news/tax-credits-claimants-warned-over-scam-emails>

3. POLICY INSTRUMENTS AS THE FOUNDATION FOR A NEW FRAME OF REFERENCE

This paper aims to put in place a frame of reference for e-government that is grounded in the real nature of what government and public administration do, and further that is independent of technology as proposed by Hood (2007) and supports the practice of policy design (Howlett and Lejano, 2013).

In answering the question “what does government do?”, Hood and Margetts (2007) suggest that we might look at how it works internally and takes decisions, or the policy topics that it addresses, or the “tools” with which it interacts with the public and the environment to achieve its policy goals. These last are *policy instruments* and — being the practical means for the achievement of policy goals (Salamon, 2002; Howlett, 2004) — are the most relevant for exploring here how technology impacts what government does to intervene in society, the economy and environment (the intentions behind which constitute its “policy”). We reserve its impact on internal functioning (as contrasted by Salamon, 2002) and decision-making as separate topics that might embrace for example e-procurement, policy modelling and casework management.

To illustrate, instruments for giving money, through benefits, grants, or loans, utilise the state’s ability to redistribute money within the economy. That money will be raised through another class of instruments that includes taxes, fees, charges, and borrowing. A government can seek to influence the behaviour of individuals by non-coercive means such as running information campaigns (for example on health or safety), or coercive means by criminalising certain activity (such as using drugs) or requiring specific permission to be obtained before doing something (through licencing and issuing permits). All such instruments require an organisation to administer (and/or enforce) them.

In other circumstances, a government can use its resources to create a more substantial and direct intervention in society, the economy or the environment (Hood and Margetts, 2007). A public national health service is an instrument (a directly-acting state organisation) for achieving health-care policy goals. This is a political choice: a state could have an insurance-based private-provider system as an alternative instrument. Police and emergency services, the armed forces, and social services are other organisational instruments, as are utility services in some countries. Physical public goods form another type of instrument, commonly transport infrastructure, public buildings, and protected lands — these also will have a public body charged with management, maintenance, oversight or regulation of use of the asset. Note that “public” is used here in the sense of “government-funded”, as opposed to the economists' meaning of “non-rival, non-excludable”.

The translation of political goals into the means of achieving them through interacting with the world entails policy design (Howlett, 2004 & 2009), sometimes called “statecraft” (Anderson, 1977). The process of policy design involves the selection of appropriate instruments. The range of instruments available to achieve policy goals is vast and the choice may be influenced by many factors (Schneider and Ingram, 1990; Hood and Margetts, 2007; Howlett, 2014). Many instruments are generally needed for the implementation of any policy (Lascoumes and Le Galès, 2007), but different governments make different choices of instrument sets even in pursuit of similar policy outcomes (Schneider and Ingram, 1990). Instrument choices will, in parliamentary systems at least, be encoded into administrative law by a parliament (e.g. Cabinet Office, 2011) and responsibility assigned to a minister or official (generally delegating to supporting staff) to administer them.

Thus with every instrument, or set of instruments in combination, designed to implement a policy, there will be an associated public institution. That body will have a governance structure that links back to parliamentary authority and political accountability. Consequently, the majority of the public sector entities visible to citizens can be classified as either being **instruments in themselves** (either human organisations or physical objects), or **organisations administering instruments**.

Both these types of organisations and the role of technology in their operations have been the focus of attention in the field of e-government, but this analysis shows that they exist necessarily and sufficiently either to be or to manage instruments arising from the policy design process. Indeed, “policies and government services are largely the result of political compromise” (Fountain, 2001 p62). The scope for change — e.g. process or organisational transformation — within or between them is constrained by the political, design and legislative process that constituted them, which, depending on the legal and public sector norms in the relevant national context, may leave managers within them little discretion for structural change, process change or innovation. Indeed as Linder and Peters (1989b) point out, there is potentially a conflict between managerial empowerment and the principles of objectivity in administration and legality (e.g. through creating a possibility for bias or corruption).

This all leads to the conclusion that the assumption implicit but pervasive in much discussion of e-government, digital government, and ICT-enabled public sector innovation — that public bodies are like autonomous service businesses and their managers have the power to change what they do and how they do it in order to meet the needs of their clients — is false (Linder and Peters, 1989b; Fountain, 2001).

The implicit assumption above can be traced back to the Clinton-Gore National Performance Review in 1993, where “services” emerged as a generic term for electronic, online administrative applications. Then, when they appeared, web-based companies were used as role models for government as a service business (Hood, 2007), making no distinctions between the functions of government, public administration, and the private sector. This perspective had its roots in the desire to replace the post-war model of the inefficient “overloaded state” (Held, 2006) and re-invent government (Osborne and Gaebler, 1992) by applying the doctrines of the time associated with so-called New Public Management (NPM; Hood, 1995).

In the UK this laid the foundations for the 1996 Green Paper “government.direct” (Cabinet Office, 1996) that inaugurated the “government as a service industry” approach across Whitehall and the wider public sector. The goal became to “put online what government does because that makes services easier and cheaper”, to paraphrase many statements over the subsequent years such as Office of Management and Budget (2002), European Commission (2010), and Lane Fox (2010). One effect has been that, historically, e-government products have been technical creations mimicking those of online retailers and commercial portals.

The extensive constitutional, political and practical problems caused by this repositioning of citizens as consumers experiencing “customer services” are explored in depth by Fountain (2001) and Bekkers and Homburg (2007). More recent research shows that there can be serious consequences. First, for civic participation and democracy, as and when it leads to the creation of a mind-set in individuals (Galen et al, 2012) of being a consumer rather than a citizen: “we are seeing ... an increasing body of evidence that the dominance of the Consumer identity is directly undermining the cause of encouraging political participation” (Alexander, 2014). Second, for public bodies, if a focus on the “customer” overwhelms their broader purpose in relation to public policy goals (Alexander, 2014). Also, the expected positive results of NPM have now been strongly questioned (Hood and Dixon, 2015).



Ministers’ powers derive from: Parliament, which grants powers through legislation; ministers’ common law powers to act; and prerogative powers of the Crown that are exercised by, or on the advice of, ministers. Each form of power is subject to limits and constraints, and its use may be challenged in the courts. Ministers can also only spend public money for the purposes authorised by Parliament.

Cabinet Office, 2011

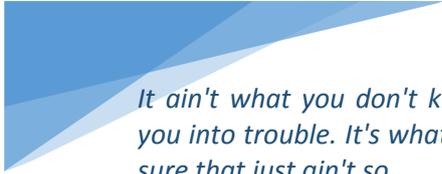
Moreover and regrettably, the use of language emerging from this perspective has led the e-government community into a terminological fog that envelopes a large proportion of the academic and government-produced writing over two decades. The term “service” is used to apply to everything from an entire taxation or healthcare system, through processes and transactions, to a piece of computer code for executing an online payment for a government licence (European Commission, 2013).

The confusion is compounded in the term “public services”. A full English dictionary (such as Merriam-Webster, Oxford or Collins, or online legal dictionaries) will give multiple meanings of both words, but most relevantly the adjective “public” can mean either “of, relating to, paid for by, or working for a government e.g. she was elected to a public office; public finances, public housing”, or “able to be used by anyone — accessible to people in general rather than restricted or private e.g. a public telephone or toilet, they agreed on a coffee shop as a safe public place to meet”. The latter does not imply the former, nor vice versa. Consequently, “public service” can mean something like city transportation, even if provided by a private company, or an administrative function of a government in the form of a state-funded and politically accountable organisation — a particular case of which is an organisational instrument as explained earlier.

The nature of the domain of e-government would point towards this last being the appropriate use of the term. But then we encounter “online public services”, “citizen-centric services”, “open government services”, “composable services” (Bouguettaya et al., 2006), and other phrases that lead readers into mental gymnastics as they try to work out whether they refer to web sites, transactions, administrative functions, organisations of people, or bits of computer code, and then what the adjectives might mean when applied to those. Through careless over-use, the term “service” now serves to obscure meaning.

This paper asserts that clarity of thought and communication in this domain will be significantly improved if precise terminology from the realm of public administration is adopted (as opposed to NPM or computer science), such as developed in this paper in relation to policy design and instruments.

If that is done, “**transformation of government**”, can then finally be defined as **changing the set of instruments that a government selects in order to implement a particular policy**: this gives a level of granularity that is specific and identifiable, independent of the structure of a government or public administration, independent of technology, and usable across different governments. Its realisation can only occur through policy (re)design, not operational or organisational change. Curiously, it might then even make sense in its common location in stage models of e-government.



It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so.

Mark Twain

If thought corrupts language, language can also corrupt thought. A bad usage can spread by tradition and imitation, even among people who should and do know better.

George Orwell, 1945



But you are not obliged to go to all this trouble. You can shirk it by simply throwing your mind open and letting the ready-made phrases come crowding in. They will construct your sentences for you – even think your thoughts for you, to a certain extent – and at need they will perform the important service of partially concealing your meaning even from yourself. It is at this point that the special connexion between politics and the debasement of language becomes clear.

George Orwell, 1945

4. POLICY INSTRUMENTS CLASSIFIED FOR DIGITAL TRANSFORMATION

To examine how digitally-enabled transformation of that nature might be achieved, it is necessary to address the potential impact of ICT on the choice and implementation of instruments during policy design, or re-design. One can explore how ICT might influence the process of formulating and deciding on policy *goals* (Navarra and Cornford, 2012) within policy design. To do so would helpfully and correctly position data analytics, and also “e-participation” to be distinct from a continuation of an e-government trajectory through information and transactions in stage models (as implied by for example United Nations, 2005 p16 Box 1, and 2014 Annex A6), but here we will look only at ICT within the *means* of policy implementation (i.e. instruments) given our definition of transformation.

Choices on policy means may be influenced by the ability of technology to change the relative effectiveness and economics of possible instruments (Hood, 2007), leading to instrument design and legislative draughting that embodies the contribution of technology. Once chosen, many instruments require *calibration*, or setting the parameters that are predicted to achieve the desired policy outcome e.g. a tax rate or a qualifying threshold for a benefit entitlement like a pension.

ICT still has a major contribution to make in the *operational machinery* of public administration, notably by reducing the overall economic cost of administration (Administrative Burden Reduction, ABR — European Commission, 2014). However, action here will benefit from being set in the context of the bigger picture rather than as an end in itself, by shifting the focus of attention to instrument choice and design rather than on process automation. This can however benefit from one side-effect of making instruments’ transactions electronic, highlighted by Waller et al (2014b), in that they can then generate near-real-time management information. The availability of this to an overarching policy review function could facilitate the fine-tuning or modification of the instruments in question.

Hence we will look now in depth at instruments, their characteristics, and how technology can augment them to give a greater range of building blocks for policy design. The first step towards this is to go into more detail about the nature of policy instruments. There have been numerous attempts to draw up a taxonomy of policy instruments (well described on the pages of the Policy Design Lab website², so not covered here) but the work of Hood and Margetts (2007) and Hood (2007) provides a well-established and relevant foundation.

Instrument Resource	Interpretation	Examples of Instruments
Nodality	The ability to collect and disseminate information	Safety campaigns, public & company records
Authority	The ability to determine how people must act	Laws, taxes, permits, regulations
Treasure	The ability to provide money	Benefits, grants, loans, subsidies
Organisation	The physical ability to act directly on people or the environment	Infrastructure, health service (public goods & services)

Table 1. Hood’s Classification of Instruments: resources underpinning government capability to act on the environment and society. Source: Hood & Margetts (2007)

Their scheme groups instruments according to the resource upon which a government draws to make each instrument work in terms of impact on the economy, the environment or society. The

² <http://policy-design.org/wiki/development-of-taxonomies-and-models-for-policy-design/the-development-of-taxonomies-2/>

four such resources are Nodality, Authority, Treasure and Organisation, abbreviated to NATO and explained in Table 1.

A level of detail beyond that in Table 1 is needed to give sufficient differentiation between types of instrument for the purposes of assessing the contribution of ICT to instruments, while keeping a structure that has a manageable degree of variety. Table 2 illustrates one way to do this, and that constitutes part of this paper’s proposed frame of reference.

Resource type	Instrument sub-class	Examples
Nodality	Information Provision	Public health campaigns, health advice website
	Data Publication	National statistics, census data, performance data
	Self-service Information	National archives, law databases, company information
Authority	State Prerogatives	Criminal law, diplomatic relations, military action, border control, currency control
	Taxes and Duties	Personal tax, corporate tax, sales tax, import duty, fuel duty, alcohol duty
	Registration, Permits and Standards	Passport/ID card, driving licence, birth registration, trading permit, parking permit
Treasure	Entitlements, Grants, Subsidies, Loans	Unemployment benefit, pensions, housing/care allowance, research grants, student support
Organisation	Public Services	Utilities, mail, health, education, welfare, transport, emergency, waste, accommodation
	Public Goods	Roads, railways, airports, parks, broadcasting, museums, libraries, public housing, “platforms” for public use
Meta-class		
Information about Instruments		

Table 2. Sub-classification of Instruments for assessing digital contribution

Nine sub-classes of instruments are identified within Hood’s four resource groups. Added to these is a distinct meta-class, that of information about instruments, that allows us to take account of the requirement of a government to explain to the public what instruments it is using to implement its policies and thus what individuals and businesses need to do in response to them. We recognise that other structures and labels are possible, but propose that this is suitable for the need here. Hood makes a distinction between “detectors”, instruments that sense or gather data from the environment, and “effectors”, those that make an impact. While this is a useful differentiation to

make in policy design, we have not found it material for our purposes here (it is relevant at the next level down when we would start to identify possibilities for using technology and data).

If we now take each sub-class of instrument as something that would provide options at the *choice of means* element of policy design, require tuning at the *calibration* stage, and become realised or administered through *operational machinery*, we can begin to identify those factors of design that could be influenced by ICT at each of those three stages. In so doing, we recognise Howlett's (2009) point that these are not sequential steps in practice but loop back and forth between each other and redefinition of policy objectives: policy-making and implementation is non-linear. Tables A1 to A5 in the Annex illustrate such factors of design for each sub-class across the three stages, and the meta class.

The impact of ICT on instrument selection and design

Drawing on the principles of public administration and seminal works (European Commission, 2014, Randle and Kippin, 2014, Arendsen et al., 2014), three concepts stand out that provide the rationale for choosing or modifying instrument sets in favour of new, technology-enabled ones, in order to achieve transformation not as an end in itself but as a means to one of these three ends. They are Demand Management (DM), Administrative Burden Reduction (ABR), and Availability, explained below. The policy design proposition is that an ICT-enabled set of instruments would lead to a more effective policy, and/or a more effective or efficient implementation, than alternatives. In any specific situation, this should of course be tested by a robust impact assessment, ex-ante appraisal or business case.

The implementation of the London Congestion Charge in the UK illustrates how a number of applications of ICT can feature in a policy implementation. The policy goal is to reduce the level of traffic in central London by using a permit instrument with a moderate but non-trivial fee. Rather than having motorists pay at old-fashioned toll booths, through a network of cameras, automated number-plate recognition identifies vehicles entering the charging zone and raises a charge on a billing system. Charges against a vehicle's registration number can be paid online, by SMS, phone, automated phone, post, or by automatic charge to a credit-card backed account, with no ticketing involved. Enforcement of non-payment is done by linking the vehicle registration number to the owner and address on the national vehicle database. Many e-government studies would only pick up the online payment element — a small part of the whole scheme.

Demand Management

Users of a directly-provided public service or public good will typically experience a benefit, such as medical care, a bus ride, use of a park, or internet access at a public library. They may or may not pay for such an experience. The provision will have a capacity (usually limited), whereas demand will fluctuate. Where the benefit is great (or the price at the point of use is low or zero), demand may put pressure on the public provision capacity — this is particularly noticeable in Western countries' health and elderly care systems, and globally in urban road congestion. In other cases, the policy goal may require driving up demand, such as for immunisations in developing regions. The practice, by public administrators, of balancing demand and provision to optimally meet the policy objectives, is termed Demand Management (Randle and Kippin, 2014).

Randle and Kippin (2014) propose that there are three classes of action available in this context. First, for the short term, to make better use of existing capacity primarily by altering behaviour or expectations e.g. in the health service, by texting reminders to patients to reduce the number of missed doctor's appointments or encouraging use of different sources of advice such as pharmacists. Second, for the medium term, to redesign services (i.e. the instrument set) with service users to find different ways of meeting the demand e.g. provision of care at home. Third, for the long term, to take preventative measures (i.e. deploy new instruments) that reduce future demand, e.g. reduce the incidence of chronic conditions, such as obesity through regulation of food manufacture, taxing sugar or fat content, or information campaigns. In all three classes of action, there is the potential for ICT to widen the range of options.

Administrative Burden Reduction

The interactions in support of many instruments, particularly Authority-based ones, between a government and a citizen or a business are invariably a burden on both. Even if the end result may be of benefit to the person or the community as a whole, the obligatory process in the way of achieving it is at best an inconvenience and at worst a large consumer of time and effort imposed, in the eyes of the recipient, by an impersonal bureaucracy. In many cases of taxation procedures or regulatory compliance, there is no direct benefit at all to the individual, so an even greater perception of burden. Depending on circumstances, citizens or businesses may experience transactional interactions very rarely or quite frequently: registering a birth, quarterly business returns, and buying a parking ticket daily have quite different characteristics. However, at the public administration end of the processes, the volumes can be massive and consume significant resources. At both ends, the time and effort consumed in these activities is economically unproductive with potentially substantial opportunity cost to citizens, businesses and the nation. Tools such as the UK's Regulatory Impact Assessments, often published alongside policy proposals, are intended to provide a measure of such burden. Hence in this context, the aim in policy design is to reduce the impact as much as possible, through the practice of Administrative Burden Reduction (European Commission, 2014).

ICT significantly increases the options available for burden reduction in public administration, as explored in the European Commission report cited. At a relatively simple transactional level, the online process for paying the UK annual car tax saved car owners much time in finding paper documents and taking them to a Post Office. The scheme met a number of policy goals (keeping a register of vehicles and owners, collecting a duty originally intended to fund road repairs, and ensuring that a car had insurance and a safety certificate) with one instrument. Compliance was confirmed through receipt, by post or over the counter, of a paper disc to put in the windscreen of the vehicle, with enforcement achieved by visual inspection by a policeman. Now, given there are databases of vehicles, insurance policies and safety certificates, payment can be automated through setting up direct debits and enforcement can be done by automated number plate recognition and database processing to flag violations — the paper tax disc was abolished in October 2014.

However, context is crucial and it cannot be assumed that online transactions automatically reduce burden for the citizen. While submitting a tax return online may indeed make life easier for someone with wealth to manage, having to complete an application for benefits through the Internet may add to the problems facing someone in poverty not only with the technological aspects but also through reinforcing their social isolation (Atkinson, 2015³).

On the administrative side, in designing manually administered instruments, the trade-off was often between one that differentiated between different target groups and one that was uniform in application across a population. The narrower the focus of an instrument the harder it was to administer as targeting criteria had to be obtained and evaluated through human judgement: universal coverage was much simpler (Linder and Peters, 1989a). The economics of this trade-off are altered when ICT and data are available, for example in the UK car tax example it became possible to levy a different rate for vehicles according to the polluting emissions as opposed to a flat amount per car or lorry.

Availability

In any area of public policy that affects individual people or businesses, it is essential that they are fully aware of, and understand, the impact on them. Without that, the policy is unlikely to succeed in its objectives. This may relate to locations of facilities, tax obligations, benefit entitlements, permit requirements and fees, and so on — in other words, information relating to the policy instruments in use. A government must therefore provide the necessary information in a form, language, time and place that achieves the necessary awareness and understanding. The information must be fully

³ Reviewed in *The Economist* 6 June 2015.

accessible including to those without internet access or with disabilities, which is why accessibility (particularly of web sites) has been a major issue with e-government. We can sum up these essentials in the term Availability (to make it more general a concept than accessibility, which has taken on a specific meaning as above). In the case of a public information campaign (e.g. on road safety), information provision may itself be the instrument, and we have made this distinction in the sub-class and meta-class difference in the classification of instruments, but the same principle of Availability applies in respect of the audience to whom it is relevant.

The communications business would regard knowing the audience and working out the ways to reach them most effectively as fundamental. Through the power of the Internet, mobile technology and other means, ICT significantly increases the potential availability of government information. However, most obviously in the light of the significant proportion of the population that does not access the Internet, that is not the only channel we need: “multi-channel strategies” are still important. Print media, posters, leaflets, advice centres and telephone help lines are still part of the mix, augmented by social media, text messages, streaming video and the like.

Consolidating a Frame of Reference

Table 3 sums up how these three concepts broadly map on to classes of instruments and builds in, admittedly simplistically, a citizen perspective on those instruments derived from the discussion above and their inherent natures. In combination, each mapping leads to an implied approach to policy design and implementation. While crude, it does however take us beyond the nostrum of the earlier era along the lines of “citizens are demanding quick and simple online public services”, a sentence which under the lens of this paper’s analysis is clearly muddled.

Instrument Classes	Citizen Perspective	Key Design Factor	Implied Approach
Information about Instruments	Must have	Availability	Channel strategy
Public Services & Goods	Do want	Management of Demand	Whole-System design
Information Provision	Might need	Availability	Channel strategy
Transaction-based Instruments	Don’t want, must do	Administrative Burden Reduction	Instrument selection & design

Table 3. Perspectives on and approaches to instrument classes

The components are now defined to construct a high-level frame of reference for researching issues of e-government effectiveness in the past and identifying and addressing issues for the future, as set out in Figure 2 which brings together the elements discussed in this paper.



Figure 2. A Frame of Reference for digital transformation of public administration

5. E-GOVERNMENT RE-ASSESSED

The principles set out in this paper, encapsulated in the frame of reference, enable a reassessment of the development of e-government over its first two decades, insight into the problems and issues that e-government faced in those first 20 years, and the construction of a new basis for future work. We suggest that a typical, generalised, e-government development of that period consisted of the components in Table 4.

Component	Online Content	Offline Equivalent
Information about government *	What government does & how, rules & procedures to follow, how to access organisations, how to claim money	Leaflets, guides, forms, manuals, helplines, advice centres
Interactive functions/transactions **	Information provision and payments	Request & submit forms and payments by post, phone or in person
Policy communications	Policy announcements, news, government meeting reports	Press releases, speeches, posters, media articles
Local information	Visitor information, public facilities, history, geography, events	Visitor information centres, local newspapers, leaflets, guidebooks
Feedback on government activities	Alerting to problems, complaints, experiences	Contact centre, response cards, surveys
Feedback on policy	Proposals, suggestions, opinions, evidence, petitions	Letters, consultation documents, polls
Feedback on provision channel	Views on relevance, intelligibility, usability	Views on relevance, intelligibility, usability
* Information on policy instruments including public services & goods		
** Components of policy instruments		

Table 4. Typical e-government development 1995–2016

It shows that the first stage, of putting government information on web sites and portals, was focussed on publishing information to the public about policies, instruments (particularly those entailing obligations and entitlements), the manner in which citizens and businesses were able to engage with instruments, and the organisations that administered the instruments (Layne and Lee, 2001). This replaced volumes of hard-to-access guides, manuals, leaflets and information campaigns, saving time and money for both the citizen and public administration (Heeks, 2005; Weerakkody et al., 2011). This usefully and primarily provided access to essential information about instruments, and secondly described other aspects of government and public administration. Availability is key — moreover, once this becomes established as the primary means of disseminating such information, it must be comprehensive and accurate: anyone depending on it for statutory guidance must be able to find what they need. It is not acceptable to leave information off the site just because few people are likely to need to know about a particular aspect of a particular instrument — someone will.

The second phase of e-government, often characterised as the interactive and transactional stages, is more problematic and by most measures was less successful in achieving value (United Nations, 2005 & 2014; European Commission, 2009 & 2012; Weerakkody et al., 2011).

In essence each such action was an attempt to put online just one component of a policy implementation instrument set designed for non-electronic operation (see for example the 20 basic transactions — inevitably labelled as “services” — used in EU e-government benchmarking, in the reports cited). To make the task harder, this often included a process requiring a manual signature that formed part of the instrument for legal reasons. This approach, while technically complex and expensive compared to the first stage of information provision, generally made no fundamental difference to the instrument form (O’Neill, 2009), and thus ambitions for a “transformational government” (Cabinet Office, 2005) proved to be somewhat optimistic (Bannister and Connolly, 2013). This may partly explain why e-government has often been seen by policy-makers as purely operational, or as a project for the IT experts (Sharif et al., 2010; Weerakkody et al., 2011; Barker, 2015; National Audit Office, 2015b). The focus on web sites as the carrier of transactions, encouraged by benchmarking such as by the UN and EU, also risked missing opportunities for more user-friendly vehicles such as SMS messaging or automated payments, and so-called “multi-channel” approaches, despite there being well-known cases of all of these (Waller et al., 2014a).

Given the reasoning so far, we might now begin to understand why many of the “big ideas” of e-government have not become reality (Bannister and Connolly, 2013). We have explained that the public sector comprises the institutional machinery for administering instruments yet many commentators refer to this as “government” — the government is the policy-making function, for example in the UK it is the Cabinet and other ministers (Cabinet Office, 2011). So “e-government” is more properly “e-administration” unless the subject is the political decision-making process, where the term “e-governance” has been used — though again this is not accurate as “governance” is the term for an overall structure for governing (Zwahr et al, 2005; Howlett & Lejano, 2013).

Similarly, the “organisational silos” of public administration (often termed the “bureaucracy”), frequently referenced as the objects of transformation and barriers to progress (Bannister, 2001; Weerakkody et al., 2011), in fact map on to instruments created by policy, legislation, and political accountability, and are not organisations created by managerial design. This may cast new light of the issues of “joining-up”, “whole of government and collaborative governance” (United Nations, 2014), and the “once only principle” (European Commission, 2014). Systems not created by managerial processes but designed politically and legislatively — and set in statute — are hard if not impossible to change solely through internal managerial or technical action (Peteraf and Reed, 2007; Mott, 2014).

Similarly, the commonly-stated ambitions of online identity management and “personalisation” of government



The limits of my language mean the limits of my world.

Ludwig Wittgenstein, 1922

functions must be considered as matters of policy design and legislation, in the light of evidential requirements for law-enforcement and procedural standards that mitigate against bias, fraud and corruption, rather than matters relating to accessing web sites.

The use of technology in the pursuit of government aims exists within a local political, cultural and social context. As discussed above, different governments— even adjacent local governments — have different policy goals and instrument preferences. Legislative norms and the form and governance of nations’ public sectors vary widely. Consequently, it is not valid to assume that the application of technology in policy implementation can be the same in different geopolitical settings, even where broad policy objectives are similar. This brings into question the validity of concepts of “best practice”, “transferability”, “scalability”, “interoperability”, and “benchmarking”, across governments (common in the statements of international institutions), and supra-governmental investment cases where there is an implicit assumption of comparability. We might note that few multi-national businesses would assume that their products and business processes could be reproduced identically across different cultures and regulatory regimes.

None of this disputes that in some cases e-government has achieved overall value through reducing the burden of administration on citizens and the public authority, and around the world there are many highly regarded government information web sites and cases where online transactions have hugely improved processes (such as the UK’s annual vehicle licence payment). Cases exist of successful “joining up” of transactions around life events or common sequences of processes (in a citizen’s “journey” through an administrative task), such as Tell Us Once in the UK that reduces several requirements to inform authorities about a death to just one (note however that in this case, the burden on the citizen is transferred to a new public intermediary function that informs the back office systems, not removed completely). Citizens would certainly be disadvantaged if all these improvements vanished.

However, evidence in the form of full economic cost and benefit analysis is scarce (Sharif et al., 2010; European Commission, 2014; Weerakkody et al., 2015). Indeed Hood and Dixon (2015) looking at 30 years of NPM (including the use of IT) in the UK could find no evidence of government being better or costing less, and the National Audit Office (2015a) found little cost saving attributable to digital transformation. In parallel there have been significant increases in the cost of cyber-security, and other unforeseen effects such as having to shut down hundreds of fraudulent web sites pretending to provide government functions⁴.

This analysis serves to demonstrate that while these phases of e-government may have used ICT-enabled process change to achieve better efficiency, they could not in themselves result in transformation, whether loosely defined or using the stricter definition above, as policy instruments remained unchanged.

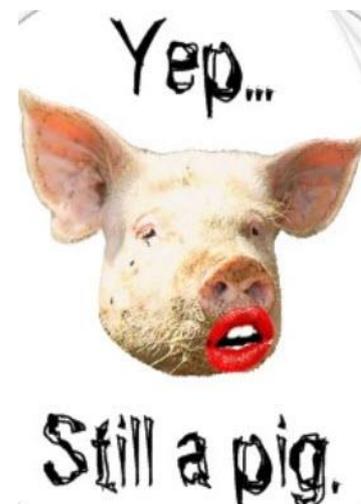


Figure 3. Lipstick on a pig

⁴ <https://www.gov.uk/government/news/tax-credits-claimants-warned-over-scam-emails>

6. IMPLICATIONS OF THE INSTRUMENT-BASED APPROACH

Once we look at the application of ICT to government and public administration from a policy design and implementation perspective, with instruments as the objects with a real-world presence, many familiar issues take on a different appearance. Even within the tight scope of this paper, many new questions stand out relevant to both research and practice. Beyond its scope there are many more, such as the role of data analytics and ICT-enabled participation in policy design (“open policy making”, “e-participation”, and so on).

The differentiation in Table 3 of the characteristics of instruments opens up possible hypotheses to test to explain the poor take-up of online transactions (as opposed to using government web sites as sources of information; Bannister, 2007). Such research might investigate psychological angles on the problem rather than rational — perhaps the citizen is subconsciously thinking: “If I am only doing something occasionally, because I have to and it is a burden, why would I spend time and effort learning how to do it differently?”

Further, it poses the challenge of how, given the perspectives for each instrument class, the economics underlying the instruments, and thus the Key Design Factors, do policy designers select and design instruments incorporating the potential power of ICT, to get better policy outcomes? In other words, how in practice do they take the approaches in the final column in table 3? This also calls for a critical rethinking of all instances where technology is leading the debate such as mobile access, apps, social media, open data, and big data. That we suggest is where the focus of future work should lie.

To give a simple illustration, one difference between an instrument-based approach and that of starting from the point of view of online transactions is that ABR may better be achieved by minimising interaction when designing policy rather than having a transaction and putting it online. The important proviso here is that the use of technology and data to achieve this is supported by proper consultation, debate and legislation as opposed to a hidden application of, for example, data sharing or algorithmic regulation (Morozov, 2013) — the choice to use particular technology and data is a political one not a technocratic one.

This paper is not attempting to take the next step to map particular technology to instruments, partly because of the scale of the task and partly because of the pace of technological developments would date it too quickly. Rather, it poses the challenge of how to bring into the policy design process, at any moment in time, current knowledge of what is technologically possible and relevant to the achievement of the policy goal through instrument choice and implementation. Sufficient levels of policy and technology knowledge will be rare in one person, necessitating a collaborative and multidisciplinary design team. The conversation will need to be significantly different to the historically common ones based on either hyped technology in search of a problem or — or sometimes in combination with — naïve faith in technology by the political cadre.

Of course, when an interactive electronic component is called for, then the principles of ABR, as well as common sense, require that it should be as quick and simple as possible from the user and public administration point of view. So design, ergonomics, usability and user testing are certainly important, as long as these take account of the totality of the policy goals, instruments and stakeholders concerned — a degree of complexity that is easily missed or ignored if IT-driven approaches focus on the web front end (National Audit Office, 2015b; House of Commons, 2015).

The analysis opens questions of a more academic nature — but ones with a major impact in practice. The first is how policy designers make a choice between ICT-enabled instruments (*ex ante* evaluation); the second is related and asks how the effectiveness of implemented policy is measured (*ex post* evaluation). The third is about how “best” or “good” practice is shared and adopted (or adapted) when as described earlier, instrument selection and implementation involves political

choices that are highly sensitive to the political, cultural, social, economic and environmental context within which they are made.

The fourth (a corollary to the third) is how, if they continue to do so, pan-national institutions such as the United Nations and the European Commission conduct comparisons between nations in their so-called benchmarking and ranking exercises. Trans-national plans, analysis or comparisons are made difficult by the fact that across nations there is no standard set of functions that are provided by the state, and further, different governments (even at sub-national level in a country) can and do choose different instrument sets to achieve the same or similar policy goals (Bauby & Similie, 2010). This suggests that any comparison across or learning from other nations regarding e-government is very challenging.

We do not intend to address these here as they are huge questions. However, we make two observations that may be helpful.

For the first and second questions we suspect that the answers are essentially the same as they would be if the ICT factor was not present, though it does add to the complications (Waller et al., 2014a). Policy makers have established processes for *ex ante* evaluation of options, largely based on economic appraisal, affordability and deliverability (see for example the UK's HM Treasury *Green Book* and guidance on developing business cases). Such a process results in a business case for a policy intervention that provides the basis for both the policy implementation project and *ex post* evaluation. Waller and McKinnon (2013) start with the general approach to business cases to develop a methodology specifically appropriate to ICT-enabled innovations in directly-delivered public services, supporting initial investment decisions and subsequent evaluation. The method emphasises the need for stakeholder engagement — just as there always has been in policy design — but gives a reminder that policy makers have to build in the technology element at that early stage and not leave it to an implementation afterthought.

For the remaining questions, we note that public administration is carried out by nations across the world — regardless of their government's political nature, scale and structure — using the near-common set of policy implementation instruments set out earlier. Every government is unique and every public body is unique, but the instruments in their toolkit are remarkably common. They will be used in combinations to achieve a specific policy objective that may be as grand as a UN Sustainable Development Goal or as local as providing a better village bus service. Yet, while a policy goal may be common between many governments, the combination of instruments they choose to use will probably be different depending on their circumstances. Hence it is the commonality of instruments rather than domain of application that may possibly support the sharing of knowledge and experience across governments regarding the transformative power of ICT on public administration, and give a different twist to international comparisons.

7. CONCLUSION — WHAT NEEDS TO CHANGE IN PRACTICE AND RESEARCH

Early e-government plans based on “government as a service industry”, made attractive with a good colouring of technocratic rationality and idealism, have kick-started vast efforts, some of which may be of enduring value. However, there is little evidence that the balance of costs and benefits in e-government has met the political expectations. Rather expensive issues like dealing with legacy portals, meeting the challenge of access from mobile devices, taking spoofer of government websites to court, and defending infrastructure against cyber-attacks did not feature highly in the initial equation. Neither did the reluctance of people to do administrative transactions online, nor the length of time it has taken to make inroads into digital exclusion. Coding existing administrative processes into hardware and software may thus have wasted time and money, created legacy systems to give future inertia, and missed transformational opportunities.

Organisations established by governmental action as public bodies are invariably involved in implementing an aspect of public policy, be they direct public services such as for health or

education provision, ones managing public infrastructure like roads, or ones administering taxation, grants, benefits, permits, regulatory enforcement, and other instruments. They are the Public Administration. They are not commercial firms with services and customers as NPM implies. To understand the potential of ICT in the public sector we need to consider how it fits in with policy design, implementation and administrative practice. Only by that means can we explore the true potential for ICT-enabled transformation. This paper has sought to show that technology-enabled policy instruments are the appropriate vehicle to do that, and provide a robust definition of what transformation means.

It also highlights difficulties in realising that potential. It has major implications for strategy, measurement, public servants' skills in policy design and ICT development, multi-disciplinary working between ICT, policy and legislative teams, and policy implementation project design and execution. It identifies the challenge of how to bring into the policy design process, at any moment in time, current knowledge of what is technologically possible and relevant to the achievement of the policy goal through instrument choice and implementation. Rationality does not apply: what is technically optimal or efficient (perhaps in systems architecture or use of data) may be unworkable, and choice of tools and data is subjective and political. Therefore, more work needs to be done to make this instrument-based approach useful to policy makers, bridging the worlds of technology and politics.

Researchers in this field will have to get to grips with how to measure and interpret social, economic, legal and political phenomena where change is effected by the use of ICT. This is the domain of social and political science: a strange land for many e-government academics.

There is no shortage of burning questions, ranging from how to do an *ex ante* policy options appraisal, through the meaning of identity online in dealing with legislatively-backed instruments, to how to back-up and defend a government digital infrastructure in the face of an intensive cyber-attack. There is no shortage of jargon to unravel and pretention to uncover: the digital culture is characterised by being a production line for "new" concepts once old ones run out of currency. There is no shortage of areas of national and international governance to look at using the new frame of reference, rather than NPM-based models, for example participation in politics, public sector innovation and reform, good practice sharing and use, and the merits and issues associated with sharing ICT infrastructure across public bodies. Always, the next technological fashion — be that big data analytics, algorithmic regulation, platform government, co-creation or whatever — must be critically assessed against the distinct context of politics and government.

Lastly, supra-national bodies, consultancies and others with a desire to conduct comparisons across countries and regions need to look very hard at their methodologies. The old ones are now shown to be flawed and — worse — driving countries who take them seriously down unproductive and risky routes. What is on a web site really is not the point.

This paper nevertheless concludes that ICT has a huge part to play in the future of policy design and administration, but through the lens of policy instruments, not technology. Whether any such use of ICT in realising public policy goals is politically feasible, socially desirable, strategically wise, or economically sound is of course an entirely separate set of issues. We can say that they are ultimately the more important issues, as well as the least understood. The answers to them will vary between places and in time, but the responsibility for those answers lies with those in political power.

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ANNEX – POLICY DESIGN FACTORS AFFECTED BY ICT

Introduction to the tables

The first four of the following tables are a first attempt to identify where ICT can contribute to the design and administration of policy instruments. The instrument sub-classes of Chapter 5 are used, grouped into separate tables by their NATO classification.

The three columns correspond to three elements of Figure 1: Instrument Choice and Instrument Calibration (two aspects of policy design), and Operational Machinery (the administration of the instrument).

The entries in the tables are intended to indicate where design factors relating to each form of instrument, relevant to the element represented by each column, could be affected by considering the potential of ICT. The hypothesis is that a different design for a policy and its administration, even a different choice of instrument, would arise if ICT were applied to some of these factors than otherwise.

The fifth table is slightly different as it performs the same analysis — of factors on which ICT might have an impact — on the meta-class of providing information about instruments. Here the columns represent the choice, design and management of communications media to be used to provide such information.

As explained in the text, we make no attempt here to identify specific technologies or exactly how they might contribute to each factor. That would end up a large but incomplete work as we tried to hit a moving target. That in itself does highlight the challenge we identified, of how in real policy design within government, the opportunity to use technology creatively can be explored and evaluated. However, readers can almost certainly pick out factors in the tables and, based on knowledge of work in the field, see some examples for themselves — particularly in the well-trodden territory of the operational machinery factors for the transactional instruments in the Authority class.

This material cannot be said to be more than illustrative at this stage: refinement and research is required to validate and extend it. A mapping of existing cases of e-government implementations against it might be a start — we are not aware that this has been done through such an instrument-based lens. Nevertheless, it can be said to give support to the assertion that the potential for ICT to influence policy design does exist.

Instrument sub-class	Instrument Choice	Instrument Calibration	Operational Machinery
Information Provision	Cost Effectiveness in achieving behaviour change	Targeted information provision - audience and media Impact Measurement	Maintainability Feedback collection Effectiveness monitoring Diffusion analysis (e.g. via big data)
Open Data Publication	Enable innovation & economic value Enable behaviour change Transparency & accountability Cost Availability	Accuracy Clarity & Understandability Standards Usability (machine readability) Selectivity	Common access points (repositories) Data sharing including G2G Data standards Search Download New applications
Self-service Information	Cost Availability Enable innovation & economic and social value through capacity building	Usability Accuracy Clarity & Understandability	Databases Search & Retrieval Data sharing including G2G

Table A1. Nodal Instruments

Instrument sub-class	Instrument Choice	Instrument Calibration	Operational Machinery
State Prerogatives	Risk management Data availability Collaboration between governments internally, externally	Real-time data Demand data Resource allocation	Identity management and authentication Data sharing Data matching Case management Payment simplification Intelligence gathering Mapping
Taxes and Duties	Administrative Burden Reduction Enforcement cost Transaction cost – both ends Evasion, fraud, error & debt detection Evidential requirements	Scope & Rates Encouraging compliance	Identity assurance Payment simplification Transaction simplification, including combination Compliance advice Availability Front-office effectiveness Back-office efficiency Data matching
Registration, Permits and Standards	Administrative Burden Reduction Enforcement, Compliance Transaction costs Evasion, fraud, & error detection Deregulation Regulatory Impact Consultation	Scope & Fees	Identity assurance Payment simplification Transaction & compliance simplification, including combination, reduce repetitive info provision Compliance advice Availability Back-office efficiency

Table A2. Authority Instruments

Instrument sub-class	Instrument Choice	Instrument Calibration	Operational Machinery
Entitlements and Grants	Administrative Burden Reduction Demand management Evasion, fraud, & error detection Enforcement cost Transaction cost – both ends Evidential requirements	Scope & Rates Eligibility rules	Identity assurance Payment simplification Transaction & compliance simplification, including combination, reducing repetitive information provision Entitlement Advice Availability Front-office effectiveness Back-office efficiency

Table A3. Treasure Instruments

Instrument sub-class	Instrument Choice	Instrument Calibration	Operational Machinery
Public Services	Demand management Service failure risk Inspection Operating cost Capital investment SROI Citizen-centric design, co-creation Public monopoly vs mixed economy Market creation, commissioning & contracting-out Enabling intermediaries; capacity building Behavioural incentives, “nudges”	Quality Access & availability Service levels User entitlement Charges, fees, subsidies Usage data Resource allocation	Data sharing Open data Access/use transaction simplification Billing/payment simplification User authentication Enable service integration Reduce repetitive info provision Case management & service user record management Service-user feedback Facilitating stakeholder engagement Service innovation
Public Goods	ROI, VFM – asset utilisation Demand management Capital cost Maintenance cost e.g. repairs, cleaning Running cost/subsidies Safety PPP, private provision	Scale/capacity Usage charges Usage data	Availability promotion Selling tickets/permits Problem notification (by users e.g. potholes, streetlights) User feedback Support co-design

Table A4. Organisational Instruments

Meta-class	Media Choice	Media Design	Media Operation
Information about Instruments	Availability Accessibility Accuracy Clarity & Understandability Consistency Immediacy – crisis management Cost	Usage tracking User feedback Navigation & Search Multiple channels Common access points Presentation standards	Content management

Table A5. Information about Instruments

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Vishanth Weerakkody is a Professor of Digital Governance at Brunel University London, UK. Prior to his academic career, Vishanth worked in a number of Multinational organisations in the area of software engineering, business systems design and process analysis. He is currently involved in several R&D projects which are funded by the European Commission (Live City: <http://www.livecity-ppsp.eu/>; PolicyCompass: <http://policycompass.eu/>; DAREED: <http://www.dareed.eu/>; SI-DRIVE: <http://www.sidrive.eu/>; EMPATIA: <http://empatia-project.eu/>) and other international bodies such as the Qatar Foundation (I-MEET: <http://www.brunel.ac.uk/bbs/research/research-success/i-meet>) focusing on themes such as Smart Cities, ICT enabled process transformation, social innovation and digital inclusion in the public sector. He has published over 150 peer reviewed articles, guest-edited special issues of leading journals and edited several books on these themes. Vishanth has many years of R&D experience in the field of ICT innovation, process transformation and digital governance and is currently the Editor-in-Chief of the International Journal of Electronic Government Research. A Chartered IT professional and a Fellow of the UK Higher Education Academy, he combines over 25 years of practical industry-based knowhow with academic and teaching experience.

