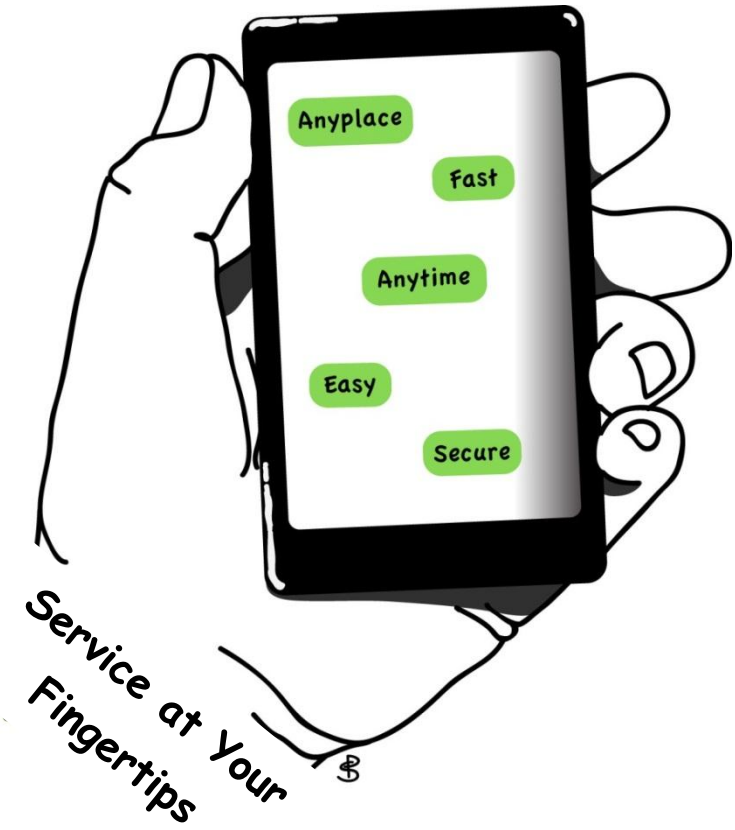
MOBILITY AND GOVERNMENT:

OPPORTUNITIES AND CHALLENGES FOR SERVICE DELIVERY AND INFORMATION MANAGEMENT



A Report Commissioned by the Research Committee of the Public Sector Service Delivery Council and the Public Sector Chief Information Officer Council

Prepared by: Jeffrey Roy, Dalhousie University

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TABLE OF CONTENTS[1]

[1] The author gratefully acknowledges the dedicated research assistance of Claire Heisler (MPA candidate, School of Public Administration, Dalhousie University), as well as the thoughtful guidance and feedback from members of the ICCS Executive Research Committee.

[2] In lieu of an Executive Summary, each of the four main parts of the report begins by identifying the key lessons derived from the subsequent discussion.

[3] Not included within this document, two accompanying appendices have been submitted to ICCS (a bibliography of all resources gathered and reviewed in preparing this report and a compilation of various mobile and otherwise related Gov 2.0 initiatives in Canada, the US, and jurisdictions around the world).

Introduction

Prepared for ICCS and the Joint Councils, the purpose of this report is to provide governments at all levels in Canada with context and guidance to better address the advent of mobility and its consequences for service delivery externally, operational infrastructure internally, and how both are intertwined in today's increasingly digital environment.

For any government, mobility heralds both opportunity and challenge, a reality underscored by the following trends both globally and domestically:

- By 2015, IDC Research estimates that more people will access the Internet via mobile devices than via desk top computers;

- Tablet sales are expected to permanently overtake PC sales by 2017, according to Gartner (others project this inflection point to come as early as 2015);

- ABI Research estimates that more than 1.2 Billion users downloaded more than 50 billion apps in 2013;

- In 2013, there were nearly 2 million different apps from which to choose across the major mobile device operating systems (Apple, Android, Windows, and Blackberry);

- In the US, mobile traffic on 'Black Friday' (the day following Thanksgiving) grew by 34% over 2012 levels, representing nearly 40% of all Internet traffic on that day and 21.8% of all online sales (a 43% increase from 2012)[4];

- A 2013 British survey found that 46% of 18-34 year olds cited mobile as their 'most important screen', with 28% of all respondents saying mobile devices are now their first screens, ahead of television (27%)[5];

- A 2013 Statistics Canada survey of Canadians found that 56% of the population owned a smart phone (up from 33% in 2012), with 69% of online households using more than one device to access the Internet;

[4] Source : http://howtomobile.apps.gov/

[5] Source: http://www.marketingweek.co.uk/news/almost-half-of-all-young-people-use-mobile-as-first-screen/4008308.article

- 70% of Canadians owning a mobile device report using mobile banking apps (according to a 2013 survey commissioned by the Bank of Montreal);

- The Weather Network and MétéoMédia mobile app has been downloaded more than seven million times in Canada since its inception; and

- In the 2013 Manion Lecture to public service leaders in Canada, the mobile Internet was highlighted as the most disruptive technological force in terms of economic and social impact between now and 2025.[6]

Beyond the basic tenants of devices and apps, mobility is also closely tied to the Internet's 'web 2.0' evolution featuring user-driven content (including text, imagery, and video), social networking, big data, and cloud computing. As such, mobility must be situated within a new societal paradigm of online expectations and behaviour. The OECD thus underscores the transformational potential of mobile government, provided that technology be viewed and understood as a means toward greater ends:

> *M-Government – the adoption of mobile technologies to support and enhance government performance and foster a more connected society – can help improve government performance and strengthen public good governance provided that the emphasis is not placed on the "m". Focus should be indeed on the needs of the public sector and of the end-users, be these citizens or businesses, to ensure that technology is exploited to reorganize the way civil servants work and to meet the needs of citizens through improved service delivery (p.12, OECD 2011).*

The US federal government's 2012 Digital Strategy invokes a similar sentiment in viewing mobility as a much wider governance transformation for the public sector driven not only by new technologies but also a new environment within which government must adapt in 'profound' ways:

> *"Mobility" is not just about embracing the newest technology, but rather reflects a fundamental change in how, when, and where our citizens and employees work and interact. Mobile technology – the devices, infrastructure, and applications required to support a mobile citizenry and workforce – is a critical enabler of mobility, but is only part of the profound environmental shift that mobility represents.*

Yet such change does not come easy and most all organizations are struggling with mobility: one 2013 survey across sectors, for instance, that that nearly 80 % of business and technology executives viewed their mobile efforts as low to medium in maturity levels, while 40% define their organization's mobility strategy as 'weak'.[7]

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[6] Source: (presentation slides) November 14, 2013, Canadian Museum of Civilization in Gatineau, Quebec, 2013 Manion Lecture. The event featured Canadian Dominic Barton, Global Managing Director of McKinsey & Company and member of the Prime Minister's Advisory Committee on the Public Service.

[7] Source: http://www.cioinsight.com/it-news-trends/slideshows/cios-struggling-to-meet-mobility-challenge-09/

In a public sector grounded in traditional work cultures and legacy infrastructures - and often under-investing worldwide in mobile relative to most other industries[8], such findings undoubtedly find resonance. Moreover, many public sector officials rightly convey frustration with an excessive focus on transformational claims that minimize or simply ignore present realities and transitional challenges.

Further societal complexities are also apparent. While the trends presented above lend credence to the importance of mobility for government performance and legitimacy, they likewise underscore stark cleavages and corresponding challenges. Nearly one half of Canadians, for example, do not presently own a mobile device – and most public sector service providers in Canada continue to struggle with a fragmented citizenry in terms of comfort levels and preferences with online channels (both traditional – i.e. PC-based, and mobile).[9]

The Canadian banking sector reports similar fault lines, with privacy and security chief among the reasons for reticence toward online channels and mobile banking specifically.[10] Geographic and social disparities with respect to affordable and reliable Internet infrastructure further accentuate the challenges confronting the public sector where equality and inclusiveness are important principles and core considerations.

By undertaking a wide and comprehensive review of government actions, professional surveys, media commentaries, and academic research, this report aims to provide Canadian public sector officials with a stronger basis for what one senior manager aptly described as *an informed point of view* as to where governments in Canada should best marshal resources and energies both now and looking ahead.[11]

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[8] Source: p.7, http://www2.deloitte.com/content/dam/Deloitte/global/Documents/Public-Sector/dttl-ps-govonthego-08082013.pdf

[9] 2013 reports by the Auditor General of Canada and the Provincial Auditor of Ontario illustrate this point, both finding uneven and languishing uptake rates for many online services offered by Service Canada and Service Ontario respectively (a finding common to many jurisdictions around the world and similar reviews undertaken in 2012 in the UK and Australia to name but two examples). Furthermore, a presentation by BC Hydro to the Joint Councils in February 2013 further underscored the complexities at play, characterizing BC household customers as three largely distinct groups in terms of those strongly preferring to interact online, those at present strongly opposed to doing so, and roughly one third in the middle more pragmatic and open to persuasion by incentives.

[10] https://newsroom.bmo.com/press-releases/bmo-mobile-banking-survey-70-per-cent-of-canadian-tsx-bmo-201309170898511001

[11] Despite many significant and promising initiatives underway in Canada (many of which are profiled in the accompanying appendices), this report does not seek to directly catalogue or assess the current state of mobility within the Canadian public sector, but rather to examine how governments elsewhere around the world are addressing mobility both conceptually and in practice. In doing so, the emphasis has been placed on: i) self-published mobility strategies by governments; third-party reviews, commentaries, and surveys and reports undertaken by identifiable and credible sources; and iii) academic studies on topics most relevant to the coverage of this report. In addition, a number of examples profiled in media sources have also been included in order to better illustrate the issues and topics discussed (and for those

The structure of this report:

As this report shall demonstrate, within such a dynamic context many governments around the world are moving quickly and substantively to articulate strategies for mobile government. The main structure of this report, therefore, is derived from a recent effort produced by the Government of Australia that sought to examine mobility's specific impacts on the public sector.

The resulting *Australian Public Service Mobile Roadmap*, published in 2013[12], dissects the mobility agenda for the public sector into three main dimensions: service delivery, internal operations and infrastructure, and participation (which can include both external and internal elements that may often be enjoined as well).

As the Australian Roadmap provides a sound basis for understanding mobility (and given the similarities with in Canada in terms of public sector governance contexts, it serves as a useful organizing prism for this report (that, in turn, is much more substantive in its examination of these three themes and their implications for governments).

Consequently, this report adopts the three main dimensions of the Australian framework (service, infrastructure, and participation), upon which:

- The first and second dimensions – service and infrastructure – are the focus of Part One and Part Two respectively (and in keeping with the Joint Council's Service Delivery and CIO composition, many of the themes and issues examined across these two parts are closely related).

- Part Three further illuminates the participative dynamics of mobility in terms of how mobility is tied to open government and public engagement involving the citizenry externally, and a shifting and more mobile workplace for public servants internally;

- Part Four specifically addresses matters pertaining to mobility and digital inclusion (and how governments have sought to deploy digital and mobile strategies to diminish socio-economic and geographic divides);

- Part Five includes a final set of observations and recommendations pertaining to the roles and collective efforts of the Joint Councils, and how best to further efforts to prepare and adapt the Canadian public sector for the mobility era and the specific challenges examined by this report.

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examples appearing in this report, every effort has been made to further validate them with additional sourcing materials from either government or research bodies).

[12] Available online at: http://www.finance.gov.au/files/2013/06/APS-Mobile-Roadmap.pdf

To reiterate a point made above, this report makes no pretense to provide a final or definitive word as to what government should or should not do to successfully leverage the potential of mobility going forward. Instead, it seeks to further inform and better situate the many conversations and initiatives already underway across the country[13], enabling a sharper allocation of attention and resources – both within and across jurisdictions.

[13] Many examples are included in the second of two appendices submitted to ICCS in accompaniment to this report: the first being a bibliography of all sources and materials reviewed (many of which are not specifically referenced), and the second comprising a domestic and international compilation of mobile-related initiatives.

CENTER FOR TECHNOLOGY IN GOVERNMENT:

FIVE ESSENTIAL ELEMENTS FOR MORE A MOBILE STRATEGY FOR GOVERNMENT[14]

• Look inward and outward. The benefits of mobile extend beyond apps that enhance citizen services to policies, practices, and applications that improve an agency's workforce performance.

• Accept that mobile is everywhere and it's here to stay. Do not dismiss or delay your adoption of mobile technologies because "it's just the latest trend."

• Recognize that mobile is more than another delivery mechanism. Mobile brings a new set of capabilities – such as GPS location services, cameras, remote control, and testing – that can be leveraged to redefine how, what, when and where services are delivered.

• Address security, compliance, and identity management. Do not take shortcuts around the very real and possibly new security and compliance issues that the adoption of mobile raises.

• Evaluate mobile apps versus the mobile Web. If device features are not so critical, a mobile Web approach may be better and vice versa. But apps can also take more time, money, and resources to develop and deploy. Identifying why you are developing and for whom can help you decide.

[14] Source: http://www.ctg.albany.edu/publications/issuebriefs/mobile.pdf

PART ONE – MOBILITY AND SERVICE

Key Lessons:

- Mobility is expected to play an increasingly important role in both the delivery of public services and the creation of public value.

- Mobility will soon become the first point of contact with government for a significant proportion of the populous (much as the Internet already is).

- Despite pockets of savings, mobility should be viewed more as a strategic investment than a significant driver of cost savings in the immediate term.

    - In the short term, mobility can be a critical lever in overcoming the inertia of traditional delivery channels that has hampered the online efforts of many governments to date.

    - In the medium term, the most significant source of cost savings stems from informational, self-service (and where feasible, transactional) services shifting to online and mobile processes.

    - Over the medium term, mobility can likewise drive e-migration efforts, provided more aggressive steps are undertaken to prioritize online service channels.

- Government usage of - and investments in, mobile can be important determinants of the competitiveness and creativity of businesses.

- Measuring mobility's impacts on public satisfaction and trust requires incremental changes to existing methodologies and more novel efforts to leverage new and wider forms of online participation and engagement (the latter also an important theme of Part Three).

> *While less than one % of citizens currently use digital or social media like text messaging, Facebook, online payment systems or mobile applications to connect with government, expectations are fairly high when it comes to what they should or would like to be able to do via these channels. Citizens want to be able to access services anytime and anywhere. They want choice, flexibility and convenience. Lots of work needs to be done to explore these channels and how they might best be accessed and used by citizens.*
>
> *{Citizen's First 6, 2012[15]}*

1.1 Introduction

As the above finding from Citizen's First 6 indicates, mobility has thus far been a modest element of public sector service delivery in Canada. Nonetheless, expectations and trends suggest much greater impacts are on the horizon. In the Australian State of Victoria, for instance, there are clear indications of widening mobile predominance:

> *The increased use of mobile devices like smart phones has created demand for location-based services and content optimised for smaller devices. Government services, transport, timetable and traffic information were among the most requested categories for apps development last year. Mobile devices comprised 10.5 per cent of Victorian Government website traffic in May 2012, up 256 per cent from May 2011. It is predicted that by 2016, global mobile data traffic will outgrow global fixed data traffic by three times.*[16]

As noted in the introduction, global predictions are similar in direction and proportion – with mobile devices gradually and steadily surpassing desktop computers as the most utilized means of accessing the Internet. Not surprisingly, then, mobile-friendly websites and the usage of apps are becoming an increasingly prominent fixture of the public sector landscape in many countries (including Canada[17]).

Mobility is also central to the broader evolution of digital government and online service delivery efforts, a point underscored by British and American digital government strategies released in 2012. Similarly, the new Coalition Government in Australian, elected in late 2013, has pledged to accelerate digital government efforts (with a specific emphasis on mobile), an example that creates some interesting comparisons for Canada in terms of both federalism and multi-channel service delivery going forward.[18]

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[15] Source: http://www.iccs-isac.org/research/citizens-first/citizens-first-6/?lang=en

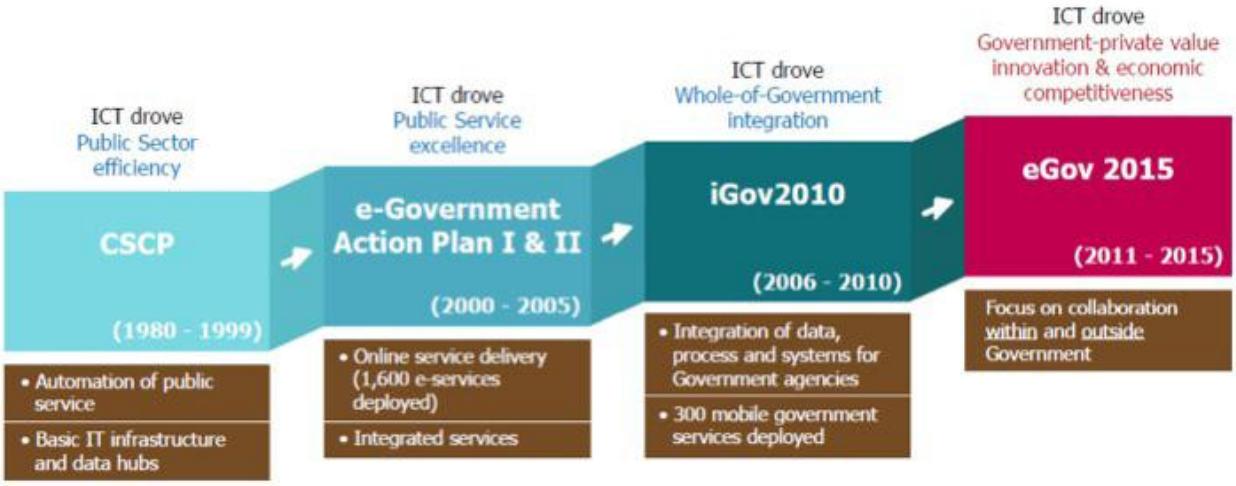
[16] Source: p.4, Digital by Design – delivering better government services through information and technology. Victorian Government ICT Strategy (http://digital.vic.gov.au/wp-content/uploads/2012/08/Victorian-ICT-Strategy-2012-Public-Consultation-Draft1.pdf).

[17] For a listing of such sites, for example: www.mobilegovernment.ca

[18] Among other reforms suggested, the new Government has sought a rethinking of the National Broadband Network initiative, while also floating the possibility of greatly reducing Centrelink's physical network of delivery centres – and instead delivering services in-person via Australian Post outlets.

Few countries, at present, can claim levels of mobile usage and penetration in terms of public sector usage that can reasonably be characterized as having achieved a level of mobile ubiquity inside and outside of government. With nearly 200 mobile service offerings externally – and a cloud-based infrastructure internally, Singapore is often recognized as a leading jurisdiction.

For Singapore, the relatively rapid emergence of mobile service delivery channels on the front-end (as well as cloud-based infrastructure within the public sector) is reflective of a strong political and societal focus on digitization and mobility as a collective prism for not only public sector evolution but growth and innovation for the country as a whole:



Source: World Economic Forum (2011).

It bears noting that a similarly holistic rubric was recently presented in the Canadian initiative, Taking Ontario Mobile[19], a point that underscores the importance of viewing mobile service delivery as not only a platform for government but an enabling vehicle for societal development. Indeed, part of the challenge for government is that in many respects, mobility is evolving more rapidly outside of government than within it.

Despite such diverse conditions and approaches, there is a widening global consensus that mobility and the wider digital transformation of the public sector are central to government performance and legitimacy. The World Economic Forum (WEF), for instance, in their 2011 report on 'The Future of Government' links a technology enabled public sector to the creation of public value, as defined in the following four manners:

[19] http://www.takingontariomobile.ca/

- *Quality public services are delivered;*
- *Socially desirable outcomes are achieved;*
- *Citizens are satisfied with the services and outcomes; and*
- *Trust in government is created and/or increased.*[20]

These four dimensions of public value are familiar to the public sector value chain that has been so influential and important to the evolution of service measurement and performance improvement in Canada and elsewhere (notably the linking of Citizen's First surveys and service satisfaction to trust in government). Yet as the WEF makes clear, what is rapidly changing is not only the landscape for how governments deliver services, but also the mechanisms for listening to citizens and the many new ways of involving citizens and businesses in the assessment and co-production of existing services on the one hand, and in service innovation on the other hand.

The derivation of apps is one of the most visible example of how government service delivery is becoming a more open and flexible eco-system of participants from both within and outside of the public sector. Not only are apps central to the evolving interface between citizens and public sector service providers, they are emblematic of a world of mobility and openness and big data which carries much wider transformational ramifications for key public service sectors such as education and health.[21]

The government experience with mobile service delivery is shaped and compared to that of the private sector – where there is growing evidence of a strong and growing set of linkages between mobility, customer service, enterprise architecture, and business performance. In one survey, for instance, of more than 140 mainly private sector organizations from 13 different countries, more than 80% of respondents identified mobility as one of their top ten strategic initiatives for 2014.[22]Accordingly, Forrester Research identified mobile solutions as a 'must have' for 2013 in its own examination of key customer service trends for this past year.

While automation and self-service are important attributes of mobile service offerings (and a key driver of efficiency), the human touch remains central to effective customer service across both the private and public sectors (ibid..). In a 2013 GovLoop survey of more than 250 officials from government and industry in the US, for example, the top three ways to improve customer service identified by respondents include:

[20] Source: http://www.weforum.org/news/future-government-lessons-learned-around-world

[21] For a recent Globe and Mail article discussing mobility's impacts on health care and insurance for example:
http://www.theglobeandmail.com/technology/how-insurers-are-turning-to-fitness-apps-to-decide-your-health-coverage/article16065068/

[22] Source: http://www.cionet.com/Data/files/groups/Mobileweb.pdf

- *Implement organizational culture change initiatives to promote a customer service orientation;*

- *Deploy a multi-channel approach that includes a comprehensive array of communication vehicles (i.e. phone, mail, email, social, mobile, virtual, etc.); and*

- *Mandate soft skills training (how to improve customer service, communication techniques, etc.).*[23]

This same survey not only identifies social media interaction as an emerging 'bright spot' of public sector service delivery, but it further reinforces the themes of openness and collective engagement conveyed by the World Economic Forum (above) and many governments themselves in seeking to forge a new 'partnership' between governments and citizens:

> *Advancements in technology and the application of that technology to government services will result in more self-service opportunities for customers. Customers will also be able to more effectively and independently engage with government agencies in their pursuit of particular goods and services. As one respondent notes, there will be a "system enabling citizens with ways to submit opinions, problems, and service requests without organizational knowledge." This type of system, according to another respondent, will create a partnership between the government and its customers, in which "citizens play a more active role in their services, whether through self serve or through informing and influencing the practices of government in providing services" (p.11, ibid..).*

In short, mobility is becoming a key feature of digital government generally and service delivery efforts specifically. Building on this brief introduction, the remainder of Part One examines the service dimensions of mobility in the following manners: the types of services offered and a starting point and criterion for selection of services; costs and benefits; and client satisfaction and engagement.

[23] Source: http://api.ning.com/files/Lq-MVtloOMBuPmC4KHRIb2pjETgyE*v9rkjf70NF4qy9jhZ-Ghj4pp4X9JhJK6mnamROEfo7uZZUC6e6i*1czkio78Ki-eCC/AoF_CS_FINAL.pdf

1.2 Service Types & Mobile Migration

Mobility's impacts will be felt differently across different types of services. Such distinctions, in turn, carry important impacts for the Joint Councils and member organizations with respect the roles and inter-relationships between lead service entities (i.e. Service 'X') and other parts of government. This point is consequential both for service architecture (the immediate focus of Part One) and also in terms of balance and alignment between individual departments and agencies and government-wide strategies with wider aims.[24]

According to Gartner and various other sources, there are three main types of public sector services to consider with respect to mobility: informational, transactional, and social.

The first and second of these types are most closely aligned with traditional e-government efforts of the past two decades, and the introduction of online channels as a prominent component of today's multi-channel service delivery framework. Mobility offers the potential to accelerate efforts toward self-empowerment by citizens, thereby diverting basic information requests away from traditional in-person and telephony channels in favour of electronic and online means (some analysis of this potential is provided below).

Transactional services arguably represent the greatest opportunity and the greatest challenge at present for governments: the opportunity stems from the potential for efficiencies and value creation from service simplification, integration and bundling; the challenges stem from the layers and complexities of program requirements, often enshrined by legislation and necessitating paper-based verification and processing mechanisms both within and across various government entities.

One of the most promising short term opportunities for mobile delivery channels lies in driving up the proportion of the population that is both aware of and making use of online government services. As has been well documented in numerous surveys and studies in Canada and elsewhere (including the 2013 public auditor reports of Service Canada and Service Ontario, as noted in this report's introduction), the migration to online service delivery overall has been stunted in many jurisdictions by a lack of awareness and/or an unwillingness on the part of citizens to make use of online channels.

This graph of survey results from across Europe (for a research study commissioned by the European Union) illustrates the current under-utilization of online services – comprising two essential groups: citizens not yet online and those that are online and not making use of government service channels digitized via the Internet:

[24] To put this differently, the primary focus of this section (i.e. Part One) is on informational and transactional services (thereby enjoining Service 'X' organizations and CIO-type functions within governments). At the same time, mobility's impacts will increasingly be felt across more complex and multi-faceted service types, including more varied and inter-related aspects of socio-economic and human development (themes addressed more prominently in Part Three and Part Four).

Table 2.1: Key Insights User Survey

eGovernment Use	Barriers that prevent eGovernment use	eGovernment Satisfaction	Fulfillment & Benefits of eGovernment use
▪ 46% of users of public services used eGovernment services ▪ 54% preferred traditional channels ▪ However 50% of all respondents indicated to prefer the eChannel next time when they contact government ▪ Most popular eGov service (among the 19 services examined): 'declaring income taxes' (73% of user will use the eChannel for this service next time), 'moving/changing address within country' (57%) and 'enrolling in higher education and/or applying for student grant' (56%) ▪ Least popular eGov service: 'reporting a crime' (41%), 'starting a new job' (41%) and 'starting a procedure for disability allowance' (42%)	▪ 21% was not**aware** of the existence of relevant websites or online services, mainly younger people (especially students), who are more able/skilled and willing to use eGov BUT less aware of relevant services existing online ▪ 80% indicates a lack of willingness to use eGov services. This group consists of relatively more women and older people but also 62% of daily Internet users ▪ 11% did not use Internet because of concerns about protection and**security** of personal data ▪ 24% was not able to use eGov services. Mainly older people, but also young people who abandoned because the service was too difficult to use	▪ Satisfaction with eGovernment services is significantly (-2,0) lower than the satisfaction with eBanking services (resp. 6,5 & 8,5) ▪ Satisfaction with eGovernment services is dropping since 2007, with 1,3 % ▪ 'Declaring income tax' shows that eGovernment services can live up to citizens expectations ▪ Services around (un)employment receive low satisfaction scores, reflecting today's economic situation	▪ 47% of eGovernment users fully got what he wanted from the public administration ▪ 46% only partially receives what was looked for ▪ 5% did not get what he wanted at all ▪ Time and flexibility gains are most important to users, followed by saving money and simplification of a delivery process. Apparently, quality of a service is less relevant to citizens

Giving that Internet access via mobile devices is rising sharply, there is a significant opportunity to better inform the public of the opportunities for public sector services and to better entice individuals toward self-service options and online transactions where available. As this European study concludes:

> *More is needed to address the needs and concerns of citizens that are unwilling to use online public services: preferring personal contact (62%), anticipating that the service requires face-to-face contact (34%), seeing other channels are more convenient (19%), or who are not convinced of the benefits (11%). Of these unwilling, many are however daily Internet users (62%) (p.4[25]).*

[25] Source: Public Services Online: Digital by Default or Detour? (https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/eGov_Benchmark_2012%20background%20report%20published%20version%200.1%20.pdf)

Creating a basis for a gathering wave of mobile migration for self-service informational interactions alone would underpin significant cost savings for service providers (savings that have thus far proved unrealized, a point underscored by the findings of research undertaken by Deloitte Research for the Joint Councils that strongly endorses the importance of self-service and channel migration as priority undertakings for Canada's public sector[26]).

Two other important findings of this European study merit consideration. First, the survey results suggest that the first encounter of an individual with an online service offering is extremely important to determining subsequent willingness to utilize web-based channels (raising the bar considerably on the importance of a seamless experience across both mobile devices and traditional desktop computers, especially for transactions not be fully attainable via a mobile channel). At the same time, going forward it is likely to be the mobile device that denotes the first point of online contact between a government service provider and a citizen: a 2013 US survey, for instance, found that '34 % of users surveyed who have used their mobile device to access the Internet, had used their mobile device to visit a government website' [27]

Secondly, the European survey (table above) revealed that concerns around the security of personal data 'were significant though surprisingly modest' according to the report's analysis (with only 11% of respondents citing the issue as an explicit reason to not use online services). This finding, which would no doubt vary considerably across different European cultures and jurisdictions, suggests a deepening degree of confidence overall in online channels and systems generally, a positive condition upon which public sector service providers can build.[28]

Migrating to mobile:

As noted, the underlying complexities of many transactional offerings may not lend themselves to rapid mobile migration. Based upon its own research, Gartner puts forth the following criterion for selecting mobile services – noting the emphasis on more informational services and those types of transactions with limited degrees of complexity:

- *Demographics: Certain demographics are likely to be easier targets for mobile services — in particular, active people who spend a fair amount of time on the road, younger people who have grown up with mobile devices rather than laptops, and senior citizens who find tablets an easier device to use than a regular computer. Certain services, such as those targeting students, self-employed people or senior citizens (as in services concerning culture and recreation), are probably better suited than others for mobile delivery.*

- *Frequency/Recurrence: Frequently used services are more conducive to consumption through mobile apps, as the user is comfortable in using these services on a device with small real estate.*

[26] Source : http://www.iccs-isac.org/library/2013/10/Research_Committee_Bulletin_-_June_2013.pdf

[27] Source: http://www.fiercemobilegovernment.com/story/better-mobile-gov-sites-could-boost-citizen-satisfaction-report-says/2013-07-31

[28] The topic of mobile security is further addressed in Part Two of this report.

- *Immediacy/Urgency: Services that need to be accessed immediately or have an element of urgency are best-suited for mobile delivery, as they can be accessed "anytime, anywhere."*

- *Simplicity: In order to make the best use of the limited real estate on a mobile device, and in recognizing the attention deficit caused by being in a mobile environment, the transaction should be kept as simple as possible.*

- *Automation: Related to the criteria described above, services that are more conducive to be automated due to limited interactions and complexity are also easier to be consumed through a mobile device with limited real estate.*

- *Location-Based: What drives users toward mobile service is their immediacy, proximity and relevance.*[29]

In Australia, the successful introduction (more than one million downloads by mid-way through 2013) of Centrelink's Express Plus mobile apps reflects this logic: users are encouraged to make use of apps for updating basic information, tracking payment histories, and uploading of documents. Importantly too, the downloading of these apps require registration with Centrelink's online services, a linkage that further builds the capacities for additional transactions to be completed online for those processes not fully attainable via a mobile device.[30]

Building on such efforts, then, governments must also establish a specific set of migration milestones, both for electronic service adoption generally and for mobile channels specifically. For instance, the State of Victoria in Australia has adopted two performance targets for 2014 including a 15 % reduction in measurable customer effort through online and mobile migration efforts.[31]

These targets are underpinned by an eleven step action plan that incorporates a number of measures to specifically address mobility channels (including web-sites and apps) and underlying ICT capacities needed to ensure alignment and the ability to achieve greater simplicity online and seamlessness across channels from the user perspective.

Briefly, then, multi-channel management and analysis are familiar undertakings for governments already – resulting in the mixed performance of online delivery systems to date. As mobile devices and mobile websites increasingly rival traditional Internet sites as the first point of access between citizens, companies, and government, mobility augments the importance of more explicitly targeting and incentivizing online channels. Doing so necessitates a wider examination of the costs and benefits of going mobile.

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[29] Source: Gartner (November 2013), How to Prioritize Government Mobile and Social Applications.

[30] For some additional information on these apps and a brief video explaining their usage: http://www.humanservices.gov.au/customer/services/express-plus-mobile-apps

[31] Source: http://digital.vic.gov.au/wp-content/uploads/2013/02/Victorian-Government-ICT-Strategy-web.pdf

1.3 Costs and Benefits

The findings and examples reviewed above – notably the uneven European experience, reinforce a frustrating reality for governments going online: namely that significant savings are potentially achievable but as yet unrealized. In the short term, mobility may well exasperate this frustration: the realization of significant short term cost savings is largely a fallacy.

At the same time, mobility is viewed by many as an important inflection point in multi-channel delivery and online processes specifically. The UK Digital by Default strategy, for instance, explicitly targets mobile as a significant source of unrealized savings to be exploited over the next several years:

> *As the Digital by Default agenda moves swiftly forward, it is now more important than ever for the public sector to embrace new digital technologies. According to the Government's Digital Strategy, an hour currently spent interacting with Government costs the citizen £14.70. In fact, if just half an hour were saved by digitising every transaction currently completed offline, the total savings to the economy would be in excess of £1.8 billion. And from April 2014, all new or redesigned Government department transactional services must meet the Digital by Default service standard.*
>
> *This includes a requirement to design digital services that are usable on mobile devices as well as desktop and laptop computers. 56% of UK adults now own a mobile phone that is web enabled and there is a growing demand for services to be available digitally from individuals from wide ranging backgrounds. For example, 39% of people whose household income is less that £12,500 use a mobile phone to access the internet. This presents a great opportunity for the public sector to enhance service delivery through the active use of mobile applications.*[32]

Cost savings is a key driver of the British Government's plans to expand mobile service delivery in the coming years (the overall strategy aiming to save £1.7 Billion annually). The following parameters are illustrative of the business model underpinning this plan including the gradual suppression of more traditional service channels:

> *By 2015 the government plans to offer online access to a tranche of services including tax self-assessment and applications for patents, visas, pensions and various living allowances. Each of Whitehall's seven biggest departments have chosen at least two major services that will be delivered online...*
>
> *Government will scale back face-to-face, phone and postal delivery of these services after these online channels go live. The Cabinet Office claims the shift to online delivery will save taxpayers up to £1.2bn by 2015, and £1.7bn each year thereafter. Reduced staffing costs will account for the bulk of the savings, a Cabinet Office spokeswoman said, although public bodies will continue to offer alternatives to online access to these services.*

[32] Source: p.1, Public Sector Mobile Applications & Strategies (Survey Report 2013) : http://www.igovsurvey.com/surveys/report/16.pdf

The savings figure is an estimate that does not include the cost of switching these services over to digital delivery, or the potential savings from fundamental service redesign and back-end technology changes.[33]

This latter point underscores the complexity of costing models: mobility is also likely to complicate efficiency aims due to the need for new skills and competencies within the public sector in creating and adapting mobile channels, as well as aligning legacy program and processing requirements with the deployment of mobile-based mechanisms.

In a survey of US federal government agencies, the Government Services Agency (GSA) summarized the main budgeting challenges faced by these units when devising mobile capacities as follows:

1. *Agencies are challenged to expand and improve their mobile products to communicate during emergencies, monitor events and update with real-time, relevant information while still maintaining call center and website operations.*

2. *Many agencies have to make hard decisions about the best use of limited IT research and development dollars with mobile expansion and innovation competing with other important efforts.*

3. *Once an agency secures funding for a mobile project, there is an ongoing need for resources to maintain and enhance it. Ongoing funding is needed for storage and access to data used in the mobile app as well as to staff a product team or manager.*

4. *Some mobile projects can have significant start-up and increased volume costs. For instance, some agencies are unable to create simple cell phone text messaging (SMS) programs to reach highly-mobile low-income audiences because of high per-message costs.*[34]

The most tangible, upfront costs for governments going mobile lie in adapting online sites in a mobile-friendly manner. Responsive design allows for a user experience optimized for any device, seamlessly tailoring content and graphics accordingly.[35] Designing a mobile-first strategy means designing sites with the mobile experience in mind (and building out accordingly for non-mobile users, i.e. a traditional desktop).

The cost and performance considerations are complex and must be examined with sobriety and care. As one 2013 survey of customer satisfaction with US federal government websites

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[33] Source: http://www.zdnet.com/uk/tax-pensions-and-visas-shift-online-in-uk-government-overhaul-7000009086/

[34] Source: http://www.gsa.gov/portal/content/295345

[35] 'Essentially, a responsive site provides a dynamic layout and sometimes content or functionality to fit the screen and the context of visitors. This involves more than hiding content for the mobile experience. Since entirely new layout rules are applied at critical screen size and resolution breakpoints, it is possible to tailor one site to suit the desktop, tablet, and mobile experiences.' Source (appendix) : http://www.foresee.com/research-white-papers/_downloads/e-gov-q2-2013-foresee.pdf

explains, 'implementing a responsive design means redesigning all of your sites. If you have a desktop site that is working well for you and satisfying your customers, it may be more cost-effective to build a separate mobile site rather than redesign your desktop site.'[36]

Additional information on the British Government's early experience with responsive design is provided in the appendix to Part One.

Wider benefits from mobile:

Cost savings from improved service performance and greater online and mobile migration are not the full story: they must instead be viewed as one (albeit very important) dimension of a more multi-faceted business model encompassing medium to longer term investment horizons – and a variety of direct and indirect benefits including but not limited to efficiency gains from an evolving channel mix.

With respect to indirect benefits from government usage of mobility, the competitiveness of the small business community is one such example. One recent US survey of small business owners, for example, reveals growing usage of mobile applications and channels - with a deepening set of cost savings and performance improvements resulting.[37]

While the focus of this survey was not on government service delivery, the opportunity for the public sector lies in leveraging this widening mobile space to the improve the range of service and regulatory interactions between businesses and governments. This point is consistent with a number of provincial initiatives aimed at improving the service and regulatory environment for business, and small and new businesses especially – a constituency that has thus far proven to be a laggard in electronic service delivery uptake in this country:

> *In 2010, the telephone remained the primary channel for accessing services, while client satisfaction and channel loyalty was highest with online service delivery. As more government services are now being delivered online, businesses are beginning to recognize the benefits of conducting business over the Internet or via government websites. The relatively high positive "surprise factor" suggests that online and web-based solutions are becoming more acceptable, and even preferred, for a growing proportion of Canadian businesses.*[38]

[36] See previous footnote (ibid..).

[37] http://www.sbecouncil.org/uploads/Mobile%20APP%20Final%20Report%20SBE%20Council.pdf

[38] Source: http://www.iccs-isac.org/library/2012/06/CSMB-204_Taking_Care_Of_Business_3_-Excerpts.pdf

The 'Taking Care of Business 3' report goes on to state that: 'The emergence of online delivery options is not without challenges. As the Internet is the primary channel for just one-quarter of business respondents, governments may wish to consider employing incentives to encourage greater use of online/web-based channels.'

Within such a context, there are tremendous opportunities for governments both individually and collectively to devise mobile capacities for bettering the competitiveness and productivity of the business community (most notably small businesses and entrepreneurs that as a grouping have proved more trepid then larger companies in gravitating to traditional online channels, i.e. desktop-based channels). In doing so, cost savings within government are one component of an overall business model of prospective costs and benefits that should also comprise impacts across the societal and economic spheres as well.

In this light, initiatives to promote mobile usage and new mobile competencies inside and outside of government (i.e. apps competitions as one example) may be viewed and evaluated with this widened set of prospective benefits. The example of the Finnish gaming sector is a unique success in this regard, but emblematic of the importance of government's role and presence in fostering a more outward and open eco-system of apps developers that will help to nurture and exploit synergies between mobile government and the mobile economy.

In what may seem a surprising characterization, Forbes Magazine lauds this Finnish brand of 'soft socialism' acknowledging the support of the public sector in driving market innovation and economic gains that would otherwise not be feasible in most jurisdictions:

> *Many American VC people scoff at government funding and find it an absurd anachronism at best. But in countries lacking the scale and sophistication of the US financial infrastructure, state support is vital. When it is implemented judiciously, the results can be fairly dazzling. Finland's gaming industry revenues are now projected to hit $1 Billion in 2013 – that would be equivalent to a $60 B industry in a country the size of America.*[39]

Albeit on a micro scale, the September 2013 presentation by Calgary-based firm, Robots & Pencils, to the Joint Councils reflects a related emphasis viewing mobility through an outward and creative lens. Similarly, Ontario's recent 'Energy Apps for Ontario Competition', an initiative featuring 50K of external prize money along with the internal resources invested to manage such an undertaking, is indicative of this wider spectrum of investments and savings.[40] Potential improvements in energy efficiency, consumer awareness, and business innovation must all be factored into the prospective sources of public value resulting from this targeted example.

[39] Source: http://www.forbes.com/sites/terokuittinen/2013/06/19/operation-badland-how-individualism-and-government-support-fuel-finlands-app-miracle/

[40] Source: http://www.energy.gov.on.ca/en/green-button/#.UrmQ9vRDuSo

In sum, the potential sources of cost savings stemming from mobile service delivery externally must be viewed within a wider prism of investments and prospective benefit streams both within and outside of the public sector. More specifically, the preceding examples and review suggest that any business model for mobile service migration and development, in the new term, should be crafted upon due consideration accorded to the following elements:

- First, modest resource investments for innovation and experimentation in order to better test mobility's potential and to ensure that government not only adequately responds to the segmentation of the population most engaged via mobility, but also learns from this segment in expanding mobility's reach;

- Secondly, the assurance of rigorous cost-benefit analysis for the introduction of mobile initiatives with due consideration given to both hard financial savings and softer but often equally important benefit streams stemming from wider and deeper mobile usage across society; and

- Thirdly, more aggressively adapting multi-channel service apparatuses with an eye to greater incentivizing online channels that are, in turn, increasingly seamless across mobile and fixed access devices.

All of these elements are dependent upon an integrative approach to mobility that enjoins service and infrastructure (and the main themes of Part Two). First, however, mobility's impacts on client satisfaction and public trust are examined.

1.4 Client Satisfaction and Engagement

The introduction and expansion of mobile service channels must ultimately be measured by its impacts on public sector performance, including traditional metrics of public satisfaction and customer service measurement. At the same time, the evolution and convergence of mobile devices, social media platforms, cloud computing systems, and big data analytics are creating a new landscape for both capturing and measuring impacts on performance.

Ground-breaking initiatives such as Citizen's First surveys remain highly relevant in a mobile world: their adaptation in detailing and measuring mobile channel costs and experiences are an essential component of performance management as a basis for continual improvement. At the same time, these forms of mainly post facto review and evaluation will also require complementation with more open, interactive, and ongoing mechanisms for feedback, dialogue, continual assessment, and collective learning.

For example, some local authorities are experimenting with online initiatives and both gather and report service quality assessments to citizens in an open and ongoing fashion.[41] These types of typologies lend themselves well to mobile since for many information services, quick and easy access is the main determinant of public satisfaction – and accessing this information and providing a real-time assessment of the delivery experience becomes feasible. Moreover, as is the case with one such initiative in the District of Columbia, social media traffic can also be tracked for comments and discussion of relevance to service providers.[42]

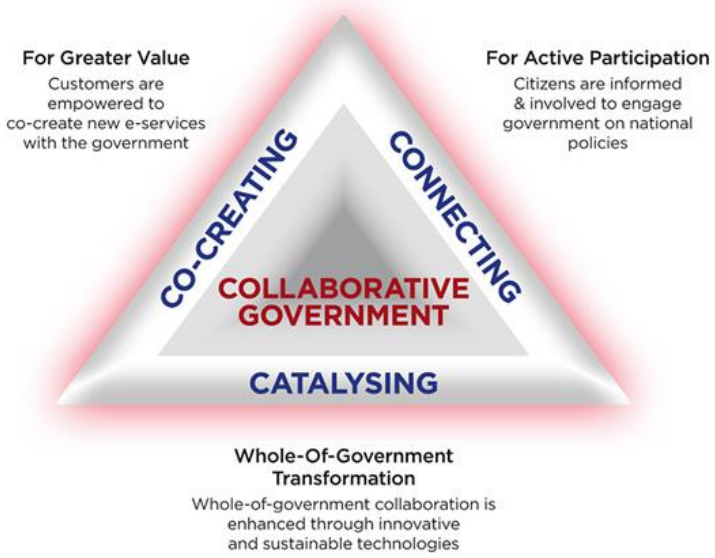
A key shift in this regard is mobility's participative dimension (further addressed in Part Three) that creates new linkages between customer service and public value. As first highlighted in the introduction (by way of the World Economic Forum report), the Singaporean Government, a world leader in mobile service delivery presents its vision of co-creation of public value in the following manner:

> *Today, citizens and businesses can access more than 1,600 online services and more than 300 mobile services provided by the Government. Besides continuing to improve the richness and quality of public services, the focus of eGov2015 will be to empower citizens and businesses to co-create new e-services with the Government.*[43]

[41] One such example is the City of Edmonton's Citizen's Dashboard: https://dashboard.edmonton.ca/

[42] Service Report-card: http://grade.dc.gov/ For some additional discussion of this initiative: http://www.govtech.com/data/Grade-DC-How-Citizen-Feedback-Is-Changing-Service-Delivery.html

[43] Source: http://www.egov.gov.sg/egov-masterplans/egov-2015/vision-strategic-thrusts;jsessionid=79A4F286FB7037A298C3A36F1B63CCAD



This type of dialogue is an important new dimension to client satisfaction and determinations of public trust. As mobility is increasingly tied to open government initiatives and likeminded experiments with crowd-sourcing[44], there is a heightened expectation on the part of the public, particularly the most digital savvy citizens, for a more active voice in service innovation and improvement mechanisms.

Measuring such participative dimensions within an evolving service eco-system is thus an important new endeavour – and an important piece of the mobility puzzle (once again, one examined in greater detail in Part III).

At the same time, the scope and utility of such as a collaborative dialogue will vary – particularly with respect to 'what' services are delivered versus 'how' they are delivered. In terms of the former, there are unquestionably limitations for large-scale service entities delivering bundles of existing transactional services that are, in turn, underpinned by significant legislative and program requirements. By contrast, participative service design may generally be more conducive to devising new services through open data efforts, apps, and likeminded processes more open and novel in formation.

[44] For a recent review and discussion of public sector crowd-sourcing within the American federal government context: http://www.businessofgovernment.org/sites/default/files/Using%20Crowdsourcing%20In%20Government.pdf

In addition, for service entities seeking to introduce mobile channels where the 'design' element applies instead more directly to altering (modestly or significantly) the multi-channel framework housed and operated by government, a more openly consultative approach has considerable merit. The recent public consultation launched by Service BC is indicative of such an outward approach toward engagement and service reform.[45]

This type of public conversation directly engaging the citizenry can thus tie together three important and inter-related elements: first, choices and trade-offs involving multiple delivery channels both online and offline; secondly, the participative aspects of mobile governance both internally within the public sector and externally (themes examined in Part Three); and thirdly, overall public awareness and digital literacy as key planks of learning and adaption for extending mobile innovation in an open and inclusive manner for society as a whole (themes examined in Part Four).

In an increasingly mobile and participative environment, moreover, the risks of not doing so are considerable. If any new online initiative is introduced by a public sector entity without upfront consultation and input, the negativity of feedback and dialogue via social media with respect to any perceived or real flaws or shortcomings is likely to be heightened. Such negativity, in turn, is more likely to flow into a traditional media and political cycle largely adversarial in nature.

Consequently, in better understanding the current and prospective impacts and opportunities stemming from mobility, three layers of performance evaluation should be contemplated by public sector service providers:

- First, the creation of a mobility scorecard to track and measure mobile interactions and transactions and the relative growth of mobile channels in comparison to other service channels (both online and online);

- Secondly, the formation of a customer focus group or citizen's panel to better understand the qualitative aspects of mobility service relationships (including awareness, device management, and web interface determinants of mobile usage and satisfaction); and

- Thirdly, the development of a wider set of metrics linking mobile service delivery with wider participative dynamics tied to social applications and service communities, open government and public value creation.

The first of these layers – a mobility scorecard, more quantitative in focus, can potentially be tied in part to existing initiatives such as Citizen's First surveys (to draw the most relevant example from the Canadian public sector environment). As noted above, these types of ongoing surveys denote an important source of data for benchmarking and tracking public sector

[45] Source: http://engage.gov.bc.ca/digitalservices/

performance through rigorous and standardized survey methodologies. A number of mobile dimensions could be added to such methodologies.[46]

This point was also an important finding by a 2012 study of mobile service delivery undertaken by Service Quebec[47], which quotes from an external source on the importance of devising mobile analytics since 'if you can't measure it you can't manage it'. Two key excerpts from this wider set of ten reasons for gathering mobile analytics include:

> *Counting app downloads is pointless – app usage is what matters.*
>
> *Mobile analytics provide key customer insights. Marketers need to know that all those people who are downloading their app are actually using it (which is the whole point, right?), rather than simply trying it once and then ignoring or deleting it. Understanding these sorts of interactions – and adjusting tactics accordingly – is the lifeblood of customer engagement.*
>
> *Can't prove return on investment (ROI)? Don't expect any more budget.*
>
> *Implemented correctly, mobile analytics help marketers answer two critical questions: 1) is there adequate return on investment for mobile marketing programs? and 2) which tactics are reaping the highest returns? If you can't answer these questions with hard data, then it's virtually impossible to seek additional investment for the mobile channel or maintain job security for an extended period of time.*[48]

The second dimension above is meant to complement a mainly quantitative assessment of mobility channels and their impacts with more exploratory and qualitative mechanisms to learn more directly from the user experience. Such mechanisms should feature channels and tools that can gather tacit knowledge and softer contextual factors tied to mobile usage (and the wider placing and trade-offs between mobile and a mix of channel offerings).

The Government of British Columbia, for example, has used this approach in organizing a public 'user panel' to examine options and directions for the new Citizen's Service Card[49], and municipalities have experimented with a range of outreach experiments designed to both

[46] The most basic starting point is to track and better understand the overall proportion of citizens and companies accessing government sites via mobile devices and for what purposes. As specific pilot initiatives are introduced for completing service transactions via mobile devices, it is important to not only track usage of such mechanisms, but dissect the sorts of factors that shape the user experience, outcome, and willingness to return (as well as share their experience both directly with peers and potentially via more socialized platforms such as social media and government information resources).

[47] Portail gouvernemental de services – Recommandations concernant l'implantation de la mobilité (Marie-Andrée Vézina et Julie Rochon, Service Quebec, July 2012).

[48] Source: http://mobithinking.com/webtrends-mobile-anlytics-interview

[49] http://www2.gov.bc.ca/govtogetherbc/consultations/digital_services.page

explore and address various policy and service challenges (including electronic voting in Edmonton as just one example with some potential relevance for mobile[50]).

In addition, and in line with the third dimension above, the spreading of social media platforms empowering users to both initiate input and feedback and respond to service encounters and experiences opens up a new vista for government's efforts in customer relationship management. Social media analytics and public engagement indicators are thus also important new competencies for governments to develop both internally and in concert with outside specialists.

As social media is closely tied to the participative dynamics of service eco-systems, their importance is returned to in Part Three within the contours of this wider discussion.

[50] Along with a Citizen's Panel on e-voting, the City's open government efforts featured a range of outreach initiatives with industry and arts communities to examine, among other topics, ways in which apps and mobile government can improve local government and local governance. Although it will not be directly examined in this report, the nexus between e-voting and mobile is apparent in a jurisdiction such as Estonia where mobile identification systems are being aligned with electronic voting platforms thereby enabling citizens to vote from their mobile device.

Part One - Appendix

The British Government's Adoption of Responsive Design Mobile Sites (excerpts from, Designing for Different Devices, Government Digital Service[51])

Responsive design

When the Beta was launched in January (2012) we took the decision to use responsive design for mobile support. This means there is no separate website for mobile users: everyone uses the same site that 'responds' to displaying on different size screens and devices through extra CSS (and some JavaScript).

It also means each page on the site will only exist once and, importantly, on one URL. It's important users can use the same URLs to access the site anywhere without the experience being inhibited or degraded by the device they use.

Directgov had about 10% of their access from mobile and since the GOV.UK launch (and) this has only increased:

Figures from the first week (October 17th – 24th, 2012):

	Visits	*%age of total visits*
Non-mobile	5,658,644	75%
Mobile	1,433,461	25%

Source: Google Analytics

Designing on mobile

When looking at how to approach designing for mobile and tablets we tried not to focus on resolution, designing instead for physical size and use.

Screen size

Screen size is not the same as resolution. Retina displays are just the start of the confusion that surrounds this subject, with a wide range of resolutions and screen sizes existing across mobiles and tablets. What's really important to ask is how physically big the screen is first. From there we can start to look at how to use that space.

[51] Source : http://digital.cabinetoffice.gov.uk/2012/11/02/designing-for-different-devices/

Device usage

Mobiles and tablets are held while being used. With mobiles a common use is to hold the phone and use the touch-screen with the same hand, the thumb touching and scrolling the view.

The benefits of accessible pages

When considering the extra requirements users of different devices have we found a lot in common with work already done on accessibility.

Both mobiles and tablets can be used so that the distance between the screen and the user's eye is changing all the time and the screen is viewed in a variety of lighting conditions. Motor skills can be stretched by asking us to perform precise touch interactions and cognitive abilities tested by busy environments having an effect on our reading ability.

Set breakpoints at the limits of designs, not resolutions

This is important and ties into our intention to change as little as possible.

Breakpoints in responsive design are traditionally the defined measurements at which pages will switch from one format of display to another.

Assigning breakpoints between set page sizes only makes sense if your designs are static. We design in the browser, meaning those designs are built to be more fluid in how they occupy the space given.

Despite this every part of our pages is, like anything, designed to work within certain limits. When these limits are passed and the part no longer fits the space it occupies, we need a new design.

Progressive enhancement

Web designers have used 'progressive enhancement' for some time to deliver the best experience to all and ensure whatever capabilities your browser has, the content is always available. We wanted the same benefits and so built this approach into how we apply responsive design to the pages.

Only optimise when it adds something

Smartphones and tablets are perfectly capable of displaying web pages as you would see on a desktop computer. Responsive design is not a fix for this but rather an alternative to the default of interacting with a desktop format of the page through dragging and zooming in and out. Responsive optimisations are only applied when it is proven they will be a better alternative.

A good example is our https://www.gov.uk/trade-tariff app. The app receives far fewer visits than the average from users on mobile (around 1.99%) and those visits occur almost entirely during work hours (9am – 5pm). This shows what was commonly known; that the trade tariff (outside of our making it into an app) has always been a resource used as part of a work process that happens in an office, on a desktop computer.

Because of this we serve users the full desktop format on all platforms.

Keep iterating

The amount and variety of mobile devices is only increasing and with it so will the needs of our users but this way of working enables us to change along with it.

So, we'll continue to monitor how the site is being accessed and used. However it changes, we will ensure this access is never limited by the choice of device and that our designs make the most use of the method of display.

PART TWO – MOBILITY AND INFRASTRUCTURE

Key lessons:

- Mobility necessitates greater collaboration and more integrative governance models encompassing both service delivery and CIO roles and functionality.

- Identity management is a critical prerequisite and enabler of mobile services both within and across the public and private sectors.

- Mobile applications and cloud computing platforms are significantly altering the landscape of government enterprise architecture – creating costing and capacity opportunities and risks.

    - The openness and portability of technology standards solutions are key performance and cost factors in procurement and agility in this emerging environment.

- The impacts of Bring Your Own Device (BYOD) strategies are a growing, albeit contested reality in the mobile workplace – and governments must prepare accordingly.

- Mobile security – both within and outside of government, requires thoughtful and sustained attention in cultivating a culture of responsible practices and enlightened usage.

2.1 Introduction

Reflection of the importance of the partnership between the PSSDC and the PSCIOC, many themes discussed in this second part of the report directly impact and build upon Part One. Accordingly, Part Two begins by examining how the governance of mobile and digital government comprises both service and infrastructure dimensions. More specific mobile topics then examined include mobility and identity management, apps development and enterprise architecture, and mobile security both generally and with respect to bring your own device (BYOD) strategies.

By way of introduction, mobility has been recognized as a key driver of the IT revolution's third wave - following the mainframe computer and the personal computer. The impacts on organizational infrastructure and IT governance are already being felt much as they are expected to continually expand in importance. For example, IDC Research foresees that:

- ***By 2015****: 3rd Platform requirements will drive 60% of CIOs to use enterprise architecture (EA) as a required IT tool, but only 40% will deploy EA effectively. Meanwhile, 60% of CIO security budgets for increasingly vulnerable legacy systems will be 30% to 40% too small to fund enterprise threat assessments. Another major trend for 2015 will be a demographic shift to young and mobile customers, which will require 80% of CIOs in consumer-facing businesses to integrate IT with public social networks.*

  By 2018*: Adoption of 3rd Platform IT technologies will redefine 90% of IT roles.*[52]

A likeminded report by Ovum Research further underscores the rising importance of mobility on both external service delivery and internal governance – reinforcing the importance of organizations accelerating the conversation today with respect to how to prepare for an increasingly mobile future:

> *Mobile devices are increasingly becoming the first point of contact between a business and its customers (B2C), suppliers (B2B), and employees. As such, businesses will aim to provide a strong multi-screen, multi-channel experience for customers, suppliers, and employees alike...*
>
> *Ovum believes this trend will have as big an impact as the evolution of the Web, as it will challenge people's thoughts on how they work, when they work, and whether traditional office spaces are needed. Consumers and employees are becoming more mobile, and working practices and habits will change as businesses make more services and tools available on mobile devices. In 2014, organizations of all kinds will at least be thinking about how they can take advantage of mobile devices to improve working practices in all lines of the business.*[53]

[52] Source: http://www.enterpriseefficiency.com/author.asp?section_id=2468&doc_id=270268

[53] Source: http://www.enterpriseefficiency.com/author.asp?section_id=2468&doc_id=270067

Despite this widening scope of mobile technologies and their usage, large organizations are struggling to adapt their systems and policies. For example, 'a survey of 300 IT decision makers in the US and UK, conducted in the summer of 2013 by the research firm Vanson Bourne (undertaken on behalf of the enterprise application and data security vendor Mobile Helix), reveals that very few companies have mobilized core enterprise applications' (ibid..).

Moreover, a recent survey of CIO's working for State governments in the US bears out these tensions, while also underscoring the immediate impacts on public sector operations today. The following ten priorities were identified by State CIO's for 2014: Security; Consolidation / optimization; Cloud services; Project and portfolio management; Strategic IT planning; Budget and cost control; Mobile services/mobility; Shared services; Interoperable nationwide public safety broadband network (FirstNet); and Healthcare.[54]

While security is intertwined with the expansion of cloud computing and mobile capacities, the ranking of mobility as seventh reflects the myriad of public sector challenges associated with large scale legacy systems on the one hand (exerting cost and performance pressures on existing operations), and the escalating importance of the five components of the 3rd Platform on the other hand. The issue of identity management is presumably included within mobile services, though it also bears noting that identity and access management has been identified by Gartner as the top trend likely to impact enterprise mobile strategies in 2014 (underlining its longtime centrality to online service capacities for the public sector).[55]

Within such a dynamic context, this report examines the following four fundamental aspects of mobility and infrastructure: *integrative governance across service and infrastructure, identity management, apps development and enterprise architecture, and security and BYOD.*

[54] Source : http://www.nascio.org/publications/documents/NASCIO_StateCIOTop10For2014.pdf

[55] Source: http://www.informationweek.in/informationweek/perspective/286223/trends-impact-enterprise-mobility-strategies-2014

2.2 Governance: Aligning Service and Infrastructure

The evolving governance architecture for mobile service delivery must reflect federated coordination and alignment – in ways that build upon the horizontality of previous service integration efforts but also account for more contemporary aspects of service innovation and reform associated with mobility.

In aligning service and infrastructure, the most significant impact of mobility in this regard is a complementing (and not displacing) emphasis on openness and outward collaboration for business process innovation, technological design and employee engagement internally and customer and stakeholder engagement externally. Outward collaboration is essential as mobility drives a more open and participative eco-system driven technologically by various mobile platforms, devices, and channels, as well as socially and politically by new government-led undertakings such as open data and an expanding cadre of public engagement initiatives.[56]

The resulting governance challenge is to complement the traditional CIO functions of government with more outward and service-minded functionality that will be federated and collaborative across government. As the CIO of the Government of Canada frames this tectonic shift:

> *This new reality requires a paradigm shift. CIO's can now focus in the future, proactively improving service design and delivery with their business partners throughout government and changing their role from service provider to innovation agent and catalyst for enterprise transformation.*[57]

A recent global survey of CIO's reported growing enthusiasm for this type of shift (although many CIO's still feel constrained by a more traditional focus on cost and control[58]). The Victoria Government in Australia has moved in a likeminded fashion by creating a new horizontal position, the Chief Technology Advocate (and supporting secretariat) to work alongside of the CIO Council and External Advisory Board for that jurisdiction in pursuit of their ICT transformation and service delivery efforts (including a strengthened focus on mobile).

In Canada, a related example of this governance evolution is the Government of Alberta which has created a Chief Advisor for Open Government[59], a position with a government-wide focus, born out of Service Alberta but now both outside and alongside of this Department in order to devise government-wide approaches for outward-stylized openness and reforms. Likeminded efforts have also been undertaken in other provinces – notably BC and Ontario, both of which have assigned Deputy-level positions to their open government initiatives and agendas.

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[56] These participative dynamics are explored more fully in Part Three.

[57] Source: http://www.canadiangovernmentexecutive.ca/e-government/ict/item/1349-paradigm-shift-the-cio-as-a-strategic-business-enabler.html

[58] Source: http://www.cio.co.uk/news/strategy/growing-divide-between-traditional-digital-cios/

[59] http://data.alberta.ca/blog/overview-open-data-portal

Locally too, the new digital strategy of the City of Vancouver is similar in its contours as the appointment of a Chief Digital Officer who will oversee the establishment of 'digital services governance' comprising three main elements: first, the identification of a cross-departmental digital services team; secondly, the assignation of accountabilities and responsibilities for key digital initiatives; and thirdly, the development of digital skills training for staff. Complementing this third point, the City has also prioritized the creation of a mobile workforce strategy.[60]

What can be gathered from these examples is the importance of integrative leadership and enjoined governance as mobility extends and deepens ties between outward-facing security capacities and internal infrastructure. While some jurisdictions (as well as some private sector entities) may opt for the creation of a 'chief mobility officer'[61], the salient issue at hand is less about creating more chiefs and more about creating new organizational capacities that can serve as the interface between outward service and engagement capacities and government's internal operating environment (encompassing both technological and human systems).

A Profile of India and the US:

India and the United States, both geographically large federations not unlike Canada in this respect, have both devised mobile government frameworks with this alignment and balance in mind. In India, a central element of their 2012 Mobile Governance Framework is the creation of a Mobile Services Delivery Gateway (MSDG) sought in a cooperative manner with state and federal governments in order to facilitate the following actions:

- *Web sites of all Government Departments and Agencies shall be made mobile-compliant, using the "One Web" approach;*

- *Open standards shall be adopted for mobile applications for ensuring the interoperability of applications across various operating systems and devices;*

- *Uniform / single pre-designated numbers (long and short codes) shall be used for mobile-based services to ensure convenience; and*

- *All Government Departments and Agencies shall develop and deploy mobile applications for providing all their public services through mobile devices to the extent feasible on the mobile platform. They shall also specify the service levels for such services.*[62]

[60] Source: http://vancouver.ca/files/cov/City_of_Vancouver_Digital_Strategy.pdf

[61] For a brief discussion of this position within the private sector (and complementing recommendations for coordinating bodies across technology and business functions), please see: http://www.computerworld.com/s/article/9224560/Chief_Mobility_Officer_The_Next_Big_IT_Job_

[62] Source: p.3, www.mgovworld.org/.../Framework_Mobile_Governance_1712012.pdf
The officially notified version of this plan is also available at:
http://deity.gov.in/content/framework-mobile-governance

The federal Department of Information Technology (DIT) is leading the collaborative undertaking, including the creation of a Governance Innovation Fund and Knowledge Portal and Knowledge Management Framework open to all federal and state level departments and agencies (ibid..). Additionally, the strategy states that an 'appropriate facilitating mechanism will be created to ensure compliance with the standards for mobile applications and ensure seamless interoperability of services and implementation…across multiple service providers' (ibid.).

The Indian Government's mobile efforts reflect a widening mobile landscape for economic activity and financial services, including the provisioning of new forms of mobile payments to previously disenfranchised segments of society (a point that, while outside the scope of this report, also bears relevance for Part Four's discussion of digital inclusion and socio-economic divides[63]). Although the tremendously large population of this developing nation creates unique conditions in this regard, this synergy across government mobile services and the financial sector is also a key theme returned to below in the next section on identity management (and one that is equally relevant in the world's most advanced mobile jurisdictions).

The resulting national mobile governance initiative (entitled, Seva[64]) launched in 2013 has enjoined more than 800 public sector entities in a mobile platform offering 265 services (including both informational and transactional) and 240 apps (including Apple, Android, and Java platforms) as of the close of this same year. An SMS Gateway is being deployed as a platform to both gradually inform more citizens of the services available and to respond to the growing number of inquiries made by phones.[65]

In the United States, the 2012 strategy for Digital (and Mobile) Government features a similar emphasis on the creation of shared platforms across the federal government in order to facilitate mobile innovation and solutions with respect to digital services and content (as well as shared infrastructure needs). A key element of this plan involves the creation of a Digital Services Innovation Center with a primary focus on three major areas:

[63] A recent report by Ernst & Young concludes that the scope of mobile money services going forward carries enormous implications for financial systems and societies as a whole: 'The growth of mobile money services is set to be one of the most significant trends of the coming years. As technology advances and the mobile money ecosystem expand, mobile phones are becoming a multi-purpose payment platform. Mobile money transactions across the globe will transform the world of finance and the world of mobile. It will change human's lives with increased convenience, enhance the standard of living for the unbanked population and stimulate economic development.' Source: http://www.ey.com/Publication/vwLUAssets/Mobile_Money./$FILE/Ernst%20&%20Young%20-%20Mobile%20Money%20-%2015.10.09%20%28single%20view%29.pdf

[64] http://mgov.gov.in/home.jsp

[65] For additional details please see: http://mgov.gov.in/msdp_subsystem.jsp?ln=eng

- ***Identify shared and open content management system (CMS) solutions*** *and support implementation through training and best practices. This will offer agencies an alternative to building their own platforms in isolation and enable code sharing and modular development.*

- ***Help agencies develop web APIs*** *and unlock valuable data by providing expert resources and other support to enable developers, entrepreneurs, and other end users take advantage of government data and content.*

- ***Launch a shared mobile application development program,*** *in conjunction with the Federal CIO Council, that will help agencies develop secure, device-agnostic mobile applications, provide a development test environment to streamline app delivery, foster code-sharing, and validate official government applications.*[66]

This Center will be aided by the formation of a new advisory body comprising senior officials from both inside and outside of government. The Group 'will work with the Federal Web Managers Council to develop guidelines for improving digital services and creating better digital content...and setting up intra-agency governance models for delivering better digital services' (ibid..). It is also notable that the 2012 plan was devised by a Federal Mobility Task Force that deployed an online consultation platform to solicit ideas and dialogue on priority areas to be addressed by the final strategy.[67]

The main lesson to be derived from this selective and introductory review of governance models is the importance of the governance interface between service and IT/CIO capacities within the public sector as mobility expands in importance both internally and externally. This interface is clearly foundational in terms of the evolution of identity management and its evolving form in a mobile-centric environment, the topic that is the focus of the next section.

[66] Source: http://www.whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.html#digital-services-center

[67] For details on the consultation and the input and activity that ensued please see: http://mobility-strategy.ideascale.com/a/pages/analytics

2.3 Mobility and Identity

Identity management has been at the heart of online service delivery since day one. As the Joint Councils appropriately framed the issue several years ago, many of the key challenges are less about technology and more about governance and leadership.[68]

Today, this characterization is more relevant than ever – as mobile augments pressure on governments to devise new identity management methodologies that are both in keeping with private sector innovation and sensitive to public sector realities. A combination of under-performing online channels (more traditionally desktop-based) and newly emerging mobile channels makes identity management central to public sector service performance going forward. As illustrated by the Estonian, UAE, and Finland examples below, mobile identity and payment platforms represent a critical pathway both for public service delivery and widening capacities for more interoperability and alignment with the private sector.

Yet there is a distinct cleavage between federations such as Canada, Australia, and the United States, and a group of smaller unitary states that are taking the lead in mobile identity management (chief among them being Scandinavian nations, Estonia, Singapore, South Korea, and the UAE). In the former cases, as discussed in Part One of the report, electronic service uptake has proven to be slow and uneven. Fragmented and inconvenient forms of identity management are a key factor in this regard.

The South Korean experience is illustrative of how mobility and identity management are interdependent factors in digitizing and improving government performance:

> *By 2011 government agencies in the Republic of Korea had launched more than 160 mobile applications covering internal processes, access to information, and public service delivery. Problems soon emerged, however, because the applications lacked a common framework. As a result, there was a redundant development of products, mismatch of technical standards across ministries and agencies, and the lack of a clear direction for budget priorities around mGovernment services.*
>
> *To address these challenges, the government in 2011 launched a five-year, $55 million strategy to integrate mGovernment, focusing on both internal processes and public services. This strategy establishes a common framework for developing simple mobile websites, hybrid websites customizable by operating system, and mobile applications. For each of the five years, the strategy sets priorities ranging from security to quality assurance and authentication, to the establishment of a mobile common data management system. It also provides a detailed guide to the user interfaces and experiences with mobile government websites.*[69]

[68] Source: http://www.iccs-isac.org/councils/joint-councils/identity-management-sub-committee/?lang=en

[69] Source: World Bank (Making Government Mobile): http://elibrary.worldbank.org/doi/pdf/10.1596/9780821389911_ch06

Estonia's success with respect to mobile identity credentials is reflective a wider, decade-long push for electronic governance with strong political backing nationally – as well as relatively high levels of continental digital literary and support via the European Union. Being one of the first EU members to deploy electronic voting, as well as being one of the first to create an electronic identity card for all citizens, are precursors to the mobile architecture being deployed at present. These factors also underscore the importance of political dialogue and support for digital governance initiatives at the political level.

The electronic national identity credential in Estonia (which has also served as a basis for widely accepted digital signatures) has most recently enabled the development of a mobile service architecture for citizens of that country widely recognized as uniquely advanced:

Estonia: a glimpse of the future for mobile identity[70]

Estonia is arguably the world's most advanced country within the realm of digital and mobile identity. The country's Mobile- ID service allows an individual to use their mobile phone as a form of secure electronic identity. Like an ID Card, the Mobile- ID can be used for securely accessing eGovernment services and for digitally signing documents (a process which has already become an established norm in Estonia). The service uses a W-PKI SIM card, which individuals must request from their mobile phone operator (all of the country's mobile operators offer such SIMs). Private keys are stored on the SIM card along with an application for authentication and signing.

In brief overview, the service works as follows:

- ***The individual clicks the "Log in with mobile ID" option on a supported website;***
- ***The phone displays a message indicating that a connection is being made;***
- ***The user is prompted to enter a PIN code into the phone;***
- ***The message on the phone disappears and the website is automatically reloaded with a logged in screen.***

The list of applications of this mobile digital signature service is broad and growing. Individuals can vote (even when overseas), pay for goods and services online, pay for municipal services such as parking, access social security services and even register a new business.

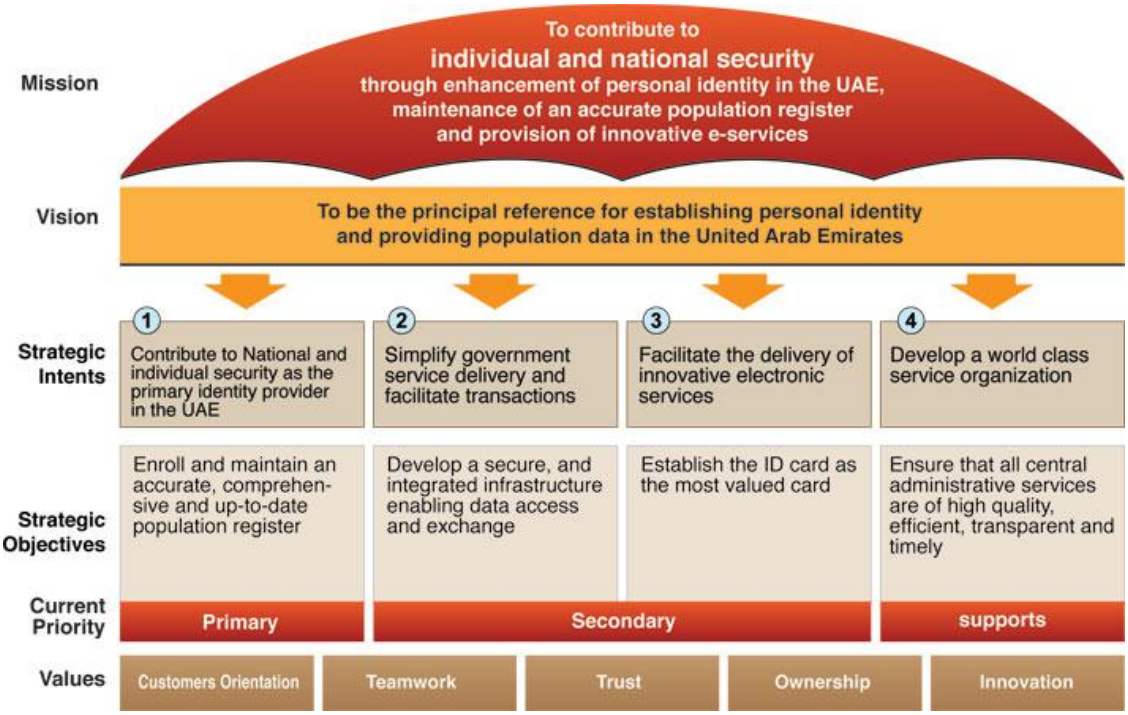
[70] Source : http://www.gsma.com/mobileidentity/wp-content/uploads/2013/10/Mobile-Identity-Global-Review-2013.pdf

In the Middle East, the UAE has emerged as the leading proponent of electronic governance and mobile service delivery and - as with Estonia, strong and centralized governmental support within a relative small and homogenous jurisdiction are important enabling conditions. Central to the UAE effort is the Emirates Identity Authority (Eida) which has led a national strategy (depicted below) that aims to create a national smart card as not only the basis for government service delivery online and via mobile devices but also as the credential of choice across the public and private sectors, notably in the latter case financial institutions.

In December 2013, Eida announced the launching of a new batch of mobile services including the renewal of ID cards (in 2 minutes according to Eida) and several other 'smart' transactional services, viewed as a first phase to a wider roll-out set to begin in 2014:

> *Emirates ID's batch of "smart" services, launched in English and Arabic through 'Android' apps as a pilot edition, includes ID card Renewal for Emiratis and GCC countries citizens as a first phase, tracking progress of transactions for all residents in the UAE, user profile personalization, sending suggestions and complaints, notifications and geo-locating Emirates ID's service centers and approved typing offices. Commitment to Excellence.*[71]

The UAE national strategy for ID management is depicted in the figure below:



[71] Source: http://www.emirates247.com/news/emirates/renew-your-emirates-id-card-in-just-2-minutes-from-your-mobile-2013-12-12-1.531068

The smart card at the heart of the ID Management framework features the following characteristics:

- *One card type for nationals and residents with personal profile information;*
- *All cards are PKI-enabled (digital certificate);*
- *Biometric data on card with "match on card" feature;*
- *Multiple security features (anti-fraud) built into the card; and*
- *Multi-factor authentication mechanisms for identity verification.*

The security and authentication requirements and credentials further enable an expansion of mobile service offerings across both the public and private sectors – the foundations of which reflect a national service eco-system comprising the state identity management authority, telecom-wireless carriers, and the financial services sector (a detailed description of the technical foundations of this mobile ID platform is available[72]). Building on this shared and coordinated infrastructure, the UAE strategy going forward entails an aggressive expansion of secure mobile transactions via smart phones – underpinned by the national identity credential and SIM card technology embedded within the mobile device.

Across both the Estonian and UAE examples, linkages between the financial sector and government are central to the creation and expansion of a mobile ID eco-system. Although, to some degree, the strong state-centric flavour of ID Management in the UAE is not easily transportable to most other OECD democracies, many of the technological and organizational contours are similar. Moreover, the key point of fragmentation versus more synergistic collaboration across the private and public sectors is one further underscored by wider international observations and experiences.[73]

One study of the UEA model by INSEAD, situated within a wider review of European ID management models, illustrates the manner by which portability and collaboration across industry and government are essential ingredients for the facilitation of electronic and mobile service systems.[74]A key take-away lesson from this review is that a wider and deeper uptake of more integrated services via both electronic and mobile channels will not occur unless a jurisdiction creates a more cooperative, portable, and federated ID management infrastructure

[72] Al-Kourhi, A.M, (2013) Identity and mobility in a Digital World. Technology and Investment, 2013, 4, 7-12

[73] See, for example, this 2013 review of mobility identity trends and models, a study undertaken by GSMA (a global industry association of mobile operators rooted in Europe and spanning more than 200 countries) : http://www.gsma.com/mobileidentity/wp-content/uploads/2013/10/Mobile-Identity-Global-Review-2013.pdf

[74] Source: http://www.insead.edu/facultyresearch/centres/innovation_policy_initiative/events/documents/National_ID.pdf

encompassing of all sectors (and by implication, all levels of government). Given that ICCS is presenting training public sector staff in the UAE, there may be additional learning opportunities for Canada and the Joint Councils stemming from the UAE experience.

Many OECD countries – including Australia, the UK, and Canada, would appear to be moving in such a cross-sector manner. The British example is particularly insightful as their recent 2012 Digital by Default Strategy includes an explicit choice to widen the public sector's reliance on private sector credentials through a shared set of standards and protocols to ensure appropriate security and privacy safeguards:

> *Eight providers have been announced: PayPal, Post Office, Cassidian, Digidentity, Experian, Ingeus, Mydex and Verizon. In future, as more companies are certified to become identity providers, it is intended that identity provision will become an open market commercial opportunity for identity providers. It is hoped that this will drive down the cost of identity provision to Government.*
>
> *Privacy and security are key concerns of the Identity Assurance Programme. The IDAP is developing a model which aims to address these concerns. It is engaging with an independent Privacy and Consumer Advisory Group comprising external stakeholders to work on this issue. It is also working with the Government's National Technical Authority for Information Assurance to ensure that the model meets security requirements.*[75]

In Canada, mobility accentuates the ID management imperative that has thus far proven to be the Achilles heel of wider levels of electronic service delivery in Canada. At the same time, however, mobile banking is growing as is usage of alternative payment platforms via mobile devices (i.e. a taxi driver for instance, using his or her smart-phone to process payment from a client). Research undertaken for the Taking Ontario Mobile initiative, found that more than 80 % of those surveyed in that Province expressed interest in making use of a mobile wallet (with one half of that proportion open to exploring such usage for both sensitive and non-sensitive items including, notably, financial transacting).[76]

There are also a number of additional promising conditions upon which to build including: rising cellular penetration and smart phone usage rates; a steady growth in online and mobile banking; growing calls for and experiments with integrated smart cards[77]; and widening recognition across the public sector on the need for portable ID solutions rooted within collaborative frameworks enjoining all government levels as well (and in some cases led by) industry.

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[75] *p.3,* www.parliament.**uk**/briefing-papers/POST-PN-434.pdf

[76] Source: Research Highlights, http://www.takingontariomobile.ca/

[77] The BC Citizen's Card is one such example of course, whereas the 2013 report by the Provincial Auditor in Ontario recommends the pursuit of a likeminded initiative in that Province.

Within such a dynamic and evolving context the Government of Canada thus defines its ID management approach with the following parameters:

- *Give choices to citizens and businesses to decide how they want to identify themselves to receive services;*

- *Enable a "tell us once" strategy by allowing re-use of personal identity information across multiple service delivery channels;*

- *Ensure integrity of information through validation from trusted (authoritative) sources of identity information;*

- *Establish interoperability standards; and*

- *Collaborate with other jurisdictions and the private sector to deliver solutions.*[78]

Such conditions underpin the Government of Canada's new Credential Broker Service, a platform 'that gives Canadians the option to use credentials (user name and password) they already have with their financial institutions to access government of Canada online services'.[79]In this manner, identity management has never been an issue for government alone, and mobility further accentuates this point – an observation underscored by the examples and discussion above as well as recent Canadian initiatives such as the federal Payments Review Task Force Report.

The missing element thus far in the Canadian context – and one that will likely confine domestic progress in expanding mobile service offerings involving the public sector specifically, is deeper and wider political engagement and support for both innovation and interoperability in terms of identity management and payment solutions (increasingly necessitating an important mobile dimension). In contrast, the countries reviewed above have all benefitted from such high level political commitments – including an underpinning more open and public conversations concerning all aspects of privacy and identity.

The example of BC is instructive as a modest step in this direction within one provincial jurisdiction.[80] At the same time, in line with the Joint Council's foundational efforts over the past decade the ultimate aim should be the forging of a pan-National mechanism with strengthened and collaborative authority – both administratively and politically. Such a mechanism for managing identity would ultimately be situated within a wider dialogue on the growing

[78] Source : http://www.ucentricid.com/wp-content/uploads/Dagg_UserCentricIDLive_13.pdf

[79] Source: http://www.canadiangovernmentexecutive.ca/e-government/ict/item/1349-paradigm-shift-the-cio-as-a-strategic-business-enabler.html

[80] Two elements from BC are noteworthy here: first, the introduction of the BC Citizen's Card and secondly, the public consultation launched by Service BC in late 2013 to engage provincial residents in a dialogue on service delivery reform (an important element of which would presumably be channel preference and online security and the government's evolving means of authenticating identity for public services).

opportunities and risks of digital and mobile service delivery both for the public sector and the jurisdiction as a whole.

By way of appending this section, an additional case study of the Finnish mobile identity solution is presented below. For a wider global review of mobile identity initiatives – which highlights Estonia and Finland as leading jurisdictions, this resource is also available.[81]

Finland's Mobile ID: Key Success Factors[82]

A. Interoperability - ***By establishing a "Circle of Trust" between the three operators, Mobile ID was able to offer a significant advantage over other existing solutions.***

B. Reaching high frequency transactions - ***High volume transactions, such as banking, online payment and e-commerce verifications, will be the key to driving sustainability in terms of revenue and reach.***

C. Gaining acceptance of the banks and new mobile payment service providers - ***Determining a basis upon which Mobile ID can enter the market and stand compatibly alongside the Bank IDs will be crucial to ensuring the success of the solution.***

D. Positive role of government - ***Governments around the world are beginning to recognise the positive benefits of mobile identity for citizen authentication and access to public services. The Finnish Government is developing plans to make all public services fully available online by 2015. By encouraging migration to e-services which require strong authentication solutions, the Government will help to drive uptake by consumers who recognize the value in being able to access services – for activities as diverse as accessing private health or housing records, bidding for housing, receiving benefits, filing taxes – all from their mobile phone.***

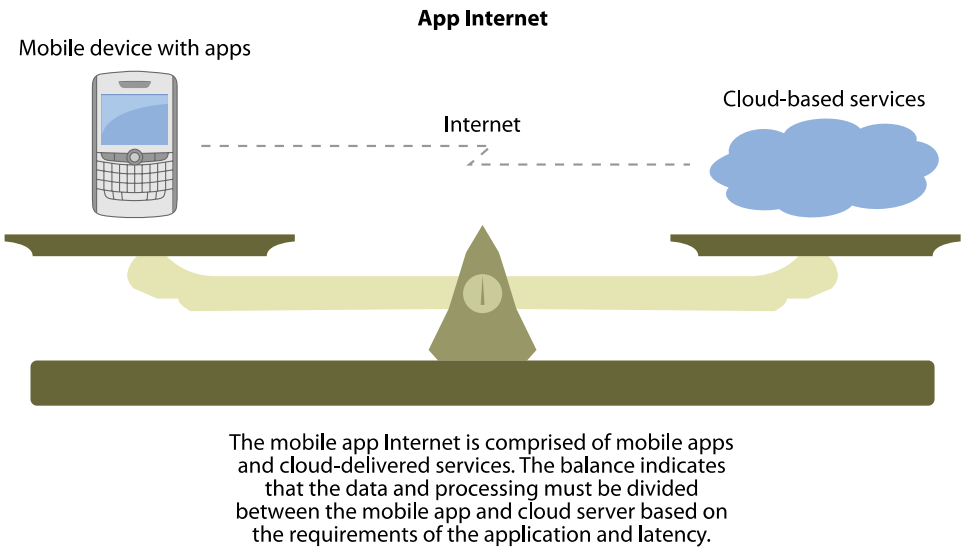
[81] Source : http://www.gsma.com/mobileidentity/wp-content/uploads/2013/10/Mobile-Identity-Global-Review-2013.pdf

[82] Source : http://www.gsma.com/mobileidentity/wp-content/uploads/2013/03/GSMA_Mobile-Identity_Finnish_Case_Study.pdf

2.4 Apps & Cloud Architectures

A useful point of departure in framing the evolution of mobility and enterprise architecture is offered by Forrester Research in their presentation of the emergence of a 'Mobile App Internet' in the following visual manner:

Figure 2 Client/Server Is Dead; The Mobile App Internet Is The New Architecture



60069 Source: Forrester Research, Inc.

This model is based upon three fundamental mobile components:

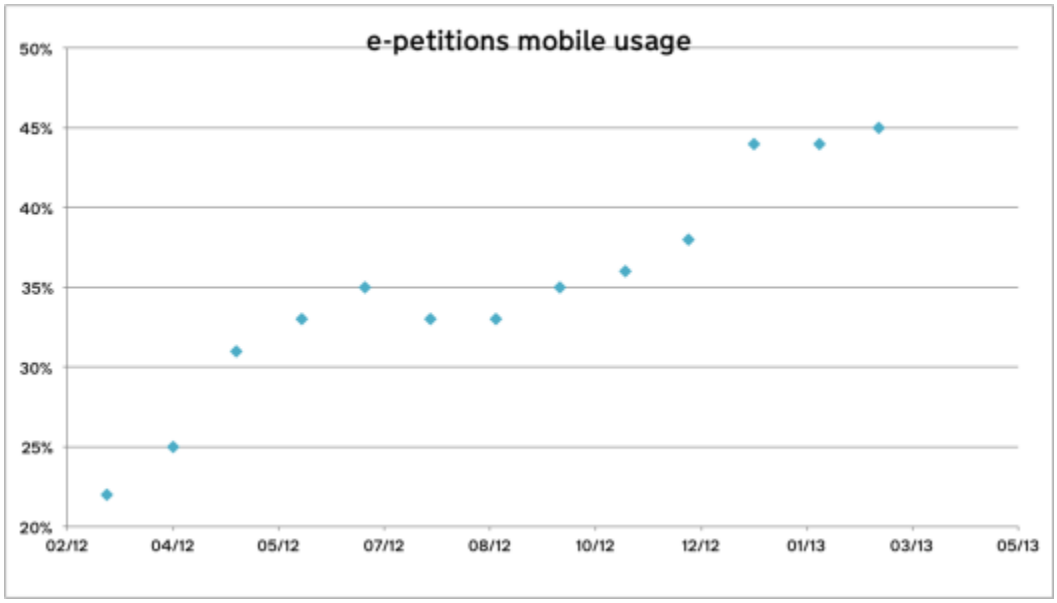
- First, the proliferation of apps and mobile websites as not only mechanisms for external service delivery but also all aspects of business operations including employee engagement and collaboration, logistic and supply-chain management, and various services and tools tied to enterprise resource management;

- Secondly, employee devices and the expansion of BYOD and CYOD policies across the organization (and across organizations enjoined within similar eco-systems: i.e. different levels of government and various government agencies);

- Thirdly, the cloud as an underlying architecture for information storage and processing in a manner that facilitates a constant alignment and upgrading of apps, devices, data-bases, and other software and hardware needs.

The first component signals the need for a strategic framework to encompass apps development and deployment across the public sector (either within a jurisdiction but potentially across the public sector as a whole). This is not to say that all apps should be created and run from a single venue – but rather monitored, supported, and facilitated by a set of standards and guidelines to ensure that apps maintain or enhance security while contributing tangible improvements to performance.

The experience of the British Government is instructive in this regard – both in terms of the importance of going mobile and the set of choices confronting governments in doing so. According to the Government Digital Services group (the body within the Cabinet Office responsible for leading the Digital by Default strategy), 'in March 2012, just over 20% of those visiting the British Government's e-petition service were using a mobile device. In the spring of 2012 its design was made responsive. The graph below shows the trend since then. It's now over 45% mobile.' The following graphic depicts this growth:



Similarly encouraging results were experienced by the Driving Standards Agency in the English region of Nottingham where – following the introduction of a mobile-friendly website, nearly 30% or all bookings (new and altered) are now conducted via a mobile device ('book your driving test on the bus' is how this evolution is marketed[83]) .

[83] Source: http://digital.cabinetoffice.gov.uk/2013/03/12/were-not-appy-not-appy-at-all/

The principle of 'responsive design' (which ensures that a web-site adapts seamlessly across different devices, be they mobile or PC based) is central to the front-end capacities of mobile infrastructure in facilitating such results. But as the British Government itself states, 'does this mean that governments should also be investing heavily in mobile apps?'

Their response is a resounding no – that the development of native (or custom-built, typically in-house) apps is rarely justified, a point underscored by Action Six of the Government Digital Strategy which states

> *Stand-alone mobile apps will only be considered once the core web service works well on mobile devices, and if specifically agreed with the Cabinet Office…'the benefits of developing and maintaining apps will very rarely justify their costs, especially if the underlying service design is sub-optimal. Departments should focus on improving the quality of the core web service' (in a manner that is consistent with responsive design in order to ensure mobile compatibility) (ibid.).*

The head of the British Government's Digital Government Service (GDS) team, furthermore, provides an uncharacteristically strong condemnation of devising native apps for the public sector, pointing to (among other reasons) research suggesting that for utility-type services offered by government , the mobile web is the preferred channel for service engagement and should thus be the priority. Recognizing that there will be exceptions to this logic, five key questions are presented as a basis for seeking an exemption from this logic – and thus investing the time and resources into devising a native of hybrid app:

1) *Is our web service already designed to be responsive? If not, why not?*

2) *What is the user need that only a native/hybrid App can meet?*

3) *Are there existing native/hybrid apps which already meet this user need?*

4) *Is our service available to 3rd parties via API or open data? If not, why not?*

5) *Does meeting this need justify the lifetime cost of native or hybrid apps?*[84]

While this British view offers a useful reality check for over-burgeoning enthusiasm toward devising new apps, two important points must also be underlined: first, there may be exceptions and rationales when government must devise its own apps; and secondly and more widely, the point of the British Government is not that there is no place for apps within the public sector, but instead that most will be devised outside of government by third parties.

As with the classic tensions confronting government IT leaders regarding in-sourcing versus outsourcing, at least part of the logic for government development its own apps in some instances is to ensure a basic level of competencies and knowledge in house, as government undertakes various external arrangements with apps developers (and as importantly, as new apps are devised using open government platforms and open data sponsored by the public

[84] Source : http://digital.cabinetoffice.gov.uk/2013/03/12/were-not-appy-not-appy-at-all/

sector). Such logic underpins the Obama Administration's decision, for example, to ordain that all federal agencies develop at least two new apps of their own making.[85]

With respect to using commercial apps, there are similar tensions and coordinating challenges. For example, a recent study by the CIO Council of the US federal government found the following highlights the major challenges identified by agencies (though this list is not comprehensive of all challenges discussed in this review[86]):

- *It is difficult to control and regulate access to mobile applications on government furnished mobile handheld devices;*

- *There is significant fragmentation of mobile operating systems, handheld device models, and mobile applications, which all require additional security reviews;*

- *It is not clear how to handle storage of information in non-government clouds; and*

- *Unique terms of use for each commercial application can require a high level of government review and negotiation.*

The same report goes on to make the following recommendations, scalable to most all jurisdictions and governments of different sizes and degrees of complexity:

- *Establish a government-wide catalog for commercial mobile applications that highlights key functionality and characteristics relevant for government use;*

- *Document best practices regarding commercial mobile application review processes;*

- *Develop standard government-wide terms of service for commercial mobile applications; and*

- *Initiate a government-wide cloud storage service (ibid.).*

In line with these directions – and building on its 2012 digital and mobile government strategy, the US federal government offers a number of publicly available resources for developing public sector mobile capacities. Within the GSA, the Office of Citizen Services and Innovative Technologies houses a uniquely integrative set of service and CIO-minded perspectives in keeping with the earlier discussion of Part Two of this report. Specifically, 'Making Government Mobile' provides a rich array of background and training materials available for further review.[87]

[85] Source: http://gcn.com/articles/2012/07/16/agencies-build-digital-government-with-apps.aspx

[86] Source: https://cio.gov/wp-content/uploads/downloads/2013/05/Commercial-Mobile-Application-Adoption-DGS-Milestone-5.4.pdf

[87] http://www.howto.gov/mobile/making-government-mobile

While by no means providing a final word on appropriate selections for apps by the public sector, one Australian effort suggests the following typology as guidance for what governments should do themselves – and when governments should instead look elsewhere in relying on the marketplace and third party development:

- ***Critical*** *- apps which governments consider core to its ongoing business and therefore both creates and maintains, retaining ownership on an indefinite basis (though commercial entities may create their own versions).*
    - *ie: Emergency management apps, train/tram/bus timetable apps*

- ***Very important*** *- apps which governments believe must be provided and will make, however are not critical for them to own on an ongoing basis, and therefore may sell to private concerns (with appropriate distribution and maintenance conditions and perhaps a 'resumption' clause if the private concern ceases development)*
    - *ie: Traffic or toilet map apps.*

- ***Important*** *- apps which governments prefer are developed, but are only prepared to partially invest in - via partial funding or other support or a partnership with private entities.*
    - *ie: Crime statistic/locations, parliamentary information or library/gallery works apps.*

- ***Interesting*** *- apps that governments find interesting, but not worth investing in. In this case they may release the ideas and data for the apps and leave up to private enterprise to develop - or not.*
    - *ie: Sports field locator or health information apps.*

- ***Uninteresting*** *- apps which government doesn't care (from a public benefit perspective) whether they are created or not and leave entirely to the private sector.*
    - *ie: most apps you'll find in app stores*[88]

Some additional resources on defining, developing, and deploying mobile apps and mobile websites are provided in the appendix to Part Two.

[88] Source: http://www.govloop.com/profiles/blogs/how-should-governments-treat-mobile-apps-in-an-age-of-open-data

Cloud-based architectures and systemic openness:

The inclusion of cloud-based services in the Forrester diagram above invokes the growing trend toward utility-based and online forms of infrastructure, and the alignment between cloud-based infrastructure and a more mobile and collaborative experience sought by organizations. In this regard as well, apps can plan an equally important role in internal enterprise architecture (enabling employee access to a range of resources and services) as with external service delivery.

Building on its prior analysis Forrester provides the following contrast as further illustration of the advantages of looking to the cloud as a strategic option in this context:

Figure 3 Why The Cloud Is Better Suited To Mobile Collaboration Experiences

Factor	On-premises solution	Cloud-based solution
Multidevice support	Fewer mobile platforms	More mobile platforms
Time to deploy on a new mobile platform	Years, or your server software refresh cycle	Months, or vendor's SaaS release cycle
Response time to a mobile user action	Seconds	Subsecond
Latency bottleneck	Your data center and network	Wireless network capacity and backhaul
Access	VPN-protected devices, secured through the network	Any supported device, secured through the application
Security	High to moderate	Moderate to low

60069 Source: Forrester Research, Inc.

With respect to security - the presentation of security as 'low to moderate' for cloud-based solutions explains much of the trepidation of government in embracing this path (the security implications of mobile devices are examined in the next section), although there are equally prevalent concerns about the costs and challenges for the public sector in maintaining and refurbishing legacy based systems (typically on-premise). Moreover, the point of this table is less about overall security determinations of cloud systems – a complex undertaking involving both public and private variants of the cloud, and more about the overall suitability of cloud-based solutions for a more mobile-centric environment.

The twofold impact is: first, pressure on IT suppliers to devise new solutions that are more suited to cloud-based mobility while preserving hybrid elements of on-site components for select purposes; and secondly, for governments in turn to adapt their procurement processes and policies in accordance with this new vendor landscape and a new set of resulting choices.

As CIO's know full well, however, the cloud is a fluid concept encompassing many variants both open source and proprietary (a point discussed as well in the informative Forrester review). As governments look to expand their mobile capacities, the risks of complex vendor relationships resulting in under-performance and escalating cost is a familiar theme (two British sources bearing this point include a 2011 Parliamentary Review and 2013 presentation by a local government CIO[89]).

In a manner analogous to the British trepidation toward the building of custom apps, governments constructing their own mobile enterprise architecture should view proprietary products and solutions as the exception, favouring wherever possible open source systems, or at the very least systems and solutions compatible with open standards and protocols. Within their most recent e-government plan, for example, Norway adopts the following 'architectural principles for ICT solutions:

- *Openness: Public ICT systems must be based on open or approved standards. The systems shall not entail compliance with any special technology requirements on the part of users;*

- *Flexibility: The public sector is to establish and develop ICT systems in such a manner that they will facilitate change in use, content, organization, ownership, and infrastructure; and*

- *Scalability: ICT systems are to facilitate changes in terms of the number of users, data volume, and lifespan of services.*[90]

The aforementioned case in Great Britain of a local government struggling with mobility is indicative of the relative absence of these principles – resulting in a plea by the lead government official for suppliers to start "taking integration with APIs and mobility seriously".[91] Similarly, the aforementioned British Parliamentary Review makes a similar call for government to expand the cadre of potential vendors and solutions via a rigorous pursuit of open source and openness and portability across platforms and solutions.

It bears noting in this regard that initially, cloud computing featured stark divisions between open source and proprietary systems, with some companies in the latter realm, such as Oracle and Microsoft, questioning the legitimacy of the cloud as a workable architecture. Today, even these companies have embraced variations of cloud solutions – as in reality the cloud has become a

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[89] 2011 Parliamentary Review (Recipe for Rip-off):
http://www.publications.parliament.uk/pa/cm201012/cmselect/cmpubadm/715/715i.pdf

2013 Profile of Cambridge County Local Council:
http://www.computing.co.uk/ctg/news/2274061/enterprise-mobility-summit-2013-we-ve-been-failed-by-our-suppliers-says-byod-project-lead-cambridgeshire-cc

[90] Source:
http://www.regjeringen.no/upload/FAD/Kampanje/DAN/Regjeringensdigitaliseringsprogram/digit_prg_eng.pdf

[91] Source: see previous footnote above (Cambridge County Local Council).

continuum of hybrid systems that often encompass both open source and proprietary elements. Within this evolving environment, the most salient point for the public sector is wider recognition of the need for interoperability and portability across operating systems – and by extension, mobility platforms.

Although government will face design challenges stemming from compatibility and co-offerings of service channels and devices across operating systems – notably Apple and Android (flagship example of proprietary and open source systems), these challenges can be increasingly mitigated by the importance of open and federated standards across the technology industry.

In December 2013, moreover, the State of Massachusetts formally sought to tie their open data strategy with the development of an open source cloud – a further extension of this logic outside of the confines of government[92] (and indicative of themes explored more fully in Part Three).

In short, architectural design principles such as openness, scalability, and flexibility are centrally important in maximizing portability of solutions and overall government agility in a mobility era.

This importance is especially relevant due to the expansion of mobile devices that tie citizens and stakeholders to governments within shared information and service eco-systems, as well as due to the growing usage of BYOD frameworks internally for devices and their integration into organizational-wide platforms and policies. This latter topic is examined in the next sub-section below within the wider context of mobility and security.

[92] Source : http://gcn.com/articles/2013/12/16/massachusetts-open-cloud.aspx

2.5 Security & BYOD

> *The BYOD movement is here, and it's here to stay. Government IT leaders must strategize and plan now in order to accommodate and manage the influx of personal mobile devices. While there are numerous technical and legal factors to consider, the employee must not be overlooked. IT leaders who overlook or ignore the human factor will inevitably find their jobs that much harder. Time and time again, employees will circumvent IT policies and procedures if they are cumbersome and hinder work. It is in the government IT leader's best interest to work with employees and take into account the human factor, while developing an MDM strategy and plan that reflects all technical and legal requirements.*
>
> *{Sleepless Nights Over BYOD MDM Considerations for the Government IT Leader[93]}*

As is well documented but under-appreciated by the public at large (a public that potentially plays dual roles as external customers and internal employees), the steady and inter-related expansion of cloud computing, social media, smart devices, and wireless Internet access creates a set of conditions ripe for inadvertent and malicious exploitation. The high-profile theft of personal data of some 40 million customers of American retail giant, Target, in late 2013 merely serves to underscore this truism in today's digital environment.

In the business sector as well as in government, few entities view themselves as adequately prepared – despite growing awareness and involvement by senior management and modest budget increases that are nonetheless viewed as insufficient for the challenges presenting themselves (these findings from a 2013 survey of senior executives from more than 1,900 companies and government organizations globally[94]). Half of all respondents cited a lack of skilled workers as a barrier to addressing current security priorities, with competition between industry and government cited as one factor in fueling such shortages for many organizations (ibid.).

The 2012 US Digital Government strategy, for example, outlines the heightened vulnerability stemming from mobile devices specifically:

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[93] Source: http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheadername1=Content-Disposition&blobheadername2=Content-Type&blobheadervalue1=inline%3B+filename%3D%22BYOD+and+MDM+Considerations+for+Government+IT+Leaders%22&blobheadervalue2=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1251815240179&ssbinary=true

[94] Source: http://www.csoonline.com/article/742486/enterprise-defenses-lag-despite-rising-cybersecurity-awareness

> *Mobile devices have unique security challenges. Due to their portability, they are easy to misplace, potentially compromising any unencrypted sensitive data or applications stored locally…The rate of change of mobile operating systems, new update and notification capabilities from external hardware and software vendors, diversity of the devices themselves, and introduction of employee-owned devices (BYOD) also make security in the mobile space more challenging than in a traditional desktop environment and require new approaches to continuously monitor and manage devices and secure the data itself.*[95]

For public sector organizations pursuing mobility as an organizational mindset as well as technological strategy, an emphasis on employee awareness and responsibility is therefore central to fostering collective capacities for cyber-security across infrastructure (including cloud systems and the myriad of personal devices deployed by public servants within and outside of the organization's physical and virtual walls) and data processing.

As a retired American Lieutenant General describes it, the fundamental challenge is as much about behavioural culture as technical specifications and policies:

> *"The future of cyber-security is sustainable risk management," said Lt. Gen. Raduege. "The tipping point of cyber will likely come when it blends in seamlessly with the agency's broader business portfolio and becomes part of how the agency operates and delivers on its mission." That calls for a new cultural approach that's integrated into almost every aspect of public and private life he noted.*[96]

Importantly, while this call for sustainable risk management as a new organizational ethos underscores individual choices and decisions, such an enlightened culture must also emphasize responsibility by device users. Citing both industry and academic research, a recent article on mobile security in The Economist underscores this point – arguing that thus far malicious viruses have been relatively rare across mobile apps and devices, whereas the largest vulnerability from BYOD and mobile device management stems from employee behaviour and poor and ill-informed decisions.[97]

Establishing an appropriate security compact at the heart of the cultural ethos for an organization is thus an essential prerequisite to any significant degree of BYOD embracement. The compact is essential to the realization of many key benefits ascribed by IDC research to improvements in organizational performance emerging from their own research with large organizations. Based on their own interviews, they report high degrees of satisfaction with BYOD policies leading, in turn, to the following sources of gains for organizations:

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[95] Source, US White House (2012) Digital Government: Building a 21st Century Platform to Better Serve the American People (http://www.whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.html). The report provides a thoughtful and useful examination of the implications of mobility and security for public sector governance both internally and in terms of external outreach.

[96] Source : http://digital.turn-page.com/i/65260/20

[97] Source: http://www.economist.com/news/technology-quarterly/21590753-mobile-security-when-it-comes-mobile-devices-viruses-are-not-problem-they

- *Self-provisioning of mobile devices by employees allows IT to keep up with technology changes and deliver innovative solutions that would be financially and operationally impossible with corporate-liable devices.*

- *Higher penetration of mobile devices enables greater information sharing, decision making, and customer support.*

- *The cost of wireless services will be controlled, if not reduced, by the shift to employee plans.*

- *Employees have more freedom and satisfaction with self-provisioned devices.*

- *With the right management tools and policies, IT support for end-user devices can decrease. Many CIOs are optimistic that application mobilization along with employee-liable devices will reduce demand for laptops, further reducing support and device costs.*

- *It will be perceived as more progressive and contributing to business innovation.*

In a separate American study of private and public sectors undertaken in 2013, IDC Research underscores the BYOD is already a reality in many areas whether or not the organization has formally embraced such an avenue: '40.7% of devices used by information workers to access business applications are ones they own themselves, including laptops, smart-phones, and tablets...(a ten point increase from 2012).[98]

Yet BYOD remains a contested topic with mixed views and evidence in terms of costs and benefits – with security viewed as an over-riding determination for many organizations, but by no means the exclusive concern: see, for example, 'ten BYOD concerns that go beyond security issues[99]. Many of the concerns discussed in this brief article tie back to the complexities of enterprise architecture and apps development discussed in the previous section.

Security, however, remains a paramount concern – as data breaches and the theft and loss of devices become a regularized feature of digital governance.

While Blackberry has traditionally been viewed as the most attractive alternative for enterprise security, the explosion of Apple devices across the consumer and business sectors renders this platform equally essential, much as Android now dominates the smart phone market globally. While this latter, open-sourced platform has been associated with increased security vulnerabilities relative to the others mentioned here, companies such as Google and Samsung

[98] Source : http://www2.forescout.com/idc_flexible_byod

[99] Source: http://www.techrepublic.com/blog/10-things/10-byod-concerns-that-go-beyond-security-issues/3388/

have made important strides in addressing such matters. Indeed, in 2013 the US Department of Defense certified the Android platform for use within the US military.[100]

Accordingly, governments must be open to supporting – in different circumstances, all of these platforms and potentially others as the market landscape evolves in the future. In its cautious and qualified endorsement of BYOD, the British Government provides detailed guidance for usage of the major aforementioned platforms as well as Windows.[101]Indeed, one of the benefits of BYOD is that it enables government to benefit from the competitive dynamic of the marketplace in terms of the performance and resilience of devices offered by leading technology companies (and their expertise and reputations underpinning their product offerings).

The briefing on BYOD prepared for the State of Colorado (cited at the outset of this sub-section) presents this viewpoint in the following manner:

> *With the variety of mobile devices being introduced, it is unlikely that the existing Mobile Device Management (MDM) solution used by government IT agencies will be able to accommodate all of the devices. It then stands to reason that the new MDM solution ought to be able to support a variety of mobile devices with diverse operating systems and carriers.*

Nevertheless, multiple systems need not imply all systems – as governments may define the contours of BYOD within a number of certifiable solutions and platforms (further accentuating the importance of open standards and portability. In this vein, some commentators prefer the term CYOD (choose your device) as a more apt label for offering employees a select number of choices, rather than unlimited options or the imposition of a single solution.[102]

Such considerations and choices become all the more relevant as governments embrace an increasingly outward, collaborative and participative mindset (a theme extended to Part Three).

In a manner analogous to ongoing tensions between proprietary and open source systems, individual users of mobile devices facing competing incentives and choices with respect to managing and sharing their own personal information.

Public awareness and behaviour is thus an important aspect of mobile security. Calls for citizens to become ‘data activists’ (i.e. more enlightened users of online processes and mobile devices and more informed and vigilant in terms of sharing personal information and demanding responsible usage by organizations) seem very much in keeping with likeminded employee challenges facing organizations.

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[100] This article provides a useful description of the shifting security dynamics leading to this decision: http://www.csoonline.com/article/732794/pentagon-nod-shows-android-can-be-as-secure-as-blackberry

[101] Source: https://www.gov.uk/government/collections/end-user-devices-security-guidance--2

[102] For additional discussion of BYOD versus CYOD and some recent trends in this regard: http://www.zdnet.com/cyod-to-rise-amid-death-of-byod-in-2014-forecasts-idc-7000023676/

Across both of these environments, the cultural challenge of mobile security is the necessity of a stronger focus on responsibilities and the self-governance of users in terms of conduct and decisions in making use of digitized devices and governance processes.

Government messaging matters – in complementing pledges to uphold privacy and information security while also conveying appropriate expectations for mobile behaviour on the part of citizens. The UAE smart card initiative is emblematic: as part of the roll out strategy, citizens are reminded of their user responsibilities in deploying and safeguarding their card in appropriate manners.

A likeminded emphasis on employee responsibility characterizes the BYOD guidelines of the US federal government (freely available on the White House web site along with a number of federal government BYOD case studies[103]) which state that employees must:

- *Protect their government-issued device from theft, damage, abuse, and unauthorized use;*

- *If the device is lost or stolen, the user will notify the [AGENCY NAME] Help Desk ([AGENCY HELPDESK PHONE] or [AGENCY HELPDESK EMAIL]) within one hour, or as soon as practical after you notice the device is missing. [AGENCY OFFICE OF INFORMATION TECHNOLOGY] will lock and disable the device upon notification. A lost or stolen device will be replaced a maximum of three times, pending availability of devices and funding;*

- *Maintain usage within the plan parameters identified above. If your business use requirements are dramatically different than the standard plan, you must contact [AGENCY OFFICE OF INFORMATION TECHNOLOGY] to discuss other available options; Comply with [AGENCY NAME] appropriate use policies when using the device ([REFERNCE AGENCY APPROPRIATE USE POLICIES]);*

- *Abide by the law governing the use of mobile cell phones and/or smartphones while driving (e.g., hands-free use and/or texting); and*

- *Purchase any additional mobile device accessories (e.g., holsters, cases, car chargers, screen protectors, Bluetooth headsets, etc.) that the user may desire in addition to the items provided by the government.*

In addition, the guidelines reinforce the limits of privacy when conducting professional activities:

> *Government employees do not have a right, nor should they have an expectation, of privacy while using Government provided devices at anytime, including accessing the Internet and using e-mail and voice communications. To the extent that employees wish that their private activities remain private, they should avoid using the Government provided device for limited personal use. By acceptance of the government provided device, employees imply their consent to disclosing and/or monitoring of device usage, including the contents of any files or information maintained or passed -through that device.*

[103] http://www.whitehouse.gov/digitalgov/bring-your-own-device

The main take-away lesson is the importance of maximizing openness and learning for platforms and solutions that comprise the IT infrastructure of government, while also facilitating dialogues both internally (predominantly for employees) and externally (for the citizenry at large) with respect to mobile security risks and responsibilities (in accordance with the realization of offsetting benefits accruing to device users for greater flexibility and choice in device selection and deployment).

Whereas the internal dialogue must be led and nurtured by senior management, there is also a political dimension to the more outward facing conversation that must also ensue, a point that ties back to a similar recommendation stemming from the discussion and review of identity management.

Part Two Appendix –

Additional Information Source on Mobile Apps, Enterprise Architecture, and Security

The CIO's Guide to Mobile Applications (Blackberry[104])

- This informative and mainly vendor-neutral report provides a good overview of apps types (including a comparison of web-based versus native and hybrid applications), as well as some guidance on costs and benefits and calculating an ROI for apps deployment.

Government Mobile and Wireless Security Baseline (US Federal Government 2013[105])

This document contains the mobile security baseline and explains its relationship to the Reference Architecture, the Mobile Computing Decision Framework, and other DGS mobile security activities. It builds on the DGS (Digital Government Strategy) report for milestone action 10.2, Government Use of Mobile Technology: Barriers, Opportunities and Gap Analysis (hereafter "DGS Barriers and Opportunities report"), which identifies four key areas that require improvements in tools and processes to "accelerate the secure adoption of mobile technologies into the Federal environment":

1) Mobile Device Management (MDM);

2) Mobile Application Management (MAM);

3) Identity and Access Management (IAM); and

4) Data Management.

Building Addictive Mobile Apps for Citizens and Employees (a local government perspective)

- This article discusses the main steps in developing successful apps (Keep it Simple, Engage the User, Solve a Problem, and Embrace Flexibility), providing a number of American local government examples.

[104] Source: http://cn.blackberry.com/content/dam/blackBerry/pdf/cioGuide/RIM_CIO_MobileApplications.pdf

[105] Source : https://cio.gov/wp-content/uploads/downloads/2013/05/Federal-Mobile-Security-Baseline.pdf

Apps for Local Government and Mobile Web Usage (Australian Centre of Excellence for Local Government[106])

This report catalogues nearly all local government apps available in Australia in 2010, supplementing this inventory with some additional analysis and discussion. The report's concluding observations are provided here (providing a useful transition into many themes explored in Part Three):

The development of "apps" designed specifically for the needs of, and application by local government needs provides many diverse opportunities to better provide information and services for local communities. Apps in themselves are not new, yet could be an integral part of a local innovation focused on a new product, process, system or delivery of service to the community.

Councils in Australia need to be cautioned against rushing into the app market place ahead of getting their own primary website into better practice functionality first.

Firstly, this includes ensuring that a council website is of Gov 2.0 standard.

One definition for this is:

"Government 2.0 is not specifically about social networking or technology based approaches to anything. It represents a fundamental shift in the implementation of government - toward an open, collaborative, cooperative arrangement where there is (wherever possible) open consultation, open data, shared knowledge, mutual acknowledgment of expertise, mutual respect for shared values and an understanding of how to agree to disagree. Technology and social tools are an important part of this change but are essentially an enabler in this process." 7

Next, providing a mobile web (or smart phone) friendly version of the council website is rapidly becoming the norm based upon expectations from users of these hand-held devices.

Even with such a mobile web version in place, many users will still want to option of diverting to the full desktop (or 'classic') version of the website. So it is best to test and refine the latter, so a smart phone can still upload pages efficiently and also be able to use the full range of interactive functions including e-commerce and messaging, blog posting etc. This will overcome all too frequent complaints and frustrations for clients, ratepayers and external stakeholders using their smart phones.

The cost of designing and developing a local government app needs to be balanced with likely performance improvement, productivity gains and better services delivery to the community. Will this contribute to cost savings in a business sense, or provide a burden from increases expectations from sections of the community and the lack of internal resources to be able to effectively and efficiently respond?

While there are many very ethical, competitive and technically competent private contractors and consultants to undertake app development work for local government, there is a strong case for building internal capacity of a council or groups of councils to carry out such work or at least share the tasks. This can include partnerships and collaboration with third party entities.

[106] Source : http://ofti.org/wp-content/uploads/2012/09/Apps-for-Local-Government-and-Mobile-Web-Usage-ANZSIG-ACELG-24-August-2012-updated-24-August.pdf

For councils with limited capacity (e.g. smaller low rate base remote-rural), there is great potential for the shared services approach to collaborate and employ a position that works across the region or sub-region. So an important message is to think beyond just contracting work out to a consultant.

The application of new information communication technology (ICT) will require councils to rethink their internal structures to facilitate better team approaches across the organization. Workforce and skills requirements will need to be based around new ways of doing business where ICT including communication tools like apps become some of the principal community engagement methods.

Apps along with the various forms of social media and other web-based technology applications need to be approached strategically, alongside other methods of communication, conversations and engagement with local communities.

ICT will be evolving component of the emerging paradigm shift towards e-democracy and citizen-centric decision-making processes.

PART THREE - MOBILITY AND PARTICIPATION

Key Lessons:

- Mobility is closely aligned with open government and public engagement, creating new opportunities for service innovation, participative service design, and online learning.
    - New indicators of metrics of such participation and its impacts on public sector performance must be devised.

- The emergence of a more mobile workplace (in terms of both device management and the underlying structures and cultures of organizations) will play an increasingly significant role in the recruitment, retention and individual and collective performance of public servants.
    - Realizing the benefits of mobility requires innovative and flexible workspace design, and corresponding shifts in organizational culture, accountability and performance measurement.
    - This new environment also brings with it intensifying risks stemming from information overload and multi-tasking that must be properly addressed and mitigated.

3.1 Introduction

Mobile government is closely associated with more participative governance – both outwardly in terms of public and business engagement and internally with respect to employees. Accordingly, the participative element of mobility builds upon many themes discussed in Parts One and Two of this report: here we examine the participation dynamic more closely in terms of both opportunities and challenges for an evolving public service and public sector workplace.

To frame participation and mobility in government, a useful starting point once again is the Australian Road Map for Mobile Service Delivery and its complementation of service and infrastructure with the importance of participation as a third essential dimension:

> *Mobile channels and social media provide increased opportunities to collaborate with stakeholders in real-time and provide them with up to date government information regardless of their location.*
>
> *Agencies can also explore partnerships with non-government organisations and businesses to create new opportunities for improved government service delivery. By providing open access to structured data and system interfaces, while ensuring security and privacy, agencies can enable third-party organisations, and even citizen-developers, to deliver innovative mobile services and applications to people, businesses and communities. This increases the value to the broader economy of government data and services. It also creates opportunities for new cross-jurisdictional services by joining up data sources from agencies across governments.*[107]

The challenge for governments in the mobile era is to leverage the potential from such enlarged participative capacities into concrete and actionable initiatives to create and sustain public value. As first noted in the introduction of the report, the most prominent sources of public value include the following four elements endorsed by the World Economic Forum (WEF):

- *Quality public services are delivered.*
- *Socially desirable outcomes are achieved.*
- *Citizens are satisfied with the services and outcomes.*
- *Trust in government is created and/or increased.*

The main purpose of Part Three is to explore how these sources of public value are increasingly tied to both a more mobile and participative public sector.

[107] Source: p.7, http://www.finance.gov.au/files/2013/06/APS-Mobile-Roadmap.pdf

3.2 Open Government and Public Engagement

Both closely associated with mobility, there are two key platforms for open government initiatives that potentially expand third-party and public participation in democratic governance: open data and social media.

Open data's relevance to mobility stems first and foremost from the design and deployment of apps that draw from, process, and share, government information sources made public. Yet beyond the derivation of apps, open data also reflects a wider set of growing means and opportunities for governments to outsource or 'crowd-source' service innovation and design processes that were previously internalized within the public sector.[108]

In distinguishing them from informational and transactional services, Gartner has labelled these types of services as 'social engagement' (the term 'social' as being less about the traditional usage of social assistance for targeted support programs and more pertaining to an interactive and communal dynamic of activity tied a particular realm of government service).

Gartner thus suggests a partial distinction between mobile services (more informational and transactional in nature) and those services most conducive to 'social engagement'. The criterion for such services begins with the degree of human interaction:

> *Degree of Human Interaction: Online government has traditionally focused on services that are relatively "easy" to automate. However, there are several cases where transactions are inherently complex or specific to the situation of the individual, and a fair amount of interaction with either employees or other intermediaries is beneficial or required. The use of social networking to connect to these experts, as well as to share information with other individuals in similar situations, is certainly helpful (provided privacy concerns do not prevail or are properly addressed) in domains as diverse as those that involve receiving health treatment, applying for social benefits, facing a tax audit or applying for a new business license.*[109]

The example of business engagement is illustrative – as first noted in Part One in terms of potential benefit streams of augmenting the usage of mobile channels via small businesses. A recent report by the World Bank takes this logic one step further in terms of how mobility can facilitate real-time dialogue and feedback – a basis for learning and adaption for government service providers and regulators.[110]

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[108] Two useful sources of conceptual analysis and applied examples of these dynamics come from the Center for Technology in Government and the IBM Center for the Business of Government respectively: http://www.ctg.albany.edu/publications/reports/opendata/opendata.pdf http://www.businessofgovernment.org/sites/default/files/Using%20Crowdsourcing%20In%20Government.pdf

[109] Source: Gartner (November 2013), How to Prioritize Government Mobile and Social Applications.

[110] Source: https://www.wbginvestmentclimate.org/advisory-services/cross-cutting-issues/ict-in-investment-climate-reform/upload/Enabling-Private-Sector-Feedback-on-Public-Services-through-Mobile-Devices.pdf

With the wider emergence of Gov 2.0 tied to extended participation for stakeholders and citizens, governments at all levels (and most especially perhaps at the provincial level in Canada) are going to face new pressures and new opportunities in thinking more holistically about the architecture of all service types across traditionally separate realms of service and policy (i.e. transactional services bundled by lead service agencies versus human development and community assistance programs and services).[111]

Nonetheless, the linkages between social media and mobility are complex and not without risk. On the one hand, social media is invoked as a platform for customer service (emphasizing better informing and transacting – and the feedback ensuing from such processes); on the other hand, social media is invoked as a platform for social and public engagement. The following distinction underscores this duality of form and purpose between expressive and collaborative forms of social media:

> *• Expressive social media enables people to express themselves by sharing with others text, picture, video, and music. Facebook, MySpace, Twitter, YouTube, and Flickr are examples of this type of social media.*
>
> *• Collaborative social media enables people to work together to achieve common goals. Wikis and Google Docs are examples of this type of social media.*[112]

The traditional government service and communications mindset is more aligned with expressive social media in this regard, whereas devising strategies and platforms for genuine engagement are more novel and complex. Consequently, in order to enhance learning and performance in a mobile environment, a key shift in both mindset and tactics for government is to think beyond linear forms of communication (and even consultation), and to devise methodologies for nurturing and gauging conversations.

Much of these conversations will occur online – and outside of the confines of traditional government websites and service processes, in particular via social media platforms. In a Web 2.0 environment, for instance, government-housed feedback surveys and response forums are unlikely to garner the sorts of insights and intelligence that exist elsewhere across a myriad of social media venues and the interactive patterns of users in terms of both expressive and collaborative types of social media activity.

The main lesson here is that mobility, government service delivery, and open government are becoming increasingly interlinked elements of a broadening canvas of participation and engagement – tied to notions of public value that transcend traditional metrics of client satisfaction. One study of this environment thus puts forth the following indicators of public value creation stemming from what the authors define as a framework for 'ubiquitous engagement':

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[111] This point is further addressed in Part IV with a more specific focus on society and digital exclusion.

[112] Source: p.9, Lee and Kwak (2011): http://www.businessofgovernment.org/sites/default/files/An%20Open%20Government%20Implementation%20Model.pdf

- *Increase in the number of users, shared data sets, and channels*

- *Increase in public participation and collaborations and interagency and public-private collaborations*

- *Number of mobile users/platforms/applications/ services*

- *Level of integration of OG processes and services*

- *Perceived usefulness of public engagement tools and applications*

- *Overall user experience*

- *Extent of public engagement throughout lifetime*

- *Net impact of OG initiatives on productivity and innovation*[113]

These sorts of indicators – underpinned by the devising of precise and quantifiable metrics, should be targeted as ways to both track and measure the creation of public value stemming from mobile service delivery and its ties to open government frameworks and initiatives. Already in Canada (as is the case internationally), the rise of open data and open government agendas is clearly on display locally, provincially, and federally.[114]

In sum, mobility is an important linkage between measuring service performance and client satisfaction (as initially discussed in Part One) and open government and public engagement, a linkage that shall unquestionably grow in importance going forward.

[113] Source: p.9, Lee and Kwak (2011): http://www.businessofgovernment.org/sites/default/files/An%20Open%20Government%20Implementation%20Model.pdf

[114] See, for example, this discussion of open data and open government by Roy Wiseman: http://cgexecblog.wordpress.com/2014/01/07/from-open-data-to-open-government/

3.3 Workforce and Workplace Impacts

In their examination of mobility and government, Deloitte Consulting suggests five ways in which mobility can improve the productivity of government workers: i) reducing time spent on data entry; ii) enabling better situational awareness for frontline employees; iii) facilitating work from any location; iv) improving accuracy and reduce the effort involved in performing tasks; and v) enhancing collaboration and data sharing among employees/agencies.[115]

These five ways provide a basis for a continuum of workplace impacts from a traditional focus on automation and efficiency to more Gov 2.0 and participatory minded processes for collaboration and internal engagement.

Underpinned by a formal Gov 2.0 Action Plan for the State of Victoria Government, the Department of Justice has devised many practical initiatives linking virtualization and participation in ways that complement and extend mobility's BYOD infrastructure (discussed in Part Two). Comprising nearly 7,000 staff and more than 50 business units and service agencies, Justice 'has supported its Gov 2.0 strategy by building and embedding internal capability into day to day practice.' It has done this through implementing a suite of complementary initiatives, including:

- *Webcasting Inside Report, a multi-media internal news report for employees. Producing the report is outside normal responsibilities, so staff with no previous film making skills have now acquired these skills. The report provides another channel for internal communication and is more engaging than RRS feeds and static homepages.*
- *Providing online writing skills sessions for content creators to learn to write for an internet user. The training itself is being delivered online.*
- *Running Ignite-style presentation sessions to teach fast and effective communication in a time constrained format.*
- *Using Yammer internally for staff to learn to communicate in 140 words or less and experiment in a low risk environment with word tags, sharp messages and user collaboration*
- *Using VPS Hub, the whole of government social media intranet, to conduct a wiki, form groups to collaborate and share information and resources.*
- *Developing practical social media guidelines and policies.*[116]

A complementing study undertaken by the Australian federal Department of Justice discusses the impacts of digital infrastructure (including mobile technologies and social media) on the Justice sector, showcasing a number of state-level initiatives underway in this regard.[117]

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[115] **Source:** http://www2.deloitte.com/content/dam/Deloitte/global/Documents/Public-Sector/dttl-ps-govonthego-08082013.pdf

[116] Source: http://www.dpc.vic.gov.au/index.php/resources/corporate-publications/gov-20-action-plan-html

A 2013 MeriTalk (The Government IT Network) survey federal government IT professionals in the US found significant support for linking productivity improvement, cost savings, and mobile technologies:

> *Federal IT professionals report that a mobile workforce is more productive, helps government achieve its telework initiatives, and enhances the employee experience. In fact, 49 % of Federal IT professionals doubt that Federal agencies can be productive without PC alternatives such as laptops, smartphones, and tablets. The report also reveals that if the addition of smartphones enables Federal workers to be even 10 % more productive (low relative to many smartphone productivity studies), the Federal government could add $2.6 billion in Federal productivity by 2013. In addition, 51 % say that not having these technologies could impair government's ability to attract and retain top talent.*[118]

The aforementioned report by Deloitte Consulting reports on the experiences of the US Air Force in deploying tablets as a source of productivity improvement and organizational innovation:

> *The U.S. Air Force has purchased 2,725 iPads to be used as electronic "flight bags" by the Air Force Mobile Command. The iPad eliminates $1.7 million in printing costs for a paper manual, an additional $3.2 million per year for maps and charts, and $770,000 per year in fuel by reducing the weight of the paper material from the aircraft. It has also led to a 90 % reduction in staff hours required to build and maintain charts and maps, along with a whopping productivity increase of 22,000 staff-hours per year. Moreover, safety has improved by reducing the need to manage paper in the cockpit, which impaired situational awareness.*[119]

Tele-working in the US federal government (linked to mobility via the MeriTalk survey findings above) has received an impetus from the Obama Administration, stemming symbolically from the President's 2009 decision to use a personal mobile device, labelling himself as 'Tele-worker in Chief.' In its 2012 report to Congress, the United States Office of Personnel Management articulates the evolution of tele-working from an individual benefit to a more strategic basis of organizational value:

> *Aligned with agency strategy and mission, telework supports achievement of objectives increasingly important for operation of an efficient and effective Federal Government, including cost savings and improved performance, and maximizing organizational productivity.*

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[117] Source: http://www.sclj.gov.au/agdbasev7wr/sclj/documents/pdf/harnessing_the_power_of_technology_analysis_paper.pdf

[118] Source: http://www.meritalk.com/pdfs/Mobile_Powered_Government_Release.pdf

[119] Source: http://9to5mac.com/2012/09/27/u-s-air-force-electronic-flight-bag-team-fought-windows-bureaucracy-and-deployed-ipads-video/

Developed as a strategic program, telework is a powerful agency recruitment and retention tool with the capacity to improve the competitive position of the Federal Government for recruiting and retaining the best possible workforce. .

Leveraged as a management tool, telework mitigates potential disruptions to workplace productivity (e.g., severe weather) (p.6 United States Office of Personnel Management 2012).

Aligning closely with the US federal government's articulation of tele-working benefits for workers, agencies and society as a whole, three similarly core dimensions are offered by a UK Consultancy specializing in 'smarter work practices':

• *Measurable business benefits – improved service delivery, increased productivity, reduced costs, reduced absence, improved staff retention, greater organisational agility*

• *Improved environmental performance – travel reduction, reduced resource consumption, better environmental performance of (fewer) buildings*

• *Improved social performance – better work-life balance for staff, greater choice, autonomy and motivation, improved staff satisfaction, widening the recruitment pool for staff and increasing diversity (p.34, Lake 2011).*

Accordingly, one large private insurance company, SCAN Health undertook a distributed work program from 2007 to 2010 that would yield the following benefits: a 40% return on investment for program development and deployment; 38% reduction in cost of workplace support; 18% increase in productivity; a reduction in provisioning (i.e. processing of claims and payments) time from 12 weeks to 3 days; and a decrease in travel to work by 20% for program employees (Ware and Grantham 2010).

Driven by such trends and Web 2.0 tools and mindsets, the impacts of mobility on both the workforce and workplace are rapidly evolving in manners increasingly recognized and embraced by the public sector as well. As the US Department of Defense (itself a notable example of what many regard as emblematic of traditional bureaucratic authority and culture) articulates:

The transformation of the workplace is just beginning…The workplace of the future will be radically different from today's preconceived workplace that involves hard-wired equipment, multiple cubicles, and 9 to 5 workdays. The future promises more flexibility, more mobility, and more independence, while at the same time, helping employers to get the most out of every employee.[120]

[120] Extracted from an online commentary on 'Shaping the Workplace Through Web 2.0 Technologies', CIO Office of the US Department of Defense. Source: http://dodcio.defense.gov/Home/Initiatives/NetGenerationGuide/ShapingtheWorkplaceThroughWeb20Technologies.aspx

3.4 Information Overload, Multi-Tasking and Demographics

Along with the positive potential of mobility in terms of work patterns and workspaces there are offsetting risks and costs. In a world of virtualization via online channels and mobile devices, there is widespread agreement that the social and cognitive demands on public servants are rising sharply (World Economic Forum 2011). Developing filtering mechanisms and multi-tasking capacities are regarded as essential attributes of a more engaged and empowered public servant.

At the same time, research studies demonstrate that multi-tasking alters cognitive behaviour in ways both positive and negative, with evidence and concerns about coping skills and even addictive behaviours on the rise (Ritchel 2012). A key dimension of this debate centres on the impacts of the Internet on brain functions, a debate accentuated by mobile ubiquity in the 'anywhere, anytime' workspace.

A prominent researcher and spokesperson for such concerns is Nicholas Carr. His much discussed and widely referenced book, *The Shallows: What the Internet is Doing to Our Brains*, explores the neurological underpinnings of his arguments, as well as the wider implications for society ever more informed but with diminished capacities for long term memory and inward and thoughtful reflection and analysis:

> *We don't constrain our mental powers when we store new long-term memories. We strengthen them. With each expansion of our memory comes an enlargement of our intelligence. The Web provides a convenient and compelling supplement to personal memory - but when we start using the Web as a substitute for personal memory, by bypassing the inner processes of consolidation, we risk emptying our minds of their riches (Carr 2010).*

A related set of concerns suggests a diminishment of the appreciation of introverted skill sets in today's digital environment where 'solitude is a source of innovation' (Cain 2012). Such claims and counter-claims are reflected in the contrasting stances of senior executives at Facebook and Yahoo with respect to tele-working and flexible work arrangements (see appendix below).

There is a real danger within large and traditionally hierarchical organizations that an infrastructure of connectivity may subsume managers in a futile attempt to simply keep up with multiplying informational demands and tasks of nominal value. This danger stems from conflicting behaviours of senior managers – who are using mobile devices more and more, but at the same time often remain grounded in and constrained by traditional paper-based governance and policy processes and what some have termed as a 1.0 mindset and culture that remains deep-rooted in the public sector. [121]

Such transitional challenges stemming from technological change are hardly new, but their relevance is intensifying in a more mobile-centric environment. An article in *McKinsey Quarterly*

[121] On the point of senior management adoption of mobile devices, one 2013 survey of the American public sector found two-thirds of senior ranking officials using a mobile device, a significant increase from the previous year. Source: http://www.prweb.com/releases/2013/5/prweb10741702.htm

offers guidance on “Recovering from information overload” and calls upon senior managers to take heed of warning signs and apply thoughtful, disciplined strategies to ensure appropriate boundaries are in place.[122]

The alternative – for workers at all levels and most especially for middle managers (interface between senior executives while managing their own teams) is a potentially harmful spiral of anxiety and stress that can inhibit performance both individually and collectively. Indeed, for society more broadly, there is widening evidence of growing anxiety and stress levels due at least in part to the porous nature of constant and distributed work demands.[123]

Within government, one important cleavage stems from demographics. Mid-career professionals are much more likely to identify with the arguments of Carr and others since they themselves are living through technological changes that provide both flexibility and disruption. Younger people, particularly those with post-secondary education training for managerial careers, are much more inclined to view Carr as a middle-age luddite bemoaning change (a charge Carr readily acknowledges). While such characterizations risk over-generalizing, they must also be recognized and addressed.

The main lesson here is that mobility demands differentiation in terms of deployments in order to accommodate a diversity of both individual traits and organizational usage. There is a critical link between sensitivity and empowerment at the heart of training and development, as organizations seek to ensure that mobility is a platform for improving individual and collective performance.

[122] Source : http://www.mckinsey.com/insights/organization/recovering_from_information_overload

[123] Source : http://newsroom.carleton.ca/2012/10/25/carleton-releases-2012-national-study-on-balancing-work-and-caregiving-in-canada-linda-duxbury-to-talk-about-findings-at-building-healthier-workplaces-conference/

Part Three - Appendix

Yahoo and Facebook: interaction versus isolation for an innovative workplace

Since the technology sector is often regarded as an incubator for virtual and mobile work models, it came as a surprise to many when in 2013 the CEO of Yahoo, Marissa Mayer ordained the end of tele-working arrangements for that company, insisting that in order to maximize creativity and innovation, it was essential for all employees to be working and interacting within the confines of a common workspace (a workspace incorporating many flexible and modular features to encourage collaboration and innovation).

This decision triggered a firestorm of debate over the merits of tele-working and flexible work patterns underpinned increasingly by mobile infrastructure. In contrast to the Yahoo example, during this same year Facebook COO, Sheryl Sandberg published a book on gender and management in which she lauds the usage flexibility and mobility within Facebook (partly for reasons tied to gender and the advancement of women and partly for a wider range of personal and organizational benefits tied to the above discussion of mobility in the workplace).

{It also bears noting that both women work for companies based in Silicon Valley (where both were colleagues while employed by Google), itself a regional epicentre of innovation and flexible work arrangements both within and amongst companies, while also reflective of the power of geographic proximity and social interaction.}

In attempting to find some common ground between these two contrasting examples, Clive Thompson, writing in Wired Magazine, offered the following contours of what he views as a necessary hybrid between solitude and focus on the one hand, and collaborative interaction on the other hand:

> *The problem is, both sides are right. Telework makes you more productive, and working together makes you more creative. And therein lies a paradox. The real challenge for people who run modern organizations is understanding what type of thinking they want to do, not where to do it.*[124]

While the public sector differs in many fundamental respects from leading technology companies in Silicon Valley, governments are nonetheless also knowledge-based organizations where innovation and creativity are significant determinants of successful outcomes. Indeed, the sort of performance-based considerations tied to openness and engagement discussed in the preceding sub-section imply, and even necessitate, innovation and adaptation in the workplace (as do recruitment and retention efforts for younger workers more seamlessly wedded to mobile devices and online interaction both personally and professionally).

[124] Source: http://www.wired.com/opinion/2013/05/fa_thompson/

PART FOUR – MOBILITY AND DIGITAL INCLUSION

Key Lessons:

- A significant proportion of Canadians are not regular Internet users and as such, they have yet to adopt a mobile device with online functionality.
    - Many jurisdictions including Denmark and Great Britain are devising strategies to make digital and mobile channels the default option for both service delivery and wider forms of interaction between citizens, companies, and public sector authorities.

- Mobile technologies create new opportunities to better empower persons with disabilities, though technology alone cannot suffice: such empowerment requires explicit recognition and innovative strategies on the part of the public sector.

- There is a significant risk of a widening cleavage between urban and rural communities in terms of wireless Internet infrastructure and the clustering of competencies and resources driving mobile innovation.
    - Mobile and cloud computing expands the opportunities for smaller governments to envision shared infrastructure arrangements across jurisdictional boundaries.

4.1 Introduction

The purpose of this fourth part of the report is to showcase and discuss some key trends and examples pertaining to mobility and various facets of digital and societal divides. Underpinning this discussion is the broad question, central for governments, as to whether or not the spreading of mobile devices and related web 2.0 capacities is likely to narrow or diminish societal cleavages in terms of online access and usage and resulting opportunities for personal growth and development.

While this topic can clearly be quite vast, the discussion here will be grounded by ties to the preceding content of the report – and how government strategies and government's own adoption of mobile are likely to have an impact on societal cohesion positively and / or negatively.

The Canadian landscape, in this regard, provides evidence for both optimism and concern. Most recent surveys published by Statistics Canada demonstrate high levels of broadband access and a growing trend to household making use of more than one device in going online (a clear indicator of mobile's expanded reach). More than one half of Canadians in 2012 went online via a wireless handheld device while nearly two-thirds of Canadians are regular users of social media (with a growing proposition of such usage happening via mobile devices).[125] In addition, and as noted in the Introduction, the uptake of mobile banking in Canada has been stronger than initial levels of online banking nearly two decades ago, with a healthy proportion of mobile device users making use of mobile channels and applications.

On the other hand there remains a notable divide between the roughly one half of the population owning smart phones or tablets, and those without such devices. In one 2013 survey, nearly one quarter of Canadians indicated that they never shop online[126], a figure rising to 31 % in a more comprehensive Internet usage 2012 survey published by Statistics Canada (see footnote one). Statistics Canada also reports that 17% of Canadians did not go online for any reason in 2012, with persisting digital divides in Internet usage correlated to income, education, and urban – rural dwellings.

A similar backdrop in the UK provides the context for the 2012 Digital Government Strategy featuring the adoption of the principles of 'Digital by Default' and 'Assisted Digital'. This effort is examined in the next section.

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[125] Source : http://www.statcan.gc.ca/daily-quotidien/131028/dq131028a-eng.htm

[126] Source: http://www.thestar.com/business/tech_news/2013/08/21/not_all_canadians_love_to_shop_online_study.html

4.2 Assisted Digital and Digital Inclusion

Whereas a very limited number of countries have begun to significantly suppress non-digital channels of service delivery, the UK model is Germany and akin to Canada and many other countries in facing more complex and fragmented social terrains.

The German Government, for instance, within its current e-government framework seeks to take 'greater account of the special concerns of persons with disabilities for accessible and barrier-free use of ICT services (such as internet applications, digital television media, digital health management, home environment, traffic information systems, and workplace design).[127]

Similarly, in adopting Digital by Default – and Assisted Digital, the UK 2012 strategy signals a desire to more aggressively promote electronic channels for all citizens and companies, devising explicit steps on the part of government service providers to gravitate users away from in-person and telephony channels toward online channels. On doing so, mobile is highlighted as a key opportunity: 'with 69% of current non-internet users owning a mobile, there is scope to increase access to internet-based information and services through this route.'

The strategy goes on to underscore that in addition to cost savings for government (savings that can facilitate a redeployment of resources as well as or in place of reduced overall expenditures), a move toward digital self-service can also represent an important basis for individual development and a lessened risk of outright social and economic exclusion. The British report also acknowledges that Assisted Digital cannot be a government endeavour alone, but instead denotes a complex policy and service agenda entailing partnerships with both industry and civil society.

A 2013 assessment by the National Audit Office lays out the context of envisioned cost savings and corresponding efforts to lessen societal and digital divides through the evolution of government service delivery channels and strategies:

> *The government in calculating potential savings has assumed that 82 per cent of transactions with public services will be carried out online, the proportion of the population currently online. Nevertheless, according to today's report, online use of some services falls short of that level, despite the widespread access to the internet by the public and the ability by most people to carry out the kind of transactions required by online public services. For the 20 public services covered by the NAO research, the proportion of transactions carried out online by people surveyed ranged from less than 50 per cent for one service to over 80 per cent for a number of other services.*

[127] p.25, http://www.bmwi.de/English/Redaktion/Pdf/ict-strategy-digital-germany-2015,property%3Dpdf

The research suggested three main reasons why people choose not to use more public services online. One is the preference by many for face-to-face contact, even where they are aware of the possibility of using the service online. The second is a general unwillingness to provide personal information online. And the third is low awareness of some online public services.

The government has set out plans to help people not on the internet to use digital services. Given the scale of 'digital exclusion', the government now needs to put these plans into action to avoid a 'them and us' problem. Of those surveyed, 17 per cent did not use the internet and, of those, 72 per cent do not intend to go online. Based on these numbers, departments need to plan for around four million people in England who are likely to need help in using online services. However, of those not on the internet, 48 per cent receive help from friends and family with internet access, a fact not recognized in the government's approach to assisted digital services.[128]

A set of detailed departmental reporting strategies (including measures taken in 2013 and steps planned for 2014) are available.[129] While most, at present, reflect early stages of research and new capacity building, together they convey an integrated and government-wide focus on digital inclusion as a central objective in government service reform efforts.

A critical issue for all governments in these settings is the degree to which mobile can serve as an accelerated platform for those previously offline to undertake more of their informational and transitional service offerings online – via mobile devices.

A related issue is the degree to which mobile devices and inter-related platforms and strategies for Gov 2.0 can serve as the basis for a more holistic and integrated paradigm of citizen-centric services encompassing not only information and transactions but also a wider array of support and developmental services.

To take Ontario as one example of a jurisdiction where these two issues are on display:

- A late 2013 report by the Provincial Auditor General recommends that Service Ontario do more to augment usage of electronic channels for identity management and service delivery;

- An external review of social assistance delivery in the same Province calls for wide-ranging systemic reforms - leading one former senior public servant and present media observer to link such reform and Gov 2.0 participative capacities[130];

[128] Source: http://www.nao.org.uk/report/digital-britain-2-putting-users-at-the-heart-of-governments-digital-services/

[129] Source: https://www.gov.uk/government/collections/departmental-digital-strategies#departmental-progress-summaries

[130] Toby Fyfe, Editor of Canadian Government Executive, asks – 'Could the government turn Ontario's benefits system into a fully integrated model with a single point of access for benefits and a coordinated interface for clients? This would make programs more effective, reduce costs in the long run and improve

- The recent study, Taking Ontario Mobile[131], similarly puts forth a wider societal prism for what it views as holistic undertakings including public sector reform, economic development, and social inclusion.

Open government, similarly, is based upon the notion that public sector information is a resource, the release of which will maximize its social and economic value as citizens use it individually and collectively. In this regard, for example, the OECD rightly underscores open data and open government as a driver of greater self-empowerment social participation[132]. Such efforts, however, have also sparked fresh concerns about the digital divide and accentuating new forms of 'data divides'[133].

As societies become more mobile in manners that reflect both pre-existing digital and socio-economic divides and more contemporary forms of unevenness in terms of abilities and interests, governments will at the very least need to orchestrate more coordinated efforts to better align strategies for service delivery, infrastructure development, and open and participatory government.

Demographics and Disabilities:

Much as governments face internal, employee-related challenges tied to mobility, the same is true externally. What is well known is that younger people are gravitating most quickly to mobile devices: at GTEC 2013 Louise Seguin of Transport Canada reported that in 2012 nearly 70 % of Canadians aged 18-34 were regularly users of a mobile device (a notable increase from 48 % in 2011).[134]

This group constitutes an important driver of online service delivery generally and mobile channels specifically, representing opportunities for cost savings stemming from the gradual suppression of paper-based processes and traditional in-person channels (especially for transactional services and self-service inquiries). Furthermore, this group underpins the participative and social dynamics (examined in Part Three) that are increasingly apart of open

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service. Mobile, social media, the cloud and big data/analytics technologies could be part of an integrated, enterprise model for a common platform that would manage programs across all key departments and stakeholders.' Source: http://www.canadiangovernmentexecutive.ca/category/item/1401-how-do-you-ensure-efficient-social-assistance-at-an-affordable-cost%3F.html

[131] http://www.takingontariomobile.ca/

[132] Source : B. Ubaldi (2013) : http://www.oecd-ilibrary.org/governance/open-government-data_5k46bj4f03s7-en

[133] Source : A. Halonen (2012) : http://www.finnish-institute.org.uk/images/stories/pdf2012/being%20open%20about%20data.pdf

[134] Source: http://www.ottawacitizen.com/technology/Mobile+mantra+2013+Government+Technology+Conference+feds+push+enterprise+agenda/9012723/story.html

government and Gov 2.0 capacities – including open data and the creation of apps stemming from such data for collective pursuits.

Tempering this positive dimension to mobility's acceptance and expansion, there are two areas of immediate concern that may grow more prominent in the future: first, an excessive focus on individualism and immediacy in terms of user expectations and participation in service and policy making processes housed by government; and secondly, the masking of more complex digital and social divides within a youth segment that is largely though not universally gravitating to online channels, social platforms, and mobile devices.

With respect to the first point, universities have witnessed some impact – in devising online schemes, for instance, for course evaluations (previously completed in the classroom with pencil and paper). At Dalhousie University, participation rates in online mechanisms have plummeted (despite heightened flexibility in completion and various electronic messaging reminders via email and mobile devices), tainting the legitimacy and useful of the results (as lower participation rates tend to correlate significantly with negativity and criticism).[135]

ICCS has faced similar and more complex methodology issues in terms of public satisfaction surveys – including overall participation rates as well as the capturing of younger people on mobile phones (often shunning land lines, the traditional means of user surveys). Furthermore, there are related concerns about expressive social media (as opposed to more collaborative forms of social media) serving primarily as a platform for negative coverage and complaints, rather than genuinely helpful dialogues for feedback and learning.

Such concerns should not be exaggerated as a universal characterization of all younger citizens. Nonetheless, it does bear noting that today's generations are growing up digital with a much stronger online emphasis on commercial values - including escalating promises for greater convenience and self-gratification and corresponding 'rights' as consumers, notably privacy protection (a similar observation was made with respect to employee responsibility and BYOD in Part Two). One prominent American scholar frames this issue as a 'citizenship and democratic deficit' that seems likely to be rooted to some degree in today's digital culture.[136]

While much of this report implicitly or explicitly compares, benchmarks, and often enjoins industry and government perspectives on mobile service and infrastructure (as is entirely appropriate), public servants and elected officials must also not lose sight of the fact that government services delivered within a democratic context may also feature their own unique characteristics tied to the creation of public value (as opposed to private value).

[135] Source: http://thechronicleherald.ca/metro/1173114-dal-takes-aim-at-professor-evaluations

[136] Source: Nabatchi, Tina (2010). Addressing the Citizenship and Democratic Deficits: Exploring the Potential of Deliberative Democracy for Public Administration. American Review of Public Administration, 40(4): 376-399 [winner of 2010 best article award from journal].

A strong democratic culture of public engagement (a stated aim of all governments) is central to a mobile and participative service eco-system: addressing digital and social divides with this point in mind is thus an essential element of mobile government's future.

In terms of the second point above – namely the complexities of a youth segment that may also comprise within it various cleavages in terms of online access and behaviour, there is strong reasoning to view social cohesion and digital inclusion as ever-more closely interlinked (a point underscored by Great Britain's complementing principles of Digital by Default and Assisted Digital for example).

According to the PEW Research Institute, in the US the impacts of mobility are already visible and significant:

> *The rise of mobile is changing the story. Groups that have traditionally been on the other side of the digital divide in basic internet access are using wireless connections to go online. Among smartphone owners, young adults, minorities, those with no college experience, and those with lower household income levels are more likely than other groups to say that their phone is their main source of internet access.*[137]

An expanded emphasis on mobile should thus be viewed through a lens wider than improved customer service – a key lesson derived from the research report, Taking Ontario Mobile. Much as service and infrastructure linkages are important in this equation, a wider conversation within and across jurisdictions seems warranted (while such a conversation carries with it the potential to provide an additional impetus for strengthened online and mobile channels as is evident in the UK strategy.

Finally, an equally important finding from the aforementioned PEW study – also with relevance for Canada, is the importance of addressing the specific and unique needs of those with physical or mental disabilities. To again quote from this study:

> *The 27% of adults living with disability in the U.S. today are significantly less likely than adults without a disability to go online (54% vs. 81%). Furthermore, 2% of adults have a disability or illness that makes it more difficult or impossible for them to use the internet at all.*

According to Canadian measures of disabilities that differ from those of the US, Statistics Canada reports that in 2012, 'about 3.8 million people, or 13.7% of Canadians aged 15 and older, are limited in their daily activities because of a disability'.[138]The same survey further suggests that more than one half of this portion of the populous are under-employed. In addition, the 2006 variant of this same undertaking reported that nearly two-thirds of persons with disabilities require some form of specialized device or equipment.[139]

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[137] Source: http://pewinternet.org/~/media//Files/Reports/2012/PIP_Digital_differences_041312.pdf

[138] 2012 Canadian Survey on Disability: http://www.statcan.gc.ca/daily-quotidien/131203/dq131203a-eng.htm

[139] More recent figures on this aspect of the disability populace are not available.

This latter point in particular is notable given the tremendous advancement in technology over the last several years – that have witnessed the birth of mobile devices, many of which are significant in terms of innovations for various disabilities, physical and cognitive. As just one example of a wide scope of emerging possibilities, the Australian Government has studied how tablet devices can be used to assist in the training and education of students with autism.[140]

Within this shifting context, governments in Canada are increasingly active in terms of policy development and online presence – including various provincial consultation efforts currently underway that feature Internet-based engagement channels. In addition to the government of Canada 's information portal devoted to persons with disabilities,[141] the Government of BC has recently launched a public dialogue devoted this topic (including both online and in-person outreach efforts[142]) , whereas the Province of Saskatchewan is experimenting within online consultation as one element of its devising of a new mental health and addictions strategy for that jurisdiction.[143]

Looking ahead, the Danish Government provides one prospective window on what it defines as the 'digital path toward future welfare' - an integrative and holistic strategy explicitly linking digital and mobile government to wider social and economic developmental efforts and objectives (cataloguing such measures from 2011-2015[144]). In addition to improving and automating disability benefits and devising special support strategies for public servants with disabilities, Danish authorities view more digitized processes for and with companies as a means to also better integrate this constituency in the labour force:

> *Citizens with different disabilities or a lower capacity for work should also be given the opportunity to use their skills in the labor market. To achieve this, reimbursements and other benefits should be simple to administer, enabling companies to hire people with a lower work capacity easily. Today, companies use a lot of resources to make requests and calculations, and apply to local authorities for subsidies and reimbursements. Once these processes are digital and easy to use, both companies and Jobcenters will save time – and money (ibid.).*

Denmark's unique degree of digital inclusion stems in part from an aggressive roll-out of digitized administration and mandatory online interactions with citizens (mandatory in electronic form by 2015) and companies (mandatory since the beginning of 2013). The compete

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[140] Source: http://www.autismtraining.com.au/orionfiles/upload/public/files/FactSheet%2013_iPads%20and%20other%20tablet%20devices_06_05_13.pdf

[141] Source: http://www.pwd-online.ca/pwdhome.jsp

[142] Source: http://www.eia.gov.bc.ca/pwd.htm

[143] Source: http://www.gov.sk.ca/news?newsId=f07178d2-71ef-4567-a36f-808de0a6a577

[144] Source: http://www.digst.dk/Servicemenu/English/News/~/media/Files/Digitaliseringsstrategi/Engelsk_strategi_tilgaengelig.ash

suppression of paper-based transacting creates transitional challenges akin to Great Britain 'assisted digital' approach that the Danish Government has sought to recognize and address:

> *This major step towards eGovernment will require considerable changes to the way public authorities work, and a certain degree of acclimatization from citizens. However, the transition will take place gradually, as user-friendly eGovernment solutions are introduced in more and more areas. Help will be available for citizens who find it hard to use the new solutions.*

Differences in the social and digital landscapes notwithstanding, the main lesson here is that it would seem an opportune and necessary time for jurisdictions in Canada (both separately and collectively) to draw from such models and launch open and integrative dialogues on digital and social inclusion (with the opportunities and risks stemming from mobile technologies and devices a central element). A related point is that the maintenance of a multi-channel service apparatus may not only be increasingly costly, but also detrimental to social cohesion and wider socio-economic developmental capacities going forward.

Assisted Digital and the UK Digital Champion: An External Evaluation[145]

As the report explains:

> *In 2009 there were over 10 million adults in the UK who had never been online. The Government appointed Martha Lane Fox (MLF) as the UK's Digital Champion to provide leadership and direction to the many initiatives underway to increase digital participation.*
>
> *The Digital Champion hired a small team and, together, they established a programme of work and a campaign – Race Online 2012 – to convince others to take action to help millions more people online. They invited organisations to become Partners of the campaign and positioned themselves as leaders of the agenda (not deliverers). By using a partnership approach they sought to maximise their funding which was insufficient for large scale delivery.*

An evaluation of these efforts was commissioned in 2012 and completed by Capgemini Consulting. Martha Lane Fox resigned her position in late 2013, for personal and undisclosed reasons. Highlights of the evaluation include the following.

Key Achievements:

1. They raised awareness – digital participation has became part of the national conversation
2. They created momentum
3. They secured commitment and increased delivery capacity
4. They accelerated and amplified Partners' delivery
5. They influenced policy makers to make 'digital by default' a reality

Key Challenges:

1. Managing reputational risk
2. Ensuring action that affects the target outcome
3. Being clear about the role of the team
4. Increasing digital participation takes time

[145] Source : http://ec.europa.eu/digital-agenda/en/news/uk-independent-review-digital-champions-activity

4.3 Geographic Disparities & Shared Infrastructures

The distribution of infrastructure for mobile government entails two basic dimensions: the existence of affordable and reliable access for the public and communities (including citizens, companies, and civil society), and the internal architecture of governments (at all levels) determining their ability to both transact and interact via wireless channels.

As noted above, significant challenges remain in terms of the first dimension, namely public affordability and usage of mobile devices and data plans, cleavages that will impact the efforts of governments to migrate more services online. Within urban areas particularly, municipal governments in Canada are exploring new partnerships with industry to expand the presence the scope of free WIFI availability in many jurisdictions (while openly sharing knowledge with one another in doing so[146]).

At the same time, the mobile ubiquity sought by cities (jurisdictions typically featuring higher degrees of market competition) raises the offsetting spectre of deepened urban – rural divides in Canada, also raising policy questions as to which level(s) of government are most responsible and able for ensuring mobile infrastructure for all communities large and small, urban and remote. Current initiatives and debates in Australia and the United States are more akin to the Canadian landscape in this regard, and the optima mix of public sector and market-based mechanisms to address unevenness in broadband access and affordability (and increasingly with respect to mobility).[147]

In terms of the second dimension above – namely the operational architecture and mobile capacities of governments themselves, smaller and more rural and remote communities often have a more limited public sector presence within them, a presence that may be augmented by remote access centres and online channels of governments based elsewhere[148]. From the perspective of local communities and their public sector authorities, one opportunity stemming from mobile and cloud computing capacities is an expanded set of linkages amongst jurisdictions through various shared infrastructure arrangements.

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146 Source: http://c.ymcdn.com/sites/www.misa-asim.ca/resource/collection/9F65E0F8-A501-4D6E-9187-A74B0F9FB23D/2013-09_Municipal_Interface.pdf

147 In Australia, the new Coalition Government elected in late 2013 has embarked upon a re-thinking of the National Broadband Network, a federal crown corporation created by the previous government to roll out high speed broadband infrastructure to all communities across the country. For a wider discussion of the NBN and digital divide issues pertaining to the agriculture sector and Indigenous populations, please see:
http://www.computerworld.com.au/article/435492/nbn_won_t_close_broadband_gap_say_advocates_rural_communities/

148 In this regard, the term 'mobile' can create confusion – as Service Canada, for example, refers to mobile services centres with respect to their roaming, on the ground facilities that serve remote locations on a rotating basis.

For example, a number of local governments in the UK have begun exploring and forming these sorts of arrangements, both for back-office, cloud-based infrastructure (a trend further supported by the national government's investments in this regard) and front-end mobile capacities. To quote from a senior official leading one such shared arrangement:

> *"There are several councils across London, working through a pan-London project led by Camden, who are getting involved in working together on mobile technology. Not only can we use our collective weight to change relationships with suppliers, we can also get them to open up our internal architecture. That will be a very exciting development."*[149]

Although this example – based within the confines of the greater London area, can serve to reinforce notions of large cities agglomerating expertise and resources, it is indicative of a wider trend of shared service arrangements that may be all the more imperative in lesser populated and more remote regions. The association of local governments in New Zealand thus saw fit to undertake an exhaustive international review of such arrangements[150] (including but not limited to technological infrastructure and service delivery apparatuses), more recently endorsing a shared services model for its members.

The New Zealand experience further mirrors an effort in Australia tied to the creation of shared cloud computing platforms:

> *LGAQ (Local Government Association of Queensland) had also created GovCloud for cloud computing services, which allowed councils to rent rather than buy infrastructure, Resolute Information Technology for IT services, and Local Government Workcare, which was a workplace compensation scheme. Hallam said the combined savings these shared services and procurement companies was forecast to be around A$300-400 million a year within four years and to have been around A$2 billion over the last 20 years.*[151]

As the New Zealand commissioned report and this useful discussion paper of cloud computing and shared service options for government published by Ovum makes clear, shared services models have thus far delivered highly uneven results – and are not without significant risks. Yet it is difficult not to view the cloud as a long term trend that necessitates more collaboration and partnering between governments, while also affording new opportunities to smaller governments via such arrangements that would otherwise not be attainable.

In doing so, it is equally important to recognize that cost savings are merely one important variable in a more complex equation of governance capacities and performance outcomes:

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[149] Source : http://business-applications.governmentcomputing.com/features/a-tale-of-two-councils

[150] Source : http://www.lgnz.co.nz/assets/Uploads/Shared-services.pdf

[151] Source: http://www.interest.co.nz/bonds/65509/local-government-nz-pushing-shared-services-and-procurement-way-tame-rates-inflation-ami

Cloud computing does introduce some new risks, but in practice these are variations on risks that most agencies have experienced under previous outsourcing arrangements. Not all cloud services are equal in terms of their ability to meet public sector reliability and security requirements, so the biggest risk mitigation is the choice of a high-quality enterprise-grade cloud services provider.

The overwhelming sense from our discussions with cloud adopters is that the cloud decision needs to be seen as a strategic move toward a new model of sourcing ICT capabilities to drive innovation, not simply as a tactical initiative to cut costs.[152]

Although some examples exist in Canada of local governments beginning to form similar collaborative arrangements, by and large the municipal community in this country has thus far moved in a relatively trepid manner down this path. It seems clear that as federal and provincial governments upgrade their own IT architectures and make greater usage of cloud-based approaches to both backend infrastructure and frontline service delivery (further benefiting in turn from the relative concentration of public and private expertise in larger urban areas), local governments – especially those in more remote settings, are going to face heighten pressure and incentives to move forward in more innovative and collective ways.

In line with the Australian Queensland example above, provincial and territorial governments are particularly strategic to this evolution given the possibility of shared infrastructure for all public sector authorities within their domain – and / or support and incentive programs for local authorities under their umbrella to forge partnering initiatives of one sort or another (a point acknowledged, for instance, by Ron McKerlie, Ontario's former Deputy Minister of Government Services in a recent study of public sector cloud computing adoption[153]).

In sum, the consequence for the Canadian public sector with respect to the development of mobile infrastructure is twofold:

- First, longer term, a more formalized federated architecture for the digital infrastructure of the public sector as a whole – encompassing all levels of government, will need to be devised and overseen by collaborative governance arrangements involving both political and operational delegated authority; and

- Secondly, within the confines of existing political structures and cooperative administrative arrangements, there is a growing imperative for municipalities to explore innovative outsourcing arrangements in concert with one another, and a similar urgency for Provinces to rethink their infrastructure planning in a manner sensitive to the mobility requirements of their own operational capacities as well as their extended public sector domains (including health, education, and municipal sectors).

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[152] Source: p.10, http://www.telstra.com.au/business-enterprise/download/document/business-ovum-government-cloud-whitepaper-17-feb-2012-aus.pdf

[153] Source: p.7, http://www.kpmg.com/MK/en/IssuesAndInsights/Documents/External_Publications/exploring-cloud.pdf

This latter trajectory – the most relevant for the Joint Councils in the immediate term, further informs some additional discussion pertaining to the prospective roles of these national inter-jurisdictional bodies in this regard, in Part Five.

PART FIVE – JOINT COUNCIL RECOMMENDATIONS

The Joint Councils provide a uniquely cooperative forum for addressing mobility in ways that encompass service and infrastructure perspectives within and across jurisdictions.

Stemming from the context examined by this report, moreover, two broad observations underscore the central importance of the Joint Councils in regards to addressing the mobility imperative from the public sector vantage point:

- First, the growing interdependence of service and infrastructure perspectives (a key theme examined in the governance section of Part Two), an area that recent surveys suggest is a significant challenge for most large organizations[154]; and

- Secondly, the rising interdependence of governments across all levels as a holistic architecture for the public sector as a whole becomes more important in an environment shaped by a wider 'nexus of forces' including mobile, social, cloud computing, and openness and big data.[155]

In terms of this second point, one clear and present example of the importance of moving forward in a concerted manner is identity management, a point already recognized in previous iterations of Joint Council-sponsored research and preparation. Mobility further augments the stakes at hand in moving this agenda forward.

Mobility and identity management:

The growth of mobile service delivery channels for the public sector on the one hand, and the more general rise of mobile payment options across the economy on the other hand, necessitate - with growing urgency, a more open, collaborative and national framework underpinned by political commitment and public engagement.

From the federal perspective, the introduction of a new identity management model for federal services as well as the recent Federal Payments Task Force Review – along with embracement of open data and open government priorities, all suggest that the timing for a deepened national initiative may well be promising in this regard. Akin to what BC has done in recent months with its own public consultation exercise, a national initiative would encompass all levels of government in a shared conversation with Canadians and key stakeholders about the collective opportunities and challenges pertaining to identity, privacy and service delivery in a changing and increasingly digital and mobile world.

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[154] For a discussion of a recent survey demonstrating tensions and challenges in coordination and collaboration across those responsible for customer service and marketing and those with CIO-type responsibilities, please see:
http://www.enterpriseefficiency.com/author.asp?section_id=3240&doc_id=267730&

[155] For an illustration of these integrative challenges se the Gartner diagram presented at the end of this section.

Such national leadership is evident in both the US and the UK where governments in both countries have recently championed high profile digital government strategies. Additionally, those countries that have progressed furthest in facilitating mobile service and payment systems across the public and private sectors (such as the UAE, Finland, and Estonia) have similarly done so on the basis of national projects strongly and visibly endorsed by political leaders.

In the absence of this sort of deepened political commitment in Canada, and more within current structures and mandates of the Joint Councils, much can still be done building on the foundational and ongoing work of the Joint Councils. Rather than a new national apparatus (that at some point shall be required), the immediate and still quite significant opportunity lies in deepening policy and strategic ties across jurisdictional levels in order to encourage open and portable solutions across governments and across sectors. At a time when many provinces, for example, are exploring new smart card and identity management solutions, there is undoubtedly already widespread agreement on this point.

A key lesson from leading mobile nations is the need for strong working ties between governments, financial service providers, technology companies, and consumer and privacy groups. In Canada, from the public sector perspective, it is essential that such ties be forged openly and collaboratively rather than in a fragmented manner. The Joint Councils should champion efforts to strengthen such ties across sectors – in order to facilitate shared learning and ultimately shared capacities for mobile identity and payment systems.

Shared lessons, integrative pilots, and public engagement:

A working committee devoted to mobile could identify a small number of pilot initiatives inter-jurisdictionally suitable for mobile innovation and experimentation. Some of these pilots could well be existing initiatives – such as BizPal, for example, a platform that seems ripe for mobile application and a more general '2.0' refurbishment with social media and interactive capacities.

Similarly, a repository of apps with some element of inter-jurisdictional purpose could be established (i.e. an Apps Store for the public sector as a whole), underpinned by the sharing of best practices and the development of a unified apps development framework for the public sector as a whole (including the establishment of common policies and guidance toward creating native apps versus the usage of commercial apps);

As mobile channels become more widely deployed, there is also a critically important role in better measuring their impacts on customer performance and public satisfaction, a point already recognized and acknowledged by most recent Citizen's First surveys. Within this realm:

- The ICCS must continue efforts to appropriately adapt existing methodologies for measuring satisfaction and trust, ensuring that the presence and performance of mobile are captured and tracked going forward;

- In addition, ICCS may consider the development of a separate mobile scorecard to be piloted by a select number of jurisdictions (and in line with the discussion of Part Three of this report, such a scorecard should aim to capture linkages between mobile device

usage for self-service and transactional services and more novel forms of public engagement - such as open government and crowd-sourcing platforms that are likely to feature significant levels of involvement via mobile devices); and

- ICCS may also explore new outreach strategies with non-governmental sectors (such academe, industry, non-profit institutes and others) to augment the research and innovation arm of the public sector devoted to mobile matters (in ways that generate shared and applied outcomes for member governments).

On a range of internal infrastructure and governance matters, governments can benefit from sharing experiences and insights – already a key focus and source of value of the Joint Councils. Mobility accentuates the necessity and payoff from deepening collaboration in this regard.

Learning platforms for public servants:

The evidence from this report suggests that the Canada's public sector would benefit from a more established, visible and online set of resources devoted to mobile government. The American model is promising in this regard: specifically, the portal created by the General Services Administration devoted to Mobile Government.[156] Although developed by the US federal government, its resources extend to the wider public sector community in a manner that facilitates increased sharing and collective learning.

By contrast, at present, a focus on mobile government within Canada has mainly occurred informally or indirectly via media sources that showcase innovation but do far less to foster discussion and consideration of challenges as well as opportunities (here again the American model is instructive in housing dialogues with officials from across government and accordingly reporting on problems, barriers, and potential solutions).

The creation of this type of online resource could aid in the emergence of a de facto BYOD-stylized environment for the Canadian public sector as a whole. Rather than harmonized policies and purchases, the objective being a more federated and aligned approach of policies, awareness and learning across jurisdictions that can also contribute toward a more interoperable and collaborative environment for inter-jurisdictional governance.

Beyond service and infrastructure: participation and inclusion

Finally, while the Joint Councils are well positioned in terms of mandate and composition to address many aspects of the mobility challenge linking service and infrastructure, some additional thought must also be given on how to widen the mobility lens in ways that reflect the participation and digital inclusion aspects of this report.

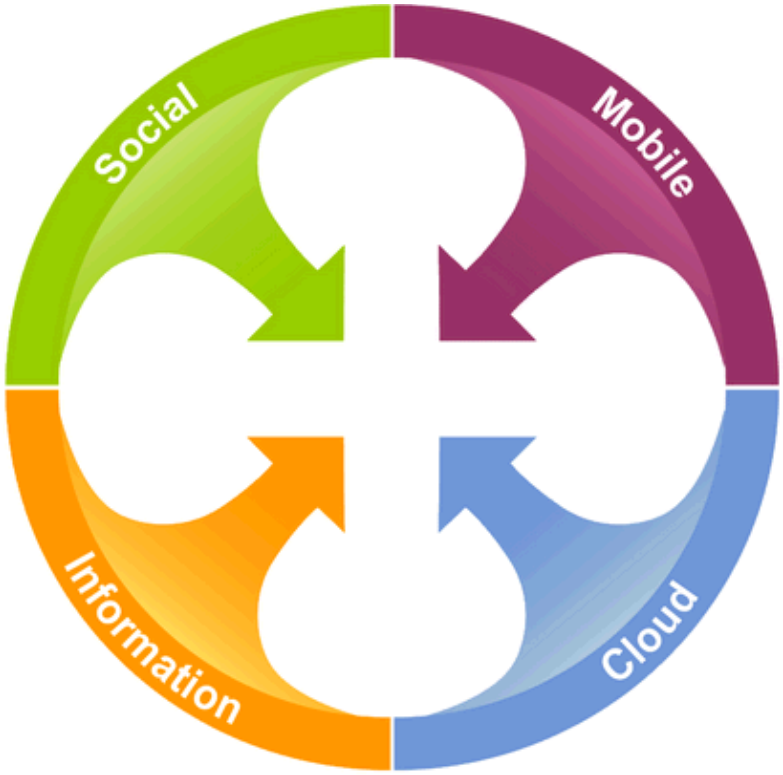
[156] Source: http://www.gsa.gov/portal/content/288141?utm_source=OCSIT&utm_medium=print-radio&utm_term=HDR_6_Help_mobilegov&utm_campaign=shortcuts

With respect to the latter, for example, the interdependence of mobility, multi-channel service delivery and digital inclusiveness carry important ramifications for whether or not mobility will generate cost savings, and how to quantify and assess an appropriate set of investments in mobile capacities. Moreover, a February 2014 report on persons with disabilities in Canada, released jointly by federal, provincial, and territorial governments, reinforces the challenges in this realm, an area where mobile could make a major impact (but has yet to do so).

In terms of mobility's impacts on the public service internally – and the opportunities for widened participation and employee engagement, a number of promising initiatives are underway across the country across all levels of government. As one practical and modest step in this regard, the Joint Councils may benefit from the outcomes of the current Blueprint 2020 initiative[157] led by the federal government – for insights and new initiatives that can better inform Joint Council efforts and facilitate subsequent innovations inter-jurisdictionally.

In sum, in building upon past successes and ongoing efforts that are growing in importance, the Joint Councils are uniquely positioned to help ensure that this country recognizes and seizes the full potential of the emerging mobility imperative – both within any one jurisdiction and ultimately for the public sector as a whole.

[157] Please see: http://www.clerk.gc.ca/eng/feature.asp?pageId=349



The Nexus of Forces (Source: Gartner, June 2012[158])

[158] Source: https://www.gartner.com/doc/2049315