Ten Emerging E-government Challenges Today: The Future May be Sober and Not Hype
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Abstract
This paper overviews the e-government scenario as it obtains at the end of year 2006 and identifies ten emerging e-government challenges which can help policy makers in e-government policy formulation and implementation highlighting the central position of efficient public service delivery and certain e-government developments like global and national league tables, information explosion, technology forecasts, management information systems (MISs), e-government project monitoring, wiki technology, semantic web and artificial intelligence (AI) and concludes that the future of e-government may be quite sobering after the initial hype surrounding it settles down.

Keywords

Citation

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It is useful from time to time to ask certain questions about the state of art, craft, practice and research in e-government and their policy implications so as to assist decision-makers in taking appropriate policy decisions in a fast-changing global environment. When one looks at the vast, emerging and often problematic terrain of e-government worldwide at the end of year 2006, one is struck by the mixed scenario of almost universal acceptance of e-government, many notable successes and perhaps equally notable failures, an unprecedented information explosion, heavy public investments and waste in e-government and very promising e-government research notably in artificial intelligence (AI). An attempt is made in this paper to capture some of the important contours of the vast e-government terrain as they obtain at the end of year 2006 by way of identifying ten emerging e-government challenges.

At the end of the twentieth century, there was loss of confidence in governments worldwide. For example, in the U.S. in the ‘Visions of Governance for the Twenty-First – Century’ project, Nye (1999, p-v) noted that confidence in U.S. government has sharply declined. ‘In 1964, three-quarters of Americans said that they trusted the federal government to do the right thing most of the time. Today only a quarter do so.’ Nye further noted: ‘Government is not alone. Over past three decades, in America, public confidence had dropped by half or more for many institutions: from 61 to 30 per cent for universities; 55 to 21 for major companies; from 73 to 29 per cent in medicine; and from 29 per cent to 14 for journalism (ibid., 1999). A subsequent study for other countries edited by Norris (1999) showed that the U.S. was not alone.

It is in this environment that the e-government appeared on the scene and was widely subscribed to by various stakeholders in government. However, the experience of last more than a decade shows that the expectations aroused by e-government, by and large, continue to remain unfulfilled. What are then the emerging challenges e-government faces today? The following ten appear noteworthy.

**Challenge No. 1: How to achieve the objective of efficient public service delivery which is not yet being successfully met by e-government?**

E-government is being driven by a number of stakeholders – the politician who would like to offer some thing new to the people, the civil servants who at the senior levels perceive it as a promising field where they can make some meaningful contribution, the technology vendors who see the prospects of earning profit from e-government projects, the civil service organizations (CSOs), who perceive it as an unique opportunity to serve the people by acting as intermediaries between the state and its citizens. Citizens too endorse the widespread acceptance of e-government as it promises to be government online and not inline.

Yet what drives e-government today are not these stakeholders, important as they are, but the need for efficient public service delivery. Governance has become a key concept in the international development debate (Hyden, Court and Mease 2004, p-7). Public services are widely perceived as unproductive, dilatory and insensitive to the changing needs of citizens. The application of private sector model to public sector, characterized
by the emergence of new public management (NPM) in 1980s and subsequent call given by Osborne and Gaebler (1992) to reinvent government and such other efforts also did not succeed.

Dealing with government remains a hassle (Holmes 2001). The emergence of e-government in mid-1990s therefore caught the imagination of different stakeholders and e-government was subscribed to by all and sundry in almost an unquestioned way. It is the need for administrative reforms, which incorporates business process reengineering (BPR), that drives e-government to-day. The first and foremost emerging e-government challenge, therefore, is: how to achieve the objective of efficient public service delivery which is not yet being successfully met by e-government?

**Challenge No.2: How to make e-government anticipate emergence of new technologies and respond to them quickly?**

Governments are usually taken up by surprise by new technological developments. (This of course is true of private sector too.) While it is not expected of governments to be technology blazers, it is also not expected of governments to be technology trailers either. The earlier forecast of computing becoming a utility, like electricity, has so far not materialized, yet an influential and popular publication still confidently claims: Despite early failures, computing will eventually become a utility (Standage (ed.) 2006, p-19). In developing economies, for example, demand is gradually building up for m-government (mobile government) and some public services are also being made available (for example, railway reservation status, school result, bank balance, etc.). In India demand for m-government may escalate as mobile phones start penetrating deeply its rural hinterland, thus exerting pressure for launch of m-government.

It is essential that legislators, as policy makers, are trained in e-government generally and in technological developments in particular. A recent study of governments across North America indicates fewer than 7 percent of legislators have even the most basic understanding of technology – and these are the very people addressing information technology policy and strategy issues, notes Thronton (1997, p-48). The percentage of such legislators is expected to be much lower in developing countries with serious consequences for e-government policies and programmes. This author’s attempt to launch an eMLA programme some time back in India, to train members of state legislators in e-government on pilot basis, had to be abandoned at the planning stage as it could not muster sufficient support despite every one endorsing the idea.

One way out to be technologically up to date is to scan the technology horizon and identify technologies of relevance to e-government which are likely to emerge in near future. For example, one of the technology forecasts of 2005 BT Technology Timeline (Table 1) is that all government services will be delivered electronically by 2008-2012. While this could be the case in developed economies, this may not be the case for many developing economies where e-government efforts are still to gather necessary momentum. Such technology forecasts nevertheless are useful in alerting us as to the
direction to which technologies are unfolding. The second emerging e-government challenge, therefore, is: how to make e-government anticipate emergence of new technologies and respond to them quickly?

**Challenge No.3: How can global and national league tables contribute to e-government policy formulation and implementation?**

The last decade has seen emergence of many global e-government and related information and communication technology (ICT) league tables. Five important streams have contributed to this development: (a) international organizations (for example, ITU 2006, UNCTAD 2005, UNDESA 2005a, 2005b, UNESCO ORBICOM 2005 and World Bank 2006), (b) national organizations (for example, DIT 2003), (c) universities (for example, Holzer and Kim 2005, West 2005 and WU 2005), (d) private companies (for example, Accenture 2005, BAH 2005 and Brainbench 2005) and (e) private organizations (for example, WEF 2006).

Such reports have made e-government competitive and benchmarked. However, their contribution to e-government policy formulation and implementation, where the future of e-government is often decided, has so far not been very significant. It is imperative to make such reports more e-government policy-oriented so that they can provide independent inputs to crucial e-government policy formulation and implementation. The third emerging e-government challenge, therefore, is: how can global and national league tables contribute to e-government policy formulation and implementation?

**Challenge No.4: How to set up dependable management information systems (MISs) in government in the light of information explosion and other developments?**

An unprecedented information explosion has taken place. Almost 800 MB of recorded information is produced per person each year equivalent to about 30 feet of books for storage (SIMS 2003). Print, film, magnetic and optical storage media produced about 5 exabytes\(^1\) of new information in 2002 and 92% of the new information was stored on magnetic media, mostly in hard disks (ibid.). On face of it one expects that decision-making in government, based on abundant information, to have vastly improved. But this has not happened.

The reason why decision-making in government has not significantly and visibly improved is the fact that appropriate management information systems (MISs), making use of information explosion, exploiting information and communication technologies (ICTs), breaking inter-departmental communication barriers and utilizing principles of change management (CM) and knowledge management (KM) including setting up of communities of practices (COPs), have not so far been put in place. The fourth e-government challenge, therefore, is: how to set up dependable management information systems (MIS) in government in the light of information explosion and other developments?
Table 1 E-government and Selected Technological Forecasts

<table>
<thead>
<tr>
<th>No.</th>
<th>Forecast Description</th>
<th>Forecast Period</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Computers that write most of their own software</td>
<td>2013-2017</td>
</tr>
<tr>
<td>2</td>
<td>Most software written by machine</td>
<td>2013-2017</td>
</tr>
<tr>
<td>3</td>
<td>Human knowledge exceeded by machine knowledge</td>
<td>2016-2020</td>
</tr>
<tr>
<td>4</td>
<td>All government services delivered electronically</td>
<td>2008-2012</td>
</tr>
<tr>
<td>5</td>
<td>Email used to communicate with most social service claimants</td>
<td>2008-2012</td>
</tr>
<tr>
<td>6</td>
<td>Academic learning is argued to be unnecessary in the age of smart machines</td>
<td>2013-2017</td>
</tr>
<tr>
<td>7</td>
<td>Retirement age raised to 75</td>
<td>2013-2017</td>
</tr>
<tr>
<td>8</td>
<td>95% of people in advanced nation computer literate</td>
<td>2030s</td>
</tr>
<tr>
<td>9</td>
<td>1Bn internet users</td>
<td>2006-2010</td>
</tr>
<tr>
<td>10</td>
<td>Personal remote web servers</td>
<td>2006-2010</td>
</tr>
<tr>
<td>11</td>
<td>Automated Stenographer</td>
<td>2008-2012</td>
</tr>
<tr>
<td>12</td>
<td>Chips with 1 billion transistors</td>
<td>2006-2010</td>
</tr>
<tr>
<td>13</td>
<td>Chips with 10 billion transistors</td>
<td>2011-2015</td>
</tr>
<tr>
<td>14</td>
<td>Personal memory sticks replace hard drives for everyday files (HD used as archive)</td>
<td>2008-2012</td>
</tr>
<tr>
<td>15</td>
<td>Public storage provided by local government to support social use of IT</td>
<td>2008-2012</td>
</tr>
<tr>
<td>16</td>
<td>100GB memory sticks (typical 2005 HD capacity)</td>
<td>2008-2012</td>
</tr>
<tr>
<td>17</td>
<td>DNA computer</td>
<td>2011-2015</td>
</tr>
<tr>
<td>18</td>
<td>Desktop computer as fast as human brain</td>
<td>2013-2017</td>
</tr>
<tr>
<td>19</td>
<td>2nd internet with guaranteed security for email, with no spam</td>
<td>2011-2015</td>
</tr>
<tr>
<td>20</td>
<td>AI member of parliament</td>
<td>2016-2020</td>
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Challenge No. 5: How not to keep on overloading government websites with all sorts of information but to anticipate and meet information and/or transaction needs of the citizens quickly and in user-friendly manner?.

There has been an explosion of government web pages. The US .gov top-level domain, for example, accounts for 368 million pages, according to Wagner et al. (2006). They report that no other government comes close. But even smaller e-government sites, such as .gov.uk (9.28 million pages) or .gov.au (7.2 million pages) exceed the size of major company sites such as IBM (3.93 million for ibm.com), eBay (3.14 million for ebay.com) and dwarf sites of companies such as Ford (55,700 for ford.com) or Barclays Bank (24,200 for barclays.co.uk). Even Slovenia, a country with only 2 million citizens, maintains a vastly larger e-government website of over 380,000 pages. (ibid, p-20)

The increasing volume of e-government web pages is, however, no indication that they are meeting the felt information and/or transaction needs of the citizens, notwithstanding the familiar rhetoric of e-government being citizen-centric. In fact, the increasing volume of e-government web pages has made the task of citizen of finding the desired information on government websites a difficult task. This indeed becomes daunting when
viewed in context of multiplicity of websites, lack of uniformity in their presentation and absence of suitable guidelines for setting them up. Such a situation has led private sites like Government Info Finder (http://govinfofinder.com/) to be launched. The fifth emerging e-government challenge, therefore, is: how not to keep on overloading government websites with all sorts of information but to anticipate and meet information and/or transaction needs of the citizens quickly and in user-friendly manner?

Challenge No. 6: How to set up appropriate search capabilities on e-government websites to ferret out the required information?

FirstGov.gov (http://www.firstgov.gov/), US Federal Government website, went online on September 22, 2000. Its database has shot up from 8 million to 40 million pages. It offers access to content from U.S. federal, state, local, tribal and territorial resources. How does then one ferret information from such huge databases? Well, the answer is: launch a search engine, not a general purpose Google-type but a specialty search engine based on government databases. No wonder, therefore, that the U.S. government launched a new search engine in January 2006 based on “dynamic clustering” (clustering of information on the fly) and “meta search.” (based on searches of other search engines).

On October 17, 2006, FirstGov.gov added new image and news search capabilities to its site making it “the most comprehensive and accessible source of government-related images and news.” (Vivisimo 2006). Its search now covers government web, images, news and FirstGov. In near future other features like RSS feeds and blogs/vblogs may also be added to e-government websites. If this development becomes a trend-setter for other countries in e-government, as it is likely, coupled with increasing volume of information on e-government websites worldwide, then appropriate search capabilities are required to be set up on e-government websites. The sixth emerging e-government challenge, therefore, is: how to set up appropriate search capabilities on e-government websites to ferret out the required information.

Challenge No. 7: How to make use of semantic web in e-government websites to improve the quality of the required government information?

Semantic web is being promoted by W3 Consortium (http://www.w3.org/) and Tim Berners-Lee, the inventor of World Wide Web which now has links to 10 billion pages (Shadbolt, Hall and Berners-Lee 2006). It is “not a separate Web but an extension of the current one, in which information is given well-defined meaning, better enabling computers and people to work in cooperation” (Berners-Lee, Hendler and Lassila 2001): Governments face the difficulties of “management of too much information, created by too many heterogeneous, distributed sources. Resulting issues such as inconsistent terminologies, information overload and too little maintenance of outdated knowledge are only too frequent.” (Wagner et al. 2006). One way out is to develop “semantic web” for e-government.

1 One exabyte is $10^{18}$ bytes. 5 Exabytes: All words ever spoken by human beings (SIMS 2003)
A recently concluded (March 27-29, 2006) international symposium on the semantic web and e-government, at Stanford University, CA, claimed to be the first event of its type, noted: the e-Government domain can provide an ideal test bed for existing SW research, and SW technologies can be an ideal platform to achieve the vision of a knowledge-based, user-centric, distributed and networked e-government” (SW=semantic web). (http://imu.ices.ntua.gr/sweg/). There are other interesting developments too. For example, possibilities of use of artificial intelligence (AI) agents in deciding legal cases (say, to begin with, minor traffic violations) and teaching/training in e-government. The seventh emerging e-government challenge, therefore, is: “how to make use of semantic web in e-government websites to improve the quality of the required government information?

**Challenge No.8: How to make use of wiki technology in e-government if public sector is constrained by resources as it is?**

First wiki was established by Ward Cunningham more than a decade back on March 25, 1995. Wiki (from Hawaiian word wiki wiki, meaning fast) is “a type of website that allows users to easily add, remove, or otherwise edit all content, very quickly and easily, sometimes without the need for registration.” (http://en.wikipedia.org/wiki/wiki). “This ease of interaction and operation makes a wiki an effective tool for collaborative writing. The term wiki can also refer to the collaborative software itself (wiki engine) that facilitates the operation of such a website.” (ibid.). About 1,000 public wiki communities existed as of December 6, 2004 (Turnbull, Yim and Niemann 2006). US Federal CIO Council’s Semantic Interoperability Community of Practice (SICoP) has a wiki. NASA’s WorldWind, an open source software for viewing satellite imagery, has a wiki. Any one can suggest code modification.

As noted earlier, US top level domain has 368 million pages. To cope with this information overload, Wagner et al. (2006) have suggested a two-layer web. The first layer is the traditional web. The second layer is wiki. Any one can edit information. If public sector organizations have constraints of manpower and financial resources, government websites can set up wiki on their websites allowing citizens to edit information and also guide each other in ferreting requisite information from the government websites. Wiki technology thus offers an interesting way out for governments working under financial and manpower constraints. The eighth emerging e-government challenge, therefore, is: how to make use of wiki technology in e-government if public sector is constrained by resource as it is?

**Challenge No.9: How to monitor investments in e-government as serious problems of unproductive investments in e-government have started surfacing?**

Heeks (2003) brought to our attention the high failure rate of e-government projects. His working estimates that 35% of e-government projects in developing/transitional countries were total failures, 50% were partial failures and 15% were successes (Heeks 2003) were
and, still are, widely quoted in e-government literature. But bad news keeps coming from other sources as well from the developed world.

Gauld and Goldfinch (2006), for example, study a number of e-government project failures in New Zealand (the Shared Medical Systems (SMS) information system of Health Waikato abandoned in mid-2000s at a cost of $17 million, the INCIS development in the New Zealand Police force, abandoned in 1999 at a direct cost of $100 million, etc.) and argue that New Zealand Government has not learnt one of the key lessons of continuing project failure: that large projects generally fail and should be avoided if possible (ibid., pp 25-26).

It can be argued that, and with some substance no doubt, why e-government projects are singled out for partial and total failures as such failures are quite common in other government sectors too. Even if this argument is conceded for sake of argument, the fact remains that e-government projects are often total or partial failures raising questions of advisability of investment in e-government projects. E-government project failures can, to a large extent, be addressed by setting up appropriate monitoring mechanisms which are currently not adequate. The ninth emerging e-government challenge, therefore, is: how to monitor investments in e-government as serious problems of unproductive investments in e-government have started surfacing?

**Challenge No. 10: How to put proper customer relationship management (CRM) and/or electronic customer relationship management (eCRM) programmes in place in e-government in developing/transitional economies?**

A dissatisfied customer is the norm and not a exception when it comes to citizen satisfaction from public services. To tackle this problem, public grievance commissions (PGCs) have been set up in India but the procedure followed by them often results in serious delays in redressing the grievances. Similarly by October 2006, 113 citizens' charters, originally introduced in United Kingdom in 1991, stood formulated by central ministries/departments/organisations in India (DARPG 2006). Citizen’s charters appear to have been overtaken by recently legislated Right to Information (RTI) Act in India.

Information and communication technologies (ICTs) have complicated and have not made any significant contribution to the solution of the largely intractable problem of efficient public service delivery. The initial efforts are far from reassuring. The problems of privacy/security are yet to be resolved to the satisfaction of citizens and non-citizens. Harris (2001)’s remark that there are snakes in the virtual garden is still true. The widely-used interactive voice response system (IVRS) is not only time-consuming, as it follows a predetermined path, but often exhausts patience in reaching a human being at the end of a long line.

Telephone, and not the internet, is still the best friend of a citizen as far as public services are concerned even in developed countries (see, for example, Newcombe 2005). Proper customer relationship management (CRM) and/or electronic customer relationship
management (eCRM) programmes are urgently required to secure the loyalty of citizens and non-citizens to e-government. The tenth emerging e-government challenge, therefore, is: how to put proper customer relationship management (CRM) and/or electronic customer relationship management (eCRM) programmes in place in e-government in developing/transitional economies?

Conclusion

Public interacts with government in 3 ways: (i) as consumers of government information, (ii) as customers of government services, and (iii) as citizens participating in government decision making and policy making (Abramson, Breul and Kamensky 2006, p-20). In none of these three aspects e-government has made any substantial contribution though modest attempts can be seen here and there. It is believed that identification of emerging e-government challenges described above can assist in development of appropriate e-government policies and programmes.

These are then ten among many emerging e-government challenges at the end of year 2006. The list is not exhaustive but indicative of the growing complexity of the field of e-government today. Many more items can be added. An overview of the field of e-government, however, does show that the field is devoid of any intense activity and its champions too have disappeared. After content analysis of 84 egovernment papers, Heeks and Bailur (2006, p-18), among other things, also found ‘A strong theme of overoptimism, even hype, and a consequent lack of balance in considering the impact of egovernme’ All this does not bode well for the future of e-government as its enormous potential for improving the internal processes of government as well as for providing seamless public service delivery remains largely unrealized and e-government may land up as yet another channel of public service delivery and not as an instrument of transformation, or even revolution, in government as many of us liked to believe in mid-1990s, and still would like to see e-government develop this way in the first decade of the twenty-first century. A realistic assessment of e-government, however, shows that the future of e-government may be sober and not hype.

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2 Monitoring must be distinguished from review. Monitoring takes into account the feedback from users also while review is generally an internal administrative process confined to physical and financial inputs.

3 The office of eEnvoy in United Kingdom, formed in 1999, was replaced by e-Government unit in 2004.
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