Government in a Social Machine Ecosystem

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ABSTRACT
The Web is becoming increasingly pervasive throughout all aspects of human activity, and, as citizens and organisations adopt Web technologies, so governments are beginning to respond by themselves developing in the electronic space. The challenge is to proactively understand the impact that these technologies are having on government systems and processes, and, from there, to design systems that ensure a positive impact on society. Citizens are increasingly involved in processes that relate to government in various ways using a number of online services, which can now be described as social machines. Therefore, in order to examine the development of Web-enabled government, and its possible implications, is to consider government itself as a "social machine", which, in turn, operates in a social machines ecosystem. In this light, there are significant opportunities and challenges for government that this paper discusses.

Categories and Subject Descriptors
K.4.0 [**Computers and Society**]: General, K.4.3 [Computers and Society]: Organizational Impacts, J.1 [**Computer Applications**]: Administrative Data Processing – *Government*, H.5.3 [**Information Systems and Applications**] Information Interfaces and Presentation – Group and Organization Interfaces

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Web Science, Social Machines, Socio-Technical Systems, e-Government.

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Social Machines Ecosystems, e-Government.

1. THE CHANGING SHAPE OF GOVERNMENT AND CITIZEN INTERATION
"Governments need information to govern; citizens need information to hold government to account."[1]

The relationship between governments and citizens is based on the notion of a "social contract" where citizens put their trust in government to determine needs, deliver services, and develop

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[1] Hon. Brendan O'Connor, Australian Attorney General, address to Office of the Australian Information Commissioner Conference, OAIC Conference, November 2011

policy, which is enabled through developing a currency of information. Information is something that citizens give to government (whether voluntarily or otherwise); in return citizens have the expectation that government will use it responsibly. Information underpins the "machinery of government" [1], and, as information has become digital in format, and largely presented via Web technologies, so governments have slowly embraced these media.

The first phase was where governments created a publishing space on the Web and sought to transfer some services online; the second phase has seen governments respond to the adoption of Web 2.0 technologies by embracing Social Media and seeking to more effectively engage with citizens through an online "dialogue"; the third phase sees governments attempting to become more responsive, dynamic and "open" through trying to develop interoperability between government processes, and adopt a "citizen centric" approach to information and communications through an intelligent use of data.

All of these may be seen as the building blocks of "e" or "electronic-government", but this is a simplistic way of viewing government in the digital age, because it does not provide:

- An understanding of the sustainability of e-Government models that rely on the data which results from the actions of citizens and government employees;

- Any way of studying (and, if need be, preventing) the side effects of the system as a whole as it interacts with the broader societal context; and, as such

- The ability to establish links between mechanisms of efficient citizen engagement and any positive societal impacts.

In 2009 the UK's "Power of Information" report Allan stated that:

"When enough people can collect, re-use and distribute public sector information, people organise around it in new ways, creating new enterprises and new communities. In each case, these are designed to offer new ways of solving old problems. In the past, only large companies, government or universities were able to re-use and recombine information. Now, the ability to mix and 'mash' data is far more widely available." [2]

The report argued that government should "grasp the opportunities that are emerging in terms of the creation, consumption and re-use of information" by developing a strategy that:

- welcomes and engages with users and operators of user-generated sites in pursuit of common social and economic objectives;

- supplies innovators who are re-using government-held information with the information they need, when they need it, in a way that maximises the long-term benefits for all citizens; and

- protects the public interest by preparing citizens for a world of plentiful (and sometimes unreliable) information, and helps excluded groups. [2].

This constitutes a new approach and, in many ways, a "re-invention" of government, because it changes the power dynamic within the "social contract" itself by disintermediating many government processes to allow greater participation, and, through this, to enable greater transparency and accountability.

"The link between communication and character is complex, but unbreakable. We cannot transform all our media of communication and expect to remain unchanged as people. A revolution in the media must mean a revolution in the psyche." [3]

Governments are socio-technical systems, and they exist within ecosystems of people and organisations. As these systems become more interconnected via digital interaction technologies we need a model to describe their development, operate and implications. One such model is that of the "social machine".

2. THE AGE OF THE SOCIAL MACHINE

The "social machine" has been described as:

"where human and computational intelligence coalesce in order to achieve a given purpose." [4]

Social machines can be characterised as the interaction of individual action and co-ordination, mediated and enabled by the *"shared communication substrate of the Web" [5]*.

For governments this translates as

"collaboration platforms – for organizing work at a distance that could translate into ways to get all hands on deck to undertake action together." [6]

At a base level the promise of "Web 2.0" technologies lies in the efficient operation of a socio-technical system within which citizens provide their data (in all formats, structured and unstructured) to governments. In response, governments should be better able to understand societal needs, and through this, more effectively and efficiently deliver services and develop policy. Underpinning all of this is the assumption of "trust", and, as "trust" has been a major driver in the development of the Web, so "trust" is driving some fundamental changes to the expectations of government. Not only are people hoping that the Web will result in more efficient and effective government, they are hoping that it will lead to an "openness" of government and an enhancement of democratic processes.

According to the Obama Administration "Open Government" is founded on three fundamental principles: Transparency, where citizens know what their governments are doing, and thus need free access to government information; Releasing social and commercial value, where data is recognised as a key resource to deliver social and commercial value; and Participatory Governance, where citizens are enabled to be much more directly informed and involved in decision-making [7].

What is being described is a "Read/Write" Society, a reinvention of government as "Government 2.0", or as a "social machine". Studying government as a social machine allows us to put every aspect of citizen engagement with technology, government employees and information systems in perspective. It allows us to better explore the opportunities for collective action, problem solving and impact to society in a holistic way.

3. GOVERNMENT IN A SOCIAL MACHINE ECOSYSTEM

"Government 2.0 is not a new kind of government; it is government stripped down to its core, rediscovered and reimagined as if for the first time. ... (G)overnment is, at bottom, a mechanism for collective action. We band together, make laws, pay taxes, and build the institutions of government to manage problems that are too large for us individually and whose solution is in our common interest." [8]

Twenty first century Government is about enabling citizens to utilise the power of information technologies to collectively solve problems, and the hope is that instead of "vending machine government", where we pay our taxes and expect services in return, the role of government is more like being the manager of the marketplace, or the bazaar, where the community exchanges goods and services and actively participates [9].

One way of doing this is to harness the power of information and communication technologies in order to actively encourage the participation of citizens, customers and employees in numerous areas including product development, service offerings, and policy formulation [4]. Once this occurs then the power dynamic between governments and citizens will change [10, 11] and it could well be that :

"(i)n the future people will not see their influence limited to elections every four to five years; rather, citizens will exercise permanent influence through constant suggestions, ideas, and contributions, all organized over the internet." [12]

However, many of the information and communication services that governments can harness or are already harnessing, can be seen as social machines themselves, especially those on the infrastructural or service level as per the classification in [4]. In this respect, studying government as a social machine becomes more challenging since government process are often deployed in synergy with external to government services or infrastructures that are social machines.

The realization that government can be seen as a social machine operating in a social machine ecosystem puts forward a number of challenges for government itself:

1. How does Government acting (or viewing) itself as a "social machine" change the way that it interacts with citizens?

2. How are Government processes affected by existing social machines maintained by other parties? (e.g. by Twitter, Wikipedia, Ushahidi, etc.).

3. How can Government agencies successfully meet the challenges of sustainability and quality of government services given the reliance on a whole ecosystem of social machines?

4. How can governments best safeguard citizen's privacy and security in this ecosystem?

5. Does Government need to reinvent its role and responsibilities to its citizens in the complex and interdependent environment of social machines maintained by different parties?

4. METHODOLOGY

Government is about "relationships" with those who are "governed".

Our approach to better understand the above challenges will be to investigate some of the differing types of social machines that are emerging at the interface between governments and their constituent communities. Some of these are as community initiatives, some are government services, others are facilitated by third parties, such as Facebook and Twitter as illustrated in *Figure 1*.
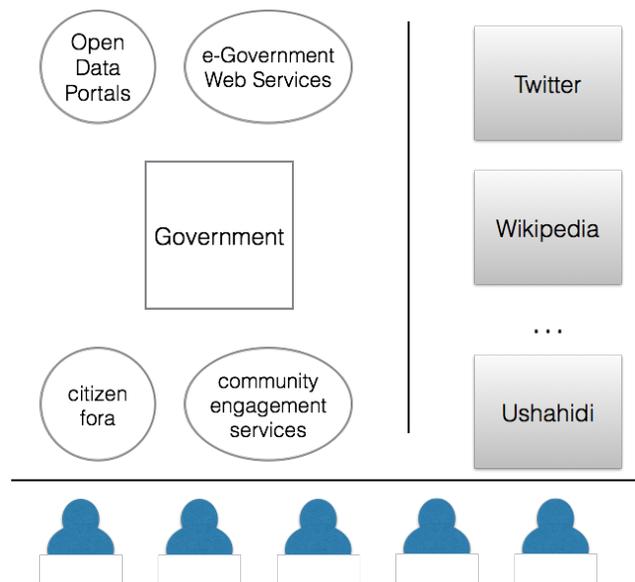

Figure 1: Government as a Social Machine Ecosystem

As such, whatever government does, exists within a "social machine ecosystem" and thus there are issues of governance and control that extend across multiple interfaces. These need to be examined within the three key drivers of public sector change which are:

1. Transformation (the relationship between government and citizens) seen as technology embodied by the social machine as a tool for democracy;

2. Effectiveness (mechanisms through which government communicates) seen as technology embodied by the social machine as a tool for communication; and

3. Efficiency (ways by which government determines its own success as a "business") seen as technology

embodied by the social machine as a tool for customer satisfaction.

We will consider a number of "cases" and describe the identified social machines in terms of the context and the need for which a socio-technical solution is required; the key players involved in creating the social machine as a "solution"; the key technologies employed; and the effectiveness with which the social machine has operated.

5. CONCLUSION

Governments around the world are re-inventing their systems and processes in response to greater citizens demand for transparency, participation and collaboration through their own adoption of Web technologies.

"Most of the failings of government can be connected to the fundamental assumption that humans are rational creatures and the inherent structural biases toward mechanical processes and short-term thinking. ... We need designers, political scientists, and social activists ... to take up the challenge of designing new systems of governance ... that are open, accessible, and learning. They need to embody the latest thinking about how the world works, how people work, and how we can use our technologies to make life better for all."[2] [13]

Whereas the original concept of the "Machinery of Government" emerged from the bureaucratic nature of Government as a "one size fits all", with the advent of the Web and digital interaction technologies governments are beginning to recognise that they exist within socio-technical ecosystems and they need to respond to the dynamic nature of society and to accommodate the complexity of interactions and services which are required. Government is then not a fixed and rigid edifice, but rather becomes a social machine itself, which, in turns, operates synergistically with a whole social machine ecosystem, which evolves as societal needs evolve.

"*(A) successful Social Machine, whether intentionally designed or serendipitously emerging, has all the properties of an emergent system; the fabric itself of its constituting parts mutates under their mutual influence, as do the interactions between them." [14]*

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