

Chapter 7 — Policy in an age of information

Evelyn, a dog, having undergone
Further modification
Pondered the significance of short-person behavior
In pedal-depressed panchromatic resonance
And other highly ambient domains ...
'Arf', she said.

— Frank Zappa

Computers and government: An intimate history

Governments have a long history with information and communications technologies (ICT). From the computerisation of census tabulation, to military calculation and code breaking, it was government need that drove the initial development of mainframe computers and networking technologies around the world. In Australia, computerisation was supported by governments as part of the nation-building activities of the Commonwealth, with the objective of developing an industrial economy. For example, the production of the CSIR Mark 1 mainframe in the late 1940s (one of the first computers in the world) was an early initiative of what would become the CSIRO (Pass and Hornsby, 2006), just as telecommunication services were largely provided by the public sector up until the late 1990s (Arnold, 2004). Given this long history of work with ICT, it should not be surprising that governments, as large organisations with an expansive range of operations and a considerable numbers of 'clients', have looked to new technology to assist in the day-to-day management of their activities. Indeed, the notion of *bureaucracy* ('rule from the desk') talks about a standardisation and automation of the process of government that developed alongside the nation-state itself (Williams, 2008: 52).

In the recent Australian context, the 1990s saw a renewed public sector interest in technology acquisition as part of a deliberate attempt to move away from this standardised model of bureaucratic rule and service delivery. With accelerating public uptake of the internet in Australia, governments of all types became interested in its use to deliver services, provide information to the community, and serve as a channel for interaction with citizens. Larger agencies have predominantly been attracted to the use of these technologies for enhanced

service delivery and cost-reduction purposes, and Australia was seen as a leader in electronic and online service delivery¹ through much of the period of the Coalition government under John Howard (United Nations, 2005: 25). Initiatives like the introduction of the Australian Taxation Office's taxation lodgement application (eTax) and the Bureau of Statistics's online eCensus tool demonstrate how online services can assist citizens' to comply with government regulation through automation, while benefiting government through the digitisation of paper forms. These developments have seen Australians increasingly interacting with government using online service portals (OECD, 2009).²

In addition to simply meeting the contemporary needs of a citizenry increasingly comfortable with online transactions (Thomas, 2004: 267), we can also see that these initiatives adhere to the priorities and concerns of the new public management (NPM) era under successive Labor and Coalition governments. NPM represents the self-conscious adoption of ideas from the private sector to reform government management and service delivery. This is achieved through the separation of policy development and program implementation (often associated with outsourcing and privatisation) and the greater use of performance management through market and market-like tools (contracting, internal markets and market testing; Denhardt and Denhardt, 2011: 12–13). Under NPM, computers and new communication technologies become important in the modernisation of 'back office' activities as well acting as a conduit through which services can be delivered. While these aspects of the new IT agenda need not be related, in reality the practice of system modernisation is a prerequisite for contracting, either through greater attention to determining service-delivery standards via data collection of existing practices or via the integration of new technologies with 'legacy' (pre-existing) databases.

The shift towards increased use by Australian governments of online service delivery is ongoing. While some authorities have made advances in delivering complex services through new channels,³ the systematic adoption of electronic and online service delivery in Australia is variable. While comparatively simple translations of offline processes represented the 'low hanging fruit' of online modernisation in the late 1990s and early 2000s (bill payments, simple bookings systems; Canadian e-Business Initiative, 2004), more complex service

1 The distinction between 'electronic' and 'online' in this context being that computerisation (electronic) does not necessarily lead to service delivery provided online (think the one-stop-shop electronic kiosk model popular at the turn of the century; Kelso, et al, 2001). Normally, electronic service delivery preceded online provision, but, in some cases in the 1990s, a shift to online provision necessitated the regularisation and automation of processes that were still undertaken manually.

2 The extent of Australia's success may be queried to some degree, as many of the initiatives represent 'low-hanging fruit' (automation rather than substantive transformation). Australia's record of cross-jurisdictional services remains more limited.

3 An example is in areas like the administration of vehicle registration, which often requires sophisticated integration of ownership, payment and safety systems (that may include third-party validation of compliance).

transformations like electronic health records have been harder to implement because of the wide range of participants in the process (public servants and private providers), the need to protect against risk ('real', such as data intrusion, as well as less-well-defined political risks) and the complexity of implementation (Dearne, 2012). Qiuyan Fan (2011: 933) has discussed how the patchy implementation of e-government makes it difficult for service delivery to be 'joined up' and integrated into single point of entry service systems that allow citizens to access services without having to navigate through a myriad of agencies and levels of government. This demonstrates how the complexity of Australia's public sector (including aspects of federalism and the legal requirements to undertake some functions in specific ways; Barrett, 2003: 11) makes the public sector unique for business process re-engineering.

Rather than discuss the development of government e-services in detail,⁴ this chapter focuses on the way that new technology (and new thinking about the technology of government) shapes the public sector. This focus on meta-policy (policy frameworks and heuristics that shape the design of other, subordinate policy; Dror, 1971: 74) allows us to see the broader impact of digital technology on thinking about policy design and implementation in Australia today. This has two components: the first focuses on the impacts of an increasingly sophisticated and 'data-driven' public sector on the design and implementation of public policy, the second focuses on new ideas to employ the creative energy of the online environment to 'rewire' government with the same ideas and energy of the dotcom start-up businesses: Government 2.0 (Gov 2.0).

The new scientific management

The digital-media environment allows for the production and analysis of large amounts of data as transactions and interactions (internal and external to government) become automated, and storage and processing costs fall. Just as the private sector has begun to 'mine' its existing transaction data for new ways to sell products and profile their consumers (Hill, 2012), governments have a wide array of points of interaction with members of the public that deposit data into public-sector owned or controlled databases. Routine interactions with the government that were once stored in seldom-to-be-opened filing cabinets now produce easy-to-access data points maintained over long time periods.⁵ While this presents concern about the ability of the state to have intrusive amounts of information about individuals (Chen, 2005a), in policy terms this data can

4 A good, systematic assessment of the development of electronic and online service-delivery systems is provided by Paul Henman (2010).

5 Unlike many private organisations, governments have long 'warehoused' data because of legal requirements to hold records and due to the longevity of public institutions.

be moved and analysed with ease to understand more about the administration and impact of public policy than ever before. It is unsurprising then that there is considerable interest in the liberation of this data to drive policy development and improve program implementation (Aichholzer and Burkert, 2004: 335). This is the age of data-driven policy-making: a focus on solving policy problems through the use of the type of large data sets produced by government's regulation of the population to provide natural experiments into the effectiveness of policies (Esty and Rushing, 2007).

The desire to make the art of government more of a science is not new. Plato's *Republic* calls for philosophers to become kings and vice versa. Beyond the personal qualities of leadership, he proposed that this ability to engage in disciplined thought must be matched with practical management training (Reeve, 1988: 191–95). In the modern era, the lessons of World War II pointed to the ability for a greatly expanded and interventionist managerial state to be able to achieve incredible results. Following the 'failure' of the welfare state model (circa 1970s) and the mixed successes of the subsequent Ronald Regan and Margaret Thatcher 'revolutions' (1980s), a renewed interest in scientific management in government was championed by the New Labour administration of Tony Blair in the United Kingdom. Calling for the use of 'evidence-based' decision-making, Blair argued for a 'third way' between state-centric governance and free-market deregulation. Rather than develop policy on the basis of abstract political or economic theory, governments should be more rigorous in their approach to the design of public policy based on structured decision-making and the use of empirical data.⁶ This type of approach remains popular with advocates of structured and rigorous decision-making in government, such as the Institute of Public Administration Australia (2012), itself a product of the formalisation of the policy 'sciences'.

An evidence-based Australian politics?

While not unique, the idea of a more technocratic administration was embraced by the Labor government under Kevin Rudd. The reasons for this are more than simply Rudd's background as a chief administrator in the Queensland public sector. Evidence-based policy (EBP) suited the reformist government for two reasons. The first served as a response to perceptions of an increasingly partisan public sector during the era of John Howard's Coalition government (Miragliotta, et al., 2009: 137).⁷ The second reason was through the transfer of ideas that Rudd brought to government as an inheritor of the third-way vision of the United Kingdom (*Lateline*, 2007). The Rudd government's penchant for detailed policy

6 The extent to which New Labour followed this idea is, however, debatable (Hay in Dillow, 2007: 8).

7 The loss of permanence of the senior executive service began under the previous Labor government (Mulgan, 1998).

reviews (which were criticised as representing a ‘do nothing’ government; Eltham, 2012) were examples of this approach to policy development. This may have been unfair, but EBP requires the political discipline to reflect when intemperate voices might call for action. For an effective implementation of EBP, Gary Banks (2009) has argued the prerequisites are for an independent public sector to employ good research methodologies, producing clear and transparent data. This reflects the spread of research expertise outside of the academy and the ability of large public institutions to fund practical research activities (Bogenschneider and Corbett, 2010: 91). In addition, the authorising environment of the political class needs to be receptive to the core principle of ‘whatever works’ policy, rather than driven by ideological (or other) motivations.

The limitations of this approach to government are clear in the rapid downfall of the Rudd government and many of the policy ideas championed by his various reviewers. The most obvious policies have been in the areas of climate change and taxation reform, where the political realisation of the proposals developed by independent experts was considerably more difficult than simply generating the ‘best’ technical solution to the problems at hand. The government found ‘selling’ its policy prescriptions and technical assessments to the general public increasingly difficult in a cluttered media environment, where any limitation in the research methodology could be exploited to create doubt. This problem should have been predicted, given the history of climate change politics to date (Zajko, 2011). In addition, while the government championed the credentials and standing of the experts selected to engage in these inquiries, this appeal to independent expertise provided minimal political capital (possibly as a result of excessive cynicism about the state of the public sector, as indicated by Miragliotta, et al., above). Thus, we need to add popular willingness to accept appeals to technical authority to Banks’s list of prerequisites for success.

This example shows how Deborah Stone’s (1998) argument about the political value of ambiguity is still important: ambiguity allows coalitions to form and be sustained because the specific costs and benefits of policy are not made clear. The elaboration of policy outcomes and costs makes these results clear, making EBP the antithesis of this proven political strategy. While good policy is often seen as having a foundation in a solid and reasoned causal theory that shows how government action is likely to affect change (Birkland, 2011: 241–42), it is easier to communicate simple linear ‘stories’ than more complex theories and ideas in the current abbreviated media news cycle. This is problematic in policy areas where the public value produced sits at the aggregate, rather than individual, level. Examples of this include public health initiatives and areas of economic redistribution where citizens must weigh collective outcomes over their personal experience. In these cases, the tendency towards confirmation bias (looking for evidence to support one’s pre-established position) is enhanced when the

group's views are polarised. Additionally, the ability to sort rigorously argued material from furphies declines when the quantum of information is increased (Beecher-Monas, 2007: 23–24). In the recent experience of EBP in Australia, it is evident that structured policy analysis does not produce structured public debate.

Having backed down on a number of key EBP-driven policy areas, the Rudd administration then faced the second dilemma of this type of technocratic model of government: if policy *should* be made in this way, how can a government justify *selectivity* in the use of evidence. As Rudd's argument that climate change represented the 'great moral challenge of our time', the decision to shelve the Emissions Trading Scheme demonstrated a lack of commitment, not simply to the policy area, but the use of EBP more generally. The ad hoc and noncommittal use of evidence, therefore, opens up the elite to claims of relativism and employing data only when it serves their political objectives. In the experience of EBP in Australia, Don Harding (2008) argues that in some policy areas evidence was stretched to fit the policy preferences of government, leading to the selection of policy based on weak evidence, which is harder to defend.⁸ Similarly, Michael Coory (2004: 582) has argued that the selection of likely future scenarios has been driven by elite preferences towards the particular policy instruments and outcomes these projections are likely to support.⁹

The opportunities and demands of data

While EBP continues to struggle against the competing logics of political realism and communicative capacity, the idea of data-driven public policy has not gone away. Under the governments of Rudd and his Labour successor, Julia Gillard, a renewed interest in shaping the performance and behaviour of markets came with the opportunity presented by the global financial crisis (Rudd, 2009). This marked a break with the consistent push towards de-regulation in Anglo countries. While wholesale re-regulation of markets and industries has not occurred, these governments have increasingly focused on the role of market regulation to improve social outcomes inside and outside of the public sector.

The concept of markets refers to real and virtual spaces where buyers and sellers come together voluntarily to exchange goods and services, with the shape and nature of exchanges determined by the factors of supply and demand. In the contemporary policy environment, markets are seen as good regulators of social provision because they can be used to disaggregate a range of choices to individuals, who are deemed to be in the best position to make consumption

8 His case example being the failure of the 'FuelWatch' system to monitor and publicise fuel prices nationally.

9 Coory's case example focused on the use of 'worst case' healthcare costs associated with the aging of the population that favoured the use of marketplace responses over state provision of care.

choices. The ‘grassroots’ nature of these interactions means that governments need not regulate exchange relationships where individuals have an interest in ensuring they receive the best outcome.

This, of course, is a fanciful view of markets, which have a tendency towards asymmetrical power relations, with resultant impacts on the price, quality, and suitability of the services received. In cases of market failure in private fuel and grocery items (in this case, inflated pricing through reduced competition and likely price collusion; Waters, 2012), Labor has proposed market transparency policies (the Grocery Watch and FuelWatch schemes) to increase the ability of consumers to make informed choices more easily. The capacity of the state to make these policies has increased as the cost of the collection, aggregation and promotion of pricing information has fallen considerably through the use of information and communications technologies across the economy.

These two initiatives employed the idea of increased marketplace transparency to reduce the cost of supply. If the market was not providing systems by which competition would drive down the prices of these staples, the government would do so using new technology to achieve their objectives. Unsurprisingly, the proposed market transparency policies collapsed under the weight of resistance from the private sector (Burke, 2009), who benefit from the inability of their consumers to have comprehensive information about comparative pricing.¹⁰

In areas where the government has direct authority, the use of more market information to empower individual choice has been more effectively (actually) implemented. Possibly the most high-profile example would be the use of performance data to influence school performance through the My School website (<http://myschool.edu.au>). Using new national standardised data collection and testing, the site serves to allow education consumers to select from public and private schools based on their assessment of performance provided through the site. This demonstrates how the NPMs’ ideas of internal markets (comparison between public schools) and market testing (comparison with private providers of similar products) are being employed in areas where wholesale outsourcing and privatisation are unlikely to occur. Thus, the government supports parental choice through ensuring information is available upon which informed decisions can be made. Similar tools are to be introduced for University performance (Gilmore, 2012) and proposed for hospital services.

¹⁰ A number of non-government price-watch websites have been established following this policy failure, including Grocer Watch (www.grocerwatch.com) and the NRMA’s Petrol Price page (www.mynrma.com.au/motoring/car-care/fuel-prices.htm).

Who benefits?

While the provision of information may be a substitute for top-down regulation, it does not negate the need for minimum standards of performance. Markets provide innovation and choice, but are most responsive to the most profitable and/or informed segment of their customers who have the capacity to act on the information provided. This capacity is not distributed evenly across the social gradient, with the educated and wealthy more likely to gain advantages under these systems for a variety of reasons (Berg and Gornitzka, 2012: 171). This is a good example of what Frank Bannister and Regina Connolly (2011) identify as the societal risk of e-transparency: failure to recognise the context in which data will be interpreted and employed in the public realm. Where concerns about the release of sensitive information are well-known policy problems associated with populist laws (such as criminal registers; Pager, 2003), debates about government data release and the potential for aggregation and mining remain formative. Michael Gurstein (2011) has identified how privileged social groups employ government data to support their economic privilege in developing and developed nations: demonstrating that while the provision of more data may appear value neutral on the surface, the context of use needs consideration.

The problem with many of these initiatives lies in their unwillingness to recognise how decision-making can be supported across the spectrum of users. While the introduction of the My School website was accompanied by assurances that this would not produce 'league tables' that reduced the range of variables on the site into a simple list, thereby stigmatising some schools unfairly and leading to a 'death spiral' or enrolment declines and recruitment problems (McGraw, 2010), mainstream media organisations quickly used the data to produce lists comparing schools, just as they have done in the past with other indicators (such as graduate entry rates). While the My School site design seeks to mitigate this through a number of means (use of captcha to prevent site scraping,¹¹ as well as 'how to interpret' information in the school reports), league tables serve a part of the community: the need for more simple decision-making heuristics to deal with the increased complexity of the shift towards greater choice in the provision of public services. We also see here the limited ability of the government to disintermediate their communication with members of the public: digital data is harder to control than its analogue predecessor.

What gets measured gets managed

The visibility of these data releases is designed to shift the attention of public managers to improve their performance. This is achieved by pressure being placed on them to perform by their clients and peers, as well as being internal

11 Using a script to access a site and harvest its data for reuse.

performance indicators for promotion and performance-based pay. The ability of these systems to accurately match the range of work areas of public employees generally defines their utility (Rosenberg, et al., 2010: 202–05). If significant aspects of a task are opaque to data collection, the market-information model runs the risk of a lopsided attention towards activities with clear performance indicators attached. The introduction of the standardised testing to support My School has led to concerns that this diverts the attention of school administrators and teachers to ‘teach to the test’ (Rout, 2011; Barry, 2012), which is seen by many educators as a retrograde step back to an excessive focus on the ‘3 Rs’.

This also has an important time dimension. In a desire to liberate data from legacy systems and make it increasingly transparent, there is a potential that activities that are easy to quantify and which deliver short-term results become the emphasis of managers. Thus, where the public service was once seen as a counterweight to the short-term orientation of the political class because of its independence and insulation from direct criticism (Alesina and Tabellini, 2008: 427), successive reforms and the use of these measures may narrow bureaucratic attention as public servants become directly accountable for their performance in real time. This is in line with NPMS’ encouragement of public-sector managers to move out of the background and engage with members of the public more directly to create ‘public value’ through engagement and entrepreneurship (Moore, 1995). Managerialism’s focus on standardised management techniques drawn from the private sector also runs the risk of importing short-term horizons over concerns about organisational sustainability.

On this front, there is Australian evidence that the use of market mechanisms may produce short-term boosts in performance and diversity of service delivery, but that these effects decline over time (Considine, et al., 2011). In response to the problems of standardised data demands from the ‘top’ of the political system reducing the value of data to generate innovation at the local level, Dunleavy, et al. (2006) have argued that this era of digital governance can be more effectively managed through the critical adoption of ‘needs-based holism’.

This type of comprehensive management process looks to the state as a powerful agent in data integration and matching to solve localised and/or policy domain-specific problems. The value proposition of this model is the inverse of the current federal approach to quasi-market information provision: largely, datasets should be liberated from a wide range of centralised government agencies to support local evidence-based policies, rather than have defined data collected at the local level for standardised reporting at the national level. This focuses on the reality that most citizen-centric policy is relational in character and that the comparators people use in their lived experience tends to be community based (physical or of-interest).

Rewiring the state: Gov 2.0

While data-driven policy and EBP tend to be ideas generated from within the public sector, recent years have seen the emergence of a new paradigm for government reform running in parallel with these approaches. Inspired by the expansive growth of web-centric firms in the last decade, Gov 2.0 proposes that the practices and technologies of Silicon Valley's successful start-ups should be used within government as a catalyst for service modernisation through co-creation with stakeholders.

The notion of Gov 2.0 remains an amorphous concept subject to competing definitions (Bardsley, 2010). The term has its origins in another socio-technological change, the introduction of what is called 'web 2.0' in the mid 2000s. Web 2.0 itself is not a specific technology,¹² but an approach to developing interactive services for the internet. Christoph Schroth and Till Janner (2007: 36–37) talk about web 2.0 as a 'philosophy' of design that focuses on the creation of 'mutually maximising collective intelligence and adding value for each participant by formalised and dynamic information sharing and creation'. In practice, this sees websites and digital-media applications as providing the capacity of co-creation with their users. This is a more full implementation of the idea of 'active audiences', as discussed previously.

Web 2.0 is often illustrated in popular parlance by talking about the 'read-write web': an emerging internet where users are able to interact with the material online, to contribute to it, modify it, reuse it and, thereby, create collective goods. Examples like YouTube and Wikipedia show how comparatively simple-to-use technology 'platforms' can be used by the public to build considerable information repositories of great value, simply by linking together individuals and providing toolsets for creation. This links to observations about the shifting capacity of members of the public to participate in policy dialogue. As Helen Margetts (2009: 6–16) has argued, computer networks have served to increase the degree of interaction between policy makers and stakeholders, particularly those who may have been less able to establish and maintain formal and physical organisational ties with government. From the perspective of policy networks, the facilitation of these exchange relationships can be empowering for actors who are more likely to have non-tangible political resources, such as information and skills.

12 Though, in its early iterations it was commonly associated with the web-development methods described as AJAX (asynchronous JavaScript and XML). These allowed webpages, once static 'repositories', to become interactive and dynamic.

Gov 2.0.au

In Australia, following similar high-level endorsement of the idea as seen with the presidency of Barack Obama in the United States, the then Rudd–Labor government created the Government 2.0 Taskforce to investigate the utility of the idea. Presenting an enthusiastic report to government, the Taskforce defined Gov 2.0 as:

... a public policy shift to create a culture of openness and transparency, where government is willing to engage with and listen to its citizens; and to make available the vast national resource of non-sensitive public sector information (PSI). Government 2.0 empowers citizens and public servants alike to directly collaborate in their own governance by harnessing the opportunities presented by technology. (2010: 1)

In specifically calling on the adoption of Gov 2.0 by the Commonwealth public sector, the taskforce highlighted three areas for reform: opening of the public sector's culture to greater levels of transparency and engagement with the public; explicit use of web 2.0 technologies by government organisations to achieve the former and produce collaborative outcomes; and, the release of increasing amounts of public sector information into the digital commons.

This take on the promise of Gov 2.0 has been pushed by the thinker most commonly associated with the term, and the originator of the term web 2.0: technology publisher Tim O'Reilly (O'Reilly Media).¹³ O'Reilly draws upon examples from the technology sector to demonstrate the power of web 2.0 design in creating innovation and value (2009b). Given the dominance of NPM meta-policy in Australia, the report and its emphasis on cooption of private sector strategies to create public value fell on fertile ground. Lindsay Tanner, one of the ministers responsible for the taskforce, made an unfavourable comparison between the performance of public sector organisations in providing correspondence to members of the public and fast-food restaurants in his 1999 technology and policy book *Open Australia*. In 2011, he reiterated this by emphasising the relationship between Gov 2.0 and the lessons to be drawn from sectors with traditions of innovation (CeBIT, 2011).

New or new-new?

Gov 2.0 focuses on shaping government in ways to encourage the creation of self-regulating, problem-oriented communities of interest. In championing this model, Gov 2.0 presents an interesting proposal for recasting the role of government in Australia from one of provision to that of a gardener: tending the

¹³ Matthew Allen (2009) argues that O'Reilly has ongoing importance in the use of the term web 2.0 in the way he uses his media profile to sustain and shape its popular meaning over time.

productive platforms (data sets, and APIs¹⁴) from which empowered citizens can draw. The emphasis on the use of data to enhance service delivery and decision-making fits within the tradition of scientific management. In broad terms this notion of electronically facilitated democratic practice is not new. In popular fiction, the notion of automatic and automated decision-making systems emerged with the development of information theory and pre-eminence of technocratic decision-making, as illustrated in novels such as *The Machine Stops* by EM Forster (1909). With the introduction of pre-internet computer networking, ideas like 'teledemocracy' gained currency (Taylor, 1998) in the 1960s: recognising the inherent role of information and communication in political decision-making, while (implicitly and explicitly) incorporating normative assumptions and aspirations about the place of technology in structuring and rationalising social processes and politics.

In practice, Australia has had a mixed history of experimentation with new forms of democratic decision-making employing digital media, with many initial 'electronic democracy' initiatives (such as online discussion fora employed by local and state governments) being quickly wound back or cancelled. The majority of these initiatives are what are best described as 'programmatically e-democracy': top-down initiatives designed and implemented by government organisations in the same manner as any other service (as discussed in An electronic constituency surgery, Chapter 3). As such, they often sit within public service delivery paradigms, such as the automation of existing services (online petitions, for example) or applications of existing policy models (such as jurisdictional consultation manuals). To generalise, many of these initiatives at the local, state and federal level have been deemed to be unsuccessful, largely due to low levels of take up (Griffiths, 2002; Blackhouse, 2007).

The underlying causes of failure are often due to: excessive planned-risk avoidance that reduces the utility of the service (such as strict participation control, or functional limitations due to the — not unfounded — fear of system misuse); a tendency to place systems within government domain spaces, rather than undertake partnerships with civic groups to place them in existing organisational settings; and, limited stakeholder commitment to the initiatives (Anderson and Bishop, 2005). The last factor often sees these initiatives never exiting 'pilot' testing, and having no outwardly visible connection to policy-making processes. Partially this is the result of limited interest in the idea of e-democracy compared with the investment in e-service delivery (thereby instrumentalising the perception of government–citizen interactions). It also, however, stems from the failure of advocates of these 'Gov 1.0' ideas to learn from their lack of success, (such as Stephen Clift who visited Australia frequently in

14 Technical specifications that allow for data interoperability, the ability to use another organisation's data in a meaningful manner.

the late 1990s and early 2000s to talk about his experiences with one of the first high profile e-democracy projects, Minnesota E-Democracy; <http://forums.e-democracy.org>¹⁵) whereby the technologies of these initial online virtual spaces were emulated by governments, but often without observing the situation of the projects in their unique cultural contexts.

Self-regulating communities of creativity

Following these lessons of failure, Gov 2.0 is interesting in that it sidesteps direct engagement with the formal policy process to move more directly to implementation: emphasis is placed on the use of data, building new means for engagement and citizen oversight, and developing tools that increase the flow of information from government datasets into the public domain. The read–write nature of Gov 2.0 is significant in how it encourages the elaboration of public datasets to increase their value (such as overlaying data on maps, ‘mash-ups’ of multiple datasets to produce new insights, or adding user-generated data to ‘official’ information), and the formation of temporary groups working on issues of mutual concern, drawn from a range of sectors. Gov 2.0 appears, therefore, to be aligned with Henrik Bang’s idea (as discussed in Strengths and weaknesses of the OSMOs, Chapter 5) of citizenship that focuses on ends-oriented and time-limited interactions with government. Social media works well in this context with a concentration on the formation of user communities’ interest in the use of PSI. By using tools that are less strictly, or not at all, controlled by government, Gov 2.0 aims to avoid the natural risk aversion that led to many of the e-democracy initiatives remaining hidden from public view and disconnected from policy-making (personal interview: Steve Davis, 10 January 2012). This picks up on Mary Griffiths’ observation that this can lead to ‘free flows of ungovernability’: openness is hard to control from the top-down and attempting to wind back on the provision of PSI is difficult when there are stakeholder communities organised around its provision (2002: 8–9).

This allows us to ask to what extent Gov 2.0, through the fostering of spaces for civic interaction and the data for a range of purposes (including rational dialogue), provides for the development of genuine and generative public engagement within the sphere of government. There is more potential in these aspects of the plan because of the relative autonomy of new data-driven civil society actors. The core difference between Gov 2.0 and earlier e-democracy initiatives is that, in the past, online engagement was seen largely as a task of ‘place making’ (as in *Field of Dreams*; Universal Pictures, 1989) by government, focusing on the development of tools, rather than communities. Social media in the public sector can be seen as providing significant potential for the development of ‘corporate

15 A project run out of civil society in a state with a distributed population.

dialogue’ between stakeholders and government authorities (Bonsón, et al., 2012: 125–26, 130–31). As dialogue often occurs in public spaces, its conduct is regulated by citizens who are part of these communities.

The ‘hobbification’ of Gov 2.0

In the move from e-democracy to Gov 2.0, the power relationship between participants is equalised. As co-creation activities, Gov 2.0 projects create mutual dependencies among participants. This is at considerable odds to the way in which top-down e-democracy initiatives have been more structured than the offline policy process. Indeed, the reluctance of organised groups (pressure groups, industry associations) to participate in many e-democracy activities is because the use of structure undermined their capacity to go outside of the formal policy cycle to have an impact on outcomes (for example, strategic arena shifting; Holyoke et al., 2012). Co-creation presents a challenging dynamic for governments, which places governance issues at the project level with ambiguous and context-dependent accountability and performance measures. Following the era of NPM, in which policy delivery through networks saw ‘increasing control over less’ and the use of ‘rubber levers’ to effect change, Gov 2.0 will present challenges to the public manager, but not unique ones.

What is interesting for the public manager is how Gov 2.0 leads to interactions with an array of participants. While NGOs and the private sector are well represented in NPM activities, Gov 2.0 draws increasing numbers of amateurs and individuals into the co-creation process. While this can lead to weak attachment to projects, it also changes the way citizens engage with government creativity. To fill the commitment gap, interest has been shown in the use of ‘gamification’. Gamification serves to increase rates of participation across a range of activities normally considered serious chores (Weaver, 2011: 21). A good example of this would be NASA’s planet hunters ‘game’ which involves citizens in searching for exoplanets around stars, using data provided by the space agency and challenging the public to find the largest number of new extra-solar planets (www.planethunters.org).

While an ambiguous concept, gamification generally involves the use of game mechanics (competition, intangible rewards) in activities that were not normally deemed to be playful in nature. These ‘serious games’ commonly serve a public good, and can be employed to encourage participation or adherence to an activity where other rewards are difficult to deliver or provide equitably. Alenka Poplin sees the implementation of serious games under the rubric of ‘playful public participation’ (2011: 204–05), a function of the changing nature of the citizen’s relation to the state, but also a characteristic of the difficulty of the attention economy. Playful public participation sustains interest in the

involvement of constructive games through a high-level of entertainment in the process of the simulation. The extent to which this model ‘scales’ from simple hit-and-run activities to more complex policy and program activity remains in doubt, however. Poplin suggests that game mechanics should be simple to ensure the most rapid movement from initiation to participation.

The rats in the walls

While some of the claims of Gov 2.0 fail to excite jaded public servants conditioned to ‘paradigm changing’ reform every few years, the idea has advocates from within government. These individuals and groups can be found across government, but Gov 2.0’s focus on open data and information exchange resonates with agencies that have public information roles (in the same way that the initial deployment of government websites in the early 1990s were commonly driven by department library and IT units).¹⁶ Former parliamentary librarian Roxanne Missingham (2011: 426–27), for example, sees the bottom-up nature of web 2.0 technologies as instrumental in accelerating their adoption in government. This has been supported by independent online communities of public servants who have been interested in innovation in government, like Ozloop (<http://apsozloop.ning.com>).¹⁷ Just as we saw in the movement of activist techniques for political protest through conferences and events (as discussed in Online anarchists and the democratisation of hacking, Chapter 4), the distribution of Gov 2.0 ideas through programming ‘camps’ and other training sessions is being facilitated by activists.

Following a model popularised in the ICT community, groups like the Australian Gov 2.0 Community¹⁸ have run programming events that bring computer programmers (public sector, private sector, professional and amateur) and data owners (agencies) together to engage in creative competitions to develop new applications for PSI. These gatherings (‘hackathons’ or ‘hackfests’) have been popular in the open-source community as focusing events that motivate the community of contributors to projects, and by major technology firms to encourage and support their developers. Usable products and product ideas have resulted from these events, but they are more likely to be useful in

16 Sometimes without senior management being aware. This did lead to a proliferation of sites and standards in the 1990s that required rationalisation as the cost of maintaining the functionality and accuracy of many of these sites became apparent.

17 The foundation of this was in response to the limits of online collaboration and information sharing within agencies. Ozloop follows a model established in the United States (www.govloop.com). The use of social networking services (SNS) for public servants allows the ‘nodding of behaviour’ associated with the innovative use of technology to distribute information and collaboration (personal interview: Steve Davis, 10 January 2012).

18 Situated around a google group discussion board: <http://groups.google.com/forum/?hl=en&fromgroups#!forum/gov20canberra> Recently a ning SNS has been established (<http://gov20australia.ning.com>) for this community.

developing ideas, demonstrating the possibility of toolsets and data repositories, and promoting specific organisations, technologies and groups.¹⁹ This can be achieved at comparatively low cost by the host organisation (the provision of space, food, and prizes commonly of lower total value than that produced at the event). The Gov 2.0 community has used this model in Australia (2010 and 2012) through forming partnerships between private ICT companies, government agencies with data sets of interest, and the network of programmers interested in using government data.



Illustration 18: 2012 Govhack (1 June 2012)

Source: Photograph by Gavin Tapp (cc), image source: www.flickr.com/photos/92795775@N00/7314896154/in/set-72157629998807028/

These events demonstrate that network forms of organisation meet in the intersection between the disaggregated and atomistic culture of computer programmers and hackers, and the tendency for policy to be increasingly produced from policy networks rather than structured hierarchical groups. The importance of advocates of Gov 2.0 also lies in demonstrating that this type of

19 For example, the use of laptop accelerometers as input devices (as opposed to their original function as safety features to protect hard drives against sudden movement) emerged from an event like this. These are now integral to a range of consumer-ICT products.

co-creation can be undertaken effectively and without the introduction of new forms of risk (Matthews; 2009: 21–22), a barrier to the implementation of Gov 2.0 that is more acute in the public sector than is found in the private.

The outsiders

While the Gov 2.0 Taskforce solidified the legitimacy of the concept in government, advocates of this model have been working outside of government to promote the value of open data. One of the best examples of this is OpenAustralia (www.openaustralia.org; part of the OpenAustralia Foundation), a website that aims to promote civic awareness of parliament and parliamentarians by employing available government data (such as Hansard transcripts and a member's register of interests) and value-adding them to improve accessibility and use by members of the public (Bellamy, et al., 2011: 21–22). Based on the popular *They Work for You* site in the United Kingdom (www.theyworkforyou.com), OpenAustralia demonstrates both the ease of emulation of effective models across and between jurisdictions, as well as the existence of a loose international movement of reformers interested in applying digital media to improve, enhance and reform democratic practices.

There are questions, however, as to the transferability of some ideas. While Australia and the United Kingdom share the traditions of Westminster, Australia's party model virtually eliminates the autonomy of members of parliament in the casting of their vote. Whereas their British counterparts are more likely to exercise a free vote (and therefore, as in the United States, can be subject to scrutiny based on their parliamentary record), the novelty of this in the Australian context limits the value of sites that increase transparency of existing parliamentary data. Moving away from strict reliance on government data,²⁰ the foundation has also imported a 'bottom-up' model for collecting and archiving copies of political leaflets online (www.electionleaflets.org.au).²¹ The limitations of the bottom-up collection of these records to date has been their partial nature and limited geographical coverage, as well as a focus on one type of transitory, election material only.

What lies beneath

Due to the uncritical adoption of ideas from Gov 2.0 in Australia, there is a tendency for the direct importation of a range of political norms and assumptions that need to be explored if we are to understand the politics of Gov 2.0 as a meta-

20 Which can be problematic in ensuring that services remain functional if the data structure provided by the host organisation changes.

21 Recently the foundation, with the support of the Gov 2.0 Taskforce, developed an alert service for planning applications that aggregates data from a range of local government websites (www.planningalerts.org.au).

policy (Bardsley, 2010: 67). Richard Heeks, writing about the transfer of ICT technology initiatives between different political cultures, sees these programs as 'carriers of context' (2005: 58). He employs case analysis to demonstrate the unintended transfer of the assumptions of systems designers. While focused on explaining the considerable under-performance of government electronic and online service delivery projects because of misfits between administrative and political cultures, this work highlights how underlying computer code can be important in structuring the behaviours of individuals who use these systems (Giddens, 1984). As Lawrence Lessig (ongoing) has argued, the core technical standards of systems can shape outcomes in specific ways through control over what systems can and cannot do. Employing the expression 'code is law' he argues for ICT to be seen through a lens of soft determinism. Given this, it is important to recognise the context ideas about Gov 2.0 might carry. This will provide indications of the political, as well as practical, implications of the idea for Australian public life.

Here come the eCitizens, ready or not

The first point of consideration is the way in which Gov 2.0 constructs citizenship. In his discussion of the potential benefits of the idea, O'Reilly (2009a) is clear in seeing the relationship between the state and the citizen as not one of top-down service provision (which he refers to as 'vending-machine government'), but as fundamentally participative: citizenship is not restricted to procedural participation in elections and services. In this way, the citizen should not see government as the guarantee of a minimum set of rights (democratic) or benefits, but as a place for self-actualisation. This argument reflects a classical notion of the liberal state, such as the public sphere as a site of freedom, as expressed by Hannah Arendt (discussed in Chapter 3). This notion also depends on the active and informed citizen, and one who is able to recognise their own needs, and act upon them in a meaningful way. The separation between the political and apolitical citizen has been theorised considered in a rationalist tradition of theorising American citizenship in a way that has seen the passive citizen as one who has made a rational decision because of their essential satisfaction with the status quo (see Dahl's (1961) notion of *Homo Politicus* and *Homo Civicus*). That this idea has influenced the concept of Gov 2.0 is evidenced by O'Reilly's use of classic texts in American politics as the basis for his arguments (2009b).

At the core of Gov 2.0 lies a reliance on the revised classical, political liberalism of the internet economy. Comparatively under-regulated, transnational and with a Darwinian attitude towards success and failure, the internet's social and business ethos sits neatly with the liberal state of the classical period of the public sphere, but in an era where the capabilities of individuals (real or artificial) to amass considerable and disproportionate economic and social power is magnified by technology. This presents a concern about the impact

of this set of ideologically invested technologies into the domestic context – particularly as this draws largely from a political environment without the Australian focus on egalitarianism as a positive task of government. It is not clear that open platforms will contribute to goals of social empowerment as much as furthering the knowledge gap that stems from the stratification of the educational opportunities that we see emerging as a result of unequal access to the information and training that builds information literacies.

Additionally, in an environment dominated by government-as-platform, we run the risk of seeing those who fail to build on these platforms as being unwilling to engage in the self-help available to them. This has key cultural impacts. As Andrew Kernohan notes: ‘In an inegalitarian culture, many of the beliefs that people take up from their cultural environment are based on beliefs about the moral inequality of persons ... If people base their ends in life on these false evaluations, their highest-order interest in coming to know the good will have been harmed’ (1998: 88). In examining neo-liberal education policies, Becky Francis has argued that the failure to take up ‘obvious’ opportunities discursively recreates these recalcitrants as ‘the undeserving poor’ (2006). Given the importance of education and information literacies in being able to shape (rather than use) the new toolsets available to the e-citizen, the declining importance of minimal procedural forms of democratic practice as representing ‘good citizenship’ leads to concerns about a widening participation gap between stratified groups of political and apolitical people in society (see the discussion of Dahl, below).

Bootstrap government

A second concern, and a flip side of the first, is the view that Gov 2.0 has of the nature of the state. In O’Reilly’s (2009b) discussion of ‘government as a platform’, he argues that government should see itself in the same manner as a web 2.0 provider: as a basis upon which civic action can be undertaken, rather than as a distributor, regulator, or arena. This lies at the core of the argument about the value of the concept. As discussed in Chapter 1, many advocates of Gov 2.0 cite the power of the internet to overcome classic collective action problems (Wilkinson and Huberman, 2007). As has been observed:

Many cases of technology employed in collective action appear to strain, if not outright violate one or another tenet ... the classic binary free-riding decision metric is not obvious [and] the pursuit of collective action occurs either completely or largely in the absence of formal organization. (Bimber, et al., 2005: 371)

These arguments have merit, and the power of collaborative co-creation, in circumstances where it has worked, has been shown to be remarkable in the output of projects, but also the ability to mobilise large numbers of productive participants (Ortega and González-Barahona, 2007).

It is necessary to question the quality of evidence that is presented as the basis for this model, however. The examples that are cited as exemplar 'bottom-up' projects are initiatives such as Wikipedia, the Firefox web browser, and the Libreoffice/OpenOffice.org productivity suite. Each of these began as, or ran parallel to, conventional projects that were then 'open-sourced' (Nupedia, Netscape Navigator, StarOffice). In addition, some of the key institutional supporters for these projects have been commercial interests that had economic motivations to increase competition in the marketplace (such as Google's support for Firefox to open up new markets to its search engine, or Sun's support for OpenOffice.org to reduce the market dominance of Microsoft's key cash cow products).²² Thus, while co-creation is a powerful generator of activity and value (each of these projects gained considerably in public value from distributed bottom-up participation), the role of institutions in developing these initiatives needs to be highlighted. This is not just in the role of fostering their initial development, but also in the way strategic decisions were important in identifying market failures that could be exploited by new, open-source offerings.

Adhocracy's limits

In addition to the generative question, we need to question what implications the open-source model has as a governance model, a significant question in the way software projects are run, and a critical one when dealing with the use of public resources. Governance in this context is commonly associated with the adhocratic organising model: one where the structure and processes of decision-making are designed from routines, or from scratch, according to each situation. This suits volunteer activities, but produces great variability in the decision-making process. Given the strengths and limitations of this model, it is not surprising that the most effective projects are those that are divisible into discrete tasks that can be delivered incrementally (e.g. Linux distributions and their use of 'rolling updates'), rather than projects that require cohesive structure or vision (such as the *A Million Penguins* wikibook initiative, which was ultimately described as 'unreadable'; Mason and Thomas, 2008). Given their rejection of conventional government-management styles and processes, it is not

22 This point needs development. Certainly, the role of Google in encouraging the development of browsers to rival the dominant Internet Explorer did not have commercial value to Google only, but also served to develop the web platform. Internet Explorer, as a once near-monopoly provider of web access, entered a prolonged phase during which it was not developed. OpenOffice.org helped to push the case for open standards for documents, which has had an impact on existing market players, but this largely benefited insurgent projects.

surprising that what is attractive about adhococracy to proponents of Gov 2.0 is its ends orientation (Hayes, 2001: 128). Processes in this model are generally a secondary consideration to the adoption of ‘what works’.

The de-emphasis of process and leadership is problematic for government, particularly in places where resource allocation and legal proceduralism are required (i.e. most of government activity, as conventionally defined). Additionally, as Francis Rouke and Paul Schulman (1989) observe, the historical use of adhococracy by governments tends to be found in commissions of inquiry, investigations into disaster, and responses to sudden systemic shocks that signal a period of exception, where normal processes and procedures have broken down (see also, Mendonça, et al., 2007). The problem with these organisational systems, they contend, comes in the lack of accountability these decision-making arrangements bring and the relatively arbitrary treatment of rights by decision makers.

This is present in some of the exemplars cited by O’Reilly, such as the Apple iPhone. In recent years, Apple has been criticised for its internal processes of reviewing and approving applications that can run on its platforms. The company has been criticised for taking a conservative approach to the approval of material with adult content (including restricting graphic novels of classic literature) and refusing to publish political cartoons (Tate, 2010).²³ Critics of Steve Jobs’ company’s approach to censorship is that it lacks rigour in process. Responses have been arbitrary and based on aggregate popular opinion in the marketplace. This latter tendency has been seen in the differential treatment of adult graphic novels, with strong preference given to those that display heteronormative content. Arguments that the internet, by nature, automatically disintermediates hierarchies (social, economic, political) has not been born out in practice: the iTunes/App Store model itself represents a process of reintermediation and the reinsertion of Apple as an intermediary because it has control over a key point in the distribution chain at which rents can be accessed.

Time, again

Developing from the point above is the idea that Gov 2.0 has to be recognised as the transmission of approaches and models from the leading edge of online business practice. The focus on web 2.0 business models as the key technical example of what Gov 2.0 might look like in practice presents problems, largely because of the uncertain nature of ‘success’ in the web 2.0 environment. The interactive and flexible photo-sharing service Flickr is an example of how unstable online properties and services can be: lauded in 2007 as a web 2.0

²³ Should this surprise us? Consider the example of the physical public-private space: the shopping mall, and its owners’ tolerance of unregulated speech-acts.

pioneer (an online content aggregation, storage, indexing, social networking, and editing service) which insulated Yahoo! against its search rival Google (Sterling, 2007); by 2010 its fortunes were flagging as casual photo sharing moved rapidly to Facebook.

Governments have history, whereas the internet has very little. Thus, the promotion of Gov 2.0 carries a strong valorisation of the work of the private sector in creating public goods, omitting those who have crashed out along the way. O'Reilly identifies the best examples of platform providers as those economically successful parts of the ICT industry:

... every big winner has been a platform company: someone whose success has enabled others, who've built on their work and multiplied its impact. Microsoft put 'a PC on every desk and in every home,' the internet connected those PCs, Google enabled a generation of ad-supported startups, Apple turned the phone market upside down by letting developers loose to invent applications no phone company would ever have thought of. In each case, the platform provider raised the bar, and created opportunities for others to exploit.

More recently, O'Reilly (2010) has drawn an even stronger analogy between Gov 2.0 as a bountiful 'supermarket' full of products, compared with Gov 1.0 as a soviet system of supply.

This reliance on a specific section of the private sector as a paradigm for public production is a problematic for a number of reasons. First, the analogy is weak. The examples employed overstate the similarities of the business models that made these companies successful; for example Google's open-access tools that are most likely to be used in Gov 2.0 mashups, such as Google Maps, are not a major part of the company's core economic strength (its vanilla search is). Second, it implies 'platform' is an open and participative concept, which is not necessarily the case. There are considerable differences between the provision of software for undifferentiated clone computers created by Microsoft and the locked-down environment of Apple under Jobs' most recent tenure (Zittrain, 2008: 3). Additionally, while Google may have 'enabled a generation of ad-supported startups', it eats its young when it feels the need (for example, the acquisitions of YouTube, Blogger, Picasa, and the online documents suite components among many others).

Publicising or privatising?

The final point of consideration is the extent to which Gov 2.0 asks government to emulate the dotcom heroes. If we look at the definition of Gov 2.0 developed by the consulting firm Gartner, it is defined as 'the use of IT to socialize and commoditize government services, processes and data'. (Di Maio, 2009). This is

conveyed in the taskforce report, which characterises one of the three pillars of Gov 2.0 as the release of public sector information with ‘additional rights of access, rights to freely reuse, republish, repurpose and otherwise add value to government information’. The point of this recommendation is that large amounts of potential value sit in Crown copyright government information, which, if harnessed by entrepreneurial individuals, could create new value and expand the public investment in the collection of this data.

While this idea may have merit, it does not emulate any of the strategies of success used by the exemplar companies of O’Reilly’s list. Companies, such as Microsoft, flourished on the back of commodity hardware provided by other firms: effectively adding value to its proprietary products and services by lowering the comparative adoption costs of its platform against one with high switching costs through proprietary file formats. Google only provides its information as a service, not in machine readable raw form: its value-added database of websites is a major part of its ‘secret sauce’ and one it defends viciously (attacking rivals who attempt to reverse engineer Google’s search results to improve their own products; Singhal, 2011). Google’s release of data on trends and other statistics are commonly only provided in a form that is not machine-readable and does not provide comparative axes.

Where online firms have made the data releases that Gov 2.0 proponents call on, unanticipated problems have emerged. A good example is the release of three months of ‘de-identified’ search data by AOL in 2006 for researchers working on search technology (Kirk, 2006). This data was quickly analysed by members of the public and used to identify individuals from the raw material by looking at the text of successive search queries. It’s not surprising that members of the taskforce (which included a representative from Google Australia) would call on the release of government data: the indexing and use of data is what has made that company successful. That these unidentified and subsidiary-use activities run counter to the general thrust of privacy debates is a subject that has gained scarce attention.

Sustaining change

Gov 2.0 presents a range of possibilities to the Australian public sector. Like previous technology and openness revolutions, it has numbers of adherents and has generated interesting and valuable outputs. The limitations of the model, however, need to be considered further, and there is ambiguity in the political assumptions built into a reform model that is based on the valorisation of one part of the US-centric ICT industry. Like the e-democracy revolution before it, Gov 2.0 needs to more closely consider the political history and context of Australia in the way it adjusts its ideas to the Australian political landscape.

Thus, we need to question the extent to which the advocates and hackers have the pragmatic political experience to ensure the sustainability of their initiatives over time.

While the Gov 2.0 community gives considerable attention to technological exemplars for emulation, more attention to the political reality of radical openness initiatives is needed. Australia's experience with its respective *Freedom of Information Acts* (FOIA) is informative. A classic 'open government' initiative of the 1970s, and imported into Australia by reformers, Rick Snell has demonstrated how the limited use of the act by Opposition MPs and journalists to embarrass governments has led to decreased commitment to the spirit of these reforms (2002). Because of the reality of the use of these initiatives for partisan purposes (Stubbs, 2008: 672–73), FOIA remains an under-funded and understaffed area of public administration, largely because governments see it as adding nothing but trouble to public administration.

All the myriad ways

The data-driven policy agenda is still in its early days and its direction is uncertain. While there are tendencies in the project towards an uncritical adoption of aspects of 'start-up' culture that are at odds with the role of the state in providing equitable services to all, the heart and soul of these projects remain up for grabs. The inclusion of a wider range of participants 'hacking away' at/in the heart of government means a more interesting mix of participants. Just as the 'femocrats' of the 1970s and 1980s saw activist bureaucrats pushing within the public sector to diversify and expand the way policy considered the issues of women in the Australian public sector (Sawer, 2007: 20), it is likely that this new group of activist-programmers will be able to expand the ways that governments think about the development and design of policy and programs to be more transparent and participative. As with the feminist infiltration, there are questions regarding whom these policies benefit and the capacity of positive technical and cultural changes to be sustained over time, particularly those democratic initiatives that significantly challenge entrenched elites. The attacks on feminist policy structures in the 2000s and beyond in Australia show that these 'wins' are not necessarily permanent, and we have seen how initiatives aimed at general openness can be perverted by partisans and undermined over time.