Information Technology and Administrative Reform in the Digital Society

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Introduction

Heinrich Reinermann's 2015 paper "Where is the Digital Society leading? A Sketch Map of Neuland,"[1] commented on the double-edged sword of information technology (IT). For every positive aspect of the new technology's use, there seems to be a countervailing negative. Use determines impact. Public administration sets policies to promote the positive and ameliorate the negative. Reinermann argued that the technology, the technologists, the technology industry and the individuals and organizations that use technology cannot be left to their own designs. They must be channeled for positive social impact. His account of his own transformation contrasts his current work with his dissertation: "Thesis on the optimal design of the working day in the industrial plant,"[2] in which he developed techniques of mathematical programming to optimize the control of various performance determinants". He joined the Speyer School of Administrative Sciences and "directed his work toward quantitative methods, automated data processing and programming in the field of public administration."[3]

Reinermann was devoted to teaching and research to help senior executives in government realize the potential benefits of using IT to improve the efficiency and effectiveness of public administration. His work on education and training, design of information systems, and organizational change was aimed at taking advantage of the technology. It was scientifically sound, idealistic and normative. He promoted application of IT to transform public administration. He later expressed dismay at the failure of many reforms[4] and developed a nuanced view of the implications of

1 *Reinermann* 2015.
2 *Reinermann* 1968.
3 Wikipedia 2016.
4 *Reinermann* 2008.

digital society.[5] He became a social analyst of the technology. We too were social analysts of IT and admired Reinermann for this personal and intellectual transformation, taking his work seriously enough to critique it. We challenged his theses about computers in public administration, arguing that his assumptions might be true in theory, but seldom true in reality.[6] We argued that people and organizations use the technology to reinforce political, economic and social interests. To the extent technology serves the broader interests of the organization, the public, or society it is a secondary consequence of these interests. Reinermann never lost his idealism, and we never stopped critiquing it. In this paper we review the arguments, examine what has changed, and assess what it means.

Our work on IT and government in the U.S. took place in U.S. local governments and some Federal agencies over thirty years between 1970 and 2000. We deal with the question of whether things have changed since 2000 in the final section. Throughout our efforts Reinermann was a kindred spirit, interested in adoption. We felt U.S. government leaders were too enthusiastic about IT. Reinermann felt German public administrations were too slow to adopt information technology. When the Internet arrived people could see the power of IT everywhere, whether it was there or not. By 2000 the U.S. side was more enthusiastic than ever, and German public administrators had become avid adopters. Everyone hoped for greater efficiency in routine operations from IT. Reinermann joined others to call for government reorganization that would complement IT and bring greater effectiveness, especially to encourage citizen interaction with government. He promoted IT-enabled innovations such as citizen front offices, online services and online voting. Did this reform happen?

Reform Through IT

From our view, most studies of IT have concentrated on efficiency and effectiveness, changes to organizational structure and effects on work life of employees. Government officials have been interested in these issues, but they have also been interested in whether IT will produce administrative reforms that bring better service delivery to citizens. Reform ideas are not new, and predate IT as we think of it. Reforms have been made in structure (for example to the city-manager model), budgeting (for example

5 *Reinermann* 2015.
6 *Reinermann* 1988; *Kraemer/King* 1988.

executive, performance and program budgets), financial (for example unified accounting) and personnel (for example merit-based employment and pay). IT has been an instrument of such reforms. This was seen prior to 2000 mainly in urban information systems, IT-based models for policy making, geographic information systems, and enterprise resource management. Recently E-Government and Internet applications have been a major focus to bring about transformation in government.[7]

Speculation about computerization and organizational transformation has been around for more than half a century. A 1958 Harvard Business Review article by Leavitt and Whisler titled "Management in the 1980's"[8] said IT would destroy the traditional pyramidal hierarchy in organizations, and bring about a lean structure resembling an hourglass. Productivity would soar and most middle managers would be eliminated. The1974 book by Laudon, Computers and Bureaucratic Reform,[9] saw IT having the potential to transform local government. These reform notions are enduring, continuing into the millennium as illustrated by Fountain's 2002 book, focusing on the Federal government. She argued, "Technology is a catalyst for social, economic and political change at the levels of the individual, group, organization and institution".[10] IT could cause such changes, but it has not.

The rhetoric of IT facilitating administrative reform has been largely the same over the decades, but it is in the context of more efficient operations, better quality of service and easier public access to government information and services.[11] Today, E-Government promises these things as personal computers and the Internet are in households of the developed world, many people carry Internet-enabled mobile phones, and E-Services are common in business and government. By 2004 95% of U.S. city and county governments had websites. However, it is important to look beyond these adoption statistics. Most of the sites identified in 2004 were "informational", providing descriptions of services, dispensing government records and maps and so on). Fewer than 10% supported transactions like paying taxes, utility bills, parking tickets, and license/permit charges.[12] Thus, while IT investments increased for governments, and "readi-

7 *Reinermann* 1988; *Fountain* 2002; *Gasco* 2003; *Garson* 2004.
8 *Leavitt/Whisler* 1958.
9 *Laudon* 1974.
10 *Fountain* 2002.
11 *King/Kramer* 1985.
12 *Moon* 2002; *Norris/Moon* 2005.

ness" for administrative reform from IT was stronger than ever, the question of whether such reform occurred remained.

Machiavelli's admonition about the perils of leading change is as relevant in the 20th century as it was in the 16th century.[13] IT *can* be an instrument of administrative reform but there is little evidence that it has been. Organizational elites who want change, can use IT to accomplish it, but prior to 2000 IT was used mainly to reinforce the status quo.[14] Why the persistent hope for the reform hypothesis? In 1985 it was argued, "...today's applications of information technology can dramatically change the way individuals, functional units, and whole organizations carry out their tasks".[15] Yet Kling[16] showed that information and referral systems, meant to help public and private agencies improve service delivery by sharing information, failed. The agencies did not see benefits "to themselves" from sharing, and the systems expired along with the reform efforts. IT *can* bring operational[17] and work life improvements[18], but it seldom brings reform unless in the hands of pro-reform agents at all levels.

Has the Internet changed this? Most of our research on government ended by 2000, but we have looked at other research since then. The Internet has had major impacts, but it appears that the reform expectations have still not been met. Several studies have showed little change[19]. Fountain assumed that the Internet "...would overwhelm organizational forms and individual resistance and would lead to rapid organizational change," but concluded "...even the most innovative uses of IT typically work at the surface of operations and boundary-spanning processes and are accepted because they leave the deep structure of political relationships intact."[20] West concluded that E-Government, "… has fallen short of its potential to transform service delivery and public trust in government."[21] Norris and Moon's 2005 review of multiple e-government studies concluded that local E-Government remains informational, is not achieving the potential benefits hoped, is incremental and not yet transformational, and that local

13 *Machiavelli* 1513.
14 *Danziger/Dutton/Kling/Kraemer* 1982; *Dutton/Kraemer* 1985; *King/Kraemer* 1986b; *Laudon* 1974; *Holden* 2003.
15 *Gibson/Hammer* 1985.
16 *Kling* 1978.
17 *Kraemer/Kling* 1985.
18 *Danziger/Kraemer* 1986.
19 *Holden* 2003; *Kaylor/Deshazo/Van Eck* 2001; *Moon* 2002; *Norris/Moon* 2005.
20 *Fountain* 2002.
21 *West* 2004.

e-government in the future would be like it had been in the past.[22] Audit reports of Federal government information systems projects tell a similar story.[23]

Yet hope remains. The U.S. Office of Information Technology believes in the dream, saying failures are due to poor management: "Information technology (IT) advancements have been at the center of a transformation in how the private sector operates—and revolutionized the efficiency, convenience, and effectiveness with which it serves its customers. The Federal Government largely has missed out on that transformation due to poor management of technology investments (…)."[24] In "Datawars: The Politics of Modeling in Federal Policymaking"[25] we found that the poor "management" euphemism covered value differences between political parties with regard to many social welfare benefits and agricultural subsidies. Within the government, it often refers to bureaucratic squabbles over the objectives of information systems, data sharing, data access, user resistance, and a host of essentially political issues. Poor management certainly exists in some cases, but we think the failure of reform efforts is due to something more fundamental than management shortfalls.[26]

The problem is with expectations. Mainframes were thought to reinforce hierarchy by consolidating data and expertise. Microcomputers were thought to facilitate decentralization through distribution of data and expertise. Yet study after study by social analysts of computing found reinforcement of existing structures of communication, authority and power, whether centralized or decentralized.[27] IT was correlated with size of middle management, but changes were contingent on the views of senior leadership. Middle management proved to be reduced only when IT decisions were made by senior managers in times of fiscal stress. More often, middle managers were able to show value to senior leadership by using IT thereby reinforcing if not enhancing the existing middle management structure.[28] This enhancement has been borne out by historians of computing as well as by social analysts. Historian Rebecca Slayton wrote

22 *Norris/Moon* 2005.
23 US Government Accountabilty Office 2016.
24 White House 2016.
25 *Kraemer/Dickhoven/Tierney/King* 1987.
26 *King/Kraemer* 1986a.
27 *Laudon* 1974; *Robey* 1981; *Danziger/Dutton/Kling/Kraemer* 1982; *George/King* 1991; *King* 1983; *Pinsonneault/Kraemer* 1997; *Pinsonneault/Kraemer* 2002.
28 *King* 1983; *George/King* 1991; *Pinsonneault/Kraemer* 1997; *Pinsonneault/Kraemer* 2002.

in the IEEE Annals of the History of Computing, that: "If one theme pervades popular imagination and memory about the computer is it revolution. But the term begs scrutiny. Sometimes the 'computer revolution' is linked ironically to the dramatic enhancement of dominant power structures …."[29] In The Computer Boys Take Over, Nathan Ensmenger, argues that whoever frames a problem with computing as the solution tends to derive the benefits of computerization.[30]

IT decisions in organization are made by managers and subordinates who serve an intersection of interests that include their own. They enhance information available to themselves, increase their control, and rationalize decisions to superiors, subordinates and clients. Use of IT shows professionalism and rationality. It can be beneficial for administrators, staff, citizens and public administration as a whole, but much depends on what "beneficial" means. Most IT is applied to structured and repetitive tasks at the core of organizational operations: producing bills, recording payments, paying vendors and employees, recording documents, answering inquiries, and so forth.[31] IT can improve administrative performance. This reinforces values of efficiency and social control but it does not enhance the welfare of the poor, the homeless, the aged, or the handicapped. People without power typically do not benefit.[32]

Reform with IT is difficult when those who control IT do not want reform. Top managers understand their own interests and exploit IT in pursuit of those interests. When their interests coincide with government interests, they push IT application aggressively. Governments with professionalized administrations are more likely to adopt and apply IT.[33] But that does not mean IT application is focused on reform. Hierarchical bureaucracies with or without IT can distribute authority, resources and responsibility downward to work units, and cause information to flow upward for control. Most managers want to keep it that way, for good reasons. It can help that model, refined by decades of improvement that works well for complicated tasks. Senior government managers want to improve efficiency, productivity, and organizational control because doing so fits the established bureaucratic model. IT can help management to enact immediate and across-the-board changes affecting subordinates, such as the elimina-

29 *Slayton* 2008.
30 *Ensmenger* 2012.
31 *Danziger/Kraemer* 1986.
32 *Kraemer/Kling* 1985.
33 *Danziger* et al. 1982.

tion of funds for all "open" positions, enactment of budget cuts, or assignment of overhead expenses and is not power-neutral. IT reinforces hierarchy. There are reasons to reform government, but IT conforms to existing behavior and practice.[34]

Implications

The Internet did bring business transformation, including productivity gains.[35] Dedrick and Kraemer showed how the personal computer industry responded to competitive market forces and moved from vertical, supply-driven models to virtual, demand-driven models that better matched supply and demand and avoided cycles of excess inventory and product shortages. This "direct" vs. "indirect sales model" soon became an industry convention.[36] IT allowed refinement of information processes for improved efficiency. The catalyst of this, Dell Computer, did not reform the industry as much as create a superior model. Initially, no other personal computer company matched Dell's efficiency, yet Dell itself stumbled and had to become more like the rest of the industry to survive. Growth has recently moved to mobile devices such as smart phones. Yahoo, Wal-Mart, Amazon.com, e-Bay, Google, Facebook, Uber might dramatically rethink business enterprise, but success can be short-lived and the long-run is a challenge.

So what about government and reform? Studies done since 2000 suggest that hope for reform is elusive.[37] There are significant effects, but reform is not one of them. For example, although networking enables new government-citizen interactions and changes in how tasks are done and how work is organized, elites in charge before networking are still in charge after. Examples from competitive enterprises are risky to apply to government, and comparisons are often poorly done. For one thing, IT's effects on business can be more complicated than first appears. Despite stunning successes, many innovative companies failed and disappeared. There are no clear and lasting lessons. In addition, government deals with things the private sector does not. Governments are not driven mainly by

34 *Westin/Laudon* 1986.
35 *Brynjolfsson/Hitt* 1998.
36 *Dedrick/Kraemer* 2005.
37 *Fountain* 2001, *Fountain* 2002; *Holden* 2003; *Kraemer/King 1987*; *Kaylor et al.* 2001; *Moon* 2002; *Norris/Moon* 2005; *Slayton* 2008; *Enslinger* 2012.

market forces, but by missions and the ways they must work is specified by statute or executive order. Radical innovation in government is more often characterized as reckless adventurism that puts constituents at risk than as part of Schumpeter's "gales of creative destruction."[38] Nevertheless, Governments can learn from business and well-established production systems can be changed to produce benefits for constituents. This requires that government leadership embrace new models of governance and service delivery, and then bring IT into consideration.

Most E-Government initiatives are part of the broader reform agenda emphasizing customer service and responsiveness to citizens.[39] All such efforts seek to reduce corruption and increase professionalism. IT might play a role in this reform, but it is not a foregone conclusion. Reform efforts in public administration that have been around for more than a century have made government less corrupt and more professional. This is less the result of technology than result of sustained efforts by leaders who, often at risk to their careers or themselves, work toward reform. This started long before IT as we know it. IT can be an instrument in the service of this elite, but IT cannot cause reform.

One can also see E-Government as a powerful but subtly misguided form of positive technological determinism that sees new technologies as forces that will be used to change things for the better. This "faith in technology" position is as understandable as it is common.[40] Most people, including those in developing countries, have experienced the benefits of technological change. The positive results of technology (improved health care, sanitation, education, communication, transportation, … – the list is long) disposes people to believe that advances in technology produce positive results. E-Government must be a better way, but "Better for whom?" People often argue that transparency is positive, but it is not for corrupt politicians that will fight against it with skill and guile. The enlightenment brought the insight that people seek powerful positions because they like power, that power tends to corrupt, and that the only effective check on power is power. Thus was born the concept of "separation of powers" essential to sustainable society (all society, not just democratic society). People who like and seek power do not enjoy having their power reduced.

38 *Schumpeter* 1942.

39 National Performance Review 1993; Executive Office of the President 2003.

40 *Garson* 2004; see also the review of e-government research by *Heeks/Bailur* 2007.

They work against such reform. This is not an IT thing. It is a human thing.

A technology advance or an improvement in process might be followed by reform. The fact that reform has not occurred as many hoped as a result of IT's application does not mean that reform cannot happen. However, thus far there is little evidence that IT use produces the reform hoped for. This is not because IT is irrelevant to organizations or to reform. There has been ample evidence to show that IT use can bring productivity gains, and enable things that could not be done before. These outcomes are in the interests of organizational elites, who seek them and support them. Outcomes that reduce the power, influence, or control of elites are much less likely to receive support from elites. To achieve such outcomes it will be necessary for elites to lose control over IT decisions, thus allowing applications against their interests, and/or for elites to set in motion IT applications that are so powerful they damage elite interests irrespective of elite efforts to stop such outcomes. Neither seems likely in the foreseeable future, but neither is impossible.

Conclusion

We return to Reinermann's efforts to improve public administration with IT. Reinermann's concept of the Digital Society includes more than the Internet and E-Government. The Internet is an infrastructure that will evolve and become central to all kinds of activities. We believe E-Government is a passing fad that will flare and then fade as many other management fads do (for example management by objectives, zero-base budgeting, following best practice, doing more with less). Nevertheless, Reinermann was right that E-Government can produce long-term changes. Technology including IT can play a major role in transformation of sectors. Yates argues that communication technologies gave rise to system approaches in American management between 1860 and 1920, and that the U.S. insurance industry was remade by IT in the 20th century.[41] The automobile industry was transformed in the twentieth century in large part because of IT.[42] Herman Hollerith's Tabulating Machine Company (that grew into IBM) dramatically improved the tabulation of the 1890 U.S. Census, and that the very notion of Waldo's administrative state would

41 *Yates* 1989; Yates 2005.
42 *King/Lyytinen* 2005.

probably not have been possible without IT.[43] Use of IT is likely to affect government dramatically over the coming decades. But one must be careful with such predictions. Much depends on what effects are expected.

We stand by our view that IT is unlikely to alter governmental structure or citizen engagement with government. Thus far IT in and of itself has had little effect on reform. As a general-purpose engine IT can facilitate reform efforts, or thwart reform efforts. True reform begins and ends with political will. Reinermann's early efforts were to make things better. He used the term "optimize" but he was not seeking local optima, much less global optima. He was just using a word – optimization –popular at the time. Herbert Simon argued in 1956 that "satisficing" should replace optimizing.[44] In time he was successful, but optimization remained a euphemism for the best available solution to a problem. Application of IT can help achieve the best available solution when improvement in performance is supported by organizational elites. Why should they not? As government organizations face increasing demands, shrinking resources, and more fraught political climates, improvements in efficiency and effectiveness are welcome, as are innovative responses to challenges. IT can bring such benefits, and there is nothing to preclude government organizations from enjoying such payoffs from thoughtful IT investment. Reinermann argued for such applications, and in this he was right.

Reinermann's work was an appeal to the potential for application of IT. It is not Reinermann's fault that organizations fall short of potential. Reinermann pushed against the reluctance of German public administrators, encouraging them to take seriously the potential of IT. We pushed against the tendency of U.S. public administrators to assume that IT would produce positive outcomes, encouraging them to dwell on the expectation failures. It is easy to take Reinermann's work and our work out of context. If so, one can see significant differences in our conclusions. In the respective contexts of Germany and the U.S. Reinermann's work and ours look similar. IT alters productivity in organizations, and reinforces values of organizational improvement in execution of basic organizational tasks. Sometimes these changes are significant. The aspirations of reform – better relationships between government and citizens, lower corruption, greater responsiveness of government to the needs of society – are worthy aspirations. The fact that Reinermann emphasized them as aspirations and that our work concentrated on the shortfalls can be seen as flip-sides of the

43 *Waldo* 1948.
44 *Simon* 1947; *Simon* 1956.

same coin. That probably explains why we were attracted to each other's work.

It is possible that IT might change political dynamics in civil society whereby government leaders are elected and appointed.[45] In our research we saw that IT-based modeling did not alter the apparatus of government, but it did change the processes of political mobilization. Perhaps the processes whereby IT influences reform are less direct than normally imagined. We have drawn lessons from U.S. Presidential elections that are now replete with examples of the ways in which IT can alter political balances and fortunes. IT influences fund-raising, polling, and communication. This is true for other national, state and local elections, as well as for government operations. It is possible that the most significant impacts of IT on government might be in the most political dimensions of government. IT might remain only a tool, but it is a powerful tool. The 2012 and the current U.S. elections suggest that those skilled in IT use can gain temporary and marginal advantage, but the stakes are high. Key players cannot afford to be left behind. They catch-up fast. IT use throughout civil society might, in time, have greater effects on governmental reform than IT application to organizational processes. Perhaps the aspirations of Reinermann will come to pass in public administration, but not in the ways that Reinermann (or we) anticipated.

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[45] *Kraemer/King* 1986.

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