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History and IS – Broadening Our View and Understanding: Actor–Network Theory as a Methodology

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Introduction

The call for a historic turn in IS studies is mirrored in business studies generally and is the explicit recognition of the predominance of presentism and universalism in research. It is an implicit but unstated assumption that the present is the product of an extended, unproblematic and universally shared past (Booth and Rowlinson, 2006). ‘Presentism results in research being reported as if it occurred in a decontextualized extended present’ (Booth and Rowlinson, 2006: 6). This critical assumption centers the present as if it were a stable entity stripped of its messiness and uncertainty leading to the observation that, ‘Most of our mainstream journals [organizational studies, in this case] are written as if they apply to some disembodied abstract realm’ (Zald, 1996: 256).

The past, if it is addressed at all, is summed up in a paragraph of an article or Chapter 2 of a text (Jacques, 2006), which draws cursory connections between the past and present, providing a helicopter summary of the past (Clark and Rowlinson, 2004). From this high vantage point, selected elements of the past are used to validate current positions and understandings, while ignoring anything from the past that would contradict that position. This unproblematic rendition of the past justifies an exclusive focus on the present as a self-contained and the logical

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outcome of the past (Zald, 1996). 'This common genre of anachronistic writing trivializes history because, since everything has always been the same anyway, what can the past offer except exotic examples to illustrate today's mundane issues' (Jacques, 2006: 41).

The call to history in IS research is a call for context to test and to challenge existing theories and methods (Ciborra, 1998), to test our framing of the problems we identify (Preston, 1991) and to challenge potential complacency in the field (Boland and O'Leary, 1991). First, the call to history is a call to recognize contingent presents, the unique circumstances of a setting or settings in which a new artifact comes to be shaped, interpreted and enacted or rejected (Swanson, 2002). Promoters of change involving technology encounter unique settings in which other technologies, their advocates and the word views already exist and are understood (Bannister, 2002; Chae and Poole, 2005).

Second, the call to history is a call to avoid the consequences of inserting divides in time, through a focus on an artifact. An example would be the modern computer, creating a post-computer world and an irrelevant void before it (Land, 2010). Issues, practices and ideas, which may be magnified by computer technology, often have a prior life and history that shape their manifestation in the present (Scranton and Horowitz, 1997).

If our theories and explanations fail to account for context and are restricted to presentist abstracts of the 'world out there' that others may not see and experience, this raises serious challenges about the work that we do, the value of that work to others, and is cause for reflection on our impact as educators (Land, 1996). The call for a historic turn is a call to question and challenge ourselves.

If the challenge is accepted the question becomes, how does one do history? Pointing out problems with presentism does not offer a solution or a way forward. This paper proposes and demonstrates the application of Actor– Network Theory (ANT) as a means of conducting historical research that reduces the likelihood of presentism. ANT enables this by viewing the present as an outcome, something that requires explanation. To understand this outcome, we must go back to moments in time when it could have been otherwise, when the outcome (the present) was merely one option among many. From these moments we must discover, trace and recreate past actions, however diverse, that combined to produce the present.

The next section articulates the central tenants of ANT as they relate to historical inquiry, and then demonstrates the use of ANT in a case study. This is followed by a discussion of insights gained in terms of this specific case, followed by concluding comments.

Actor–Network Theory

ANT is not a theory so much as it is a philosophical view that, if embraced, leads to a simple but overriding principle, ‘follow the agents themselves’ (Latour, 1999a: 128).

Actors know what they do and we have to learn from them not only what they do, but how and why they do it. It is *us*, the social scientists, who lack knowledge of what they do, and not *they* who are missing the explanation of why they are unwittingly manipulated by forces exterior to themselves and known to the social scientist’s powerful gaze and methods. (Latour, 1999b: 19; emphasis in original)

This statement reflects ANT’s basic ontological assumption. The ‘world out there’ and the pieces of it that we wish to understand is the product of diverse past actions and association that come together, over time, to produce the present. Coming to know reality, epistemology, requires identifying and following those actually involved in its creation. Find them, follow them and trace the prior work, actions and associations that combined to configure and produce the present. Thus the essential focus of ANT is on the ‘How?’ question.¹

ANT does not tell anyone the shape that is to be drawn – circles, cubes or lines – but only *how* to go about systematically recording the world-building abilities of the sites to be documented and registered. (Latour, 1999b: 21, emphasis added)

The term actor–network needs to be examined to explain the idea of ‘world-building.’ Actor refers to anyone or anything that enables or causes others to act (Latour, 1992). An actor can be human, non-human or a combination of both. The human aspect is fairly straightforward while the non-human aspect is problematic for some, although it should not be in our field. Imagine taking your conference presentation material, stored on a memory stick, into a conference room that only has an overhead projector or has a computer projector but the bulb does not work. You the presenter and your presentation are defined and define each other in conjunction with technology (non-humans). Humans and non-humans define each other in action. They are actor–networks.

The term network is more problematic for our field because it has pre-existing connotations. We tend to think of wired or wireless networks that have fixed properties such as telephone lines, transmission towers

and switching stations: elements of fixed infrastructure (Latour, 1999b). Network in the sense used in ANT are more like associations with varying degrees of stability. Networks are connected local actor–networks nodes (Callon, 1991). This transition from micro to macro (associated micros) requires local actor–networks to willingly align (converge) around something, such as an idea, a goal, a technology potential, a public hearing, a profession, or some other intermediary. To enlist others, or for other actor–networks to willingly align around it, an intermediary must permit translation, negotiation, drift around its interpretation and substance so that different local actor–network interests can be accommodated and combined (Latour, 1999c). What eventually emerges from this constant negotiation of and with the intermediary may have little bearing with how it was originally conceived. Subsequent events and actions determine its shape and trajectory. In itself this is a challenge to presentist tendencies, the inability to assume a straight line between what an advocate proposed and what eventually emerged. Additional ANT features that resist presentism are discussed shortly.

The linking of local actor–networks in action and apparent alignment around this flexible intermediary may be fleeting, say for the installation of a new piece of technology, or more durable if it results in the creation of a profession, for instance accountants. Network building may never get off the ground for failing to enlist the willingness of others to act on the intermediary's behalf,² or network building may be so successful that the outcomes become irreversible (at least for the foreseeable future) that the outcome becomes punctualized, that it becomes a taken for granted, a black box (Callon, 1991). These black boxes, say for instance communication standards, become built into subsequent infrastructure and deeply embedded in many actor–networks (Hanseth and Monteiro, 1997). Once created, these black boxes inscribe behavior and become obligatory passage points (Callon, 1986; Latour, 1992). If you wish to communicate using electronic data interchange, there are very specific standards to follow. If you wish to drive your automobile on public streets, there are standards around which side of the road you should drive on. This is where the hyphen between actor and network is critical; it does not hold actors and networks apart, rather it stresses the inter-relationship between the terms as defining each other in action.

With this understanding of the ways in which reality and the present come to be, ANT then asks us to work backwards and 'follow the agents' to uncover and reveal the 'world building abilities' of the actor–networks involved that produced and may still be producing the present. ANT suggests that we 'follow the agents [actor–networks]

themselves.’ How do we identify the actor–networks we should follow and how do we avoid presentism and universalism? This leads to the final two elements of ANT that are critical for this discussion of ANT’s potential for historical inquiry in IS: controversies and the insertion of divides.

Controversies represent moments in time where a degree of symmetry and equivalence exists between competing ideas. These ideas are subjected to ‘trials of strength,’ a competition between the ideas and their supporting actor– networks. Black boxes or ‘taken for granted’ represent asymmetry; they emerge from the settlement of past controversies (Latour, 1988). Thus ANT seeks to understand the closure of controversies, how black boxes, taken for granted or obligatory points of passage, emerged from controversies through rediscovering, understanding and explaining ‘the work that generates inequivalence and asymmetry’ (Latour, 1988: 169). Controversies are vehicles for discovery because in controversies actor–networks for competing positions are most visible and can be seen. These are the actor–networks to follow, the actor–networks that have something to teach us about the present. ‘The aim [of empirical ANT work] is to open up these black boxes, these simplifications that we take for granted all too often and expose the way that translations occur and associations are generated’ (Doolin and Lowe, 2002: 73). Questioning the taken for granted and focusing on prior controversies helps us avoid presentism by tracing events forward from an uncertain past rather than searching for evidence of the present in the past. The actual paths taken from the past to the present can meander; paths drawn from the present to the past tend to be unnaturally straight.

Finally, the issue of inserted divides concerns severing connections and decontextualizing the present. Technology and humans are not divisible in action but are defined in action together. Dividing them and treating them separately severs the threads that connect. Similarly, separating the micro and macro obscures the movements that turn local action involving local actor–networks into networks of actor–networks. This makes the micro and macro difficult to understand (Callon, 1991). Inserting divides in time has the potential to sever past threads that still exist and shape the present. For instance if we divide time based on the modern computer, we create pre and post computer time. In the process we may sever continuing threads, such as questions of ethics and propriety generally, or historical employee–employer relationships that transcend the divide. Inserting divides decontextualizes the content of the setting being investigated, reducing the ‘world out there’ to

a 'disembodied abstract realm.' Abstracts of reality facilitate universalist tendencies as the context that makes each setting unique is removed. Inserting divides in time, such as pre- and post-modern computer time also facilitates presentist tendencies to treat the past as irrelevant or easily explained away.

ANT has been used in a number of empirical IS studies highlighting the contingent nature of the present and the rich context in which sites of negotiation involving technology are embedded. In addition to the ones already mentioned, IS studies using ANT have also shown how outcomes are negotiations and trials of strength involving an Enterprise Resource Planning system at a university (Scott and Wagner, 2003: 308), and resource management systems in healthcare facilities (Bloomfield *et al.*, 1992: 212).

What this study adds to ANT's contribution to IS is a demonstration of its application as an historical methodology in IS studies. What follows is an ANT informed case study that emerged from the resolution of a privacy controversy through an appeal to two black boxes. As foundations for the decision made, these black boxes appeared to possess substance (they were employed as arguments) but on the surface it was unclear how one managed to trump the other. The focus of this paper, within the limits of journal space, is on the practical application of ANT as an historical methodology and why it matters.

ANT as a methodology for historical research – A practical application

A controversy is closed through an appeal to black boxes

A privacy audit was conducted by the Offices of the Auditor General of Alberta and the Information and Privacy Commissioner of Alberta on the department responsible for the Motor Vehicle Registry (the MVR). At issue was the use of personal information collected from Albertans when, as required by law, Albertans registered their motor vehicles. The privacy audit was requested by the government on the basis that:

The disclosure of this information [personal information in data banks], and in particular the selling of it, has been raised a number of times with the Minister, with myself [Deputy Minister] and other department officials. As a result, ensuring adequate privacy practices are adopted – especially as they relate to the FOIP [Freedom of Information and Protection of Privacy] Act – is important to us. (Office of the Information and Privacy Commissioner and the Auditor General of Alberta, 1998: 3)

The personal information maintained in MVR databases includes names, addresses, telephone numbers, birth dates, heights, weights, and hair and eye colors (Office of the Information and Privacy Commissioner and the Auditor General of Alberta, 1998). The privacy audit revealed the sale or release of MVR data to a host of organizations including ‘public bodies, municipalities, federal government bodies, hospitals, post secondary institutions, parking companies and private sector businesses’ as well as ‘law firms, private investigators, collection agencies, small businesses, private parking companies, etc.’ (Office of the Information and Privacy Commissioner and the Auditor General of Alberta, 1998: 22).

The audit findings drew attention to the issue of lack of legislative authority for selling or releasing MVR data and the fact that the MVR had been granted an outright exemption from Alberta privacy legislation, passed a few years earlier. These audit issues (controversies) remained unresolved for a year until a government committee, charged with reviewing privacy legislation, recommended that no changes be made to existing activities.

Considering the historical purposes and practices of public registries and the review process currently under way by Alberta Registries [responsible for the MVR], the Committee recommended that Registries should continue to be excluded from the scope of the Act under section 4(1) (h) [The Freedom of Information and Protection of Privacy Act]. (Select Special Freedom of Information and Protection of Privacy Act Review Committee, 1999: 32)

Thus the Committee’s closure of the controversy weighed historical purposes and practices (‘The review process under way by Alberta Registries’ was at a standstill. Alberta Registries was waiting for the recommendation of the Committee) against a standard for privacy protection (FOIP) and decided in favor of historical purposes and practices. This relationship and result is depicted in Figure 10.1. On the one hand, there is the black box of historical purposes. No information was provided as to what those practices were and why they were justified. On the other side of the balancing act is the black box of privacy’s representative. Thus, Figure 10.1 identifies the trails to follow, the trails necessary to follow to discover the contents of the ‘historical purposes and practices’ and the FOIP black boxes.

FOIP as privacy’s representative

The Deputy Minister established FOIP as privacy’s representative in calling for the audit, ‘As a result, ensuring adequate privacy practices are

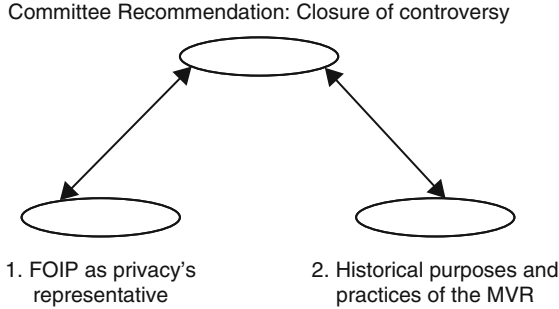


Figure 10.1 Trails to follow: opening the black boxes used to close the controversy

adopted – especially as they relate to the FOIP Act – is important to us’ (Office of the Information and Privacy Commissioner and the Auditor General of Alberta, 1998: 3). We could accept that FOIP represents privacy, granting it the substance that the Deputy Minister claimed for it, but FOIP was defeated through an appeal to ‘historical purposes and practices’ by the FOIP review committee. Yet this counterweight set against FOIP had no identifiable substance, making FOIP a puzzle rather than something self-explanatory.

To understand FOIP as it appeared in the privacy audit we must first understand the development of FOIP and how freedom of information is somehow tied to the idea of privacy protection. Freedom of information refers to the public right of access to information possessed by governments. Governments, generally, would like to limit or control access to potentially embarrassing information while opposition parties and the media thrive on such information. Thus, the shaping of the access to information side of FOIP-type legislation is highly contentious. The protection of privacy part, in this context, arises from the challenge posed by the question, ‘How do we protect personal citizen information contained in government documents if we are going to release government documents?’ This tight tying of privacy to the context of access to information is reflected in the fact that over the 6 days of debate in the Alberta legislation (March 31, April 18, May 15, 19, 30 and 31, 1994), privacy as a distinct right and issue (separate from questions of access to information) was only mentioned twice (Alberta Hansard, 1994a, b). This mirrors what happened federally, 12 years earlier. Federally, the committee responsible for the legislation left deliberation of the entire privacy portion of the legislation to a lengthy session in the afternoon of the last meeting (Standing Committee on Justice and Legal Affairs, 1981).

This background provides the context for the development of FOIP, but does not speak to the contents of the privacy protection elements of FOIP that were set up against 'historical purposes and practices.' The contents were specifically referred to, in the privacy audit, as 'Generally accepted principles known as "fair information practices"' incorporated into FOIP (Office of the Information and Privacy Commissioner and the Auditor General of Alberta, 1998: 22). Alberta Privacy Commissioner annual reports in 1998 and 1999 also reference fair information principles (FIP) as the foundation of the privacy aspects of FOIP, and the 1999 report cites the Organization for Economic Co-operation and Development OECD specifically as the source of FIP (Office of the Information and Privacy Commissioner of Alberta, 1998, 1999). Others make the same reference to FIP as the foundation of privacy legislation in Canada (Gillis, 1987), Europe (Mayer-Schonberger, 1997), the United States (Laudon, 1996) and Australia, New Zealand and Hong Kong (Slane, 2000). FIP clearly has status as privacy's representative, but they did not formally exist before 1973 (Secretary's Advisory Committee on Automated Personal Data Systems, 1973) with OECD principles not emerging until 1980 (Organisation for Economic Co-Operation and Development, 1980). To understand FIP in the privacy audit context, we need to understand FIP and in tracing the origins of FIP we find controversy.

The controversy involved tensions between government and large organization actor-networks perceiving benefits in the data-processing potential of the modern computer and public concerns about that very same potential: the potential to build dossiers on citizens. The emergence of FIP themselves is directly traceable to these tensions around the computer, but public concerns about organizational practices were not new, as reflected in the popularity of books such as *Nineteen Eighty-Four* (Orwell, 1936), *The Naked Society* (Packard, 1964), and *The Privacy Invaders* (Brenton, 1964).

In Europe, the concern for potential computer user actor-networks was that public pressure might lead individual countries to pass unique pieces of legislation that would restrict the flow of digital data across Europe (Organisation for Economic Co-Operation and Development, 1980). These actor-networks had the resources and desire to align around the intermediary of interest, the computer and data, and work toward ensuring the flow of data against a substantial but undefined and unorganized opposition. Gradually, the issue at stake came to be increasingly defined and translated into an issue involving personal data, the thing that computers process. This is reflected in the title of

an OECD publication at the time, *Digital Information and the Privacy Problem* (Niblett, 1971). This is where asymmetry developed, where the 'problem' was defined and translated with solutions developed for the translated problem. FIP emerged from this process as general principles about organizational handling of personal data and, on the surface, appeared to give individuals a degree of control over personal data possessed by organizations.

FIP started from the assumption that individuals should know what organizations have data about them (the assumption being that the large-scale centralized computers of the day would be the norm in the future). Individuals should then be able to approach these organizations and see what personal data they have and challenge the possession, and the accuracy, of that data. Organizations would be responsible for responding to individuals for these purposes, securing personal data possessed, seeking consent before collecting data, limiting secondary use of that data, and limiting the collection of personal data. The OECD version of FIP required that member countries restrict the flow of personal data to other countries that do not have substantially similar legislation.

This is where FIP came into FOIP legislation. Canada, as an OECD member with this obligation, also had to solve its access to information problem (freedom of information) and protect personal data that might be in that information. FIP, handy and required through OECD membership, fit the bill and was incorporated into FOIP legislation. This happened federally and was copied provincially.

Thus, privacy's representative in the enactment of balance in the privacy audit controversy, FIP, is the product of earlier controversies. In substance, FIP deals with a narrow concept of privacy's potential, digitized, personal data. FIP came to be employed in Canada to address a thorny side issue raised in the controversy surrounding access to government information. FIP lost in the Committee's enactment of balance against historical purposes and practices after the privacy audit, but it lost earlier, when FOIP legislation was passed in 1994. The Committee's recommendation was that '[The MVR] should continue to be excluded from the Act [FOIP] under section 4(1) (h).' Under that section, uses made of MVR records were exempted from FOIP. The question this audit raised was should that decision be reversed, and the answer was negative for its impact on historical purposes and practices.

Tracing events and opening the black box of FOIP reveals the presence of another black box: FIP, privacy's apparently universal representative. Yet FIP does not have universal, fixed properties that diffuse, unchanged

from setting to setting. FIP are, at their core, principles that, once met, permit the collection, use and dissemination of personal data. They are on the one hand data protection principles, while on the other they are data movement principles. This contradiction is built right into the documents creating FIP. 'These Guidelines [FIP] should be regarded as the minimum standards which are capable of being supplemented by additional measures for the protection of privacy and individual liberties' (Organisation for Economic Co-Operation and Development, 1980: 10). In the same document but 12 pages later, OECD member countries are advised to 'Avoid undue interference with the flows of personal data between Member countries' (Organisation for Economic Co-Operation and Development, 1980: 22). FIP are flexible intermediaries with room for interpretation and translation built into them. The OECD source document for FIP ensures that the minimum standards are not exceeded. In effect, the minimum standards become the maximum.

The 1998 committee, in the most recent enactment of balancing privacy against other interests, recommended that FIP not be applied to the MVR now, due to historical purposes and practices. Tracing of the development of FOIP has provided a sense of the substance of FOIP and while this review reveals that it represents a fairly weak conception of privacy's potential, but it does possess some substance. This begs the question, what is the substance of historical purposes and practices?

Historical purposes and practices of the MVR

Where does one begin? The review committee appealed to historical purposes and practices, and therefore the committee was the logical starting point. Fortunately, the meetings of the committee were recorded, transcribed and published, producing 700 pages of text. Unfortunately, there was almost no discussion on the history or current practices of the MVR. The committee was struck to review the entire FOIP Act, and the few times the MVR issue came up, it was mixed up with the Land Titles Registry, one of a number of registries gathered under the umbrella of Alberta Registries. The following example exemplifies the confusion that appeared a number of times (Alberta Legislature, 1998a, b, c).

I think it's important also to recognize that when the information that registries gather was originally established, part of the reason was not just for the protection of the person who got the license or the permit or whatever it was but also to provide that information for the benefit of others. [He then used an example of someone purchasing a property and accessing the Land Titles registry to see who

owned adjacent property and any use limitations that might exist on the property].

The Chair then continued,

I think it is the same thing if you are buying a car. It's important to know, to be able to find out – and I'm talking about a used car – who owned the vehicle before you. So it was not put there strictly to protect an individual or create some privacy. I think the intent was to make certain information available, and as long as that information is reasonably necessary to afford that purpose, it would be wrong to make changes now. (Alberta Legislature, 1998a: 37)

The confusion stems from the fact that the Land Registry is defined as a public registry for the purposes mentioned as well as a way for citizens to assure themselves that property tax assessments are transparent and fairly applied across properties. No evidence was gathered or offered that the MVR was established as a public registry. Quite the opposite in fact, the privacy audit revealed that there was no provision in MVR legislation permitting the sale of MVR data (Office of the Information and Privacy Commissioner and the Auditor General of Alberta, 1998: 22). This confusion continued throughout the committee's meeting and in one of the final meetings culminated in a statement that closely mirrored the final recommendation.

Recognizing that much information collected by various registries is for the purpose of protecting the interests of other people than the applicant, that historical practices of providing that information be upheld to the extent that it is necessary for those purposes and that registry services remain outside of the FOIP Act. (Alberta Legislature, 1998c: 10)

Perhaps the MVR issue was just too small a component of the overall FOIP review to spend a lot of time on it. Perhaps the Chair and committee members could not wrap their minds around registry differences. Perhaps the Chair and the committee had marching orders from the government to make sure that this was the committee's conclusion. We do not know, but historical purposes and practices as an argument carried the day, and its actual substance is not evident from the work of the review committee. The substance has to be found elsewhere.

In-person interviews were conducted with people who currently worked with the MVR, people who conducted the audit and members

Table 10.1 Identifying and following the agents

History of MVB	1994 FOIP Act	1972 Invasion of privacy study
<i>Step 1: Initial trails, actor-networks to follow</i>		
Information Sources: Documents, interviews	Information Sources: Limited documents, interviews	Information Sources: Documents, interviews, audio tapes
<i>Step 2: Go back farther, the Archives:</i>		
<i>Thread A: Anything on:</i> Wiggins: What is it, where did it come from? Addressograph/Graphotype machines: Why were they set up to produce a seventh 'wiggins' form?		<i>Thread B: Anything on:</i> R. L. Polk Canada (Polk)

of the FOIP review committee. From these interviews, a number of potential trails were identified and shown in Step 1 of Table 10.1. First, a long-time employee of the Motor Vehicle Branch (MVB), where motor vehicle registration actually took place, had started writing a history of the MVB in the year prior to his retirement in 1985. That might be useful. Second, the MVR was exempted from FOIP legislation in 1994. That required explanation. Third, mention was made of a 1972 Invasion of Privacy study by the Alberta government. That might be interesting.

The first trail involved an incomplete and unpublished manuscript on the history of the MVB. This manuscript, only partially organized and completed, was acquired from the department and its author was identified. The manuscript covered the period from the earlier 1940s through the late 1950s (Hogg, 1985). The author was later discovered and interviewed, and it turned out that he was part of a network of retired MVB employees. Three more individuals were interviewed from this cohort. They shared their general recollections on people, procedures and techniques, as well as organizational changes to the MVB over time. The history and interviews mentioned the 'wiggins' form, a duplicate form made of the vehicle registration that was batched and mailed to a firm in Winnipeg, Manitoba.

The 'wiggins' portion [copy of the vehicle registration form] was detached and forwarded to a statistical gathering service in Winnipeg who made tables and charts indicating how many vehicles were registered in each province, the size of the vehicles by wheelbase, license fee costs and revenue collected, number of different vehicles by make, year and model number. The firm was eventually purchased by R. L. Polk and Company Ltd. who at this time operated basically in the United States. (Hogg, 1985: 32)

Registration forms were produced on Addressograph and Graphotype machines from the early 1940s onwards. When these retirees started working in the MVB in the early 1940s, the Graphotype and Addressograph machines generated copies of the registration form, including the 'wig-gins' form. These retirees had the impression that these machines had 'always' been there.

The second trail involved identifying and interviewing individuals involved in passing and writing the FOIP Act in 1994, as well as accessing transcripts of debate in the Alberta Legislature. There was no formal committee charged with creating FOIP, and therefore no formal records of deliberation were created or kept. Interviews revealed that writers of the Alberta legislation (government staff not politicians) gathered similar legislation from other provinces and cut and paste sections to create the Alberta legislation. All such legislation had exempted the MVRs of their respective provinces. It was made clear to the actual writers of the Alberta legislation that this was desired in Alberta. The wording of legislation from other provinces was altered slightly to reflect conditions in Alberta. One individual interviewed related how they had watched the debate in the Legislature hoping no one would say anything, and no one did. This reflects the fact that the focus of the debate in the Legislature was on the access to information side of the legislation, as already discussed. As to why exempting the MVR was desired, the most cited reason offered in interviews was that in 1993 the MVR had been rolled into something called Alberta Registries (Registries), which housed all Alberta registries including Vital Statistics, Corporate Registry, Land Titles and the Personal Property Registry. Through Registries, the delivery of registry services was privatized. Since the access to information portion of FOIP applied to public and not private companies, Registries therefore had to be excluded from that side of the legislation somehow and it was easier to grant an outright exemption.

The last trail identified in the initial interviews was the 1971 Invasion of Privacy Study produced by a committee of the Alberta Legislature (Simpson *et al.*, 1970). This was located in the library of the Alberta Legislature. Elected officials who were on the committee and in the Alberta Legislature were identified, located and interviewed. Neither the study or interviews mentioned the MVR, but the motion put forward in the Legislature that led to the study did.

Whereas there are now no laws protecting the right of privacy of Alberta citizens [...] Now therefore be it resolved that this Legislative Assembly request the Alberta Government to set up a Special Committee on the

Invasion of Privacy to examine and review all matters related to the invasion of privacy in Alberta and, in particular [points 1, 2 and 3 and 4] ‘The desirability of continuing the sale by the Alberta Government of the names and addresses of over 800,000 Alberta motorists to an organization selling the names and addresses to “junk mail” companies.’ (Clerk of the Legislature of the Province of Alberta, 1970)

This motion was amended in the Legislature to drop the specific references (points 1 through 4). A review of the audio tapes of the debate in the legislature³ revealed that the company referred to in point 4 above was R.L. Polk Canada (Polk). The question that emerged from this trail was who or what is Polk, and how was it getting the names and addresses of all Alberta motorists?

Table 10.1, Step 1, depicts the three trails initially followed. The trail on the exemption of the MVR from the 1994 FOIP Act was completed outside of the archives. The other two trails required going into the archives. Step 2 (Table 10.1), *Thread A*, focused on the ‘wiggins’ form as it represented a leak of personal information outside of the government. What was the ‘wiggins’ form used for and how did it come to be that the processes around the Addressograph and Graphotype technologies generated it? The second trail, *Thread B*, focused on anything related to Polk, another outsider who was getting MVR data.

Into the archives

Chronologically, it is convenient to present the findings discovered by following the agents Wiggins and Polk in that order but the actual research was much less linear; the actor–networks paths overlapped.

Following *Thread A* (Table 10.1) meant focusing on the MVB to find anything on ‘wiggins.’ Unfortunately, there was no file in the archives called ‘wiggins.’ Therefore the search had to focus on motor vehicles, motor vehicle registration and the departments responsible for motor vehicles. Further research identified the branches of the government responsible for motor vehicles over time: the Provincial Secretary (1905–1955), the Ministry of Highways (1955–1975) and the Solicitor General (1975 onwards). All records had to be searched for any information that they might possess on the MVB. This search through these records for anything at all on motor vehicles involved hundreds and hundreds of hours. The first Provincial Secretary left 42 meters of records, the second left 12 meters while the third, fourth and fifth left no records at all. The same was true for Ministers of Highways. Some left a lot of records and some very few and the MVB was a relatively

minor activity within the Ministry. The Solicitor General's department raised the same sort of issues as the Ministry of Highways, but was compounded by relative recentness of records deposited in the archives records, with some being sealed for 25 years from the date of deposit. There were also scattered listings in the archives related to motor vehicles in some fashion and they were pursued as well.

Through this searching, some details related to motor vehicle registration emerged. From the beginning of Alberta as a separate province in Canada in 1905, motor vehicles had to be registered every year. From 1905 to 1910, a list of registered motor vehicles was tabled in the Alberta Legislature until it grew too large (41 vehicles in 1905, 423 in 1910). Then there is gap where the next mention of a list is the absence of such a list. A town constable in Innesfree, Alberta wrote a letter to the Provincial Secretary in 1918.

If the department has a list of the motor licenses issued with owners' names and addresses, in a booklet form, I would be pleased if you would send me a copy. Some of the drivers in this district are very careless in regard to the rules of the road, as described in the Motor Vehicle Act. (Defoe, 1918)

The response offered was:

The Deputy Provincial Secretary advises that no such list is published. In any particular case if you will write the Deputy Provincial Secretary giving him the number of the car he will be able to give you the address of the owner. (Forbes, 1918)

Thus, in 1918 there appears to be no list, but at some point this changes. Try as I might I could find nothing in the Alberta archives on Wiggins. A call to the provincial archives in Manitoba revealed nothing in their files, although a suggestion was offered to contact the Companies Office in Winnipeg. That would only be helpful if I had a company name. I reviewed the Winnipeg telephone directories in the 1940s and found two firms with the name Wiggins in them. Presented with the two names, the MVB retirees immediately identified Wiggins Systems Limited (Wiggins) as the recipient of the 'wiggins' form. This opened up two new trails to follow. What services did it sell and what happened to this company?

A review of Henderson Directory business advertisements revealed that Wiggins started as a printing company in 1913. In the 1920

advertisement, Wiggins services included 'multigraph letters, mailing work, addressing.' The 1930 advertisement services include 'Good mailing lists, human interest copy, attractive printing, multigraphing, neat addressing and careful mailing work will profitably sell any kind of merchandise.' The 1940 and 1950 advertisements expand the offerings to include 'All Advertising Service within One Organization. Newspaper. Magazine. Radio. Direct Mail. Market surveys, copy and plan, multigraphing, mimeographing, mailing lists, addressing and mailing.'

In the 1960 directory, the company is not listed. Contact with the Companies Offices in Winnipeg revealed that the company went bankrupt in 1958 and the principal reason for this was the 'loss of volume due to the automotive trades taking their direct mailing contract from him to an agency operating in Eastern Canada' (Canadian Credit Men's Trust Association Limited, 1958).

Discussing the 'agency operating in Eastern Canada' will be deferred for the moment as it leads into Thread B. There is and still remains a gap in the story. Nothing in the Alberta Archives was discovered that mentioned Wiggins at all, but ongoing curiosity has led to the subsequent discovery of actual Wiggins Mailing Lists in British Columbia (1922) and Saskatchewan (1951) archives. The BC Mailing list is a motor vehicle count (Wiggins Systems Limited Mailing List, 1922). In addition, cash reconciliations prepared for the Provincial Secretary of Saskatchewan in 1925 and 1926, on the MVB of Saskatchewan within the Provincial Secretary's Department, reveal that Wiggins was buying copies of registrations, for one cent apiece (Provincial Secretary of Saskatchewan, 1926).

With these pieces of information, we can see that Wiggins bought copies of all registration slips (90,419 slips in 1926, according to the cash reconciliations) and used this information for marketing purposes in Western Canada. Despite extensive searches, nothing has been discovered as to how this practice of releasing registration slips to Wiggins came about or why, but it is far more than the committee that appealed to historical purposes and practices appears to have known.

This leads to Thread B of Step 2 (Table 10.1), what is Polk's involvement with MVR data? The history of the MVB branch, discussed earlier, mentioned that Polk bought Wiggins but that is not quite right. Wiggins was not purchased. Wiggins declared bankruptcy in 1958 'due to the automotive trades taking their direct mail contract from him to an agency operating in Eastern Canada.' Fortunately, Polk did appear as an indexed item in the main reference cards of the Alberta Archives. This index pointed directly to a controversy in 1972 centered on Polk



Figure 10.2 The 1972 controversy shed light on events before and after it

and its access to MVR data. This access point shed light on Polk at that controversial moment. It also shed some light on events before and after the controversy and this is depicted in Figure 10.2.

In late 1971, a new government was elected and one of the first actions of the new Minister of Highways, responsible for the MVR, was to cut off Polk's access to MVR data in 1972. Being cut off appears to have caught Polk by surprise. This ties into a comment made in a phone interview with a retired individual who was a senior official at Polk, at around this time. It was Polk's practice to monitor any significant personnel change at the provincial level (a Minister, Deputy Minister or Registrar) and schedule visits with the new individual to keep the actor-network aligned and the practice going. The change in government (the former party had governed Alberta for 30 consecutive years) and the Minister's actions took place before Polk had a chance to visit.

The controversy and Polk's attempts to re-establish access to MVR data forced Polk to respond to the Minister's demands for information and reveal practices that had evolved around its access to MVR data. In 1971, 1,916,057 mailings were made from the MVR file to Albertans (Heil, 1972a). Polk, over time, had become the center of a network of actor-networks that had aligned around MVR data, as depicted in Figure 10.3. Polk argued that direct mail advertising was a relatively small part of its operation but that it was good for the economy as a whole. Polk also stressed the value of the information to assist auto and auto-part manufacturing industries establish demand (Heil, 1972b). In addition, Polk processed MVR data for the War Amputees, who did not have their own computer. Six months later, largely due to pressure to accommodate the War Amputees, contracts were signed with Polk to continue to get computer tapes of all motor vehicle registrations, including names and addresses. The new contract placed strict conditions that the personal data could be used for statistical purposes only and not for direct contact with individuals (Copithorne, 1973, #2057).

What changed between Thread A (the Wiggins story) and Thread B (this initial encounter with Polk, 14 years after Wiggins declares bankruptcy) is that MVR data was now on digital tape. The modern computer had become part of actor-networks around MVR data. This is important not as a divide in time, but as a point where multiple possible futures exist. The enlistment of the modern computer in the MVR registration process

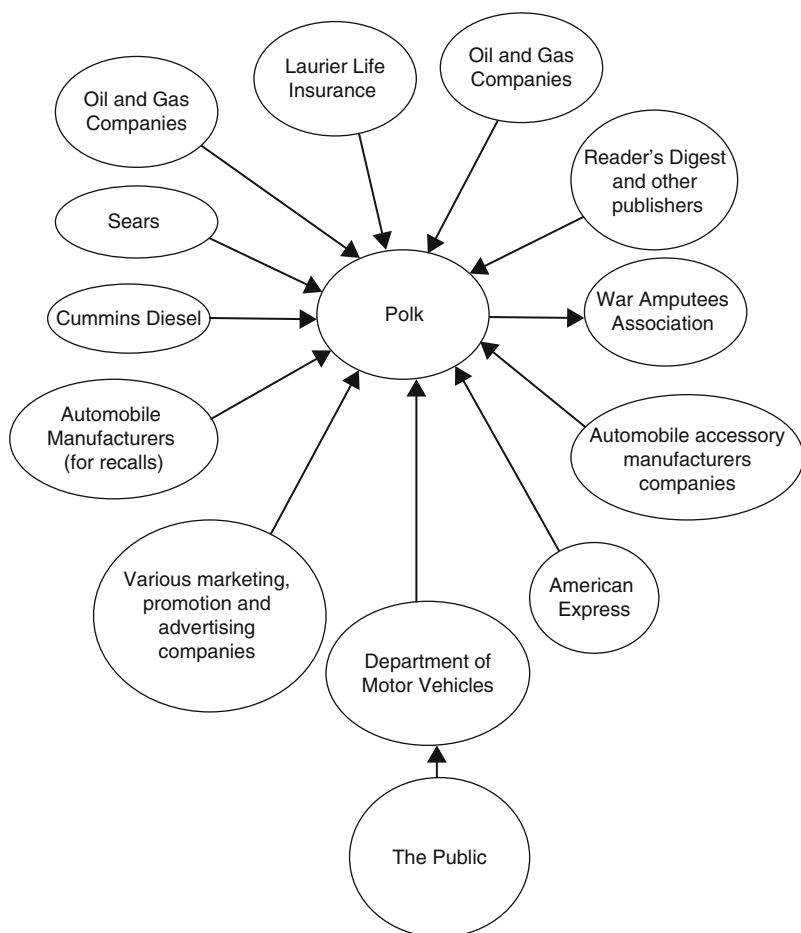


Figure 10.3 Actor-networks aligned around MVR data, exposed in controversy. All connections between Polk and its clients are one way, from the client to Polk, with the exception of the War Amputees Association. For the War Amputees, Polk sorted and provided the full listing of registered motor vehicle owners. In all other cases, Polk accepted client mailing criteria (people living in certain areas, car-type owners, numbers of people in household pulled from city directories, etc.) and the letters and envelopes the client wanted sent to prospects. Polk culled its data (bases or tables), selected prospects and put prospect names on the supplied letters and envelopes and did the actual mailing. Other than the War Amputees Association, Polk clients did not get access to the lists

in 1962 and Wiggins' bankruptcy in 1958 was a significant event to create a trail of changes in the files of the Ministry of Highways that can be followed from Wiggins' bankruptcy in 1958 to the 1972 controversy where Polk is cut off from MVR data (the left-hand side of Figure 10.2).

These files reveal that Gordon Taylor, Minister of Highways, was intrigued by the possibility enabled by now digitized MVR data, to sell it to others. He had been approached by O.E. McIntyre (a marketing company based in Montreal) about the possibility of buying MVR data and the Minister was in favor. This is explained in a note he made for his files.

With the use of a magnetic tape and the computer, it was possible to make the information available to anyone. The price is 1 cent for each registration if the purchaser supplies the magnetic tape plus \$900 for the microfilm of new registrations. (Taylor, 1968)

The note reflects the realization that data on digital tapes, no longer tied to pieces of paper, was much more mobile. To make the sale of MVR data to others possible, the Minister altered the regulations governing MVR legislation, through Alberta Regulation 453/67, changing a section that set out the terms of sale of bulk MRV information. The word 'Polk' was replaced with the word 'person' and specific reference was made to magnetic tapes and the costs detailed above. Previous regulatory change shows that the entire section altered by Alberta Regulation 453/67 was only added in 1962, via Alberta Regulation 417/62. In this change, Polk was named as the buyer and costs were related to paper registration slips. This discovery led to a review of the legislation and supporting regulations covering motor vehicle registrations, from 1905 until 1962. The change in 1962 was the first time in the history of motor vehicle registration that the sale of MVR data was ever acknowledged and then only through regulations, even though it had been going on for almost 40 years. This lack of legislative authority and weakness of regulations as a source of legitimacy is acknowledged in a 1968 internal memo between the Deputy Minister and Minister of Highways.

I have your memo of June 3rd dealing with the marginally noted [Polk] and would agree that our authority for selling registration data to the marginally noted [Polk] is very vague.

Mr. Syska [solicitor, Ministry of Highways] suggests and I agree that specific amendment [to the legislation] should be introduced at the next Session to give us clear cut authority for our actions. (McManus, 1968)

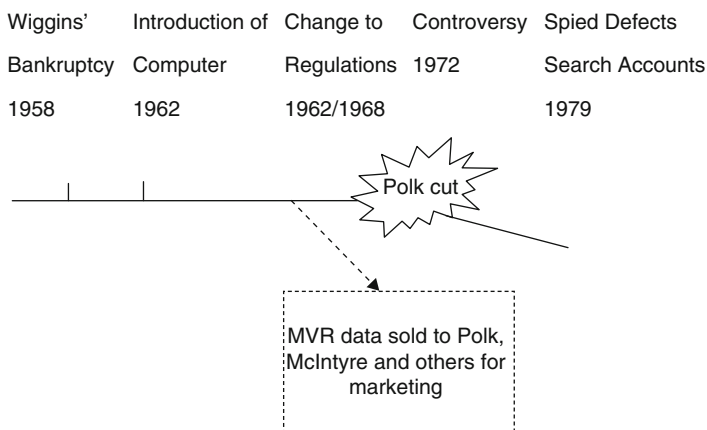


Figure 10.4 Trajectories

Thus it would appear that Wiggins’ bankruptcy in 1958 required a change to the processes involving the recipient of the ‘wiggins’ form, still being produced by the Addressograph and Graphotype machines. This raised questions about a practice that had been going on so long it was almost invisible. Questions regarding legislative authority emerged at the same time paper slips were replaced by magnetic tapes. The Minister of Highways was ideologically in favor of expanding the sale of MVR data to others as indicated by changes he made to the regulations and the note he wrote in his files, referred to earlier.

Given these activities, the continued and expanded sale of MVR data seemed the likely future, depicted in the dotted line of Figure 10.4, but that trajectory of events was changed abruptly by a new Minister of Highways in 1972. He had a different view and this view reflected a growing public concern about privacy as was discussed earlier. If the story ended here with the controversy and its apparent resolution, one would expect that the sale of MVR data would be a non-issue into the future, but the privacy audit of 1997 revealed that not to be the case. While Polk was less and less a factor through the 1970s, the lack of legislative authority continued to be a problem. A 1979 project started by the Solicitor General’s department, but never finished, ‘spied defects’ that stem in part from the unresolved question of legislative authority in the early 1960s.

Officials of the department have spied defects in the practice of imparting information to whomever requests it merely upon payment

of the fee proscribed by section 6 (h) of the regulations issued under the Motor Vehicle Administration Act. There is room for dispute whether this should be a function of the Motor Vehicle Division. (Solicitor General's Department, 1979a: 4)

The study offered a striking comment in terms of the 'historical purposes and practices' argument.

The cardinal point about the MVD's activity as an information supplier is that its service seems to have grown or evolved into its present dimensions with little record of any conscious planning that this was a function to be undertaken. (Solicitor General's Department, 1979b: 9)

While these 'defects' were spied, they were being noted because of rising concern about the unchecked growth of search accounts enabled by the advent of databases. Over 1000 search accounts had been created in less than a decade. These accounts were set up by and with the MVB to enable outsiders to search MVR records. A branch within the government, making use of modern computers, had replaced Polk and a new collection of actor-networks had emerged around MVR. This is depicted in the far right part of Figure 10.4. The practice of releasing MVR continued, but in a different form: it was not linear but a change in trajectory. The largest search account holders included bank branches, finance companies, collection agencies, insurance companies, car dealerships, investigation companies, department stores, and others whose names do not indicate their type of business. The reason for examining account holders specifically was that, 'It is this kind of recipient that most troubles those officials in the MVD who are sensitive to the security issues suggested by the wide disclosure of personal data' (Solicitor General's Department, 1979b: 5). This project provides a good description of the issues but the project appears to have been abandoned (Leblanc, 1982).

Issues around the sale of MVR data appear to have continued into the 1980s. The discovered concerns raised in the 1980s range from potential liability if people became aware that others were reaching them through access to the MVR (Armstrong, 1982), concern that female motorists might be placed at risk through being traced through the license plate on their car, and generally attempting to find the 'balance between the rights of an individual to privacy and the legitimate requirements of some other persons to obtain information' (Harle, 1982).

From here the trail fizzles. The radiance of the bright spotlight shed on actor–networks in the 1972 controversy only reaches so far. Absent new controversy, the practice slides back into the background in the 1980s until it emerges again in controversy in the 1997 privacy audit, where many of the same issues of the past reappear. Specifically, legislative authority for selling access to MVR and control over search accounts.

The issue of how the resolution of the privacy audit controversy in 1998 was resolved, between privacy's representative (FIP) and the counterweight employed in the act of balance (historical purposes and practices), is no less strange than it was, but it is more understandable. It is strange in the sense that actual historical purposes and practices were unknown by the committee members. This investigation revealed that it was largely unknown and little discussed over many decades by those actually involved in releasing the information. A common question that arose, when it was acknowledged and discussed, was whether this was something the government should even do and under what authority. Thus, the resolution remains strange because the substance of the actual history, and the uncertainty through time about the practice itself, was used to justify no change and continuation of those same practices.

At the same time, the particular resolution of the privacy audit is understandable in the sense that the historical purposes and practice argument presented was never tested. It was not subjected to trials of strength. Even without substantiation FIP, privacy's representative, did not triumph but FIP may not possess the substance they are granted as privacy's representative. This raises numerous interesting questions about the current debate on privacy generally, but they are specifically discussed in detail elsewhere (cf. Bonner and Chiasson, 2005; Bonner, *et al.*, 2009). The focus of the remainder of this paper is a discussion of two unexpected questions that emerged from this study and what these say about the present, followed by concluding comments on ANT as an appropriate historical methodology.

Unexpected questions

Two critical questions emerged from this study that has changed the way I personally look at organizations, perhaps forever. What is an organization? And who can speak for it? These questions have also made me wonder if the present, in the context of organizational practices around data, is really any different now than it was in the past. If it is not, inserting a divide in the present that severs off the past from

the present is going to lead to a very mysterious understanding of the issues in the present. I will speak to these in turn.

I will develop the basis for the two questions by focusing on the public, at the bottom of Figure 10.3. The public was largely unaware of the web of actor-networks that surrounded the data they provided.⁴ A vehicle owner was and is required by law to register their motor vehicles. In doing so, the public provided the MVB data about their vehicle and themselves. This department, a department within the Ministry of Highways, itself one of many Ministries within the Alberta government each with its own departments, sold this information to Polk on magnetic tapes (at this time, paper copies 10 years earlier and for the previous 40 years). Polk in turn provided services around this information to other actor-networks that had aligned around this data. In the chain of knowledge about these activities, the public was unaware that the 'government' sold what it forced them to provide. However, strictly speaking most of the people in that same 'government' were also unaware that a department within one of its Ministries was and still is selling MRV data. Even within the specific department selling the data and the Ministry it was located in, there was limited awareness of the sale of the information to Polk and no awareness of the extent of the subsequent dispersal and uses made of that data by Polk. With this view of an organization as a loose connection of varied actor-networks, the second question emerges from this study, 'Who can speak for an organization?'

In the case studied here, who would have spoken for the Alberta government on its handling of citizen data? What would this spokesperson actually know? In being briefed on the subject, would those doing the briefing be aware of what was going on in a small department of one of the many Ministries? Would they know enough to have probed deep enough? If they did become aware of Polk, would they have probed any deeper than those who were aware of Polk ever did, before the controversy erupted? Would the people the spokesperson relied upon even be aware of the web of actor-networks that had formed around government-collected personal information?

Emerging from the above is the question, 'is the present any different?' I am going to invoke an image to help visualize the question. To appreciate the position of the public in Figure 10.3, picture that person standing on the side of a country road that borders a cornfield, late in the growing season. Corn plants are 8–9 feet tall, thick with corn stalks, leaves and ears of corn. It is a field of impressive green. Looking into the field from the road level the density of the plants is such that details

within the cornfield itself are limited after 10 feet or so; the foliage is too thick to discern details. Imagine the size of the cornfield to be proportionate to that of an individual relative to the size of an organization, say the cornfield occupies a section of land (1 square mile).

In this scenario, the individual public member is on the road at the edge of the cornfield and the person she is dealing with, taking her registration data (and money), is seated at a desk cut into the first row of corn. The required data is collected, recorded and sent off by the person at the desk back into the cornfield somewhere. The deal is completed from the woman's point of view; she complied with the law, paid the required amount and walks away with the required paperwork and/or license plate. The deal may be finished from her perspective, but unknown to her new deals are made around that deal, within the cornfield, by people and departments of the government she has not directly engaged, with Polk and then between Polk and others.

Continuing with the imagery, take Figure 10.3 and make it proportionate to the size of the cornfield. Then overlay this enlarged Figure 10.3 onto the cornfield, from above the cornfield, and burn it into the cornfield so that the circles are now small, cleared pockets on the ground within the cornfield, and the lines connecting the circles are narrow pathways that join the pockets on the ground. The idea of expanding Figure 10.3 is to create enough space between the pockets so that each pocket (node in a network) may or may not be aware of the other nodes of the network of which they are a part. Other departments of the government (nodes in the cornfield connected to the desk taking her registration data, not depicted in Figure 10.3) did not know of Polk's presence in the cornfield, but they were connected to Polk through creating and enforcing legislation that required her to provide personal information. *Reader's Digest* knew of Polk but may or may not have known of its link through Polk to Sears or Oil and Gas companies. The woman who registered her vehicle knew of her link to the MVB as the face of the government requiring her to register her vehicle, but she was unaware that she was part of an extended actor-network involving license plates, magnetic tapes, registration slips,⁵ marketing programs, databases, auto makers and sales generation.

The essential question raised here is, What is different today about actual within-organization and interorganizational practices involving personal information and what is the same? I do not pretend to have an answer that transcends this specific case but the question raises serious challenges to interpreting studies that ignore the question entirely.

ANT and the call to history

Is ANT *the* answer to the call to history? No, of course not, but it has potential, largely unrealized at the moment, because its philosophical underpinnings challenge presentist tendencies. ANT keeps its eyes on and continually develops context, making ‘taken-for-granted’ and inserted divides, things that require explanations rather than being explanations in themselves.

But what did the modern computer really change? It was implicated in change but it did not result in a complete break from the past, as depicted in Figure 10.4. The enlistment of the modern computer in the registration of motor vehicles almost resulted in an increase in the number of firms purchasing MVR data for marketing purposes, but that potential trajectory did not solidify. The Polk actor– networks around MVR data gradually dissolved while another emerged around search accounts. The practice of selling MVR though did not start with the modern computer; it was only altered by its adoption. ANT keeps the continuities visible avoiding the presentist tendency to assume away the past. ANT, like historical research, seeks to keep the context in the present. Perhaps it is better stated the other way around. The value of ANT, like historical research, lies in not truncating that which gives the presence substance and meaning, but in working with a present that those living in it would recognize.

ANT is offered here, in an opening of a discussion on historiography in IS research, as *a* tool, albeit a powerful tool, for conducting historical IS research. ANT has been used in IS research but it can be pushed much farther into the past. Is the story told in this paper *the* story of the past? I cannot make that claim. It is an understanding based initially on curiosity about an outcome, that shaped the framing of the questions to be investigated, and my efforts and understanding in discovering and following trails, followed by decisions about ordering the material to tell the story forward in time.

I believe privacy is an important idea but I would be hard-pressed to define it. This belief framed the questions but is not what drove the research. I wanted to understand this specific enactment of balance without any idea as to how it came about. ANT is a powerful tool for this. ‘Actors know what they do and we have to learn from them not only what they do, but how and why they do it’ (Latour, 1999b: 19). Focusing on the actors who created the present helps researchers avoid inserting divides or taken-for-granted that the actors themselves do not acknowledge.

Delving into the past was fascinating in discovering what was, what could have been and what seems to have continued into the present. I interviewed the first computer programmer in the Alberta government. From whom did he learn programming? Moments like that made it apparent those times were different. Since 1905 it has been the law in Alberta that motor vehicles be registered. Drivers' licenses though were not introduced until 1927. That awareness helped explain the frustration a Constable experienced trying to keep a blind man from driving a registered vehicle on public roads, in 1917. I did not find everything I would like to have found as there were gaps in the available material. I could not find out exactly how long Addressograph and Graphotype machines came to be embedded in the paper-based processing of motor vehicle registrations, nor how they came to generate an extra copy of the registration slip for Polk. I also would like to have met, but was unable to find, any of the 'hundreds of homeworkers'⁶ who processed paper-based registrations. Through this process, however, I became aware of the continuity of personal data use for marketing that has been done and done effectively long before the computer entered the picture.

Our field is relatively recent, but issues that emerge around the artifact of our interest may or may not be. The risk of presentism is that we limit our view and focus too narrowly on the present. The more limited that view is, the easier it is to see differences and read change into them. If we broaden our focus and investigate those differences, we are more likely to see those differences as continuities and this produces a very different understanding of the present.

Acknowledgements

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Notes

1. In reading this section, a reviewer was reminded of a technique employed by research historians known as prosopography. A branch of this technique seeks to explain political outcomes by tracing webs of interplay between small groups that create unity and political force (Stone, 1971). It is not clear what role, if any, non-humans play in this technique.
2. Holmstrom and Stalder (2001) show how a cash card technology in Sweden failed for exactly this reason.
3. Alberta did not have a transcribed record of debate in the Legislature (a Hansard) until 1972. In anticipation of the Hansard debates were recorded on magnetic tape a few years earlier and fortunately included the above.

- These recordings are available, but the speakers are identified by role and not name.
4. There were occasional letters from the public in the archives and the occasional newspaper editorial commentary but they were very few, had no details to work with, and were easily dismissed. The issue would briefly appear and then disappear. Like a shooting star in the night sky, if you blinked you missed it.
 5. At this time, Polk was purchasing MVR data from all provinces and some had not computerized the registration process. Polk was still receiving paper copies of registration slips from some provinces, including Ontario, well into the 1970s.
 6. This was the terminology used by a retired senior Polk official describing how lists were created before the computer. This is a pre-computer version of distributed data processing and Wiggins must have employed this technique as well.

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