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ORIGINAL PAPER

Trusted by whom? TDRs, standards culture and the nature of trust

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Abstract The first part of this paper examines the notion of trust within the suite of standards that anchor the trustworthy digital repository (TDR) concept. The second part traces the short and confusing trajectory of the TDR project at Library and Archives Canada (LAC) and explores the extent to which the failure of LAC TDR should be understood in relation to organizational funding, operational decisions, TDR standards culture or other factors. In the conclusion I suggest that the notion of trust within TDR standards culture is itself evolving in a positive direction that emphasizes user perceptions of trust rather than seeking to establish objective evidence of trust.

Keywords Trust · Trustworthy digital repository · Trusted digital repository · Library and archives Canada · Standards · Standards culture

Introduction

The Fall 2014 report from the Auditor General of Canada included a program review of several aspects of the operations of Library and Archives Canada (LAC), including its efforts to build a trusted digital repository (TDR). Among the findings in the report was the following:

> We found that Library and Archives Canada spent $15.4 million over four years on the repository, it never used it, even though the system had been tested, approved and deemed operational in July 2011. The trusted digital

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> repository was shut down in November 2012 without documentation from management on the rationale for the decision. (p. 11)

Over the past few years, there has been "keen speculation" (Groover 2013) about the fate of LAC TDR. Curiosity about the project has been stoked by LAC's repeated announcements that the project was complete or partially complete or nearly complete, as in November 2012 when Librarian and Archivist of Canada Daniel Caron was "pleased to report" LAC TDR "has been successfully tested" (Caron 2012). Caron's announcement came mere months after Chief Operating Officer Cecilia Muir, speaking in lieu of Caron at the annual gathering of the Association of Canadian Archivists, declared that due to "the complexity of a digital universe" and "financial constraints", "the original LAC Trusted Digital Repository project has dramatically changed directions" (Muir 2012). More recently the LAC 2014–2015 *Report on Plans and Priorities* states that the organization continues to "finalize the trusted digital repository" (LAC 2014, p. 32). Meanwhile, policies and other details about the project that once were posted to LAC's website have been removed. Internal links to LAC TDR documents from LAC's own webpages lead to 404 "not found" notices. It is necessary to visit the Internet Archive to view various captures of the LAC website to stitch together a full picture of the project over the years (Library and Archives Canada [fonds] 2015).

The Auditor General's report provides some clarity, but on further reflection provokes more questions than it answers. Why would LAC build a TDR that it never used? And why would LAC's top manager have deemed himself "pleased to report" that LAC TDR had been successfully tested in November 2012, the same month that the Auditor General reports the project was definitively axed? Why is LAC's decision making around the shuttering of LAC TDR not documented?

Things get stranger when looking at the political record. In 2013 Pierre Nantel, Heritage Critic of the left-leaning Official Opposition, submitted a question on LAC TDR to the governing Conservative Party of Canada. In response, Heritage Minister James Moore reported Treasury Board provided LAC with $22,810,000 over three years, starting in 2007, for two interrelated tech projects: LAC TDR and AMICAN.[1] Subtract AMICAN, and perhaps you are left with the $15.4 million that the Auditor General ascribed to LAC TDR.[2] The Heritage Minister noted that "LAC is continuing to invest in long-term preservation and is focused on further development of the TDR … LAC's investments in its TDR ensure that LAC continues to meet the increasing demands of the digital economy while realizing significant cost efficiencies for Canadians" (Moore 2013). These statements were made about a year before the Auditor General issued his report, and about half a year after, according to the Auditor General, LAC had quietly shut down LAC TDR.

[1] AMICAN was intended to unify LAC's online descriptive systems for bibliographic holdings (AMICIUS) and archives (MIKAN).

[2] The figures provided by the Auditor General and the Heritage Minister represent only special funds awarded by Treasury Board, and not operational funds from LAC. These figures would not include, for example, wages for LAC staff assigned to the project.

It is now apparent that LAC TDR, despite good intentions and thorough planning when the project was launched in 2006, has become vaporware. Wikipedia defines vaporware as "a product, typically computer hardware or software, that is announced to the general public but is never actually released nor officially cancelled" (Wikipedia Contributors 2015). I will suggest in this paper that, like other vaporware, the story of LAC TDR necessarily includes shifting organizational priorities and resources. Towards the end of the paper I will switch to a second metaphor and suggest LAC TDR, in addition to being understood as vaporware, could also be understood as a train wreck, with the momentum of its derailment carrying it in a direction determined by the conceptual underpinnings of the suite of TDR standards.

The first part of this article will examine the 2002 OCLC-RLG report *Trusted Digital Repositories: Attributes and Responsibilities* and the 2007 OCLC-RLG and NARA report *Trustworthy Repositories Audit and Certification: Criteria and Checklist* (also known as TRAC) to consider the roots of TDR, as a concept, within a technocratic model of trust and within what might be called "standards culture". In the second part of the paper I will examine the history of LAC TDR as told through LAC official documents, paying particular attention to LAC's annual *Report on Plans and Priorities*, the document in which Government of Canada agencies detail their operational objectives for the coming year. In the concluding section of the paper I will return to discussions of trust in the digital preservation community, specifically to address how ideas of trust, and of the role of audit and certification, have shifted since the publication of TRAC in 2007.

In the interest of full disclosure, I will note that I was one of several archivists and other LAC staff assigned to the TDR project. I have previously co-authored an article on the ideas that animated LAC TDR when I was on the TDR team (Bak and Armstrong 2008). My involvement with the project ended some time before I left LAC in July 2011, westward bound to take up a new position as an assistant professor of history, teaching archival studies, at the University of Manitoba. Despite my involvement with the project, the discussion of LAC TDR in this article is based entirely on publicly available documentation.

Part one: trust, technology and standards

In 2002, the Research Library Group and OCLC published their eponymous report on *Trusted Digital Repositories*. The report emerged from anxieties during the 1990s about the nature and impact of digital technologies on the future of information. While the advantages of digital access were obvious, there was concern that digital information was peculiarly susceptible to undetectable change and deletion, and posed particular problems for long-term preservation. Libraries, archives and other institutions with a mandate for collecting and preserving information scrambled to address these concerns. The OCLC-RLG TDR report was one of several collaborative efforts.

While archives, libraries and other institutions scrambled to deal with the challenges of digital preservation, they did so confident that they already were

trusted institutions. The principal question posed in the TDR report was how to extend this reputation for managing analogue information resources to digital information resources. Typical of this attitude was the Society of American Archivist's president's address for 2000. President H. Thomas Hickerson confidently asserted that:

> Archivists are seen as trusted agents of society, acting on everyone's behalf in insuring the preservation of those records necessary in protecting the legal rights of each citizen and in preserving the historical record of human achievement, of cultural evolution, and of everyday life. We have a special role in society, and we are respected as ombudsmen acting in the public as well as each individual interest (Hickerson 2001, p. 16).

Although Hickerson's address is not cited in the 2002 TDR report, the authors shared Hickerson's confidence that cultural institutions are the "trusted agents of society". From the start the TDR concept has been more about orienting the information professions towards technology than about establishing any grounds for trust, a fact that is readily apparent when reading the TDR report. The introduction to the report includes a brief section on terminology that discusses the terms "digital preservation", "digital archive" and "designated community" but does not define the concept of trust. The four-page glossary at the end of the report defines a number of concepts, including "archival storage", "fixity information" and "technology emulation", but does not define "trust".

The only definition of trust in the report is an edited version of the definition provided in the Merriam Webster dictionary. The 2002 TDR report states:

> 'Trust' is defined by the *Merriam Webster Dictionary* as:
>
> assured reliance on the character, ability, strength, or truth of someone or something… one in which confidence is placed… a charge or duty imposed in faith or confidence or as a condition of some relationship… something committed or entrusted to one to be used or cared for in the interest of another.
>
> By this definition, most cultural institutions are already trusted. Libraries, archives, and museums are entrusted with the materials and objects that document our cultural heritage. They are trusted to store these valuable materials. They are trusted to provide access to them in order to document and reveal history as well as to foster the growth of knowledge. They are trusted to preserve these items to the best of their ability for future generations. (OCLC-RLG 2002, p. 8).

The use of a standard office dictionary, in a report aimed at information managers and professionals, to define such a central concept is striking, particularly because other terminology discussed in the introduction and glossary draw heavily on the dense, technical and self-referential language of the *Reference Model for an Open Archival Information System* (OAIS), which was concurrently under development under the aegis of the Consultative Committee for Space Data Systems. The authors of the TDR report did not attempt to claim their chosen definition of trust as their

own, stating only that the Merriam Webster dictionary defined it in this way, and asserting "by this definition, most cultural institutions are already trusted".

This brisk treatment belies the complexity of the concept of trust, which is understood to be social and contingent, in the Merriam Webster definition. The TDR report implies that trust exists in a simple binary with distrust: either an institution is trusted or it is distrusted; once an institution is trusted this trust extends to all of the divisions, systems and staff within the institution, and presumably over time as well. The TDR report suggests that trust in cultural institutions is a matter of mandate, while in the Merriam Webster trust is characterized as embedded within relationships.

In the 1980s Hugh Taylor, in an article that sought to re-orient archives in relation to digital technologies and digital culture, provided a different view. "Most of our customers do not complain since we enjoy a monopoly of the business. There is nowhere else to go" (Taylor 1987–1988, p. 26). Populations that rely upon archives are not homogeneous in their view of archival institutions. Many Canadians, for example, may view their public archives as benign, trustworthy custodians of government records. Indigenous peoples often have a different view of these same public archives, seeing only one more organ of colonization. This view prompted the Indigenous negotiators of the Indian Residential Schools Settlement Agreement (2006), for example, to require that the government and churches who ran the residential school system copy their relevant records and transfer these digital copies to the Truth and Reconciliation Commission of Canada (TRC), for use by the TRC in its truth telling, subsequently to be archived in the non-governmental National Centre for Truth and Reconciliation that was envisioned in the settlement agreement. The Indigenous negotiators of the Settlement Agreement evidently did not trust the federal government and church archives to preserve, arrange, describe and make available these records. Given that the TRC has found its work to be stymied by lack of cooperation from the government and some of the churches, and given that despite the clear terms of the Settlement Agreement, the TRC has had to take the government to court to gain access to relevant records, this lack of trust, in addition to being understandable, is seen to be good policy (TRC 2012; Sinclair 2014; CHRR [n.d.]).

The 2002 TDR report fails to acknowledge that trust in public institutions cannot be understood as a simple binary. Archival records, archival professionals, archival theory and archival systems—each of these can be trusted or distrusted, in general or in a specific instance, without requiring consistency across the others or over time. Indigenous peoples, for example, while displaying justifiable "distrust in the archive" (McKemmish et al. 2011) have nonetheless made effective use of archival records in land claims, class action lawsuits and Aboriginal rights cases. To do so, Indigenous researchers and legal teams have had to rearrange archives, read them against the grain, and place them into alternative contexts (e.g. Lindsay 2011; Perry 2005; Ray 2012). While the use of archival records in Indigenous legal cases demonstrates at least a modicum of trust in the authenticity of the records, the need to rearrange the records points to a lack of trust in the reliability of the stories that the records have been arranged to foreground (Duff and Harris 2002). The

rearrangement and re-contextualization of the records demonstrates distrust in the archival theory and systems that inform the management of the records.

Such distrust is not limited to North American Indigenous peoples. Rodney Carter (2006), in discussing the nature of archival silences, notes that some silences are intentional and should be respected. "Silences are asserted as a statement of power by the marginalized", he writes, characterizing silence in such cases as "a forceful strategy of resistance". Carter examines how a range of non-mainstream populations use silence as power, "the power to speak or be silent, to have control over one's own person and possessions, to co-operate or resist". Carter focuses his analysis on the use of silence by women while noting that "The use of silence as power is not unique to women, but their strategies are perhaps the best articulated" (pp. 227–228). Alternatively, Brian Hubner (2007) explores the refusal to be counted by the Canadian census as an expression of Indigenous sovereignty.

We must be careful not to conflate distrust in the archive with archival silences. While some communities may distrust archives because their records have not been included in the archives, in many cases the issues go much deeper. Just as some archival silences evince a conscious choice not to participate in an archives associated with an oppressive power, some independent community archives have their origins in a desire to keep information private, within a particular community, or to keep it under the control of community members (Flinn et al. 2009). The Lesbian Herstory Archives in Brooklyn, New York, was founded as a response to "the precariousness of lesbian culture … [when] seen only through patriarchal eyes". The archives' Statement of Purpose maintains that "The process of gathering this material will uncover and collect our herstory denied to us previously by patriarchal historians in the interests of the culture which they serve". The archives' principles include statements that "The Archives shall be housed within the community" and that "Archival skills shall be taught, one generation of Lesbians to another, breaking the elitism of traditional archives" (Lesbian Herstory Archives 2014). Similarly, another community archive, Ara Irititja, gathers together "materials of cultural and historical significance to Anangu", carefully restricting access to members of this Indigenous group of central Australia and further regulating access according to cultural protocols such as those based on seniority and gender. The Ara Irititja website notes that "In the past, Anangu were photographed and their knowledge recorded and published without any negotiation. Today, Anangu are careful to determine how their history and culture are presented to the world-wide audience" (Ara Irititja 2011; quotations taken from homepage and "About Ara Irititja").

Populations such as lesbians or Indigenous peoples often are described as minority communities, separate from the mainstream. In reality,

> neither the community nor the larger culture against which it is defined is a stable category: "the majority" is a shifting, hulking presence that is constituted in opposition to whatever racial, ethnic, sexual, socio-economic, political, cultural (etc.) criteria are used to define or parse out a particular minority. Communities exist as a lens with which to view the mainstream, not as a stable exclusion from the mainstream. Change the lens – ethnicity, sexual

> orientation, religious belief, geography, etc. – and membership in "the community" changes (Bak and Chen 2014)

In other words, lesbians appear as a minority when they are classified by their sexual orientation; turn the kaleidoscope and they may merge into the mainstream if, for example, people are classified by ethnicity or occupation. This matters, for distrust in archives can be found throughout society. Cassie Findlay (2013) has argued that the existence of organizations like WikiLeaks demonstrate a fundamental distrust in official mechanisms for information retention, preservation and public access. Recourse to WikiLeaks for information dissemination and information access may seem like an extreme measure taken up by only a minority, but the use, by mainstream media and others, of information released by WikiLeaks suggests otherwise. In its earliest days, WikiLeaks itself was the focus of many stories told in the media. As time has passed, WikiLeaks has become another accepted source of information for the media—and for the courts. In January 2015 *The Toronto Star* reported that the 2010 arrest of a businessman and his daughter by the Canadian Border Services Agency resulted in a $10 million settlement, based partly on evidence from diplomatic cables leaked via WikiLeaks (Malarek 2015).

A slightly older Canadian example demonstrates longstanding concerns around the trustworthiness of government archives to administer evidence of accountability. Steve Maynard relates that since 1989 historians Greg Kealey and Reg Whitaker have used Access to Information requests to compile a complete set of the Security Bulletins of the Royal Canadian Mounted Police for the period from 1919 to 1945. These reports track activities that the RCMP deemed "subversive", and were originally circulated to the Prime Minister and his cabinet. To ensure that they remain publicly available Kealey and Whitaker are sufficiently distrustful of both the RCMP and LAC that they have published them on the Web through University of New Brunswick Libraries (Maynard 2010; RCMP Security Bulletins [n.d.]). Jason Speck (2010) has identified a long list of records issues, ranging from illegitimate records closures to incompetent or corrupt management of the records that have eroded the trust that American archivists too often assume is their due.

It should be emphasized that this lack of trust does not arise simply because of the broad mandate of a public institution like a national archives. Dara Price and Joanna Smith (2011) suggest that public archives seek to establish a "trust relationship between the archives and society as a whole, rather than between the archives and the individual citizen" (p. 257). Discussing appraisal, they note that "if it is a given that the archives cannot possibly acquire all the material with the potential to be used in the future, it is also a given that a citizen is eventually going to seek information that has not been acquired" (p. 257). Price and Smith's argument speaks to the point that archives may inadvertently silence populations whom they could have or should have represented more completely. Many recordkeeping professionals would like to treat questions of trust and distrust as a matter of archival acquisitions and archival silences, but this does not address the complete breakdown of trust that resulted in situations such as those described above: the Indigenous negotiators of the Indian Residential Schools Agreement demanding that all relevant records be copied out of government and church

archives and held by an independent, nongovernmental archive; the forswearing of formal archival training by the Lesbian Herstory Archive; or Kealey and Whitaker's efforts to create an unofficial repository of official government records, simply to ensure that they will be publicly accessible on an ongoing basis (to cite just three examples).

Though conceptually foundational to the idea of a TDR, the question of whether cultural institutions like national archives are fully trusted by the public is not addressed in the TDR report—it is asserted as a simple fact. Also foundational, and equally contentious, is the suggestion that cultural institutions can extend trust earned in the analogue realm into the digital. Since the preservation and access requirements of analogue and digital records are completely different, it is appropriate to ask whether trust in the preservation of analogue records has any bearing at all on trust in the preservation of digital records. And yet, the report suggests that "While the challenges presented in the preservation of digital information are much different and require new solutions, the public will likely have at least some trust that cultural institutions will succeed based on the success of the past" (OCLC-RLG 2002, p. 9).

It may be that some of those members of the public who fully and unreservedly trust archives with regard to analogue records may also trust archives to preserve, manage and provide access to digital records. But the authors of the report do not simply overlook the various segments of society that do not trust archives even for analogue records; they also overlook the fact that archives, by 2002, already had a 30-year history in administering digital information (Ambacher 2003; Baldwin 2007), during which time they had not fully secured the trust of digital records creators. That this history is overlooked by the authors of the OCLC-RLG report speaks to both the general lack of awareness of machine readable archives (MRA) programs at the US National Archives and Records Administration and at the Public Archives of Canada (PAC) (precursor to LAC). That this history is overlooked is all the more surprising considering that important players in this history were involved with both TDR and TRAC: Margaret Hedstrom is identified as a member of the RLG/OCLC Working Group on Digital Archive Attributes (authors of the 2002 TDR report) and Bruce Ambacher represented NARA on the RLG-National Archives and Records Administration Digital Repository Certification Task Force (authors of TRAC). This low profile is discussed in the archival literature. Sue Gavrel (1986) noted that "It is not that EDP [electronic data processing] personnel do not care about the need to preserve machine-readable records, but that they are totally unaware of the existence of archives" (p.155). But the problems went beyond a simple lack of awareness. Harold Naugler (1978) had noted that EDP personnel "are somewhat suspicious of our intentions, knowing very little about PAC and even less about MRA" (p. 177). In 1987 Barbara Craig urged Canadian archivists to "very soon establish links with the real managers of machine records whatever they be called" (p. 9). Despite Naugler's, Gavrel's and Craig's urgings that archivists build bridges with what would today be called Information and Communication Technology (ICT) personnel, more recent work has found that this population remains largely ignorant and distrustful of the work of archivists. Oliver et al. (2011), in studying digital repositories created by national archives in New Zealand,

Australia and Europe, note that "the transfer of digital records into archival custody had not been as great as expected" (p. 313). Oliver et al. suggest that this paucity of digital transfers results from differing perceptions of professional jurisdiction and competence. While archives have built up solid trust relationships with the records managers in government agencies around the transfer of analogue records into archival custody, they failed to realize that the acquisition of digital records required a new set of trust relationships with a different population of government employees, namely ICT personnel.

The definition of trust from the Merriam Webster dictionary, cited in the 2002 TDR report, emphasizes that trust is social, contingent and that it exists as an attribute of a relationship. Trust, by this definition, cannot exist as an abstract attribute of a single entity: a trusted digital repository must be trusted by someone to meet the terms of trust in the Merriam Webster definition. Nonetheless, despite citing the Merriam Webster definition of trust, the TDR report positions trust as a quality that can be unilaterally created, audited and certified. As noted in the Executive Summary to the report, "The critical component will be the ability to *prove* reliability and trustworthiness over time" through certification and audit (OCLC-RLG 2002, p. i; emphasis added).

Thus, although the only cited definition of trust in the 2002 report is the Merriam Webster definition, it is evident that the notion of trust that underwrites the report is, in fact, substantially different. The authors of the report position trust as something derived from the mandate of an organization, that organization's role relative to other heritage or memory institutions, its budget and priorities, its infrastructure and other resources, and the technical knowledge of its staff. This understanding of trust can be called technocratic because it refers back to the administrative and professional competence of the repository and its staff. This technocratic conceptualization of trust is auditable precisely because it is based upon the mandate, resources, actions and obligations of the institution, as represented by that institution. This avoids the messiness and contingency of trust in the real world, and as defined in the Merriam Webster dictionary, which requires building relationships with communities and with individuals. In endorsing a technocratic model of trust, cultural heritage institutions could focus on the very considerable and complex challenges of building a digital repository, and then, by demonstrating adherence to professional standards, have their repository certified as "trusted".

Criteria for proving trusted status, called for in the 2002 TDR report, were provided in 2007 with the publication of *Trustworthy Repositories Audit & Certification: Criteria and Checklist* (also known as TRAC). TRAC offers even less discussion of trust than the TDR report. As with the TDR report, the glossary at the end of TRAC does not include an entry for "trust". The introduction to TRAC does not discuss trust at all. A section of the introduction titled "A Trusted Digital Repository" points towards the 2002 TDR report in observing that "At the very basic level, the definition of a trusted digital repository must start with 'a mission to provide reliable, long-term access to managed digital resources to its designated community, now and into the future' (*TDR* 2002)" (OCLC-RLG and NARA 2007, p. 3). As in the TDR report, TRAC identifies trust as a matter of mandate and not of relationships. Later in the same section the authors of TRAC assert "A trusted

digital repository will understand threats to and risks within its systems" (OCLC-RLG and NARA 2007, p. 3). Again, trusted status is understood in terms of internal processes and analysis, rather than as a relationship with external users or partners.

The introduction to TRAC closes with a short discussion of terminology. The first four paragraphs in this section discuss aspects of digital preservation terminology, focusing on OAIS as presenting a common vocabulary. The fifth and final paragraph acknowledges complications raised by the term trusted digital repository while still laying claim to the terminology:

> Finally, this document names criteria that, combined, evaluate the trustworthiness of digital repositories and archives. While the correct phrase to describe such entities is "trustworthy digital repositories," the community has long used "trusted digital repositories" to convey that same assessment. While grammatically incorrect, it is never the less the phrase most familiar to and in use within the community. Therefore, this document does refer to trustworthiness and trusted digital repositories. (OCLC-RLG and NARA 2007, p. 8)

This solution acknowledges the grammatical complications of the term trusted digital repository—which provokes the implicit question "trusted by whom?"—while hewing to the same technocratic model of trust as in the TDR report.

One reviewer of this article suggested the notion of technocratic, auditable and certifiable trust is not unique to TDR, but is shared by other standards that have broad public and professional support, such as the ISO 9000 family of quality management standards. This comparison does not hold up, however. The ISO 9000 series addresses a concept—quality management—that is more specific than trust, and it does so by defining quality management in a precise way that is internally consistent within the family of standards and which is consistent with non-specialist understandings of quality and management. My analysis suggests two problems with the use of "trust" within the TDR report and TRAC. The first problem is that a common, non-specialist definition of trust is invoked as foundational in the report, but that this definition of trust is not actually the one that underwrites the report. Secondly, though it would be far preferable if the authors of the report had created a specialized definition of trust in place of the Merriam Webster definition, this new, technocratic definition of trust would remain problematic, since it would go against the common understandings of trust already circulating in society. The ISO 9000 family of standards is built upon the concept of quality management, a concept that does not broadly circulate in our culture outside of its application within the world of management audit and certification that is the hallmark of the ISO 9000 suite. Nonetheless, the terms quality and management within the ISO 9000 family, taken individually or taken together, align well with non-specialist understandings of these concepts in our general culture. This stands in stark contrast with the technocratic notion of trust that underwrites TDR and TRAC.

It is obvious that TRAC was never intended to be a meditation on the nature of trust. The authors state "The challenge has been to produce certification criteria and delineate a process for certification applicable to a range of digital repositories and archives" (OCLC-RLG and NARA 2007, p. 2). It can be noted that this statement is consistent with the focus within TDR and TRAC on the needs of archives rather

than those of the communities that use archives, but there is no denying that this is itself a considerable challenge. The TRAC audit criteria are organized into three sections that examine organizational infrastructure, digital object management and overall technological and security infrastructure. The first of these areas was intended to allow heritage institutions to surface and build upon their role and past experience in the management of cultural heritage by stressing factors such as mandate, existing preservation policies and financial sustainability. The second and third areas are more technical and are largely validated with reference to other standards, especially the Reference Model for an Open Archival Information System, or OAIS.

TRAC is itself a standard and has more recently served as the basis for a standard issued by the International Organization for Standardization. ISO 16363, *Audit and Certification of Trustworthy Repositories* retains the basic structure and approach of TRAC, including the underlying technocratic model of trust. ISO has since issued another standard, ISO 16919, which identifies *Requirements for Bodies providing Audit and Certification of Candidate Trustworthy Digital Repositories*, establishing the means by which ISO 16363 can be used in formal audit and certification.

Networks of standards of this sort—TRAC expressed with reference to TDR and OAIS and then woven into a suite of ISO standards, all of which are interdependent—are relatively common and are part of what Alan Bell has termed "standards culture". But what is a standard in the first place? Bell acknowledges that "the use of the term 'standard' can be problematic", but proposes that, in his article, "the focus is on standards detailing an agreed and accepted process or series of processes to assist in achieving a recognized goal, or a technical or other specification that sets out the requirements for specified actions, outcomes or products" (Bell 2011, pp. 24–26).

Bell's rough definition is inclusive of the range of guidance standards, compliance standards and technical specifications. A *guidance standard* such as ISO 15489, the international records management standard, identifies key issues in the records management field but does not mandate specific responses to these issues. A *compliance standard* such as US Department of Defense 5015.02, which identifies the functional requirements of any Electronic Document and Records Management System (EDRMS) to be used in the US government, identifies the basic system requirements for an EDRMS but does not specify how a particular system should meet these requirements. *Technical specifications* such as those of the Internet Protocol Suite, which enable the flow of data across heterogeneous computer systems and networks, require exact compliance, without which participation in the larger network simply is not possible. This sort of standard is required whenever multiple pieces of technology must operate in concert—whether through an electricity grid, a telegraph network or the Internet.

Electrical grids and communications networks require exact compliance with technical specifications to function. But this is not what Bell means by "standards culture". Rather, Bell is referring to the increasing tendency of professional discourse to occur in relation to a range of guidance standards, compliance standards and technical specifications. Recordkeepers' engagement with standards is not particularly new. Jennifer Bunn's (2013) history of archival descriptive

standards takes the late 1970s as its starting point, while Richard Dancy (2012) traces the origins of the Canadian *Rules for Archival Description* back to the nineteenth-century movement to develop bibliographic standards.

Anyone working in the field of digital preservation, or digital archives more generally, could hardly fail to notice, particularly over the last two decades, proliferating references to various kinds of standards—descriptive standards, application profiles, metadata standards, process standards and so on. These standards form almost a language of their own—as in "I can see that you have mapped RAD to MODS to capture your descriptive metadata, but to which sections of METS do you crosswalk PREMIS?"

There are different ways of understanding the rise of standards culture within recordkeeping. A sympathetic interpretation is offered by Heather MacNeil (2011) who, in discussing "the proliferation of metadata and digital recordkeeping standards" suggests that they represent "an attempt to shore up and/or extend the narrative of trusted custodianship through, among other things, the identification of procedural controls over record making and recordkeeping that are functionally analogous to those that worked in the analogue world" (p. 183). MacNeil suggests that standards allow archivists to accomplish the goal laid out in the 2002 TDR report—to leverage their expertise in the analogue realm to gain credibility in the digital realm. MacNeil makes the case for standards as boundary spanners, the boundaries in question being those between analogue and digital recordkeeping. This is most obvious in a standard like ISO 15489, in which concepts such as authenticity and reliability of records and recordkeeping systems are generalized so as to be applicable to both analogue and digital recordkeeping systems. OAIS offers another example. The basic concepts of OAIS could apply to any analogue or digital preservation environment, which is what enables them to be referenced in multiple contexts, whether a web archive, a data archive or the kind of heterogeneous mass of formats and media typical of most government, corporate or community archives.

Seen in their best light standards are boundary spanners, allowing members of different professional communities to construct new, shared languages. Equally, however, standards can become boundary markers, declarations of professional competence that can define territory and erect a wall around it. Or, as Bell (2011, p. 34) would have it, "standardization can create problems between communities of practice as well as within them".

Bell cites a number of reasons why this is so. He points out that standards do not always represent best practices. In many cases they codify acceptable though imperfect compromises which then remain in place, due to inertia and the challenges inherent in updating standards, for longer than warranted. Within the Canadian archival community this principle is well illustrated by the history of the *Rules for Archival Description* (Dancy 2012). Additionally, cultural nuance can be lost. Bell cites ISO 15489 as an example of this, since many non-English speaking nations do not distinguish between archives and records, a distinction that is foundational to the standard. This, and other complications in creating an international standard like ISO 15489, is further discussed by Susan Healy (2010). In some cases, losses of cultural nuance can approach cultural imperialism, with standards working to enforce unwarranted and unworkable uniformity. Here

Bell, following Parman and Palme (2009) cites the ASCII character set, which disadvantages cultures that do not use Latin writing systems.

Not only do standards not necessarily represent best practice, implementations of standards are not themselves standardized. Lampland and Star point out that "standards are always relative to the infrastructure within/upon/sometimes against which they are implemented" (quoted in Bell 2011, p. 34). This is obvious when considering high-level guidance standards such as ISO 15489 or OAIS, which lack implementation instructions and therefore must be interpreted in order to be implemented. But even for more precise and granular standards, such as RAD or MODS, local implementation decisions and differing system requirements create widely differing implementations of the same standard. Interoperability—the ability to easily move data from one system to another—cannot be achieved by standardization alone, despite being routinely touted as a chief benefit of standardization. This point is brought home by the chaotic diversity that exists among electronic document and records management systems (EDRMS) that nonetheless satisfy compliance standards such as DoD 5015.02. EDRMS are so complex that identical sets of hardware and software implemented for shared aims can nonetheless have completely different system architectures and metadata regimes. For example, the Canadian government has long required federal agencies to purchase the same EDRMS system, adhere to a common information management policy and even provides a standard *Government of Canada Records Management Application Profile* (2006) to guide implementation. Nonetheless, archivists at Library and Archives Canada have found that extracting records from each department's implementation of the system, despite common hardware and software, requires a transfer application, individually customized to each institution, that extracts digital objects and metadata from the dozens of distinct databases and other components that make up the EDRMS (Smith and Armstrong 2009; Bak 2012).

Bell (2011) notes, with reference to MoReq 2010, that despite the variable results that the standard produces, "manufacturers of electronic records management systems like it because it gives them criteria … on which they can base their products and a testing framework to evidence compliance", while "record keepers can use MoReq to benchmark the functionality of those products" (p. 36). These are not unimportant effects, but improving the ease of selling and buying major IT equipment is not generally cited as a principle reason for promoting standards. "It seems legitimate to ask", writes Bell, "whether manufacturers are the principle beneficiary from standards developed by industrial groups" (p. 37). He also notes that a primary benefit of a standard such as ISO 15489 has not been any notable homogeneity in its implementation and use, but rather that "the mere existence of an international standard on records management has helped to elevate the profession". Cataloguing standards, Bell continues, help to "enshrine professional values" and regulatory standards "though difficult and sometimes tiresome in their implementation, provide necessary societal and professional boundaries" (p. 38). In sum: Bell points out that while standards have not delivered interoperable systems or data or even homogenous systems architectures or data management

practices, they have enabled manufacturers to sell their products and elevated the role of records professionals in purchasing and administering these systems.

In stressing the social, professional and economic effects of standards, rather then their technical effects, Bell points us towards a discomfiting truth about standards culture. Standards enshrine expert knowledge and opinion while dissociating this knowledge and these opinions from the professionals and others that have a vested interest in their promulgation. Once codified into a standard,

> the standard itself [becomes] the locus of expertise … [B]ecause expertise is located in the standard and not the persons behind it, 'standardisation is a system in which responsibility is both fragmented and diluted' and therefore '[s]tandardisers are rarely held to account for what they do' (or … what they have failed to do). (Bell 2011, p. 37)

Suites of interdependent standards, such as the TDR report, OAIS and TRAC, further fragment and dilute responsibility for their gaps and shortcomings. We have already seen this with regard to the definition of trust cited in the TDR report. Although the discussion of trust in the TDR report is cursory and inadequate, its presence is foundational. TRAC gestures towards this discussion of trust and addresses only its grammatical limitations.

Bell (2011, p. 38) concludes his article on standards culture by urging recordkeepers to focus on the professional rather than technical effects of standards implementation. Bell does not suggest that standards act as boundary spanners; rather, he suggests that they shore up the boundaries of a profession under "threat of being disregarded as a 'back-office' function". Referring to international standards such as ISO 15489, TRAC (which has become ISO 16363) and OAIS (which has become ISO 14721) helps to legitimize recordkeeping as an important activity. Rather than promoting professional accountability, Bell suggests that these standards normalize the professional roles of recordkeepers. Though written by recordkeepers and other information professionals, these standards provide justifications that would seem self-serving if they came directly from recordkeepers themselves. Standards allow recordkeepers to make their best case for their organizational roles and resources while gesturing towards external organizations like the International Organization for Standardization.

Part two: Library and Archives Canada's trusted digital repository (LAC TDR)

On September 25, 2006, Librarian and Archivist of Canada Ian Wilson gave a speech that stressed the connection between the preservation of information and access to information, identifying these as "two sides of the same coin". Wilson noted that "widespread and increasing use of electronic information systems across government present yet another challenge for us and all archives in the country", and also observed that "the Government of Canada does not have any central capability which meets the standards of a trusted digital repository … We are maintaining this material and can move it forward as hardware and software change,

but I am not yet certain it is preserved for the long-term in a manner that assures its integrity and authenticity" (Wilson 2006).

Wilson's use of the phrase "trusted digital repository" in this speech was not accidental. LAC's 2007–2008 *Report on Plans and Priorities* states that work on LAC TDR had begun in 2006. In answer to a question about the project in the House of Commons, in 2013, Heritage Minster James Moore stated that the Treasury Board funded the project over three fiscal years, 2007–2008, 2008–2009 and 2009–2010, providing a total of $22,810,000 (Moore 2013). A 2007 internal audit of the project, conducted before the Treasury Board funding had been awarded, noted that LAC had, at the time of that audit, budgeted an additional $6.9 million for LAC TDR and AMICAN from its ordinary operational funding (Hallux Consulting 2007). By the time Wilson spoke, LAC staff had been working towards LAC TDR for some time, assessing LAC's current state of digital preservation readiness, laying plans for development and initiating the time consuming and rigorous process of applying for special funding from Treasury Board.

The 2007 internal audit, performed by Hallux Consulting, provides an early, penetrating look at the project. The auditors describe the project as "high risk" both because as a "large scale IT project" it is inherently risky, and because it "represents a very significant change in the business". Nonetheless, the auditors identified the principal risk to the project as being the "sporadic nature of funding", going so far as to state that while "the weakest link in the project" is "aging, almost obsolete" hardware platforms, "the issue is not a technical one but a financial one".

Project funding, then, was identified early on as the major risk. The auditors noted additional worrying aspects to the project, including "no preparations in place to measure benefits achievement", an over-reliance on contract staff and that the project plan is written at a high level with "no detail[ed] deliverable or task list". These troubles notwithstanding, the auditors identified a "solid governance structure" as a strength, but noted a worrying disconnect between senior management and operational managers: "Senior management thinks that change in technology does not represent a significant risk … However, Business Managers feel that the project is moving towards a target that is not well understood and that more research is needed" (Hallux Consulting 2007).

This last point takes us back to assertions made in the 2002 TDR report about the transferability of trust in the analogue environment to the digital environment. Despite aging infrastructure, a lack of internal expertise that compelled the over-reliance on contractors noted by the auditors, and a dearth of operational funding that motivated LAC to apply for special funding from Treasury Board, senior management apparently remained convinced that LAC was an inherently trustworthy institution that would build an inherently trustworthy digital preservation system.

LAC's 2007–2008 *Report on Plans and Priorities* made official the organization's commitment to LAC TDR, characterizing "The development of a suite of Trusted Digital Repository services" as "central to our legislative obligations" (LAC 2007, p. 30)

> We are focusing on building a solid policy and technical infrastructure for effective management of submission information from content creators. We are addressing the management of metadata related to the technical, descriptive and rights attributes of the content … Much of this work will involve partnerships with content creators and other institutions and initiatives that share common digital missions and issues. (LAC 2007, p. 30)

The project is presented here as primarily technical and internal-to-government rather than outward facing. LAC commits itself to building partnerships, but with content creators (i.e. publishers and government agencies) rather than with citizens. LAC declared its intention to build a trusted digital repository but its emphasis, as in the 2002 TDR report and TRAC (only just released in 2007) is on the second word ("digital") rather than on the first ("trusted"). It also nestled LAC TDR within a series of technical and policy-oriented projects, including the Canadian Digital Information Strategy and the incipient idea of a national network of TDRs—as when the report states that "Our leadership in this area will contribute to the development of TDRs by other libraries, archives, museums and public institutions".

LAC's 2008–2009 *Report on Plans and Priorities* hit many of the same notes as in 2007–2008 but provides more detail. LAC more confidently asserted national and now international leadership roles in digital preservation, declaring LAC's "leadership in supporting the creation of a network of TDRs in Canada and ensuring that they all meet consistent standards" (36–7) and noting that this work will position "Canada as a leader in the digital world" (23). Additionally, the 2008–2009 report provides long-term performance measures ("A network of Trusted Digital Repositories, supported by standards, policies, tools and infrastructure" 36) and short-term performance measures (including a digital preservation policy in place by September 2008 and a TDR architectural roadmap by August 2008). As in the earlier documents, there is no discussion of building trust with external stakeholders in the project, other than the references to LAC leadership in building a network of TDRs.

In August 2008 the International Federation of Library Associations met in Quebec City. Pam Armstrong, a LAC manager and a driving force behind LAC TDR, presented a paper titled "Library and Archives Canada: Towards a Trusted Digital Repository". Armstrong offered an in-depth view of LAC TDR, emphasizing the project's governance structure (which included an executive-level committee on digital preservation), its reliance on OAIS and other standards and its integration with other LAC initiatives. The presentation included the LAC TDR High-Level Design, thus delivering, on time, the architectural roadmap promised in the 2008–2009 *Report on Plans and Priorities* (Armstrong 2008). Internet Archive captures of the Library and Archives website from this era chart progress on LAC TDR with the progressive addition of policies, guidelines and other research outputs on the "Digital Initiatives at LAC" webpages (Library and Archives Canada [fonds] 2015). Another of the short-term performance measures was the creation of an official digital preservation policy. Although the earliest capture of the policy in the Internet Archive is from 21 October 2011, and although the policy itself is undated,

the webpage displaying the policy shows 12 August 2008 as the date of creation, which would indicate that it was posted one month prior to the deadline set in the *Report on Plans and Priorities*.

A digital preservation policy is a keystone document for the audit of a TDR under TRAC, part of the "clear and explicit documentation of its requirements, decision, development and actions to ensure long-term preservation and access to digital content" (OCLC-RLG and NARA 2007, p. 12). Section 1.F of the LAC policy lays out key principles and commitments, including conformance to OAIS and other standards, a commitment to national leadership in developing and implementing standards and "a financial commitment to [a] … preservation program for digital materials". Although TRAC requires an explicit definition of the TDR's designated community, the LAC policy barely mentions users at all, making only one brief reference to "user groups/client groups" as an external stakeholder. Nonetheless, it is easy to see the influence of TDR, TRAC and OAIS on the policy, particularly in its frequent (more than twenty five) references to standards and standardization (LAC 2008b).

Ian Wilson retired as Librarian and Archivist of Canada in April 2009; he was succeeded by Daniel Caron, who had previously been an Associate Deputy Minister at LAC. Over 2008 and 2009 a number of external publications and presentations by project staff provide considerable detail on LAC TDR development, confirming and extending the overall emphasis on various kinds of information management, digital preservation, metadata and technical standards (e.g. Armstrong 2008, 2009; Bak and Armstrong 2008; Smith and Armstrong 2009). LAC TDR remained central to how LAC envisioned meeting its mandate and was integrated into a triumphal narrative in a speech by Caron in March 2010. In this speech Caron implies that LAC TDR was already complete and in place: "During this time [i.e. since the merger of the National Library and National Archives in 2004] critical research and development led to a new integrated Canadian national catalogue (AMICAN) and a Trusted Digital Repository (TDR) to manage long-term access to digital resources" (Caron 2010).

Daniel Caron intensified the focus on digital recordkeeping at LAC. This was made publicly evident through Caron's many speeches and presentations, as well as through the 7 December 2010 press release "Library and Archives goes digital". In this press release LAC made a number of remarkable commitments, including that "By 2017 LAC will acquire and preserve all borne [sic] digital federal archival records electronically" and "By 2017 LAC will preserve digital material through a trusted digital repository that meets international standards" (LAC 2010b)

This was a key commitment for the organization, since the nearly $23 million in Treasury Board funding for LAC TDR and AMICAN, spread over 3 years, ended in the 2009–2010 fiscal year. In the 2010–2011 fiscal year, LAC would have to fund LAC TDR solely through its operational budget, transforming it from a project to a program. A second press release, issued on 16 December 2010, confirmed "the notice given by the Librarian and Archivist in Canada in the spring of 2010 that LAC would be a Trusted Digital Repository by 2017". This press release attributes to LAC TDR capacities that went far beyond any promises made earlier, or indeed, promises made elsewhere in the digital preservation literature:

> The LAC Trusted Digital Repository (TDR) will serve as a data warehouse for the overall digital collection, which will enable LAC to fulfill its mandate to preserve Canada's digital information resources. The TDR will also support the implementation of better recordkeeping practices since it will enable Government of Canada institutions to use less paper, reduce storage costs, improve effectiveness, facilitate current operations and therefore improve services to Canadians (2010a).

LAC's 2010–2011 *Report on Plans and Priorities* uses more measured language but maintains the same tone of unfettered optimism, promising that "The first phase of the LAC Trusted Digital Repository (TDR) will become operational on April 1, 2010". For the first time, the *Report on Plans and Priorities* includes an extensive sidebar that defines the challenges of digital preservation and describes how they are addressed through a TDR. This sidebar describes a TDR as "a framework, system and tools" to manage digital assets in the long term and notes that "TDR development by LAC … is grounded in internationally established models" (LAC 2010c, pp. 18–19).

This was to be the high-water mark for LAC's commitment to an operationally funded TDR. The 2011–2012 *Report on Plans and Priorities* includes few details about LAC TDR, observing that the "internationally accepted method of doing [digital preservation] is through Trusted Digital Repositories (TDRs)" but then striking a cautious note: "We have been exploring how best to establish a Trusted Digital Repository (TDR) capacity at LAC for some years … Our experience underlines the need to move forward incrementally" (LAC 2011, pp. 14, 25). LAC's 2011–2012 *Departmental Performance Report*, submitted at the end of the fiscal year, moved the organization further from the idea of a TRAC-validated TDR, noting that although "LAC completed another phase of its Trusted Digital Repository program" the organization had "re-evaluated its approach to the development of the technologies and tools required to preserve Canada's digital documentary heritage". This report states that LAC had already "Developed a new architecture that focuses on a flexible approach to digital asset management"; "Installed and tested digital asset management systems for possible use within LAC"; and "Initiated work on policies, directives and business processes to further enhance LAC's digital preservation efforts" (LAC 2012b, p. 24).

As discussed above, the AMICAN/TDR audit of 2007 had stressed that sufficient and stable financing was the primary problem facing these ambitious projects, observing that even technical problems such as obsolete hardware platforms ultimately could be considered financial challenges. Moving a major IT project from project funding to program funding would be challenging under normal operational circumstances. LAC's financial situation in 2012, however, was anything but normal.

The 2012 conference of the Association of Canadian Archivists was held in Whitehorse in the Yukon Territory. Daniel Caron had been scheduled to speak, but at the last minute Cecilia Muir, LAC's Chief Operating Officer, was substituted to speak in his place. In her speech she related that the Government of Canada's 2012 budget had delivered a $9.6 million budget cut to LAC (estimated to be 10 % of

LAC's overall budget) by 2014–2015. Due to this and other factors, LAC estimated that its spending power had been reduced by 30 %. To deal with this reduction, the organization made cuts to various programs, including Access to Information, Circulation and Reference, IT staff and archivists working in private acquisitions and resource discovery. Perhaps most controversial of all was the outright elimination of the National Archival Development Program, a matching-funds program that had supported the work of smaller archives across the country (Muir 2012).

It was in this context, Muir explained, that the LAC TDR project had "dramatically changed direction" to find "new, better and lower cost alternatives". LAC's senior management characterized this as:

> a more modern approach of employing commercially available modules connected together to form a solution. This has significantly reduced the costs of development and maintenance and depends more on 'trust in people and organizations' while still maintaining a strong technical dimension. Essentially this means that it will be our employees, rather than the technology used, that will embody the Trusted Digital Repository. (Muir 2012)

Again going back to the AMICAN/TDR audit of 2007, the TDR project had long been associated with an excessive and high-risk reliance on contract staff. The positioning of LAC's new "TDR" solution as "more modern" is perhaps disingenuous, but it did, finally, address this central weakness of the original LAC TDR project. Unfortunately, it did so by rendering the concept of a TDR meaningless, at least in terms of the concept of TDR as articulated in the 2002 TDR report and in TRAC. When, at the inaugural meeting of the short-lived Pan-Canadian Documentary Heritage Forum on November 5, 2012, Daniel Caron announced that he was "pleased to report" that LAC TDR "has been successfully tested", it was unclear to what he was referring (Caron 2012). Speaking five months after Muir's presentation to the Association of Canadian Archivists, Caron might have been referring either to the original vision of a TRAC-certified digital preservation system, Muir's cost-effective assemblage of off-the-shelf IT, or to LAC staff themselves who, again according to Muir, were said to "embody the Trusted Digital Repository" in some unspecified sense.

LAC's official documents continue to deploy this ambiguous usage of "trusted digital repository" and have introduced further ambiguity around the very concept of digital preservation. LAC's 2012–2013 *Report on Plans and Priorities* introduced new wording for this organizational objective, replacing "LAC will ensure digital preservation" with "LAC will adapt how it manages its holdings" and positioning the organization as "working toward a networked pan-Canadian trusted digital repository". In 2012 Muir had suggested that LAC staff were LAC's "trusted digital repository", but the 2012–2013 *Report on Plans and Priorities* seems to identify the nascent, LAC-led Pan-Canadian Documentary Heritage Forum as LAC's "trusted digital repository" (LAC 2012a).

LAC's 2012–2013 *Departmental Performance Report* states that "LAC is currently developing policies, standards and work methods, as well as the technology required to become a trusted digital repository" and promises that the

"introduction of the principle of the trusted digital repository will ensure the long-term availability of Canada's digital documentary heritage" (LAC 2013b). By this point LAC had taken down the digital preservation policy that had been posted to the LAC website in 2008. In promising "the introduction of the principle of the trusted digital repository" LAC appears to have opted out of the sort of national and international efforts that were referenced in the 2008 policy or in the various publications and presentations made by LAC staff in 2008 and 2009.

References to a "trusted digital repository" remain ambiguous in LAC documentation. The 2013–2014 *Report on Plans and Priorities* reaffirms LAC's "commitment to becoming a trusted digital repository" promising to "complete creation of the trusted digital repository", while nonetheless asserting that LAC is "continuing to refine its trusted digital repository" (LAC 2013a, pp. 4, 8 and 26). The repository must already exist in order to be refined but, confusingly, the earlier reference suggests that it is still being created. The promise, in the 2014–2015 *Report on Plans and Priorities* to "continue efforts to finalize the trusted digital repository" has become routine (LAC 2014). LAC continues to work at LAC TDR, and there is no indication of when it will be completed or even what exactly LAC TDR has become as a concept, a principle, a project or a program. It has become vaporware.

I have suggested that LAC TDR can be understood as vaporware, a prestige project announced early to great fanfare but that proved difficult to implement, suffered several re-imaginings and has been withering for years. This narrative has much to recommend it, not least the corporate documentation assembled here, suggesting that what really killed LAC TDR was a change in vision for the project that came with the retirement of Ian Wilson and the appointment of Daniel Caron as Librarian and Archivist of Canada, combined with the devastating reduction of LAC operating revenues that coincided with the expiration of project funding from Treasury Board.

This is not, however, the whole story. The 2007 audit had identified the transition from funding LAC TDR as a special project to funding it as an operational program as a principal risk of the project. Seeing this flagged so early makes it reasonable to think that LAC management should have been better prepared for the transition. Additionally, the 2007 auditors' flagging of the gap between the big-picture confidence of senior management and the ongoing concerns of operational managers proved prescient. The naïve optimism of the two 2010 LAC press releases, discussed above, as well as Librarian and Archivist Daniel Caron's speeches, also in 2010, seem to indicate a fundamental lack of understanding of the actual functions and complexity of a trusted digital repository. Repeated statements that LAC TDR—or at least a phase of it—was complete also seem to indicate a simplistic understanding of the project and the deep interrelationship of its components. For example, the Virtual Loading Dock as described in Armstrong (2008), Bak and Armstrong (2008) and Smith and Armstrong (2009) is an integral part of the TDR. Official documents like the various *Reports on Plans and Priorities* seem to depict this "accessions module" as a freestanding piece of technology.

If LAC TDR can be understood as vaporware, it can also be understood as a high-speed train wreck. Train wrecks don't happen just anywhere, and trains don't derail

in just any direction: they typically happen on problematic stretches of track, with momentum carrying the train in a predictable direction. For LAC TDR the transition from special project to operational program represented a tricky switch in the track. A seasoned engineer would approach this switch cautiously by slowing down, watching for signals and making sure that his crew was ready. Daniel Caron in 2010 did the opposite, implying that LAC TDR was already complete and operational, declaring that "Within the next 7 years, Library and Archives Canada will put most of its services online, transforming the country's leading memory institution into a fully engaged digital organization, just in time to celebrate Confederation's 150th anniversary in 2017" (LAC 2010a).

Having promised more than it could deliver—or, to stick with the train metaphor, having poured on the speed as the train approached the switch—LAC management was then hit with the massive budget cuts of the 2011–2012 fiscal year. In our train metaphor, this can be imagined as an unexpected obstruction in the track on the approach to the switch. Should the resulting derailment be blamed on the debris on the track, the switch itself or on the reckless speed of the train?

Once LAC TDR derailed, the resulting train wreck followed the trajectory set not only by the decisions made by LAC management, but also by the LAC TDR project team—specifically, the decision to pursue a TRAC-certified TDR.

LAC TDR from the start shared the strengths and the weaknesses of the 2002 TDR report and the 2007 TRAC validation regime, including the technocratic model of trust that was developed through these instruments. By accepting as foundational the idea that building a trustworthy digital repository was a matter of standards, audit and certification, LAC wrote its users out of any significant role in its digital preservation solution. One effect of this was to give the institution considerable latitude to revise their plans on the fly. Already in the 2011–2012 *Report on Plans and Priorities* LAC had weakened its commitment to external validation; in subsequent reports the very idea of external validation is entirely absent.

The consequences of this isolation, for LAC TDR and for LAC itself, have been grave. While LAC management may have appreciated the freedom to revise plans afforded by a lack of commitments and ties to external parties, this left LAC isolated in dealing with its substantial funding cuts. LAC TDR was apparently sacrificed, as senior management cast about for a new, cheaper way of effecting digital preservation: by using off-the-shelf products, by defining digital preservation as the management of digital resources by LAC staff, by defining digital preservation as a function of its Pan Canadian Documentary Heritage Network. The result of these contortions is laid bare in the Fall 2014 report of the Auditor General of Canada:

> We found that Library and Archives Canada did not have a corporate digital strategy that expressed a vision for digital archiving and identified strategic priorities, roles and responsibilities, and performance measures related to the long-term preservation of digital archives. (p. 9)

Perhaps a little less freedom to re-define digital preservation on the fly would have served LAC better. Perhaps more engagement with its users, and with the Canadian public in general, would have given LAC some vocal allies outside of

government, allies who could loudly protest the severe funding cuts that were handed down to LAC.

In 2007 Bruce Ambacher, recently retired as co-chair of the RLG-NARA task force that was shortly to publish TRAC, offered his thoughts on the idea of TRAC certification for government archives.

> Two things should be noted here: First, digital certification probably will not affect the relationship of a government archives to its sponsoring government or to the government agencies that create its collections. Those relationships and obligations usually are established by law and regulation. Second, in the short term, government archives, if they choose, can ignore the draft Audit Checklist and certification process and continue their archival activities with undiminished status (Ambacher 2007).

Ambacher positioned NARA's participation in developing TRAC as a kind of *noblesse oblige*—to further quote Ambacher, "an obligation to provide leadership on the issue".

Confronted with the challenges of building a digital repository that would satisfy the full range of its stakeholders, LAC appears to have come to very nearly the same conclusions as Ambacher. Having been established by law as the official repository for government records of all media and formats LAC evidently feels that it does not have to convince either its donors or its users of its trustworthiness since, by law, it will ultimately become the custodian of the records and the only source for accessing them in the future.

This is true so long as government records are considered inalienable from government archives. We have already seen, however, that digital technologies are enabling the creation of increasing numbers of unofficial repositories of official documents. The RCMP *Security Bulletin* archive established by Kealey and Whitaker and WikiLeaks are just two examples; the LeakDirectory website links to dozens of local, regional and international whistleblowing and leak sites, many of them specializing in particular types or sources of documents (LeakDirectory 2015). As Findlay (2013) suggests, the authenticity of the documents available through these sites is demonstrated by the reactions of governments to the leaked information and to the information leakers. It is further demonstrated as the records are cited as evidence in the press, in academic works and in courts (e.g. Malarek 2015).

Additionally, more conventional non-governmental archives also provide access to government records. Michelle Caswell cites the example of the non-governmental Cambodian genocide archives, DC-CAM, in exploring the limits of inalienability, asking "should records implicating human rights abusers fall under the jurisdiction of archives still under their control?" (Caswell 2013, p. 114). This is precisely the question that led the Indigenous negotiators of Canada's Indian Residential School Settlement Agreement to require the creation of a non-governmental archives for the records of the resulting Truth and Reconciliation Commission, and to require the churches who ran the schools as well as the government agencies who administered the system, to transfer to this archive digital copies of all records relevant to the residential school system (IRSSA 2006

Schedule N). Digital technologies allow the TRC archives to provide access to these documents over the Internet, but it is worth noting that this sort of activity predates the Internet. The Walter Rudnicki fonds at the University of Manitoba Archives and Special Collections documents Rudnicki's work as an unofficial archivist of the Canadian government's policies towards and treatment of Indigenous peoples. During his lifetime Rudnicki used these materials in his own Indigenous rights activism, in addition to making them available to Indigenous peoples and other activists (Rudnicki 2010).

Postcustodial archival theory has long accepted that national archives like LAC might not be the inevitable location for all government archives. As early as 1995 Terry Cook (Cook 1995) argued that it might not make sense for government archives to create digital environments that could serve as repositories for records that are created and maintained within very complex and often expensive proprietary digital technologies. More recently, Laura Millar, Cook and other commentators have suggested that the future of archives lies in a distributed archival system rather than the single "total archive" that was the goal of Canadian archivists in the 1970s and 1980s (Millar 2014, Cook 2013). This archival network might include government agencies retaining custody over records that the national archival authority deemed archival as well as various communities maintaining their own archival infrastructures, or leveraging the archival infrastructures of larger archives, universities and other cultural institutions (e.g. Lesbian Herstory Archives 2014; Bak and Chen 2014; Ajamu X et al. 2010).

One reviewer of this paper noted that LAC made the mistake of viewing its TDR as an end in itself, rather than as a means to an end. An institution like LAC can, given the right context and sufficient resources, build a digital repository, but trust can only exist as part of a relationship. As the concepts of inalienability and chain-of-custody continue to be eroded, the monopoly that national archives like LAC and NARA had on government records will similarly be eroded. Our users are removing records from official archives—whether legally, through the use of Access to Information legislation or court orders, or illegally, through leaking—and creating unofficial repositories that they believe can better meet their needs for management, preservation and access. When WikiLeaks is accepted as a source for authentic government records, when researchers like Kealey and Whitaker publish official records on the web to ensure their circulation, when the Canadian courts order the copying of government records so that they can be administered by and accessed from a nongovernmental archives (IRSSA 2006 Schedule N)—our users are trying to create archives that they can trust. The national archives are now just one of a range of sources of government records. Depending on the nature of your query, it may not even be the best one.

LAC TDR was an ambitious project; perhaps it was even a precocious project. Initiated in 2006, LAC TDR predates the final version of TRAC by at least a year. The conceptual foundations of LAC TDR were established before the digital repositories community had finalized its thinking about TDRs and before there was a substantial research base that examined the question of trust in relation to digital repositories. Concurrent with the launching of LAC TDR, in the wake of the TRAC consultation draft of 2005, thinking about trust had already begun to shift.

Seamus Ross and Andrew McHugh noted in 2006

> We were struck by the realization that while a great deal of effort has been invested in determining the characteristics of a 'trusted digital repository', far less effort has concentrated on the ways in which the presence of the attributes can be demonstrated and their qualities measured.

They went on to observe that

> within our community [i.e. the digital repositories community] our outlook appears to be shifting from optimistic trust behaviour to pessimistic trust behaviour. That is, a healthy level of pessimism has emerged that has led many to recognise that digital repositories are only worthy of trust if they can demonstrate that they have the properties of trustworthiness.

Ross and McHugh, and TRAC itself, remained focused on a technocratic model of trust, but their comments show a welcome awareness of the problematic assertion of trusted status in the 2002 TDR report. Moreover, although they continued to emphasize the importance of compiling evidence of trust by the repository to enable certification by a professional third-party—a hallmark of technocratic trust—they subtly repositioned the nature of what TDR and TRAC were intended to accomplish. Whereas the TDR report framed its chief objective as the ability for repositories to furnish objective proof of their own trustworthiness, Ross and McHugh helped to change the conversation to address how documentation furnished by repositories might convince users that a repository is indeed trustworthy.

Adolfo Prieto (2009) went further, providing a close reading of TDR and TRAC that emphasized all of the ways that these standards could support a user-focused definition of trust. Prieto defined repository users as those who contribute or access content, and maintained that these users "are, in effect the stakeholders who ultimately make a digital repository trustworthy. Their buy-in completes the trustworthiness of a digital repository" (pp. 596–597).

Earlier in this article I discussed some of the problematic aspects of standards culture, including that guidance and compliance standards allow for a range of interpretations and implementations, thus undercutting their ability to deliver interoperability between systems. In this case, however, Ross and McHugh (2006) and Prieto (2009) were able to furnish an interpretation of TDR and TRAC that emphasized the importance of user perceptions of trust—one that, to quote Prieto, placed user communities "at the center of trust" (p. 601). The essential ambiguity of standards that comes from the gap between the standard and its implementation in this case allowed the standard to evolve in a positive direction.

Following Prieto (2009) there have been several user studies of digital repositories that have sought to understand the range of factors that influence users to trust digital repositories, including the kind of policies and documents required for compliance with TDR/TRAC, and including the process of audit and certification itself (e.g. Yakel et al. 2013; Yoon 2014; Fear and Donaldson 2012). To date, these studies have focused on data repositories that serve highly defined and highly educated user communities such as proteomics researchers, social

scientists and archeologists. These user communities map well to the OAIS concept of the designated community.

Nobody has yet studied how users perceive trust when the designated community includes everyone, everywhere—trust, as Price and Smith (2011) state, "between the archives and society as a whole" (p. 257). Jerome McDonough (2012), writing about a computer game archives at the University of Illinois at Urbana-Champaign, observes that when an archives' designated community extends to the general public it becomes very challenging to provide services that would uniformly meet the needs of all. He notes that while knowledge of mainframe or early microcomputer operating systems and hardware might be common among some computer science researchers at the university, the representation information needed by a member of the general public to run the code for a game like *SpaceWar!* for the PDP-1 or *Mystery House* for the Apple II would extend to "a small library of works necessary to provide a basic education in computer science" (McDonough 2012, p. 1630). Assembling this documentation would prove challenging for any archivist; delivering it as part of a dissemination information package would be challenging for any archival information system.

There is no denying that this is a huge challenge. OAIS concepts like 'designated community', 'representation information' and 'dissemination information package' provide little in the way of practical, or even conceptual, tools for addressing this challenge. Perhaps, however, the problem lies as much in the concept of the general public as in the concept of the designated community. It is axiomatic in the advertising and corporate communications fields that there is no such thing as the general public: there are only individuals and communities, and each requires their own tailored communications approach. Similarly, studies of crowdsourcing and social media usage have found the "general public" to be unhelpful as a conceptual category, preferring to fine-tune their analysis to identify interested sub-groups (e.g. Brabham 2012). Elizabeth Yakel's work on digital archives, participatory media and shared authority has reached similar conclusions (Yakel 2011). It may be necessary to conceptualize archival users not as the general public but rather, kaleidoscope-like, as a series of groups of individuals, constantly shifting, combining, separating and transforming. Trust in archives, in the end, may be less a matter of standards compliance and more a matter of what Scott Cline (2012) calls covenant—a network of group-based but individually felt and mutually reinforced trust relationships. For one example of what this might look like in practice, see Peers and Brown's (2009) discussion of the relationship between the Kainai of Alberta, Canada and the Pitt Rivers Museum in Oxford, UK.

Though ill-expressed and incomplete in TRAC, where the authors focus on correcting the grammatical error and not on the larger point, the shift from "trusted digital repository" to "trustworthy digital repository" is key. This change moves the discussion away from the impossible search for criteria that "prove" objective and stable trusted status. Prieto (2009) helped to further establish that a repository may be a candidate for trustworthiness, but if it lacks the endorsement of its users its mandate, its documented compliance with standards, and all of the other trappings of trustworthiness are meaningless. Studies like Yakel et al. (2013) help us to understand how audit and certification function not as an objective measure of trust,

but as a contribution to convincing specific, targeted user communities of the trustworthiness of the repository. As the digital repository community continues to grapple with the true complexity of being trustworthy, it is to be hoped that we will continue to maintain what Ross and McHugh termed "pessimistic trust behaviour" by never asserting our trusted status in the absence of strong, trusting relationships with specific user communities.

In its response to the scathing 2014 report of the Auditor General of Canada, LAC agreed with each of the recommendations made in the report and noted that

> In April 2015, Library and Archives Canada will begin a comprehensive digital transformation program. This will improve its digital stewardship function and ensure it continues to acquire, preserve, and provide Canadians with access to their digital collection. (Auditor General of Canada 2014)

Let us hope that with this reset of LAC's efforts to build a digital repository the organization, in addition to examining the more technical challenges of building a digital repository, focuses in on how to build strong trust relationships across and within Canadian society.

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