Patricia Demers
Royal Society of Canada Expert Panel
University of Alberta
Dear Dr. Demers:
I sat in at the beginning of your Feb. 01 2014 session on the Status and Future of Canada's Libraries & Archives at the OLA conference in Toronto. Although my wife and I had to leave before hearing the views of all the others who were there, some lingering thoughts occurred afterward that may be helpful to your Panel. I am sharing those thoughts even though I fully expect other commentators may have already raised some or all of them.

I did not fully develop the analogy of burgeoning, more or less self-contained and inwardly-focussed algae blooms, so it may merit further elaboration. Several trends are relevant to the situation the Expert Panel is addressing. For brevity, I will sketch them quickly below.
1. Both the numbers and proportion of Canadians who have pursued advanced degrees and become contributors to our bodies of knowledge have multiplied over the past decades. If memory serves, fifty years ago less than ten per cent of Canadians pursued a post-secondary education, and barely five per cent of university students continued beyond a pass degree. The number of doctorates most universities conferred annually could be counted on one's fingers. The intervening years have witnessed a multi-fold increase in the proportion of Canadians in post-secondary education and a proliferation of post-secondary graduate programs and graduate degree-holders. These trends have vastly increased the amount of published materials.
2. Advances in most fields have spawned the emergence of sub-specialties, each of which tends to create its own body of literature. Not only lay persons, but also specialists in given fields cannot discern and appreciate the nuanced differences in fields other than their own. The explosion of sub-specialties leads to an increase in old-fashioned ignorance among all those who are not members of any given specialty. The cognitive impact of the exponential pace of increase in detailed information is akin to the sensory blur experienced when trying to read billboard adverts as a subway speeds up leaving a station. It affects both the highly educated and those who make policy and economic decisions, as well as the general public.
3. I have observed a trend toward particularization in the quantitative disciplines over the forty plus years of my professional career. In large part, it has been enabled by the escalating power of computers to analyse huge data sets - and to do so increasingly quickly because of "canned" programs that can be applied with a few key-strokes. This explosion of progressively more fine-grained or microscopic "discoveries" has flooded the professional literature. If one thinks of bringing one's nose progressively closer to a wall of a 40-story building, let alone examining that wall through a microscope, it becomes apparent that it becomes increasingly difficult to assess the dimensions and context of what one is observing and "knows" about the building (let alone the sky line or city-scape it forms part of.)

In contrast, seminal works of a broader nature to map out fields of knowing, which take much more time to carry out (sometimes the better part of a career lifetime) and which at one time characterized most disciplines, are now out of fashion and almost passé. (My example of what one is able to perceive of urban reality when in a crowd on the street as opposed to 40 stories, or 3,000 feet or 30,000 feet up touches on this. Far-reaching vision of organizing principles requires standing farther back instead of closer up. Kuhn's *Structure of Scientific Revolutions* described how it is questioning and searching meta-analyses of detailed information that leads to syntheses that in a Hegelian manner redefine how realities are perceived and "known".
4. The distinction between producers and users of information is critical. Most professionals, although they are important users of information, are oriented to producing evidence of their own knowledge and discoveries. They have a vested interest that is not shared by all. In looking at the way forward, it is imperative that they keep in mind a clear awareness and consideration of what utility and value the rest of the population perceives and attributes to collections of knowledge which they generate and of which libraries and archives are key repositories. My sense is that academics, as well as librarians, tend to be too introspective in their valuations of the resources they use, produce and manage/administer, and fail to give sufficient weight to the perspectives of the "profane and unenlightened" general public - who are major stakeholders because they pay the taxes that provide vital support to public institutions, and are

voters.
5. A great deal of thoughtfulness and effort will be required by those concerned about the erosion of information resources to avoid being perceived/portrayed/discounted as self-serving. To do that, a broad perspective is needed on what tangible benefits others (ultimately the public, but also commercial interests, deliverers of public services, and politicians) can and /or will derive from the preserving of information resources. Knowledge for its own sake has not enjoyed favour (or ready budgetary support) over the course of many political regimes, not only in Canada but in its southern neighbour and Europe, for almost half a century. The Zeitgeist has shifted from valuing discovery to favouring broad and immediate utilitarianism and Return on Investment.
6. In some of the comments in Toronto, I sensed a marked degree of unfamiliarity with how things work in the Ottawa bureaucracy/polity. Ministers are the ultimate formal decision makers, but a plethora of non-political actors serve as critical gatekeepers or influencers who play huge roles in what issues get attention and what decisions are made. They are the individuals who write the background papers and briefing books for Ministers, and who screen and make marginal notes on submissions. Among these players are senior advisors, "analysts", Deputy Ministers, Associate and Assistant Deputy Ministers and professional staff in various secretariats. Most of these players are very highly educated and have a well-developed sense of the political landscape and environment. For any initiative to move forward, the sympathy and support of these non-political officials are usually essential. (I draw on first-hand knowledge and experience in this regard.) A fixation on Ministers and politically-appointed "Wunderkind" is misguided.
7. I suggest there may be inestimable value in engaging the services of a marketing research firm to map out the values of the various constituencies of libraries and users of academic and specialist information. This will inform the tailoring of the Expert Panel's information and awareness-building activities. The proponents of information technologies have excelled in defining what promised benefits have cachet and political appeal, in identifying and targeting their various audiences, and in defining their problems and needs for promised IT solutions, benefits and pay-outs. There are lessons to be learned from their successes.
8. Moreover, the academic and library communities will likely derive value from engaging the services of professional lobbyists to sensitize political decision-makers. The example of differences in perspective at street level compared to 40 stories, 3,000 feet and 30,000 feet up is again germane. Those selling services (such as IT capabilities) to political policy- and decision- makers focus on real time problems and nearer-term economic payouts and the value or "need" to keep current and technologically competitive. The allure of the "silver bullet" is powerful. In contrast, the focus of librarians and academics tends to be much longer term - which usually has scant currency for attracting votes. The "what's in it for me?" consideration has to be addressed if one hopes to get decision-makers' attention, and more than that, to elicit a belief there will be a sufficiently marketable political/economical payout to warrant a commitment to support libraries and preservation of Canada's information resources. Surmounting that challenge requires specialized competencies.
9. Two issues of a more technical nature also want attention and careful consideration. Both are questions of fidelity and durability. The first has to do with the degree of permanence of electronic storage media. Parchment and paper have an established track record demonstrating that they last a long time and can be preserved. Electromagnetic devices have not endured anywhere near a comparable test of durability. The experience base is simply too short. For example, I recently decided to listen to a tape my mother had recorded twenty -some years ago to preserve for posterity (more specifically for her grandchildren and great-grand children), a record of her life and experiences. She had come to Canada from Finland, by herself, in1929 when she was just 16 years old and knew no English. Her story is part of the history of Canada, that of the non-English or French speaking immigrant cohort, which thus far has been largely ignored, as well as our family's story. Although the tape was not old, the sound quality had deteriorated to the point that I will have to have it technically enhanced for it to be clear enough to have any value. **The move to a reliance on electronically stored information brings with it an inevitable need to assess and ensure or enhance its fidelity in a disciplined, methodical manner if the information is to be preserved for future generations. Realistic account must be taken of the resources that will be required for these maintenance functions of electronically stored information.**
10. The second technical issue stems from the rapid and accelerating pace of evolution of both hardware and software in the IT domain. I have lived and worked through the punch card era, what were at the time

"massive" central main frames such as the IBM 375, IBM mag cards, the word processor bubble, Tandy Radio Shack desk-top devices, networks of interconnected mini-computers for distributed processing, and an array of personal computers and laptops with ever-increasing capacity. Some of my data and writing of only 30 years ago was stored on 5 ½ inch floppy disks, which my current machines can no longer read. The personal computer I am using at this very moment and my laptop do not have the capability to let me access records I stored on 3 ½ inch diskettes 15 years ago. As a result, I am not able to assess the quality of those records, and cannot assess the fidelity with which they could be reproduced with the "advanced, enhanced and more powerful" continually upgraded software I now rely on.

11. The unrelenting pace of advances and enhancements of software also poses challenges. (Brief reflection on the number of automatic upgrades and patches should suffice to illustrate the frequency with which "bugs" and "glitches" are discovered and corrected.) The transformations from early vintage electronic data records to more current software versions are not always totally correct. And we have the benefit of only a few decades of experience. If we entrust all our accumulated information to electronic storage, what assurance is there that some does not become irretrievable and lost in 10, 50, 100 or 500 years. **Promises made now will not necessarily provide solutions in the future.** Blind faith in technology would be unwise. There will inevitably be IT equivalents to Fukushima and Chernobyl, the full long-term consequences of which are yet to be learned (even if they are not publicly disclosed.) But unlike nuclear power reactors, for where alternative power sources are available, if hard copy records are not retained there will be no alternative backups from which to recreate lost information in the event of catastrophic IT failures. It bears noting that applied nuclear science, which is about twice as old as applied information technology, despite having had stringent safety standards from the get go, has nonetheless still experienced serious meltdowns.

12. The full spectrum of long-term impacts of exponential advances in hardware and software cannot be foreseen, but one can safely anticipate the transitions will NOT all be seamless. The magnitude of the work required to verify the fidelity of electronically-stored information records, and to transform all accumulated records each time new technology is introduced might defy comprehension, but it would be folly to ignore, discount or dismiss it. And should a decision be taken that only some information is of sufficient value to be maintained, who will be mandated, tasked and able to do that selection effectively? Who will decide those questions and how? Perhaps those policy-type issues are the most important challenges the Panel can point out, and hopefully suggest viable paths forward.

It is my considered view that the Expert Panel should strongly recommend to policy and decision-maker to make haste slowly and not entrust the key decisions solely to the IT expert community. It has an enormous vested interest and only a brief track record. The Sorcerer's Assistant comes to mind. And I cannot forget a filmed segment of Dr. Rutherford demonstrating to his gathered graduate students in a darkened physics laboratory what happens when two pieces of uranium are brought within a critical distance of one another - in the days before we acquired our understanding of the effects of radiation on humans.

Respectfully submitted

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L. Lehtiniemi
21552 McCormick Road, RR1
Glen Robertson ON K0B 1H0
(613) 874 1449