Themes Emerging from Environmental Scan
of Digital Strategies in Higher Education

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Based on a review of public domain documentation related to digital[1] strategies in higher education, the following 14 observations are offered to provide an overview of the digital landscape associated with universities, to inform digital planning at Queen's University. This overview does not include developments at Queen's University itself.

1. **Comprehensive digital strategies in institutions of higher education are relatively rare,** particularly in Canada. For the purposes of Queen's digital planning framework development, "comprehensive" means a) *university-wide* (not just present/utilized in one school, department or business unit; and b) demonstration of a clear *link between strategies and the overall mission* of the institution (typically, teaching and learning, research, and knowledge-sharing with the wider world). In their 'Talking Points' report on the 2018 Digital University, PriceWaterhouseCoopers Co., notes four ideas that are central to successfully harnessing digital:

   1. Understand that digital transformation affects every part of the university, not just IT
   2. Link all digital activity to the university's overall mission and strategy
   3. Invest in communities built around willing and capable digital innovators
   4. Adopt a design approach that focuses on customer needs, not the university's internal structure.

> *"Universities that are not equipping themselves to adapt to this new digital era will be left behind."*
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> *From* The 2018 Digital University, Staying Relevant in the Digital Age by PriceWaterhouseCoopers Co. U.K

PwC notes that "*many universities are developing specific digital strategies in reaction to the massive shift towards new technology, yet lack the vision, capability or commitment to implement them*

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[1] McKinsey & Co describes "digital" as "should be seen less as a thing and more a way of *doing* things", with three attributes: a) creating **value** at the new **frontiers** of the business world, b) creating **value** in the **processes** that execute a vision of **customer experiences**, and c) building **foundational capabilities** that support the entire structure. (Bold face added for emphasis) McKinsey refers to the "being open to re-examining your entire way of doing business and understanding where the new frontiers of value are", "rethinking how to use new capabilities to improve how customers are served", "using data to make better and faster decisions, devolving decision making to smaller teams, and developing much more iterative and rapid ways of doing things" and notes that "relevance is the currency of the digital age".

successfully." (italics added) Similarly, in a research study on public sector digital transformation[2], Deloitte LLP found that characteristics of a digitally maturing government (just 13% of organizations studied) were

1. Digitally maturing organizations have a clear strategy aimed at fundamental transformation
2. Digitally savvy leadership is a game changer
3. Digitally maturing organizations have a greater user focus
4. Workforce skills and culture are deeply embedded, and procurement processes are muzzled by regulations and lack of flexibility.

Deloitte recommends that public leaders consider five questions to accelerate their digital transformation:

1. Do we have a digital strategy that is clear, coherent and central to our leadership narrative?
2. Is our strategy genuinely digital --- or are we too focused on online engagement, bolted on to our existing business?
3. How are citizens and service users going to be part of our digital transformation?
4. Have we looked at our talent pool and planned where our skills are coming from?
5. Do we have a coherent business case that monetises our digital transformation?

In hosting a National Post-Secondary Education Symposium entitled [Innovating for the Future](September 2017), KPMG focused on ways that PSE institutions are 'innovating' within the sector to not only remain viable within a highly competitive market, but also to transform their universities and colleges to meet the needs of the future. Panel discussions included: The Digital Revolution, Balancing Academic Excellence with Administrative Efficiencies, and Innovation of the Use of Assets.

Examples of comprehensive digital strategies:

[University of Bergen] (Norway) – starts by declaring that the digitalisation strategy "*shall support and complement the University of Bergen's strategy for 2016-2022: "Ocean, Life, Society"*", and notes that "*digitalisation constitutes more than just digital **tools**, digital **storage** and digital **processing** of **data** and information. Digitalisation changes work processes, organisation, and **collaboration**, both internally and externally. Digitalisation changes our **culture** and the way we do business.*" (Bold added for emphasis) The UiB Strategy is comprised of a) an underlying digitalised infrastructure (supporting research and education), b) user-oriented digital services, c) digitally accommodating university, d) a self-service university administration, and e) a culture of change and implementation.

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[22] Deloitte's study of 'public sector organizations' included central government, local government, police forces, the National Health Service (in the U.K), and further and higher education).

University of Leicester (UK) – starts by defining "who we will be" (a digital by default University): *"Digital is at the core of all the things that we do. Ensuring that appropriate use of technology enhances our learning and teaching, facilitates innovative research, and improves efficiency in our management and administration activities, facilitating new ways of delivery, it will expand our current offerings into new markets."* Digital strategy is rooted in the University's overarching Strategic Plan and includes strategies associated with a) brand and reputation, b) corporate social responsibility, c) enterprise, d) finance, e) international, f) learning, g) people, h) physical environment, and i) research.

Oxford University (UK) – starts with a vision… "*The University's reputation **in research, education, and engagement** will be underpinned by an innovative and holistic **digital capability**. This will support the **significance, capacity, and impact** of the University's research; the variety and **distinction** of the learning, teaching and **student experience** that it provides; and will inform its present strategic priorities of **interdisciplinary scholarship** and **global reach**.*" (Bold added for emphasis) Sets out three Strategic Aims related to a) facilitation of creation, preservation and discovery of knowledge, b) improving utilization and exploitation of knowledge, and c) enabling knowledge exchange in a digital environment.

Association of Universities in the Netherlands – has both a Digital Society Research Agenda (Leading the Way through Cooperation in a Digital Society) and Digitisation in Academic Education (Our Agenda for a Future-Proof Range of Degree Programmes). This work, conducted on behalf of the country's 14 universities, followed completion of a 2017 report called "Thoughtful Digitalisation" which described the education sector as "*still casting around to find the appropriate content, form and role. In many cases there is no clear vision of the relationship between education and ICT, resulting in wide variation in the way schools shape digitalisation and the extent to which they contribute to digital developments and innovations.*" The report offered three recommendations:

1. *Unburden education by guaranteeing the conditions needed for digitalisation* (separating content from technical aspects; achieving economies of scale from a collective approach to technical issues; assuring cybersecurity; modern, good-quality hardware and fast, stable internet access and adequate financial resources)
2. *Increase ownership of digitalisation in education* (involving educators and others on the demand side of the market in designing innovative applications; funding for organizations to facilitate and promote digitalization, strengthen scenarios for collaboration; incorporating open learning activities and professionalization)
3. *Explore digital applications to gain experience and develop a vision* (clarification of relationship between ICT and education, greater utilization of pilot-to-scaleup approaches; school viewed as a proving ground; protecting the benefits of 'downtime').

Concordia University (*development under way*; appears to be taking a comprehensive approach) – university-wide digital strategy linked to University's strategic directions initiative (9 strategic directions to establish Concordia as a next-generation university; focus groups planned for the February 27-March 8 period will be centred on questions such as: a) what is Concordia's digital identity and how can it help advance the university's academic and research mission? b) does the university community use technology in ways the reflect its collective needs and aspirations? c) is Concordia following, keeping up or leading in this period of rapid, disruptive technological change?

2. **Digital strategies at most institutions tend to fall into certain sub-categories** depending on institutional *situations* and *aspirations* (situations: strengths and weaknesses, culture, structures, history, financial situation); strategies therefore tend to be as much audience-focused as function-focused; aspirations: renowned for research, student experience, expertise in particular fields --- digital or otherwise. Many strategies combine one or more of the following types of strategies but are not necessarily comprehensive. Whether they are coordinated within the institution is not known at this time.

    a. '*Digital by default*', signifying an institutional philosophical shift toward digital operations based on the notion that doing so will enhance services, save money, and improve citizens' quality of life (example: University of Leicester, Province of Ontario – Digital Service, Government of South Australia; McKinsey & Company).

    b. *Digital administrative (operational) functions* such as student recruitment, financial management systems) (example: PwC digital blueprint for students).

    c. *Digital marketing/brand* functions such as web presence, social media (examples: Dalhousie University, University of Alberta, University of Manitoba, University of Waterloo).

    d. *Digital experience for students* such as digital connectivity, tools for individual and collaborative use, and digital access to academic resources (examples: University of Waterloo, University of Leicester, LaTrobe University).

    e. *Digital skill sets*, delivered through new program/course content, *to meet the need for Highly Qualified Personnel* for universities and society as a whole; most business schools have a digital strategy of this type; new program/course content may include digital marketing, data analytics, management of digital or technology-intensive companies (examples: Harvard, McGill University – Strategic Digital Communications, McMaster University, University of Alberta – Digital Analytics, University of British Columbia – Sauder, University of Calgary, University of Ottawa, University of Saskatchewan, University of Toronto, University of Waterloo, UOIT).

f. *Digital support for faculty* for teaching and sometimes research; can link to students on both functions (example: Harvard; McMaster University, University of Alberta; Leiden University – education innovation with online/digital tools).

g. *Research 'on' impact of digital deployment* --- often focused on social implications (example: Association of Universities: The Netherlands – human-centric information technology); Durham University – impact of digital technology on learning.

h. *Research 'on' digital technologies development* --- applications, software, hardware etc. (example: University of British Columbia; University of Waterloo; National Research Council; CMC Microsystems).

i. *Research 'using' digital* --- research in all disciplines relies on digital technologies, and strategy comes from many angles: it may be science-led, perhaps linked to an economically-focused innovation agenda and economic prosperity, and the Return on Investment (ROI) concept tends to arise here (examples: Dalhousie University, University of Laval, University of Manitoba, University of Ottawa); it may include a significant digital humanities focus (examples: University of Victoria; Dartmouth College); it may also be linked to diversity, inclusion and social innovation, including methodologies such as community-based, participatory research (examples: University of Oxford; Royal Roads University; European Union).

j. *Data-focused strategies* that can be of two types: a) institutional data, typically linked to an institutional Information Technology group and a Chief Information Officer and b) research data, which includes repositories, warehouses and archives, often linked to institutional libraries and archives. (Examples: Dalhousie University - Libraries, McMaster University – Strategic Framework for Digital Preservation, University of Calgary – Searchable Repository (PRISM), University of Manitoba, University of Western Ontario, Yale).

3. *The complexity of the roles that digital approaches may have in higher education is an over-riding and cross-cutting issue,* even if an institutional strategy is focused just on one sphere (or function); partly this is a result of incremental evolution in use of technology (example: the LCDRI Coordination Position Paper identified seven reasons which Digital Research Infrastructure matters, not all of which are *solely* research-related: a) attracting talent, b) building/sustaining global research excellence, c) increased potential for game-changing research, d) maintaining the Canadian advantage in data analytics, e) accelerating innovation and commercialization in the private sector, f) enabling better and more efficient service delivery, and g) maximizing public investment in research).

4. *The complexity challenge is accentuated by digital's cross-cutting nature.* Digital approaches --- and the data so generated and utilized --- cut across organizations (example: sharing healthcare data among service providers via eHealth initiatives) across groups within the

same organization (interdisciplinary research); between public and private organizations (see [Stanford Management Science and Engineering](#)); across technologies and devices, often raising interoperability issues (see [University of Maryland Center for Health and Homeland Security](#)); among owners of data ([see Data Governance Institute](#)); and across levels of security and access (see [Harvard's Information Security Policy](#)).

5. ***Digital is now disruptive, including in higher education***. A 2015 [Universities Canada workshop](#) identified six 'digital disrupters, trends and opportunities in teaching and learning in contemporary universities: a) student success through analytics, b) mentored online experiential learning, c) outcomes-based learning, d) combination of online courses and workplace practicums, e) digital technologies for outreach to communities at home and abroad, and f) new fee models. Information channels in higher education were bilateral (between professor and student/one to one); with easy internet access, informational channels are now multi-lateral (multiple professors are accessible to multiple students at any moment); teaching and learning is no longer 'local' or restricted to the classroom or campus lab; it is now global as a result of digital technologies; LaTrobe University has noted that "nearly a quarter of Australian domestic students chose to undertake their studies partially or wholly online in 2013, up from 18% in 2009." Open Colleges in Australia has educated 800,000 students in their online courses (example: [The Open University](#) – How New Technologies Could Transform Academic Work).

6. ***Digital now bridges the internal-external institutional boundary***; digital approaches are reshaping opportunities to collaborate, and to share both data and insights (example: Canada's [Ocean Supercluster](#) – NSCAD, Dalhousie and Memorial universities as partners); universities typically exist within an urban context, the leadership of which may have its own digital aspirations (e.g. '[smart city](#)', as is of keen interest to Kingston); digital approaches also pose challenges related to intellectual property, privacy/confidentiality and security; heightens risk of cyberattacks, appropriate use of 'own digital devices' and cloud services; raises important policy questions across the entire institution (see [SERENE](#)).

7. ***Data and the dramatic increase in its volume*** is a complementary and equally challenging consideration; there are also qualitative considerations associated with data (e.g. source, rigour in collection, sampling etc.) that can be difficult to manage leading to potential misunderstanding or misuse; the challenge becomes even more significant when expectations of open data are considered; (example: [Association of Universities The Netherlands](#); [Universities Canada Workshop 2015](#)) as well as responsibilities for managing data storage access and support.

8. ***Digital navigation*** within the institution or with other institutions or stakeholders is often an issue (regardless of function). For example, university IT departments strive to make the many faculty, departmental, research groups and individual faculty member pages easily

discoverable by external parties or even others within the university community. In addition, there is substantial 'corporate' information that must be disseminated university-wide: policy statements, budget and other process information, deadlines and other time-sensitive material. Digital technologies expedite these kinds of information exchanges but ensuring that the right information is found (or delivered) is still a major challenge (example: University of Alberta, Brookfield Institute for Innovation and Entrepreneurship).

9. *Institutional leadership matters* when considering the degree of embrace of digital technologies; for example, the LCDRI Coordination Position Paper identifies 'clear leadership' as one of five critical success factors of a national DRI coordination strategy; the same is likely to be the case at the institutional level and across other digital pursuits at any institution (note: the five critical success factors in the LCDRI paper were: a) clear leadership, strategic planning, roles and responsibilities; b) enhanced collaboration, communications, culture change, and elimination of unnecessary overlap; c) researcher (or user)-centred approach; d) opportunity for private sector to be at the table; and e) processes and mechanisms for global connections.)

10. *Digital support for mission-critical functions has many components*: for example, Digital Research Infrastructure has five major components: a) network infrastructure, b) advanced research computing, c) data management, d) storage, and e) advanced research software (*see LCDRI Coordination Position Paper*). Similar components are almost certainly needed to support digital teaching and learning.

11. *Human considerations may well be the biggest challenge associated with digital society*, going well beyond technical considerations, the rapid evolution of technologies and their deployment raises issues of human ability to comprehend, simplify, or navigate the complexity that digital technologies manage with relative ease; digital technologies also raise considerations of the impact of 'digital divides' (based on unequal access), and raises issues such as ethics, cybersecurity/privacy; training and change management) (example: University of Laval, Association of Universities The Netherlands; London School of Economics – Working Paper on Emotions and Digital Technologies).

12. *Digital Governance*, which may be seen, at least in part, as a human consideration is also a major challenge; must take into account long-standing interests organized along specific lines that are now changing; within the academy, governance is typically organized by faculty or school, and then by discipline. Digital technologies and data can move across these governance boundaries easily, but pose challenges to the way the academy is organized and operated. New unconventional business models may well

> *"Digital governance is the central challenge facing governing institutions and societies in the coming decades where no one owns information, power is dispersed and authority and accountability need to be re-conceived."*
>
> Institute on Governance

be needed to respond effectively to challenges and capture opportunities (example: Canada's Institute on Governance – Digital Governance Applied Research Program).

13. ***Pace of change appears to be continuing on all fronts*** --- New digital technologies are announced with increasing regularity; they are deployed ever more quickly in an effort to gain a competitive edge, the expectations of technology users and other stakeholders continue to rise, changing policy environments and competition from other institutions and jurisdictions. 'The job is never done.' This is a particular challenge for academic institutions that are used to longer term commitments (e.g. hiring faculty for extended periods, making capital investments expecting a long lifecycle). Increasingly, even universities are looking for ways to adapt more quickly to the changing world and are asking how digital technologies can help to do that, without jeopardizing academic rigour (example: Concordia University's exploration of how a digital strategy supports the institution's 9 Directions Strategy).

14. ***Competitive issues abound*** (and are articulated in LCDRI papers) and ***make desired collaboration challenging;*** inter-institutional and indeed international competition influences institutional efforts to: (a) attract talent, b) build/sustain global research excellence, c) increase potential for game-changing research, d) maintain Canadian advantage in data analytics, e) accelerate innovation and commercialization in the private sectors, e) enable better and more efficient service delivery, and f) maximize public investment in research. As highlighted in the Universities Canada workshop, the combination of crowdsourcing volunteerism, analytics and high performance computing greatly expand the opportunities for new forms of research and new collaborations between academic and corporate researchers, students and other professionals.