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Executive Summary

[To be completed]
Introduction

A Case for Change

Over the years, technology at York has grown organically according to immediate and local needs, resulting in a fragmentation of services, data, systems and infrastructure. The slow pace of technology refresh endemic to the post-secondary sector in general\(^1\) has also been reflected at York, impacting the institution’s ability to take advantage of innovative practices. Thus, the current situation is rife with opportunity. The modernization of key systems can transform York and differentiate it among its competitors. It can make York a university of choice thanks to a rich campus experience based on student and user centricity, streamlined and automated processes and higher levels of insights based on data and evidence-based information. With the right plan and commitment to its execution, we can advance York as a true digital institution.

As we move forward, it is vital that our modernization objectives put students front and centre to how we design and develop our systems and how our users interface with these systems. Our future architecture (see Appendix 3) will inform the automation of our processes, the transformation of our teaching and learning spaces, the provision of technologies and the flow of information to those who need it. How will we accomplish this? Collectively, we have created a five-year technology strategy, which will be accompanied by a rolling three-year technology execution roadmap. The plan highlights the replacement of our core systems, establishment of centres of innovation, modernization of our infrastructure and creation of data warehouses accessible to all stakeholders. Information security, a shared responsibility, will enable this vast access and protect the University from malicious intruders.

Our series of applications available from York’s App Store will make it easy for the entire York community to navigate the institution and its services. It will bring about connectedness at a new level of the individual and community.

York’s journey of digital transformation will be effected at three levels. As corrective action, initiatives will aim to remove irritants and fix issues. As ameliorative action, the goal will be to improve processes or solutions and implement best practice. As truly transformative, measures will be innovative and take us to a higher state of operation. This is the state that will allow York to shine, in keeping with its tradition of being forward-looking and trail-blazing. Tentanda Via.

Supporting the University Academic Plan

This document is a “nested” Strategic Plan, that is, a subset of the University Academic Plan (UAP), which it supports and advances. York’s vision, as stated in the UAP 2015-2020, is to “[foster] creativity, innovation and global citizenship through its open-minded and engaged approach to teaching, scholarship and research, and community outreach.” The UAP also establishes York’s guiding values: excellence, progressiveness, inclusivity and diversity, social justice and equity, and sustainability. This IT Strategic Plan will enable the UAP’s vision and support these values.

The UAP lists seven priority areas for the University:

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1. Innovative, Quality Programs for Academic Excellence
2. Advancing Exploration, Innovation and Achievement in Scholarship, Research and related Creative Activities
3. Enhanced Quality in Teaching and Student Learning
4. Take a Student-Centred Approach
5. Enhanced Campus Experience
6. Enhanced Community Engagement
7. Enabling the Plan

To ensure alignment with the UAP, the 2019-2024 IT Strategic Plan will be structured around these seven priorities.
Vision

In its broadest aspirational form and in keeping with a humanistic view of technology, York University’s IT vision sets the goal of:

Enriching the community’s experience and capacity to act through technology

In this sense, technology is in service of human fulfillment.

This vision will guide York IT in advancing the University president’s four pillars for institutional success, i.e. access, connectedness, excellence and impact\(^2\). Accordingly, York University strives toward enabling the community to seek excellence through technology and systems that allow instant access to data and knowledge, innovative teaching and research environments, and fruitful collaboration across communities and disciplines\(^3\), thus empowering faculty and students to have a greater impact on Canadian society and the international stage.

York IT provides an outstanding technology-based service experience to the York community in support of the University’s goals

Mission

Both organizational units (including Faculties) and individual users are key service foci, as both contribute ultimately to an enhanced experience for students, faculty and staff.

Values and Principles

In addition to York’s values of excellence, progressiveness, inclusivity and diversity, social justice and equity, and sustainability, York IT will be guided by a number of values and principles that will give meaning to and further its vision.

People


\(^3\) This view aligns surprisingly well with Harvard University’s IT vision statement: “Empower the community through technology that enables effortless access to data information and knowledge; rapid and profound innovation in teaching, learning and research; and seamless collaboration across communities and disciplines.”
The end or purpose of all technologically driven action is people, i.e. the end users. The idea of user-centred and student-centred service, as well as integrated approaches, is based on this value.

Community
Technology is also a means of bringing people together and facilitating collaboration. This starts with the institutional IT community and carries over to the university community and beyond.

Value
Our goal is to create value for people by providing services that meet their needs and wants. Value also implies operational cost effectiveness. In a context of scarcity, this is as much an ethical as it is a business principle.

Innovation
Given the growing expectations of the sophisticated users we serve, it becomes imperative to devise constantly new ways to create value for them. Innovation is a principle supporting a value-oriented service philosophy in the face of ever-present change and systemic entropy. We believe that innovation must become a driving force of York IT, from daily activities to strategic goals.

Agility
Innovation is not possible if the institution cannot act promptly and adapt to a rapidly changing and unpredictable environment. The term “agile” is preferred to “nimble”, as it also refers to a project management methodology York IT can draw from.

Defining Success
The vision, mission and values of York IT all gravitate around creating a rich experience and exceptional service for people in and around the institution. But what does services that enhance a student-centred campus experience look like? Another way to pose this question is to ask what experience or services are people – students in particular – ideally expecting from the University? Arguably, these expectations are fashioned by the leading-edge “next generation” IT services based on user-centred, ergonomic, often cloud-based and AI-driven technology students have become accustomed to with the likes of Facebook, Apple, Amazon, Netflix and Google (the so-called FAANGs) and other cloud applications such as Uber, WhatsApp, Instagram or Twitter. This next generation user experience (UX) has become the new standard against which technology-based service (and perhaps service in general) is now being measured. This is the level of sophistication York IT must strive for in order to succeed in its mission.

The idea of exceptional digital user experience can be unpacked into a hierarchically organized value scale of attributes.
The lower levels are usually taken for granted, but they are not sufficient in themselves to meet the full expectation of today’s users. One can postulate that the more higher-level attributes are met while satisfying the lower-level attributes, the more positive the experience. For instance, an unreliable and insecure yet speedy service is of little use. Similarly, a “cool” feature is pointless if all other attributes are not met.

- **Security** is the most basic attribute that ensures a superior digital user experience. Users increasingly expect data privacy and integrity to be safeguarded\(^4\). It also made it as the number one issue for teaching and learning in 2018\(^5\).
- **Reliability** and stability are further basic attributes of a positive experience, without which much frustration can be caused in users (e.g. during service outages).
- By **quality**, we mean the fact that services actually create the expected value to the user, including the growing expectation that value will continue to be created through additional or improved features.
- In a connected world, users have also come to expect **speedy** responses from systems, whether in transactional interaction with machines or in real-time responses in communications\(^6\).
- A user also expects a seamless, intuitive and user-friendly experience, which we encapsulate in the concept of digital **ergonomic**.
- Increasingly, users come to expect rich and personal interactivity. They expect to be “known” personally in their interactions with systems. At a basic level, this means being recognized without having to re-enter personal information (e.g. single sign-on). At a mid-level, this means having interactions customized to one’s needs. At a higher level, being known means the system can predict one’s needs (e.g. predictive analytics).

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The final attribute is coolness. The lure of novelty is deeply engrained in people and can be a strong motivator. However, cool new features are quickly disregarded if they are not founded on the more solid attributes described above.

Strategic Actions

To advance the IT strategic priorities defined in the section below, the following strategic actions will be favoured.

Simplify and Automate

In many instances, concrete benefits will be achieved by simplifying a process, orchestrating and possibly automating it. Note that automation alone is often insufficient for stable and enduring change. Orchestration is the enablement of efficient process with technological support, while automation requires no intervention or input.

Data and Analytics

Institutional data is required to improve student success and administrative processes. Every system must provide data and analytics, to be used by all members of the university community.

Learn and Train

Innovation cannot be accomplished without constantly learning from failures and successes, ensuring all can learn from local discoveries and upgrading people’s skills. Accordingly, training and opportunities to learn must be provided on a larger scale’, in the spirit of continuous improvement.

Communicate, communicate, communicate

Communication is key to successful organizational change management, yet often neglected. It will become a focus of our activities.

Strategic Priorities

IT will play a role in all priorities set in York University Academic Plan. The core activities defined below draw from various industry reports, University documents and the consultation process described in the “Background Research” section.

1. Innovative, Quality Programs for Academic Excellence

Academic excellence is the purview of the academy. However, innovative programs must often be built on a flexible digital infrastructure that enables institutional implementation. For instance, skills and competence “badges”, micro-credentials, non-conventional course structures and curricula must be anchored in appropriate systems and architectures; curricular complexity can be organized, perhaps

7 Change leadership and the awareness of a skills gap made in EDUCAUSE’s Top 10 Issues 2018.
simplified, with the help of well-designed tools; programs can partner up with IT units to enhance experiential education opportunities; the Quality Assurance framework can be made more robust with the support of management solutions; and so on.

Activities:
- Develop curriculum management
- Improve program review and accreditation support
- Re-architect foundational student information
- Support experiential education opportunities

2. Advancing Exploration, Innovation and Achievement in Scholarship, Research and related Creative Activities

Academic research is often burdened with administrative activities, e.g. grant proposal preparation and submission, CV formatting, ethics approval, community and industry relations, contract preparation for Research Assistants, post-award management, awards management, reporting, etc. And it relies on a series of tools for research management, e.g. data repository, asset management, etc. To improve research outcomes, researchers must be relieved of some of the administrative burden. A full suite of research services will include proper IT solutions.

Activities:
- Facilitate the use of an integrated research CV
- Improve research ethics management
- Design and implement a data architecture
- Improve pre- and post-award management
- Support graduate student services – admissions, funding, awards

3. Enhanced Quality in Teaching and Student Learning

Teaching and learning (T&L) is the core of the university mission. While support for pedagogical innovation is the mission of York’s Teaching Commons, under the leadership of the AVP Teaching & Learning, support and innovation in learning technologies traditionally falls under the purview of York IT.

Activities:
- Improve classroom technologies
- Formalize teaching innovation in an E-campus Innovation space
- Explore and implement new learning technologies and new we-enhanced instructional design
- Improve data access for Teaching and Learning
- Enhance online/blended learning
- Automate grade reporting
- Provide IT foundation for competencies management
4. Take a Student-Centred Approach

The UAP defines a student-centred approach in terms of “facilitating the success of our students” and “viewing everything we do from a student lens including decisions about our academic plans, the learning environment, the campus experience, and academic support strategies”. These goals also apply to IT solutions.

As early as 2013, EDUCAUSE began identifying student success as a key issue that technology could help address. While the granular focus has shifted over time, the general message has remained true: technology has a role in improving student success and completion. By applying data and analytics, earlier identification of students at risk could result in increased student success and on-time completion rates. To achieve this, data accessibility and availability will be a necessity.

Activities:
❖ Contribute to student success through the implementation of early alert mechanisms
❖ Create a seamless student experience throughout the student life-cycle
❖ Implement student-centred designs
❖ Implement more mobile solutions
❖ Improve student advising with the help of Artificial Intelligence
❖ Simplify and accelerate grade reporting

5. Enhanced Campus Experience

York IT will provide its expertise in creating an “intelligent” space at Markham Campus, thus enhancing campus experience – understood in a conventional way – in one of York’s locations. In addition, York IT has a role to play in the virtual campus experience. This perspective is especially important given the large number of commuter students at York (i.e., close to 95% of its students).

Activities:
❖ Support the creation of Markham Campus as a state-of-the-art environment
❖ Connecting people by improving faculty, staff and student communication, collaboration and ability to perform with the help of appropriate tools
❖ Improve user centredness and clarity of services
❖ Improve communication technology on campus

6. Enhanced Community Engagement

Fragmentation affects not only York’s systems, but also its IT community. Efforts will be put into creating a sense of community within York IT (UIT, Faculties and units) and making sure the whole York community is engaged in institutional technology enhancements and innovation.

Activities:
❖ Build a pan-university IT community
❖ Develop an IT and Data Governance structure in which the whole community is involved
7. Enabling the Plan

IT is commonly presented as a “business enabler”, rightfully so. ***

Activities:
- Improve data-informed decision-making
- Implement a governance structure based on a holistic view of the institution’s IT landscape
- Advance the idea of a Paperless Office
- Improve capacity to deliver IT projects
- Optimize processes through simplification, standardization, automation and streamlining
- Pursue an open-source and open access strategy
- Improve SHARP readiness

Information Security

Information Security is integral to enabling the plan. Given its significance in Information Technology, it is given its own section in this Strategic Plan, in addition to those identified by the UAP.

As outlined in the rest of this strategic plan, the university is adapting to and leveraging a rapidly evolving digital landscape that includes increased opportunities, but also greatly increased threats and risks. The increasing global spotlight on cyber-security, as well as recent noteworthy incidents at other higher-education peers, demonstrates that it is more important than ever to ensure that the institution is well prepared to appropriately manage and mitigate such risks. The goal of the information security strategy is to develop a sustainable and proactive cyber-security program that balances the effective protection of the University’s systems and data with the need to support academic innovation and agility.

With the exception of 2012, Information Security has been consistently in EDUCAUSE’s Top 10 IT issues since 2007 and has been chosen the top IT issue for 2018. Much like student success, the granular focus has changed over the years, but information security remains a topic of great significance. It is key to understand that there is no notion of completeness in information security as it is built upon layers of adaptation toward the local environment and global ecosystem, and due to the continually evolving nature of threats. As a result, it is vital to develop an all-encompassing, flexible approach for reducing institutional risk to information security threats. Developing a threat-based strategy that is designed to keep pace with those security threats and other challenges that surface due to the changing landscape.

Activities:
- Building an institutional culture of risk-awareness and cyber-security competency
- Deploy a sustainable and extensible next-generation identity and access management system (to replace Passport York)
- Widely deploy two-factor authentication for access to university data and systems
- Improve identification and management of cyber risk
- Development of next generation security architecture and infrastructure
- Implement advanced threat protection for email and devices
- Introduce mobile device security management and encryption
- Ensure increased participation and leadership with regional and international partnerships to develop and utilize shared security solutions
Major Foundational Initiatives

From the list of strategic activities enumerated above, some are considered foundational and essential to future innovation. They are major projects that will be the focus of the next few years.

❖ Enterprise Architecture framework
❖ Next Gen Student Information System
❖ Integration of the student life-cycle through Customer Relationship Management
❖ Identity and Access Management
❖ Cognitive Student Advisor (IBM Watson) – with AVP T&L and VP Students
❖ Data architecture and Business Intelligence
❖ IT and Data Governance
Appendix 1: IT Strategic Planning Steering Committee

The Steering Committee was responsible for managing the strategic planning process and writing the IT Strategic Plan 2019.

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markus Biehl</td>
<td>Professor</td>
<td>Schulich School of Business</td>
</tr>
<tr>
<td>Sarah Cantrell</td>
<td>AVP Inst. Planning &amp; Analysis</td>
<td>Office of Institutional Planning &amp; Analysis</td>
</tr>
<tr>
<td>Lucy Fromowitz</td>
<td>AVP Students</td>
<td>Student Services</td>
</tr>
<tr>
<td>Will Gage</td>
<td>AVP Teaching &amp; Learning</td>
<td>Teaching and Learning</td>
</tr>
<tr>
<td>Donald Ipperciel</td>
<td>Chief Information Officer</td>
<td>University IT</td>
</tr>
<tr>
<td>Lyndon Martin</td>
<td>Dean</td>
<td>Faculty of Education</td>
</tr>
<tr>
<td>Richard Ooi</td>
<td>Senior Executive Officer</td>
<td>Office of the Provost</td>
</tr>
<tr>
<td>Leslie Quintanilla</td>
<td>Student</td>
<td></td>
</tr>
<tr>
<td>Dominique Scheffel-Dunand</td>
<td>Co-Principal</td>
<td>Glendon College</td>
</tr>
</tbody>
</table>
Appendix 2: Background Research

The IT Strategy team surveyed trends in higher education and information technology, research on successful governance models and previous internal analyses, including the 2009 IT Strategic Plan, the PWC PRASE report, the Academic and Administrative Program Review (AAPR) – Administrative Task Force Report, the Institutional Integrated Resource Plan (IIRP) reports and Cubane’s Uniforum Benchmarking exercise. Research on higher education was compiled using reports from Gartner, EDUCAUSE, CUCIO and other sources judged to be reliable. It conducted broad consultation and strategy sessions with stakeholders and reviewed the current technology landscape at York.

Past University Reports

A review of prior reports and assessments regarding York’s information technology services reveals recurring trends and observations. These reports have several common themes. They frequently recommend using student-centric technology for advising and for establishing and reserving academic spaces. They also recommend that classroom technology meet a minimum measurable standard, and that York increase sustainable investment in technology under the guidance of enhanced IT governance structures.

The IIRP Working Group: Student Advising report states that “[e]ffective governance, enhanced technology and a student-centred approach will support colleagues who deliver advising services, and leverage York’s significant, collective institutional capacity to meet our students’ needs and expectations.” The IIRP Working Group: Campus Experience report notes that there are no University standards for academic spaces and recommends that York ensure that classes and labs are sustainable with a “commitment to infrastructure, governance, innovation, accessibility, and the student experience.”

Several of the reports recommend that the University pilot promising new technologies with the intention of University-wide adoption, streamline functions to eliminate redundancy and exceptions, and address the large technology deficit to build a solid foundation supporting future growth.

Consultations and Feedback: An Overview

The IT Strategy team also consulted with faculty members, staff, researchers, and students at York on the current state of technology at the University and their desired future state. The first round of consultations was conducted from September to November 2017. It included individual strategy meetings with members of the University Executive Council and focus groups with students and researchers.

The second round was a series of detailed Enterprise Architecture workshops facilitated by a team of consultants from KPMG with experience in higher education and technology strategy. It was conducted from January to May 2018. The sessions delivered an analysis of the current state of technology, and the key business and technical requirements for Faculties and central units to meet their stated goals. The Enterprise Architecture exercise provides a framework for the creation of an execution roadmap, which will set out a portfolio of programs and projects to accomplish the goals established in the IT Strategic Plan.

The third round included validation and refining meetings with key stakeholders. [to be completed in due time]
Strategy Sessions with York Leadership

Leaders from York’s Faculties and administrative divisions identified their short- and long-term objectives, as well as significant technology gaps and issues during their introductory strategy sessions. Overall, they expressed a need for a more seamless, integrated student experience and for greater access to information. They also expressed the desire for a more streamlined delivery of technology services and for simplification of some administrative processes.

Faculties in particular desire a strategic plan that would create an integrated, secure environment, yet allow for a range of experimentation and innovation within individual units. Many of York’s Faculties have great interest in expanding online offerings and exploring ways to enhance teaching and learning through the use of technology.

Researchers, on the other hand, are requesting increased communication about the technological solutions available to them and more customized support, especially regarding data storage and servers.

Technology Landscape at York

York’s technology services are generally decentralized, but in line with the level of decentralization found in other Canadian universities. Figure 1 shows the proportion of Central IT services at York (88Ra) compared to UBC (89Ac) and McMaster (87Fr), i.e. 49% Central IT, 34% in other academic units.

![Figure 1](image)

**Figure 1**

Technology solutions differ widely between Faculties and divisions, and individual units can have limited visibility into the technology and processes used in other units.

York spends markedly less money on “Develop & Transform” activities compared to its Canadian counterparts, i.e. delivering new applications, infrastructure, major upgrades and enhancements, normally project-based.

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8 Figures 1 to 4 are from Cubane (2018), UniForum CAN: 2016/17 Information Technology Function Workshop.
Like most other higher education institutions, York lags the private sector in technological development and the adoption of state-of-the-art solutions. The size and complexity of the institution have historically limited the speed and agility of information technology services when addressing problems or implementing solutions. Further, enterprise capable solutions adopted by the private sector are often purpose built to that paradigm. Adoption of such solutions in a higher education context often requires a translation or adaptation of both processes and the tools. These added activities act as complexity amplifiers even for relatively simple solution adoption efforts. In cloud technology in particular, York University also lags its Canadian counterpart. Figure 3 shows that most of its applications, over 96%, are traditional on-premises solutions⁹.

Note that this chart is based on data that predates the adoption of Office 365 at York. More current data would show an improvement in the adoption of cloud solutions at York, although the general situation compared to peer universities would remain substantially the same.
The construction of a new Markham campus in 2021 also presents an opportunity to develop a multi-campus mindset and strengthen the connections between the Keele, Glendon, and Markham sites, while creating a showcase campus for IT innovation.

A similar pattern of underinvestment appears when considering the York IT spending per student FTE. The following graph (figure 4), based on 2015-2016 data collected by CUCCIO, shows that York University spends less per student FTE both in its total institutional IT expenses as well as in its Central UIT expenses (data for other universities have been anonymized)

![2015-16 IT Spend per Student FTE](image)

**Figure 4**

This pattern is confirmed when looking at total IT spend as a percentage of institutional operating expenditures. The following chart compares York with similar Canadian universities (anonymized) through a number of years.

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10 The next two charts are from CUCCIO (2018). Benchmarking Report Year 2015-16.
Technological innovation already takes place across the University, whether it is occurring within central UIT, Faculty IT units, teaching and learning services, faculty, research areas, or inside student organizations. The University is also an attractive partner for external organizations in the private and public sectors, e.g. IBM, eCampus Ontario. There are opportunities for York to advance technological innovation through information sharing between units, the promotion and adoption of effective solutions, and increased collaboration between central and Faculty units.

The costs of not adopting a strategic approach to technology are high. Low or mismanaged investments in technology risks creating the perception that York is not committed to delivering high-quality academic programs.\(^1\) Furthermore, a failure to keep pace with technological change could adversely affect service delivery and the campus experience. Continued innovation on campus relies on a supportive, collaborative technological environment and a commitment from York leadership to support such an environment.

The State of IT in Higher Education

Although lagging other sectors, the state of technology in higher education is rapidly changing. According to Gartner, close to 50% of colleges and universities have reported having changed or being in the process of changing their activity models toward the new paradigm of the digital university\(^2\). More digital initiatives (e.g. digital strategy – teaching and learning) are being implemented than ever, with institutions showing a higher level of digital maturity. “Digital initiatives” ranks third (at 17%) in organizations’ top priorities for 2018 and 2019, after business or financial goals (25%) and revenue/business growth (24%)\(^3\).

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1. This is one of the Top Ten Strategic Risks for York University as an institution, as identified by an Internal Affairs risk audit and confirmed by a vote by the University Executive Committee.
3. Ibid.
That being said, Canadian universities in particular are typically more change averse than other global institutions, which puts them in a competitive disadvantage compared to global peers. And compared to its Canadian peers, York is also lagging, in particular with regard to cloud solutions and foundational technologies.

Among the technologies that are believed to be “game changers”, digital transformation ranks third. Unsurprisingly, given its momentum in all sectors of the economy, AI tops the list in a survey of higher education CIOs (see figure 5).

### Game-Changing Technologies

<table>
<thead>
<tr>
<th>Higher Education (n = 172)</th>
<th>Top Performers (n = 230)</th>
<th>Typical Performers (n = 2,329)</th>
<th>Trailing Performers (n = 276)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Artificial intelligence/machine learning</td>
<td>24%</td>
<td>Artificial intelligence/machine learning</td>
<td>40%</td>
</tr>
<tr>
<td>2  Industry specific</td>
<td>24%</td>
<td>Data analytics (including predictive analytics)</td>
<td>23%</td>
</tr>
<tr>
<td>3  Data analytics (including predictive analytics)</td>
<td>17%</td>
<td>Cloud (including XaaS)</td>
<td>12%</td>
</tr>
<tr>
<td>4  Cloud (including XaaS)</td>
<td>8%</td>
<td>Digital transformation</td>
<td>10%</td>
</tr>
<tr>
<td>5  Digital transformation</td>
<td>8%</td>
<td>Mobile (including 5G)</td>
<td>7%</td>
</tr>
<tr>
<td>6  ERP</td>
<td>7%</td>
<td>RPA</td>
<td>8%</td>
</tr>
<tr>
<td>7  CRM</td>
<td>5%</td>
<td>Internet of Things</td>
<td>6%</td>
</tr>
<tr>
<td>8  Immersive experience</td>
<td>5%</td>
<td>Blockchain</td>
<td>5%</td>
</tr>
<tr>
<td>9  Internet of Things</td>
<td>4%</td>
<td>Automation</td>
<td>3%</td>
</tr>
<tr>
<td>10 Business intelligence</td>
<td>3%</td>
<td>Information technology</td>
<td>3%</td>
</tr>
</tbody>
</table>

**Figure 5**

However, when asked in which technology areas the organization will be spending the most in 2019, priorities present themselves differently.

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15 Cubane 2018.
The vast majority of higher education leaders believe that technology will be driving a business model change in the years ahead. The consensus also holds that the biggest barrier to this change will be culture, to a larger extent than resources, talent or the president’s commitment. This is certainly an indication of where efforts should be focused.

References


Appendix 3: Change Framework: Enterprise Architecture

York IT will adopt an Enterprise Architecture (EA) perspective in its path toward digitalizing the institution. EA is a strategic framework that adopts a holistic and integrated view of institutional activities and processes, data and information, and IT applications and assets. It defines a target state informed by the institution’s vision, as well as a roadmap that guides changes from the current to the desired state. It proposes governance and change management structures that support the execution of initiatives that contribute to advancing the transformational process. According to Gartner, EA is “a discipline for proactively and holistically leading enterprise responses to disruptive forces by identifying and analyzing the execution of change toward the desired business vision and outcomes”\[^{16}\]. In the end, EA creates an integrated IT environment that enhances our ability to change.

Core EA Principles

EA principles define the underlying general rules and guidelines for the coordinated use and deployment of IT resources and assets across the institution. They reflect a level of consensus among the various elements of the enterprise, and form the basis for making future IT decisions\[^{17}\].

In this context, less is more. Among all the EA principles identified in the Open Group Architecture Framework (TOGAF), the following will be proposed to the community as guides to the institution’s EA practices:

<table>
<thead>
<tr>
<th>1. Holistic approach</th>
<th>Design and decide based on an institutional approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Value driven</td>
<td>Design solutions that will minimize costs and maximize value</td>
</tr>
<tr>
<td>3. Student and End-User Centricity</td>
<td>Design solutions taking a student and end-user perspective</td>
</tr>
<tr>
<td>4. Authoritative source of data</td>
<td>Manage information and data as an institutional asset and minimize duplication</td>
</tr>
<tr>
<td>5. Accessibility of data</td>
<td>Data is accessible to users, Faculties and administrative units to better perform their activities</td>
</tr>
<tr>
<td>6. Reusability</td>
<td>Reuse existing components before acquiring new ones</td>
</tr>
<tr>
<td>7. Procure before build</td>
<td>Applications should be procured (open source or proprietary, cloud or on-premises) rather than custom-built, given funding levels</td>
</tr>
<tr>
<td>8. Adoption of leading practices</td>
<td>Leverage out-of-the-box product capabilities and minimize application customization</td>
</tr>
<tr>
<td>9. Interoperability</td>
<td>Ensure the interoperability of technological components</td>
</tr>
</tbody>
</table>

\[^{17}\] Source: TOGAF 8.1.
| **10. Secure and legally compliant** | Respect the requirements in terms of security, confidentiality and legality |
| **11. Continuity and recovery** | Ensure the continuity and recoverability of mission critical solutions |
| **12. Supportable solution** | Ensure that solution design will consider operational requirements and be up-to-date |

In addition, EA standards, compliance processes and communication practices will be determined.
Appendix 4: Supporting Structures

Strategic Leadership

While central, operational oversight is only a part of the overall accountability of the IT Leadership’s role. Defaulting to operational accountability often leads to operational incident management as the focus. This drives IT leadership’s value primarily toward crisis management, resulting in underutilizing its value to the organization and limiting the achievability of institutional strategic objectives.

The role of IT in higher education continues to grow to the point of being pervasive. The perception of IT is slowly transforming, from being a cost centre to a key enabler of the institution’s mission. Increasingly, decisions made on institutional strategy have key technological elements involved. As such, IT leadership needs to participate in those conversations and decisions. It needs to be positioned as a strategic institutional leader, a trusted partner and advisor at the table for these conversations.

Sustainable Funding

Sustainability is often associated with requests for additional funding. While this may be part of the solution, it does not address the broader complexity that needs to be considered. Sustainable funding goes beyond the balance sheet and acknowledges three factors to be tackled.

The first is the ongoing maintenance deficit that has been identified and documented at York. Sustainability in operations must address these gaps. The costs — financial, labour and risk - associated with maintaining legacy systems must be balanced against expected benefits. Technology must be understood as having a modest shelf life. Unlike building infrastructure that can be expected to last 20, 30, or more years, technology has a refresh cycle of 5 years or less. Sustainable funding must ensure that the technology deficit does not deepen. At the same time, the institution cannot increase the IT footprint without ensuring that investment can be managed and maintained in a reasonable, sustainable and lasting manner. Funding can be found in many ways including additional financial resources, leaner operations and value-driven decision-making on service needs.

The second is the manner in which funding has generally occurred. Technology investment or refresh has typically occurred through capital expenditure funding models. Operating funds have generally been harder to secure, especially on a permanent basis. However, a paradigm shift in IT services is underway where services and infrastructure are moving outside the organization, primarily in the form of cloud services. Cloud service expenditures are ongoing rather than one-time investments. This change implies a reconsideration of how technology is funded and increases the need to evaluate the strategic value of technology investments. A sustainable funding model will need to support the institution’s objectives with the longer-term perspective in mind.

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19 According to EDUCAUSE, under the number 3 IT issue of 2018 (Institution-Wide IT Strategy), “[i]n a survey of CIOs, ECAR found that 42% of respondents serve as members of the president’s or chancellor’s cabinet. Those who do are positioned to have a significant impact on institutional strategy”.
20 Recommendation 20 - AAPR Administrative Task Force Report
The final, sustainable funding issue is succinctly summarized by Dwight Fischer, AVP and CIO, Dalhousie University: “Failure to fund information technology adequately is failure to provide a fundamental foundation upon which to thrive in the future.” Acknowledging that technology is core to the mission and function of the institution is essential. Adding more services and spreading scarce resources even further results in mediocrity rather than differentiated services. While efforts to eliminate waste to increase operational efficiency is key, there are limits to this approach being the primary source of funding. Reconciling existing services for their value and eliminating those that don’t measure up, or offer duplicate service, is another. This requires technology governance and data informed decision-making. Ultimately, new services come with a cost, and if they are deemed critical to the mission of the University, the appropriate funding models must reflect that criticality.

**Staffing and Training**

Sustainability must also be reflected in staffing. Much like funding, there are various factors that need to be considered. The first is the nature of work within information technology. As technology has evolved, the type of work being done by IT is equally evolving. The need for programmers/developers is shifting to integrators; more vendor and service managers are needed to handle cloud solutions, and business analysts, (enterprise) architects and data (business intelligence) analysts are needed to support many of the domains identified above. The challenge is bridging these gaps while both new and legacy solutions coexist.

The second is the change in how many IT personnel have increasingly less direct connection, thus internalized association, to the academic space and have workloads commensurate to other sectors but without the corresponding compensation. Traditional loyalty, often tied to the emotional attachment of the higher education spirit, of IT staff to a particular institution or the higher education sector is eroding, and data shows that nearly 50% of the IT workforce is at high risk of leaving. Compounding the situation is the attrition of long-serving staff due to increased numbers of retirements. It must be stated, that competitive salary is largely a barrier for talent acquisition. While salary is considered as part of the rationale to leave a workplace, it is rarely the primary reason for departure. More likely are factors such as better opportunities, a more supportive environment, clearer career roadmaps, more flexible work arrangements and better access to skills development.

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22 Jefferey Pomerantz and D. Christopher Brooks, The Higher Education IT Workforce Landscape, 2016, research report (Louisville, CO: ECAR, April 2016). According to the Campus Computing Survey (Green, K. (2018), 2018 Campus Computing, campuscomputing.net), “more than four fifths (79 percent) of survey participants said that their campus had ‘a difficult time retaining IT talent because salaries and benefits are not competitive with off-campus job opportunities’”.

23 Ibid.