
TO: Chair and members of the Board of Health

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Recommendations

It is recommended that the Board of Health:

1. **Receive this report for information.**

Key Points

- Technology is rapidly changing and organizations need to evolve quickly to stay current and avoid becoming obsolete. Keeping up with technology trends is one way to ensure Wellington-Dufferin-Guelph Public Health (WDGPH) is 'future-ready.'
- The strategic pillars for IT at WDGPH are *availability, accessibility and mobilization*. Information will be available everywhere, anytime and can be moved throughout the system.
- The current environment in IT has a focus on 24/7 connectivity, mobility and disposability. Many organizations are reviewing cloud computing as an option to eliminate the need to build and maintain sophisticated and expensive data centres.
- The future of IT will have a continued focus on privacy and security. Teleworking or remote workspaces are becoming increasingly common and expected by 21st century employees.

Discussion

Overview

Technology will change rapidly over the next 5 years and evolve the way people live and work in the next 10 or 20 years.¹ It is important that all organizations, including Public Health, adjust to these technology changes in order to provide more efficient and tailored service delivery.

One of the strategic directions of WDGPH is Organizational Capacity. Within Organizational Capacity, WDGPH has the goal that: “We will implement and maintain a comprehensive and reliable information technology infrastructure”. The ability to achieve this goal requires a thorough strategic review of information technology programs and services at WDGPH. To that end, 3 external consultant reviews were completed at the end of 2016 to form the foundational basis to guide the work. The summary finding of these reviews will be presented separately to the Board of Health over the remainder of 2017 along with strategies that have or will be implemented to ensure that WDGPH meets this strategic direction.

The overall strategic vision for the Information Technology (IT) department of WDGPH over the next 3 years focuses on improvements in *availability, accessibility and mobilization* which will ensure a comprehensive and reliable IT infrastructure and by doing so make WDGPH ‘*future-ready*’ in a future that is ever-changing.

Current IT Environment

Cloud computing is the practice of using third-party providers to manage, store and process data, rather than doing so on site. Cloud computing allows for greater *availability* of resources for the agency and provides both the greatest efficiencies and challenges.² From an efficiency perspective, cloud computing reduces the need for the Agency to provide and maintain an expensive data centre. There are numerous companies that provide state of the art data centres at reasonable cost located in Canada, such as Microsoft, Google, Amazon, Rogers and Bell. These centres provide high availability and disaster recovery: two things that are very difficult for a relatively small organization. High availability can be thought of as the IT hardware ‘never’ failing, while disaster recovery allows for the seamless continuation of vital IT functions after a natural or human-induced disaster.

With the shift towards mobility, handheld devices are being created with newfound capabilities to change the way people live and work. Cellular devices are available 24/7 and are running on faster cellular networks, which means employees will be more easily able to retrieve information, quickly and ‘on-the-go’. With the increase in mobility and employees scattered across large geographic areas, such as WDGPH, more collaborative tools will be necessary to bring teams together. The goal is that when staff members are taking part in meetings remotely, the experience should be nearly the same as if they were sitting in a room together. By offering high quality collaborative tools and advancing network connectivity, teleworking is becoming a viable option for many employees.

Hardware costs for end point devices (laptops/desktops/tablets/cell phones) are decreasing and these devices are becoming ‘disposable items’ with a very short refresh cycle. Maintenance and warranty agreements are becoming obsolete because when an item breaks, it will simply be

replaced. Laptops and desktops are now used as gateways to the internet and network, as opposed to locally running programs and storing data. The *accessibility* of information is facilitated through the device to enable employees to be efficient and productive using the latest technology.

Future IT Environment

Teleworking is an important expectation by the 21st century employee to achieve work-life balance and WDGPH employees are likely to have the same expectations. Moving applications to the cloud is one way to address issues of mobility and teleworking to ensure accessibility of all resources to any employee at any time.² Additionally, the high availability that is obtained from commercial data centres is essential for 'away from the office' IT activities.³ Teleworking and remote access is quickly becoming an expectation of new employees in all types of occupations.

Shifting focus in IT to backbone infrastructure (cabling, network hardware, Internet feed, etc.) is an essential component for stability and reliability. With more reliance on the Internet to do the work of Public Health, the network components that allow for the fastest possible connection will become increasingly important.

The use of big data and open data is becoming much more common among both corporate and public institutions. WDGPH is a leader in health units by recognizing the importance and applications for big data. The term big data refers to very large data sets, which can be analyzed to reveal useful patterns or relationships to aid in decision making. This is very important in the surveillance work of Public Health. Examples of big data sets in Public Health are Canadian Community Health Survey (CCHS) data, immunization data or Statistics Canada census data. Open data is freely published and accessible by anyone. Examples of open data sets are unemployment rates, life expectancy, worldwide disease outbreak incidences (OECD) and some census data. As the cost of cloud resources and cloud storage decrease, it provides smaller organizations like WDGPH the ability to use big or open data, which was previously limited to large organizations who could afford to analyze and store the vast array of information.

Artificial Intelligence (AI) is a revolutionary technology that is changing the way decisions are made. Computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making and translation between languages. In the future, Public Health predictive modeling and machine learning may be used for data visualization and forecasting for positive community health impacts, such as next-most-likely location for disease outbreak or pre-emptive water testing at high-risk public swim areas. The role of AI within Public Health may not yet be defined but at some point in the future it has the potential to significantly impact public health programs and services.

IT Strategic Pillars

Based on the future IT environment, it is important to create the foundation for WDGPH to be successful. Over the next 3 years, the IT department will be focusing on meeting the Strategic Goal of "We will implement and maintain a comprehensive and reliable information technology infrastructure" by focusing on *availability, accessibility and mobilization* across the Agency.

Availability means IT is working and ready to meet the needs of front-line staff whenever a staff member chooses. It also means that research and data are ready when called upon by staff or community partners.

Accessibility means designing technology and communications to be easily consumable and meet the needs of the system. Staff and external partners can get the information needed, when it is needed and in the format required for it to be most useful and impactful. Accessibility means systems and infrastructure function well and are reliable to meet the daily needs of front-line staff.

Mobilization allows the seamless movement of information into active use. Enabling remote capabilities allows for a highly efficient and mobile workforce to work from anywhere, anytime with access to the same information. This is very important to many of the programs within WDGPH.

To monitor success in availability, accessibility and mobilization, the IT team will measure and report on indicators to inform the Strategic Plan success. Current indicators in use include: the number of help desk tickets, the number of data loss incidents or security breaches each quarter and the VPN adoption rate across WDGPH.

Future IT Skill Set

Employees of the future will need to be proficient in technical computer skills, running the network, virtual collaboration and able to adapt to emerging technologies. Additionally recognizing data and security risks and proactively implementing strategies to protect data both personal and corporate will be key to the agencies success. In a rapidly changing environment as with technology and equipment updates, employees will need to be provided with professional development on an ongoing basis to keep abreast of emerging IT skills. WDGPH will continue to evaluate the IT staffing needs and skills and determine the most effective and efficient strategy to ensure the achievement of strategic objectives.

Privacy and Security Moving Forward

In a future which involves the seamless movement of information into active use, security and privacy of that data must be taken into account in order to ensure the protection of the Agency. There are worldwide increasing privacy concerns, with many new and emerging threats to both personal and health information.

With the increased number of organizations moving to the cloud, privacy and security of data has come under review. The current options for storage consist of onsite locally stored data or cloud based storage with large off site providers. Privacy impact assessments are key for organizations to fully understand the benefits and challenges associated with moving resources off-site or maintaining their own servers and data storage. One area of importance is ensuring data sovereignty while taking advantage of the benefits of remote hosting. Data sovereignty is the concept that digital information is subject to the laws of the country where it is physically stored. For example, storing data in a data centre located in the United States of America (USA) would mean the data is governed by the laws of the USA, and thus the US government could potentially use the *Patriot Act* to access and view any data.

Also, with the predicted increased number of malicious attacks, such as ransomware and denial of service, there is increased interest in the use of cloud computing and storage to protect data. Third-party cloud hosting providers are able to pool resources from their many clients to provide security that is far superior to what any one client could accomplish on their own. Ensuring that data at WDGPH is safe and secure remains an important risk management item both now and in all future IT states.

Financial Implications

Keeping up with changing technology trends will require some financial investment on the part of WDGPH. Fortunately, as demands increase for expenses like storage space, the price of obtaining said storage continues to go down. In the coming years, WDGPH will review investments in infrastructure, such as network hardware, internet feeds and connections at all sites to improve network infrastructure and connectivity for significant bandwidth and speed improvements. While there are investments required in staying current with emerging technologies, WDGPH has a planned budget for continual investment in these items and is committed to choosing those investments which will meet the Strategic Goal of “We will implement and maintain a comprehensive and reliable information technology infrastructure”.

Conclusion

The ‘Key Points’ section of this report describes a landscape of rapid change in processes, connectivity and devices. It is necessary for WDGPH to innovate and adopt new technologies, as well as train staff on these new technologies in order to remain efficient and effective while delivering Public Health programs and services. WDGPH is already evaluating emerging technologies like cloud computing and big data in order to maintain a comprehensive and reliable information technology infrastructure – to meet the Strategic Direction: We will improve our capacity to effectively deliver public health programs and services.

Ontario Public Health Standard

Ontario Public Health Organizational Standard – Management Operations

- Strong organizations will have an operational planning process, which may include several separate documents including an IT strategy
- Management operations relates to the administration function in terms of:
 - Financial Management;
 - Information Management;
 - Communication strategies;
 - Human resource planning and management; and
 - Program management

WDGPH Strategic Direction(s)

Check all that apply:

Health Equity

We will provide programs and services that integrate health equity principles to reduce or eliminate health differences between population groups.

Organizational Capacity

We will improve our capacity to effectively deliver public health programs and services.

Service Centred Approach

We are committed to providing excellent service to anyone interacting with Public Health.

Building Healthy Communities

We will work with communities to support the health and well-being of everyone.

Health Equity

n/a.

Appendices

n/a.

References

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3. Biro M. Telecommuting is the future of work. 2014 Jan 12. [Internet]. 2014 Jan 12. [cited 2017 May 29]. Available from: <https://www.forbes.com/sites/meghanbiro/2014/01/12/telecommuting-is-the-future-of-work/#6b9f57943c86>