2014 Technology Trends

Trends are used to inform decision making, identify strategies to manage risk and potentially decrease costs through improved operational efficiency.

We believe that the following trends will continue to influence The City of Calgary over the next five years.

Information Technology Trends 2014 SUMMARY

1. Information explosion

The volume of information The City is accumulating continues to grow exponentially. The volume of data and the wide variety of content types leads to challenges not only with discovery, storage and retention, but complicates the ability to transform this content into usable information for the business.

IMPLICATIONS:

Data security/privacy concerns, better data analytics, greater data accessibility, less paper-based documents, The Information Governance Policy and an enterprise-wide document and electronic records management system.

2. Business-driven technology investments

(aka Business Technology)

Information Technology is moving towards a new business relationship model and a federated approach to technology governance. This approach empowers technology decision-making to the right people, at the right level of the organization to support business agility, while protecting the enterprise.

IMPLICATIONS:

Managing technology solutions becomes a shared responsibility, accountability and return on investment (ROI) becomes the responsibility of each business unit. Finding the right balance between business agility and corporate controls, and business units govern the success of software delivery projects.

3. Mobility – business any time, any where, using any device

Being able to take technology wherever you go, developments in mobile devices and applications, and changes in work styles, modes of communication, demographics and customer expectations have changed the way information moves among individuals and between organizations.

IMPLICATIONS:

Business technology systems designed for mobile access, handheld, wearable and vehicle-mounted mobile devices, device management and maintaining security of City data, and more of the workforce able to work from any remote location or City facility.

4. The Internet of Things

The Internet of Things refers to the ability to identify physical objects such as vehicles, people, appliances and other devices through a unique address that is connected to the Internet and integrated into an information network. Bluetooth and Wi-Fi support access to connected devices and create the ability to control devices and capture data in the field, in real-time.

IMPLICATIONS:

Connectivity anytime/anywhere, concerns regarding data security and privacy, a Fixed Wireless Strategy resulting in reduced deployment time, improved bandwidth, increased resiliency and reduced dependency on telecommunication carriers.

5. The new rate of change

Calgary is a highly connected city with almost 97 per cent of citizens having Internet access at home. Consumers and employees are doing business in ways not previously possible by connecting, interacting and collaborating through the use of apps and social media. This rate of change forces companies to operate at a new pace in parallel to expectations set by the consumer market*

IMPLICATIONS:

Increased collaboration and better understanding of business goals and drivers and alternative delivery options for technology services — desktop virtualization, cloud computing, open source software, multi-data centres and Calgary City-Net.

* (Source: City of Calgary: Web and 311 Measurement and Survey Report, 2012)

1. Information explosion

As City staff go about conducting business, they are interacting with increasing volumes and types of information. This information comes in many forms, from paper-based plan submissions to structured information from a database such as PeopleSoft. Today, the data collected and utilized by The City comes from a wider variety of sources including video capture, social media, remote sensing, online surveys, on board vehicle locations and diagnostics, etc.

The volume of information The City is accumulating continues to grow exponentially. Since 2005, storage for electronic data has grown almost 900 per cent. This data/information is stored in any number of formats and repositories such as databases, network drives, collaboration sites, memory devices and email. Paper-based documents have decreased with the deployment of eServices, but continue to form a portion of information to be managed.

The volume of data and the wide variety of content types leads to challenges not only with discovery, storage and retention but complicates the ability to transform this content into usable information for the business. This trend is known as Big Data and refers to data whose size is beyond the ability of typical database software tools to capture, store, manage and analyze.

The challenge The City faces is to reduce the risk of information failure and exposure, treat information as a corporately-owned asset to be shared and apply business intelligence practices to transform data into meaningful and useful information to support decision-making.

IMPLICATIONS:

- As information is captured and documents are created, data security, privacy and ownership need to be considered. City business units will need to better classify and manage their information and determine what needs to be stored for future use and reduce risk. In addition, potential costs of eDiscovery and knowing what information to protect and prioritize in the event of disaster recovery need to be determined.
- Access to more information will drive the need for better data analytics to gather insight and help with decision-making.
- As customers and citizens engage with our government the demand for eGovernment initiatives such as online services, open data and transparent and accountable government will continue. Better management and access to information is needed.
- The ability to search and easily find information will improve staff productivity and reduce the effort spent in re-creating information that already exists.
- Reducing the amount of paper-based documents and freeing staff from the need to access physical records is required to support a mobile workforce.
- The Information Governance Policy was approved in 2013. The policy outlines The City's approach to information management, roles and responsibilities to govern information and ensures The City's information is treated as a corporately-owned asset.
- The Corporation is moving towards an enterprise-wide document and electronic records management system. This will help The Corporation reduce legal, financial and reputation risk, as well as maximize the value of City information. Business units will need to consider behavioural and business process changes. Resources will be needed to implement sound information management practices.

Information Technology Trends 2014

2. Business-driven technology investments (aka Business Technology)

Business environments are becoming increasingly reliant on technology. Business staff are technology savvy and self-service technology is readily available in the marketplace, e.g. cloud-based services. This makes it easier for business units to provision their own technology solutions. To address this shift Information Technology is moving towards a new business relationship model and a federated approach to technology governance. This approach empowers technology decision-making to the right people, at the right level of the organization to support business agility, while protecting the enterprise.

IMPLICATIONS:

- Creating and managing technology solutions is a shared responsibility between the business unit, Information Technology and oftentimes external service providers.
- Accountability, business outcomes and the return on investment (ROI) for technology-related investments will be the responsibility of the business unit making the investment.
- Corporate oversight needs to be maintained to protect security, ensure integration between business systems and leverage enterprise investment and economies of scale. Finding the right balance between business agility and corporate controls is needed.
- City business units ultimately govern the success of technology delivery projects. Business units need to ensure compliance with the Corporate Project Management Framework (CPMF), communication, change management, user acceptance training and consider support and sustainment when implementing a technology project.

3. Mobility – business any time, any where, using any device

Society has set the expectation that any information or service that is required is available, on any device, anytime it's needed. Being able to take technology wherever you go, developments in mobile devices and applications as well as changes in work-style, modes of communication and consumer expectations have changed the way information moves among individuals and between and within organizations.

IMPLICATIONS:

- Business technology systems must be designed to assume and support mobile access.
- Powerful and affordable hand-held, wearable and vehicle-mounted mobile devices provide added flexibility. The number of City workers who require access to information from job sites or remote locations will continue to increase.
- Business units can benefit through improved customer service and staff productivity, in particular, the reduction of travel time and delays in acquiring information. Business units need to understand the relationship to the information technology infrastructure as well as the required people and financial resources.
- Device management and maintaining the security and integrity of City business data in the event of device loss or theft is mandatory.
- Mobile technology can deliver benefits with respect to workforce retention, reduced corporate real estate costs, environmental impact and improved business resilience by allowing employees to work from any remote location or City facility. The Tomorrow's Workplace program together with mobile technology will help bring these benefits to the organization.

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4. The Internet of Things

The Internet of Things refers to the ability to identify physical objects such as vehicles, people, appliances and other devices through a unique address that is connected to the Internet and integrated into an information network. Communication technology such as Bluetooth and Wi-Fi support access to connected devices and create the ability to control devices and capture data in the field, in real-time.

According to Cisco, approximately 50 billion devices will be connected worldwide by 2020. The City has already started to connect physical "things" such as traffic light controllers, traffic cameras, security surveillance, high water sensors, lift station controls and City fleet vehicles. Embedding sensors into physical objects allow for data acquisition in real-time, remote monitoring of conditions, and remote control of devices and services.

IMPLICATIONS:

- Advances in wireless technology are contributing to the expectation that connectivity and broadband speed will be available anytime, anywhere.
- The business value of implementing connected devices will come from understanding the data these devices acquire and produce.
- As the number of connected devices increases, the amount of data generated will also grow. This will raise concerns about data security, privacy and information management.
- Information Technology continues to build a multi-year initiative, high-speed network called Calgary City Net (CCNet). This network enables The City to provide anytime, anywhere access, network availability and a sustainable technology infrastructure to support future needs.
- Information Technology will be expanding The City Internet Protocol (IP) addressing to ensure there are sufficient IP addresses available to connect physical "things" to the network.
- Information Technology is developing a Fixed Wireless Strategy that enables wireless technology to connect two or more fixed locations. For various City sites, fixed wireless is expected to offer some combination of reduced deployment time, reduced cost and improved bandwidth.
- Other benefits that Information Technology hopes to realize through the use of fixed wireless include increased resiliency and reduced dependency on private telecommunications carriers.

5. The new rate of change

Technology has become part of our everyday life. Calgary is a highly connected city with almost 97 per cent of citizens having Internet access at home. Consumers and employees are doing business in ways not previously possible by connecting, interacting and collaborating through the use of applications and social media. This rate of change forces companies to operate at a new pace in parallel to expectations set by the consumer market.*

* (Source: City of Calgary: Web and 311 Measurement and Survey Report, 2012)

IMPLICATIONS:

- To operate in this environment, increased collaboration and better understanding of business goals and drivers between Information Technology and City business units are needed.
- The City will continue to look at alternative delivery options to help with rapid provisioning of technology services. Some of these strategies include:

Desktop virtualization – All the components of the desktop are virtualized, allowing for a highly flexible and secure desktop delivery model. Desktop Virtualization supports a more complete business continuity strategy.

Cloud computing – An alternative to building or hosting line-of-business systems within the City's environment. Some City business units have contracted (purchased, licensed and funded) services delivered over the Internet. Google Mail or Salesforce are examples of cloud-based services.

Open source software – Computer software whose source code is available to modify or enhance. Well-known examples of open source software are Linux and the Firefox web browser. The City will continue to use and promote open source software, but only where risk can be tolerated.

Multi-Data Centres – The City continues to implement a multi-data centre strategy that builds a durable failover system to aid recovery and minimize the impact of outages.

Calgary City Net (CCNet) - provides the backbone to support faster, more reliable and more secure options to conduct City business anywhere, anytime.