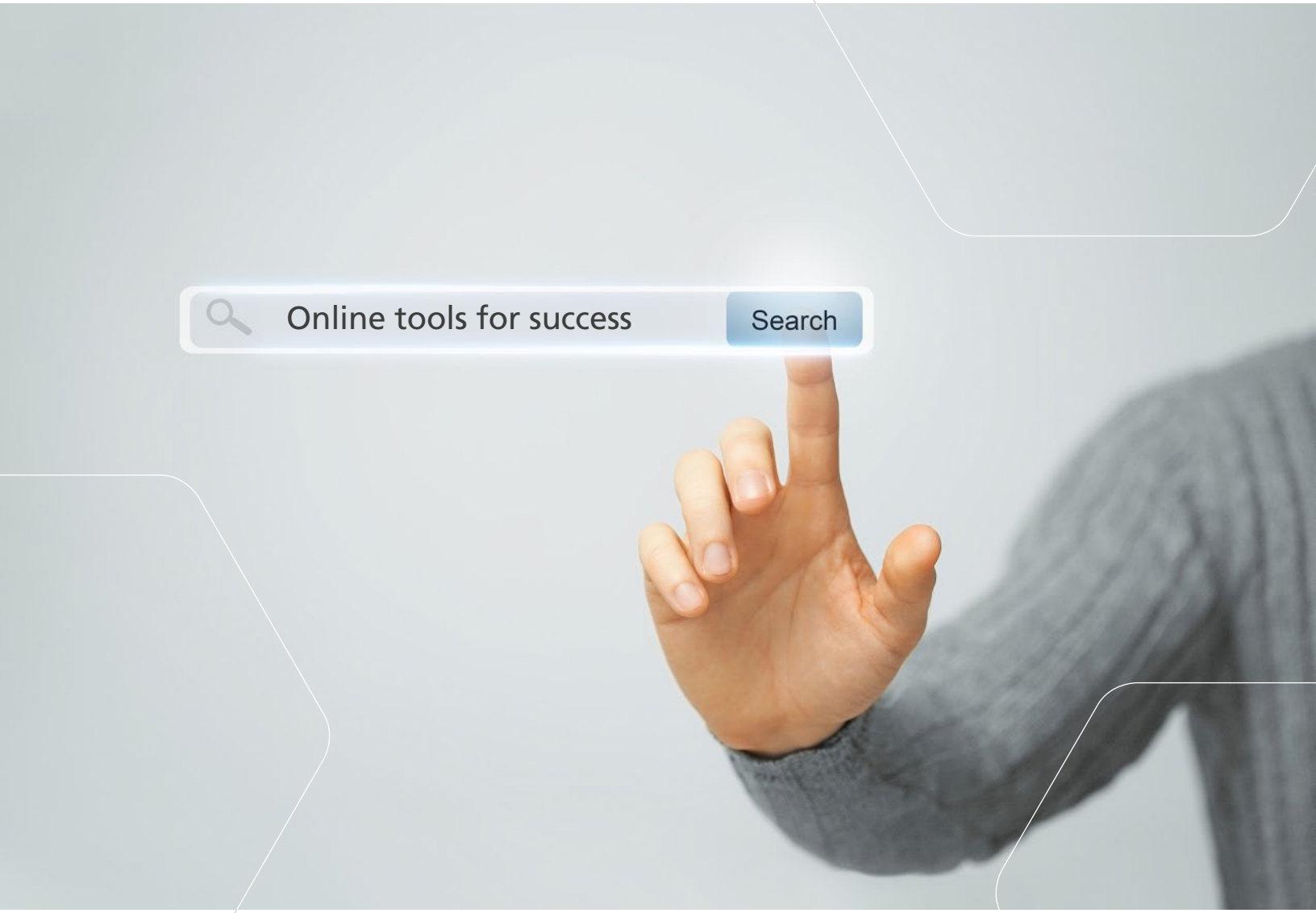
eBusiness Tool Kit

for Small and Medium-sized Enterprises (SMEs)



EORN
EASTERN ONTARIO
REGIONAL NETWORK

EOWC
Eastern Ontario Wardens' Caucus

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Prepared for the EORN/EOWC by

eFilters Inc. & RDM Management Group

Contact: reza.rajabiun@gmail.com
rpickett@rdmmanagementgroup.ca

Executive Summary

We live in an age of digital disruption. Internet connectivity is constantly changing our daily lives and has fundamentally changed the way we do business.

For Canada's small and medium-sized enterprises (SMEs), keeping up with the pace of change has been a challenge. Although Canadians have embraced digital technology in their personal lives, Canadian SMEs have been lagging behind their counterparts in many other high income countries, including the U.S., in adopting new business applications that leverage the power of broadband connectivity.

Rural businesses have faced the additional challenge of poor internet connectivity. In Eastern Ontario, that barrier is falling due to the efforts of the Eastern Ontario Warden's Caucus (EOWC) and the Eastern Ontario Regional Network (EORN). Over the past five years, they have been working with the province of Ontario, the federal government, and a number of telecommunications companies to improve the broadband coverage and speeds that are available in our Region. The EORN project, which finished building the network in March 2015, extended high-speed internet services across Eastern Ontario, as well as high-speed fiber into 65 business park locations.

The EOWC and EORN are currently working on efforts to further improve the coverage and speeds of fixed and mobile broadband internet infrastructure available to residents, businesses, and public sector users in Eastern Ontario.

Although improved broadband is making new Information and Communications Technologies (ICTs) more available to businesses in Eastern Ontario, the network cannot deliver benefits unless people know how to harness internet access for greater productivity and profit.

That is why EORN created a 10-year Digital Strategy to ensure that the broadband network fulfils its potential to deliver economic growth and improved quality of life to Eastern Ontario communities. In particular, the success of our small and medium-sized businesses is critical to the future success of Eastern Ontario businesses and the economic prosperity of our Region.

Understanding and using new online business applications can be daunting and overwhelming. This eBusiness Tool Kit is an educational resource to help SMEs learn how to use a broad range of online applications to find new customers, improve productivity, and grow employment and wages.

The toolkit is a starting point, offering an overview of how different applications can benefit businesses and the relative risks and rewards. It contains dozens of links to other resources, so that businesses can find the online platforms that best suit their needs. The first step, of course, is to understand what those needs are. Business owners must analyze their weaknesses and opportunities. Where are the inefficiencies? How are you spending your time and your money - and is it well spent? Are you bogged down in process and administration when you could be creating value? Where are the opportunities for new customers, markets or products and services?

Online business application can help save money and improve productivity, fuel growth or create entirely new industries. The tool kit has been divided into three categories, so that business people can easily learn about the online applications that are most relevant to their needs and industry.

Tools to reduce your costs and improve productivity

Digital technology can improve productivity by reducing the input costs of the business. Automating tasks through online platforms and improving the flow of information can help staff be more efficient and effective and spend more time on revenue-generating activities.

Examples include a range of cloud-based services, such as data storage and back up, accounting services, and customer relationship management. A unified communications platform that integrates telephony and various digital communications can also save money and improve customer service.

As technology evolves, the costs of these IT investments are going down and there are a range of options to meet the needs of different kinds of businesses.

Tools to grow your business

The new digital economy is opening up new ways to reach and serve customers. Online and digital marketing opportunities range from a simple web site to social media strategies and Search Engine Optimization. For many businesses, a digital strategy is a must. For example, those in the tourism industry are being reviewed on sites such as TripAdvisor or Yelp, whether they are engaging online or not. eReservations services are the cost of doing business for the hotel and restaurant industries. A variety of eCommerce platforms are also helping companies across a range of sectors do business globally.

As well, scalable digital solutions now exist for purchasing, recruitment, education and training and performance management that can benefit a range of sectors.

Disruptive technologies and rural business

Digital connectivity is not only creating business solutions, it is driving innovation and in some cases, creating entirely new industries and sectors. The Internet of Things (IoT), for example, involves connecting almost any object through sensors to an online platform. This technology can collect data, monitor and manage almost anything from the movement of goods to the moisture level of soil, with little human intervention.

For example, the development of low-cost sensors and cloud-based services helps smaller farms leverage precision agriculture tools that can reduce the use of pesticides, manage irrigation and improve crop quality.

Remote sensor technology is also driving innovation, growth and disruption in the field of transportation. Intelligent Transportation Systems (ITS) is a broad term encompassing technology that connects different kinds of transportation infrastructure, vehicles and GPS. Uber for example, leveraged the ability to easily track and find available cars to help sell rides to consumers. The result was a mode of service that is upending the existing taxi business model. Self-driving cars are using this technology to revolutionize the auto industry. For SMEs, ITS can help track the movement of goods and manage logistics more efficiently.

Another game changer is the increased use of big data analytics. This involves the analysis of very large data sets, offering the potential to drive innovation, better understand and segment target markets or automate processes through the use of advanced artificial intelligence. While much of this potential may seem out of reach for small and medium enterprises, there are resources, such as Google Analytics and other analytic tools that are tailored for businesses of all sizes.

Making the decision

There are risks and rewards to any digital business initiative. And the risks and rewards of a particular solution will not be the same for every business. SMEs need to explore the options and weigh the specific costs and benefits for their own business, before making investment decisions. Below is a summary of tools detailed in the eBusiness Toolkit.

Summary Table of eBusiness Tools and Technologies for SMEs		
Tool	Potential Benefits	Challenges and Risks
Tools to reduce your costs and improve productivity		
Cloud-based Services	• Access to a wide range of applications and services • Remote access • Low upfront cost • Security	• Data and security breaches • Reliability of service provider • Compliance requirements
Unified Communications	• Improved customer service • Improved collaboration • Efficient control and monitoring • Cost effective	• Requires high quality broadband • Employee pushback • Can be challenging to implement
Enterprise Resource Planning (ERP)	• Centralized information control • Improved productivity • Process automation • Enhances responsiveness	• Fixed costs and challenging to implement in SMEs • Potential integration issues with other systems • Vendor lock-in
Consumer Relationship Management (CRM)	• Improves customer service • Employee accountability • Enhanced strategic marketing • Mobile application	• Data security (customer information) • Requires employee engagement and buy-in
Project and performance management	• Improved planning and execution of tasks • Reduces cost over runs • Enhanced visibility • Aligns strategy with tactics	• Information overload • Micro-management • Some training requirements
Online banking and payment systems	• Customer payment flexibility • Lower bank fees • Time savings • Improved cash management • eCommerce integration	• Susceptible to fraud • Potentially high transaction fees for payment processing
Data storage, backup and recovery	• Risk management • Data archiving and organization • Security	• Security
Asset tracking and employee monitoring	• Loss prevention • Customer service • Cost control • Effective management	• Employee resistance • Fixed deployment costs • Information overload
Cybersecurity and data protection	• Risk management • Peace of mind	• Fast evolving threats • Human error

Tool	Potential Benefits	Challenges and Risks
Tools to grow your business		
Web presence and outreach	• Brand awareness • Expanding markets • Low cost to deploy	• Negative reputational consequences of poorly designed web page • Need for information consistency and integrity • Requires monitoring and resources
Social media engagement and tracking	• Personalized marketing • Brand recognition • Engagement and feedback	• Potential for abuse • Human resource intensive
Search Engine Optimization (SEO) and marketing	• Brand visibility • Improved connectivity with existing and potential customers and partners	• May require outside resources • Constantly evolving • Payoff may be limited
eReservation and online booking systems	• Expanding markets • Global awareness • Administrative efficiency	• Transaction costs • Potential fraud
eProcurement	• Cost control • Accountability • Wider range of suppliers • Avoid bottlenecks	• Limited face-to-face engagement with supplier • Restrictive conditions
eEducation and certification	• Low cost • Targeted learning • Structured/Individualized training • Flexible access to learning	• Potentially low quality • Limited engagement between students and teachers
Widgets, dashboards, and performance management	• Monitor and distribute relevant information from internal and external processes • Real-time information for Just-in-Time efficiency	• Information overload • Micro-management
Disruptive technologies and rural business		
Internet of things (IoT)	• Control and efficiency • Productivity growth	• Security • Vendor lock-in
Big Data analytics and Artificial Intelligence	• Better decision making • Identify hidden opportunities • Process automation	• Relevant information can be costly • Requires advanced skills
Precision agriculture	• Increased yield variety • Reduce costs of inputs • Improved resource management	• Capital intensive • Vendor lock-in • Potentially steep learning curve
Intelligent Transport Systems (ITS)	• Better service quality • Fewer errors • Reduced congestions • Tracking of inputs and outputs • Cost management	• Network security

Introduction: Background and Objective

Since the 1970s, large businesses have been deploying new information technologies and using private data networks to improve productivity and profitability. The wide availability of broadband internet and the proliferation of cloud-based eBusiness tools and applications now offer unique opportunities for Small and Medium-sized Enterprises (SMEs) to take advantage of many of the same tools and capabilities that only large enterprises could afford a few years ago.

Leveraging these technologies can offer SMEs outside of large urban centres a competitive advantage and counteract some of the disadvantages in terms of costs of inputs, access to employees with the right set of skills, and serving their customers. On the other hand, effectively deploying new technologies entails both risks and resources. Some SMEs may not be able to afford the fixed investments, organizational adjustments, and inherent risks of implementing online tools.

International research suggests that the diffusion of broadband technologies has had a strong positive impact on productivity growth in advanced economies.[1] While the adoption of more basic services does not appear to have a strong impact on productivity growth, the more advanced Information and Communications Technology (ICT) applications that broadband enables appears to have a significant impact on productivity growth in SMEs.[2] The proliferation of eBusiness tools and applications hosted in the "cloud" opens a wide range of new software-as-a-service (SaaS) service delivery models and reduces the need for costly fixed investments in hardware and software on premises.

The availability of broadband internet access is essential for SMEs to take advantage of these new eBusiness tools and technologies that can improve their productivity and profitability. Concerns about the coverage and speeds of broadband by residents and businesses in Eastern Ontario led the Eastern Ontario Wardens' Caucus (EOWC) to develop the Eastern Ontario Regional Network (EORN), a public-private partnership designed to address broadband gaps in communities across the Region. The first phase of the EORN project increased coverage and speeds relative to national standards, including extending ultra-high-speed fibre optic access to over 65 business parks and clusters across the Region. The EOWC and EORN are now working to address remaining gaps in terms of mobile connectivity and access to more reliable next generation fibre broadband technologies to Eastern Ontario residents and businesses.

[1] Czernich, N., Falck, O., Kretschmer, T., & Woessmann, L. (2011). Broadband infrastructure and economic growth. The *Economic Journal, 121*(552), 505-532.

[2] Colombo, M. G., Croce, A., & Grilli, L. (2013). ICT services and small businesses' productivity gains: An analysis of the adoption of broadband Internet technology. *Information Economics and Policy, 25*(3), 171-189. Bertschek, I., & Niebel, T. (2016). Mobile and more productive? Firm-level evidence on the productivity effects of mobile internet use. *Telecommunications Policy.* Falk, M., & Hagsten, E. (2015). E-commerce trends and impacts across Europe. *International Journal of Production Economics, 170,* 357-369.

EORN's consultations with stakeholders in Eastern Ontario have highlighted that availability of broadband connectivity alone is not enough for SMEs to adopt ICT applications and services. A lack of information about available technologies and eBusiness tools can make it challenging to evaluate which technologies are relevant for a particular business. The growing variety of vendors, technologies and business models for delivering eBusiness tools and applications also increases the uncertainty facing SMEs considering using these technologies to improve their productivity and profitability.

In addition to greater access to capital, larger enterprises can invest in internal capacity or hire external experts to evaluate and implement technologies that are available to them. However, this is not the case for most SMEs, which can put them at a competitive disadvantage. Despite the fact that Canadian consumers have embraced internet applications and services, Canadian businesses have remained relatively reluctant to invest in and use eBusiness applications and advanced services.[3] As noted in a whitepaper published by the National Research Council:

> *"The general Canadian population is well ahead of other countries in adopting digital technology in their personal lives. However, Canadian SMEs lag behind in adopting it for their businesses. And that is one of the primary contributors to Canada's productivity problem."*[4]

Given that SMEs are such an important part of the Canadian economy ICT adoption by SMEs is important. It is particularly important in rural regions such as Eastern Ontario, where SMEs are a key source of economic growth and employment. Economic research already shows that deploying broadband has had a positive impact on employment and wages in rural communities such as Eastern Ontario.[5] Intensifying the adoption of tools and technologies that enable SMEs to reduce costs, reach new markets, and otherwise innovate will be critical for future growth in employment, wages, and the prosperity of our communities.

Unfortunately, national trends in terms of ICT investment are not encouraging. A 2015 report by the Centre for the Study of Living Standards, in reference to the evolution of the broader productivity gap between Canada and the U.S. after the financial crisis of the late 2000s, noted:

[3] Other than simple email or webpage presence for example.

[4] Productivity into profits: A guide to digital technology adoption for SME productivity leaders, White Paper, Digital Technology Adoption Pilot Program. National Research Council Canada. Available at: http://www.nrc-cnrc.gc.ca/eng/irap/dtapp/resources/whitepaper_01.html

[5] Ivus, O., & Boland, M. (2015). The Employment and Wage Impact of Broadband Deployment in Canada. *Canadian Journal of Economics.* Pant, L. & Odame, H. (2014). OUTCOME ANALYSIS OF RURAL BROADBAND PROGRAMS: A study of rural small businesses and community organizations served by phase one of the Eastern Ontario Regional Network–a high speed Internet initiative. The Monieson Centre, Queen's School of Business, Queen's University, Kingston, Ontario.

> *"The U.S. business sector experienced a more severe downturn than Canada during the recession, yet enjoyed superior ICT investment performance. Nominal ICT investment rose 1.5 per cent per year in the United States between 2008 and 2013, compared to -1.0 per cent in Canada. Also, in contrast to Canada (where ICT investment fell after 2008), ICT investment growth in the United States picked up from 0.6 per cent per year in 2000-2008 to 1.5 per cent in 2008-2013."* [6]

The fact that Canadian businesses appear to be lagging behind their counterparts in other countries indicates the potential for large gains to business productivity and profitability from increasing adoption of advanced eBusiness tools and technologies.

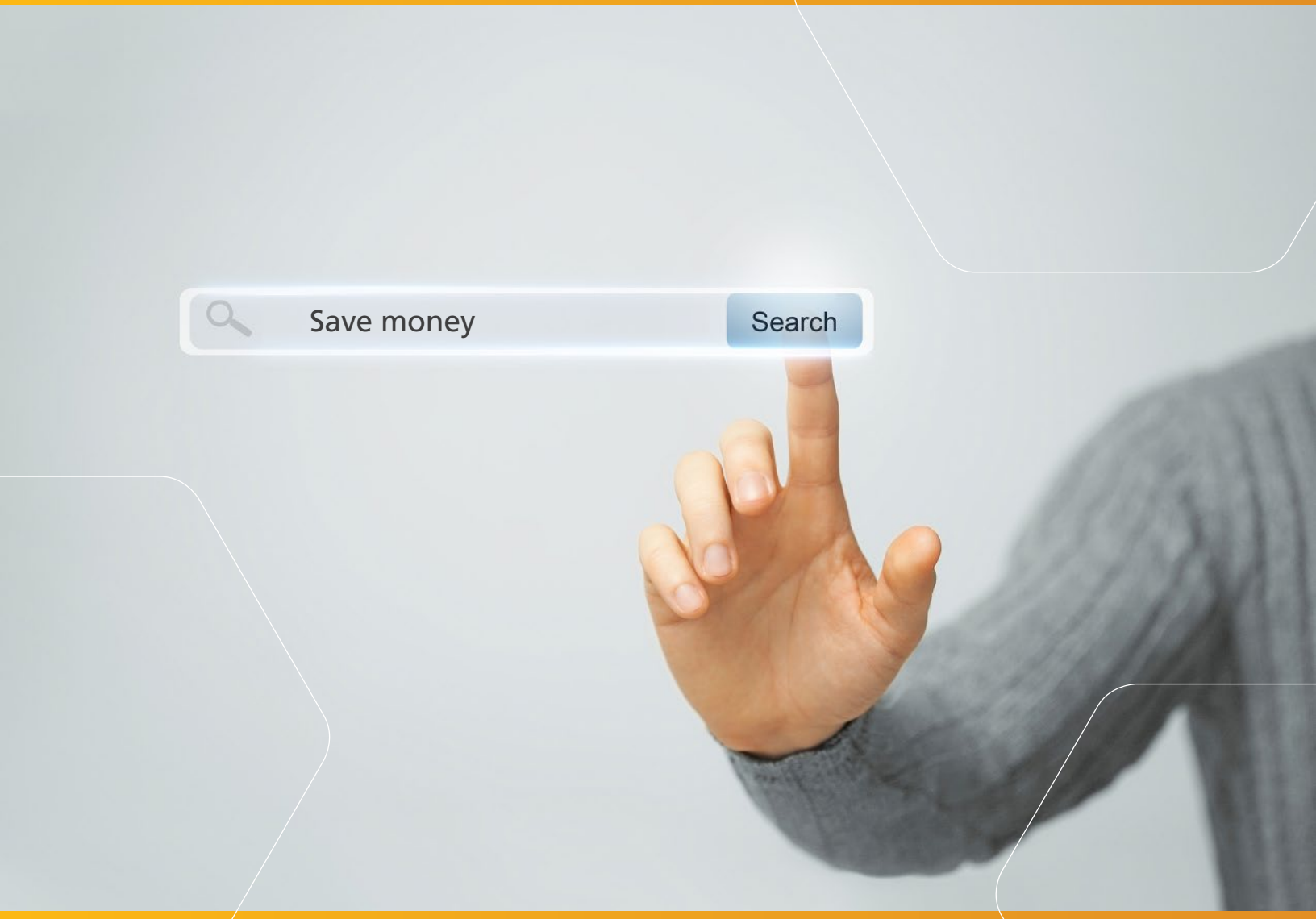
SMEs need tools to help them understand the options and opportunities. The objective of this eBusiness Tool Kit is to provide business leaders in Eastern Ontario with a broad and practical overview of different types of information technologies and advanced business services that leverage broadband internet access to improve productivity and profitability. Given the wide range of businesses in the Region and the variety of new information and communications technologies (ICT), the Tool Kit represents only a starting point for business leaders to consider the range of opportunities that might fit their individual needs.

The Tool Kit provides an overview of a number of standalone information technologies and network-based services that might be relevant to SMEs. It should not be viewed as exhaustive. The Tool Kit does not endorse any particular technologies, business models, or vendors. The stand-alone overviews of particular technologies and approaches aim to provide the reader with an independent perspective that outlines available options, selecting among competing approaches in the rapidly changing market for eBusiness services and applications for SMEs. We also provide an overview of a number of disruptive technologies that might be particularly relevant to deploy by smaller businesses in rural communities such as Eastern Ontario.

The Tool Kit discusses a broad range of tools and technologies, different approaches for procuring them, and challenges in their implementation that are particularly relevant for SMEs. References to further readings are provided in textboxes and the appendix for readers interested in learning more about eBusiness tools and advanced ICT applications that fit the specific requirements of their businesses.

[6] An Analysis of the Canada-U.S. ICT Investment Gap: An Update to 2013. Page 10. Available at: http://www.csls.ca/reports/csls2015-01.pdf

Tools to reduce your costs and improve productivity



eBusiness Tool Kit for Small and Medium-Sized Enterprises

Tools to reduce your costs and improve productivity

The development of high-speed internet connectivity (broadband) has led to significant innovation in the market for applications and services that enable Small and Medium-sized Enterprises (SMEs) to reduce costs, improve productivity, and grow their business in ways that were previously unimaginable. The wide range of new Information and Communications Technologies (ICTs) and models for delivering business services on the internet can also make it challenging to identify which set of tools and approaches meet the needs of a particular business, what are the best strategies for implementing them, and risks associated with adoption of new technologies and business models.

Why is this relevant for SMEs?

Canadian SMEs have been particularly slow to adopt ICTs relative to their counterparts in other countries, including the United States. This means there is significant potential to reduce costs and improve profitability from intensifying ICT adoption and use in Canadian SMEs.

In general, using appropriate ICTs can help reduce cost and increase productivity by improving the flow of information into and out of a business organization. ICTs enable managers and owners to receive relevant data more readily, analyze internal and external information, and make informed decisions. ICTs can further automate information flows, transactions, service, and product delivery to customers. By "outsourcing" various tasks to computers, ICTs can help limit costly human errors, and allow owners and employees to focus on innovation and revenue generating tasks (i.e. research and development, sales and marketing).

On the other hand, as with any other technology, there is a fixed cost to adopting ICTs and eBusiness tools. In addition to potential hardware and software costs, this includes learning about available options in the market to accomplish a particular type of task, how to use the new tool effectively, and ensure that its adoption does not disrupt ongoing processes and relationships.

The risks of ICT adoption to a business include investing in a solution that does not meet individual needs, poor implementation of the solution, and difficulty adjusting to the new process. The ease of learning to use a particular eBusiness tool is particularly relevant for SMEs with limited time and resources

The following sections provide an overview of a variety of technologies, tools, and business models relevant for SMEs, as well a discussion of implementation options and potential challenges associated with their adoption.

01 Cloud-based services

What is Cloud Computing?

Cloud computing is an approach to using Information and Communications Technology (ICT) applications and services in which information a company collects and uses is stored and managed offsite in a remote data centre. Employees then access and use this information via the internet using their devices (i.e. computer, smartphone etc.) based on their level of authority.

Why are cloud-based services important for SMEs?

Small and medium enterprises ("SME"), as well as larger organizations, are increasingly using cloud computing to avoid the costs of purchasing and operating expensive IT infrastructure (i.e. servers and equipment). Economies of scale for operating these services in the cloud are significant, making them a much cheaper approach for the delivery of business communications and information services. This trend towards the cloud and delivery of tools and applications as a service can make them more affordable to adopt by SMEs with scarce time and resources.

This trend is illustrated by the transition of email from local servers to cloud-based operators such as Google. In addition to reducing costs of equipment, software for cloud-based eBusiness tools is purchased and maintained by the service provider. This limits the need to purchase individual licenses as the data storage, and processing is delivered as a service.

Businesses benefit from the remote access capabilities offered by these solutions to give workers instant offsite access to allow for increased productivity. The flexibility of the cloud allows a business to increase or decrease the amount of storage on demand as the business scales. Cloud computing also serves as a risk management tool where data is backed-up, and stored securely in case of business interruptions or disasters.

How can companies employ eBusiness tools in the cloud?

SMEs can implement cloud computing to deliver services such as:

Accounting and reporting - offering features such as accounts receivable and payable, electronic payments processing, financial reporting, general ledger, and tax compliance. Electronic payments, as opposed to paper-based processes, help small businesses reduce transaction costs and are more accurate.

Customer Relationship Management (CRM) - applications that track and manage relationships between customers, suppliers, and the business. These solutions are inexpensive, user friendly and update automatically in the cloud.

Databases - all information is stored and centralized in the cloud. Businesses pay for usage as the service providers incur any hardware, installation and maintenance costs.

Document management/collaboration tools - allow for collaboration on a document or a project. These tools enable managers to allocate tasks effectively, monitor progress, control document and project cycles through workflows from initiation to completion.

Production/supply chain management - A new generation of generic and industry specific cloud-based applications are rapidly emerging that allow SMEs to optimize their production and supply chain management processes. These include applications such as logistics, order management, and scheduling which use real-time data through the cloud. Common problems such as process bottlenecks can be addressed to reduce the associated costs. Adoption of these technologies and tools by SMEs is likely to be critical to their ability to compete with their larger rivals in both local and global markets.

Potential risk and prospects

Risks of cloud computing to SMEs include data and security breaches, reliability of service providers, access to information laws, and compliance requirements. However, these risks are also present with onsite IT infrastructure, where they are likely to be more pronounced. Even for data and documents created and maintained on local computers and devices, backing them up in the cloud is highly recommended.

Cloud-computing services also present some risk in terms of data loss due to error by the service provider. Independent archiving of critical data therefore remains prudent in both onsite and cloud environments.

There is a variety of pricing and licensing models offered by cloud-based service providers, sometimes making it hard for SMEs to evaluate different available options. Expect costs for cloud-based services to decrease over time, or receive more for less as more companies enter the market to compete. Mobile applications will increase in use to complement existing cloud- based systems, so business may want a solution flexible enough to allow for mobile use.

FURTHER RESOURCES:

What Every CEO Needs to Know About the Cloud. McAfee, A. Harvard Business Review (2011).
https://hbr.org/2011/11/what-every-ceo-needs-to-know-about-the-cloud

Cloud Computing. Government of Ontario (2013):
http://www.onebusiness.ca/sites/default/files/MEDI_Booklet_Cloud%20Computing_accessible_E_final.pdf

Find free and low-cost software. BDC Canada:
https://www.bdc.ca/en/articles-tools/technology/free-low-cost-applications/pages/default.aspx

20 of the Best Cloud Services for SMBs. Martinez, J. (2016). PC Magazine:
http://www.pcmag.com/article/345308/20-of-the-best-cloud-services-for-smbs

Free Tools Your Small Business Should Be Using Today. Martinez, J. (2016). PC Magazine:
http://www.pcmag.com/article/344148/10-free-tools-your-small-business-will-love

OneDrive, Dropbox, Google Drive and Box: Which cloud storage service is right for you? Mitroff, S. (2016). CNET:
http://www.cnet.com/how-to/onedrive-dropbox-google-drive-and-box-which-cloud-storage-service-is-right-for-you/

02 Unified Communications

Unified Communications (UC) is the evolution of the business telephone system. UC refers to the integration of multiple communication channels within and outside the business. The term is used to describe communications systems that encompass a broad range of technologies and applications designed, sold, and supported as a single communications platform. Using broadband internet connections, various UC and cloud-based multimedia services enable businesses to integrate data, video, and voice. UC applications can also offer tools for archiving and controlling information flows across multiple communication channels. For SMEs, UC can reduce the costs of communicating with their customers and suppliers, as well as monitoring and managing these communications.

Why use UC in SMEs?

Basic telephony is inefficient, with many calls ending up in voicemail, and users wasting time managing messages. Increasingly, people prefer text-based communications such as chat and messaging to traditional telephony. There is also a shift in users' reliance from home phones to mobile connections and devices. Integrated messaging, voice and video interfaces with current customers can be valuable for understanding their needs and delivering personalized services. This can help differentiate SMEs from their larger rivals. Integration of multiple communications channels further allows for more effective monitoring of employees' interactions with existing and potential customers.

UC is a productivity enabler, making for shorter meetings, efficient decisions, fewer errors, and lower communication costs. It provides user access to communication applications such as e-mail, SMS/chat, video, fax, voice, through a single user mailbox. UC tools can incorporate collaboration and other interactive systems such as scheduling, workflow, and voice response systems. They also integrate multiple devices accessing many service features, options, and user accounts from laptops, tablets, smartphones or other wireless devices.

UC tools and technologies can enable businesses to reduce costs and improve productivity in various common settings, including:

- Traditional office environments, with staff on PCs using desk phones or softphones and webcams.
- Enterprise conference rooms with speakerphones, a shared display and camera system.
- Remote employees working from mobile devices including tablets, and smart phones.
- Archiving communications and transactions inside and outside the organization for further analysis by management.

For individual entrepreneurs and businesses with a small number of employees it can be more cost effective and reliable to use free multimedia communications applications, such as those offered by large global players including Google, Microsoft/Skype, and Apple. These options readily "sync" end-user information across multiple devices and archive them in the cloud, making them a good first step in the search for low-cost UC and multimedia applications for SMEs.

Implementing UC

There are many manufacturers, and vendors making and selling UC systems. Some of the more common manufacturers include Cisco Systems, Microsoft, NEC, Mitel, Avaya, Panasonic, and ShoreTel. These systems are available from a variety of vendors including the local telephone and cable companies, as well as many local independent business communications systems companies. There are also vendors that sell UC online, such as Ring Central, Vonage, and 8x8. Vendors typically offer similar features involving telephony and conferencing, but overall UC features can vary widely. SMEs considering deploying a particular tool need consider its implications on communications with customers, suppliers and partners, and within the business itself.

UC has two deployment models. First, and traditionally, UC is a premises-based extension of the telephone system. However, the cloud is gaining prominence. Hosted services are quickly becoming the model of choice. Some businesses however may not be ready for a full-scale cloud deployment. All solution providers can provide hybrid models, where some elements remain on-premises while others are in the cloud.

Vendors sell UC in different ways. UC can be a complete service that includes telephony. Where the phone system exists, UC can be an overriding service with telephony attached. Most UC vendors provide phone systems, so integrating these elements is part of their value proposition. This integration may not be always necessary for some SMEs as standalone cloud-based UC and multimedia applications and services might be sufficient for their communications requirements.

Potential risks and prospects

Reliable integration of communications across channels (online, offline, phone, text, video, etc.) and devices requires access to reliable broadband connectivity. For example, video conferencing and customer support does not work very well and can be extremely unproductive if connection speeds are too low or unstable. Broadband network providers can also "throttle" network- intensive applications such as video and voice data flows, particularly with respect to applications and service of third-party vendors. Increasingly, UC applications use content analysis technologies to help automate monitor and manage internal and external business communications.

FURTHER RESOURCES:

7 Reasons Favoring Hosted UC Solutions (2016). NEC:
https://blog.univergeblue.com/2016/07/06/7-reasons-favoring-hosted-uc-solutions/

A Small Business Guide to Unified Communications. (2011) Intelicom Analytics:
http://www.getadvanced.net/pdfs/Small-Business-Phone-System-UC.pdf

9 Ways to Enhance Google Apps with Unified Communications. Claburn, T. (2014). Information Week
http://www.informationweek.com/mobile/mobile-applications/9-ways-to-enhance-google-apps-with-unified-communications/d/d-id/1306602

03 Enterprise Resource Planning ("ERP") Systems

ERP systems represent a suite of tools and applications that allow a business to integrate back office functions (human resources, operations, manufacturing etc.) into a process management software solution. This allows businesses to collect, store and manage data from the planning phase through to the delivery phase of product or service. The use of these systems in large enterprises dates back to the 1970s, but ERM systems have become very affordable and popular among SMEs thanks to the development of cloud-based software as a service (SaaS) delivery models over the past few years.

Why should SMEs use ERP?

Small businesses tend to start with and accumulate multiple spreadsheets and software for collecting and managing information regarding internal and external processes. As the business grows, working with multiple sources of data and software becomes increasingly costly to maintain. Relevant information can be highly fragmented, error prone, hard to integrate with other business functions and difficult to analyze and act upon by managers.

ERP systems collect various information databases and transactional flows, enabling SMEs to integrate and manage information about multiple business processes. They also provide both generic and specialized tools for analyzing and optimizing these processes, enhancing productivity, limiting potential errors in decision-making by management and employees. They allow staff to focus on core functions of that business that provide it with a competitive advantage (i.e. product development and sales).

How can SMEs employ ERP?

Traditionally ERP systems were designed for larger enterprises, with large ERP vendors generating revenues from licenses for particular modules, recurring fees for servicing, and reconfiguring the systems as demands of the business evolve. Given the importance of ERP as the core information platform for the operation of a business, selecting an ERP solution requires substantive planning and analysis for both short and longer-term cost and benefits. ERP solutions can be off the shelf or customizable, with various vendors offering ERP packages designed for the needs of particular industries.

The off-the-shelf models are generally less expensive since they require less professional service time to customize and map out processes and requirements specific to the business. A project manager and developer should be engaged to work with the various components of the business, understand the information they produce and need to enhance productivity, and to design processes for each department. Members of specific departments of the business will have access to modules of the ERP that satisfy their job requirements. Various modules feed into the central repository of the system to update

and feedback the relevant data to the respective modules. Employees and management can engage in real-time monitoring of these flows, which enables them to optimize their operations, identify emerging challenges and opportunities, and address them more effectively.

ERP solutions have been traditionally delivered on a license basis, where firms would purchase the license for a given number of users and particular functional modules. Additionally, professional services and an annual subscription or support fee would be incurred for using the system. Now providers offer a Software-as–a-Service pricing model where business owners do not have to incur the same upfront expenditures that made ERPs accessible only to larger enterprises. SMEs can now procure various generic or industry- specific ERP tools by incurring a monthly fee that includes all of the services and development of the ERP over a defined term contract. Although the total cost of ownership may in fact be higher with this pricing model, it significantly reduces the fixed costs of deploying these technologies for SMEs.

Potential risk and prospects

The clear risk in deploying an ERP solution relates to implementation. Without proper diligence in advance, business processes may not improve productivity and the entire project can suffer from cost overruns. Adjustments may be necessary so that the solution fits the specific needs of that business. Inadequate training of the personnel can also increase the costs of deploying ERP systems and reduce their capacity to improve productivity in that firm. If a business has legacy applications such as accounting software, the ERP may not be able to integrate with it. This may require additional work into the new accounting module inputting past data, while continuing to use and pay for the legacy system until all of the data is migrated over to the ERP. Businesses can mitigate these risks by selecting a vendor with a flexible solution that is capable of integrating with legacy applications, as well as a support team that can collaborate with the business to implement and configure the right ERP processes and functionalities. The business should enlist an internal "champion" to be the primary point of contact in the implementation, training, and use of the system.

The future for ERP is promising with mobile applications giving users additional access points to the underlying system, allowing users to gather, analyze and input real-time data remotely through simple visual "dashboards". By using real-time data and feedback from external sources, ERPs are likely to become more "intelligent", allowing for increased automation of various business processes.

FURTHER RESOURCES:

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04 Customer Relationship Management (CRM)

CRM systems are tools for recording, monitoring, and managing interactions that encompass the entire relationship of a business with its customers. This includes marketing and managing initial interaction between company and potential customers from the pre-sale and planning stage through the post-sale service delivery, revenue generation, and consumer retention phase of the sales cycle. CRM solutions aggregate contact data, purchase history, and correspondence between agents and customers to build a positive experience for customers, motivate the sales force and optimize processes to find and follow up on leads, monitor performance, and adjust marketing strategies as necessary.

Why is CRM relevant for SMEs?

CRMs provide a systematic framework for building and serving a customer base, the most valuable asset in any business. CRMs are particularly important for those who want to differentiate themselves from their competitors by delivering a better customer experience. This can involve significant monitoring and control over interactions between employees and potential or current customers - something that CRM systems enable. SMEs can enhance their competitive advantage by leveraging data such as contact history, previous correspondence and purchase history to assess the needs of their customers and build more profitable and sustainable relationships. CRM tools allow SMEs to differentiate themselves from both large and small competitors by becoming more methodical about their interactions with potential or existing customers. Additionally, CRM features such as real-time dashboards and reports are available to give management insight into sales performance and forecasting.

How can SMEs utilize CRM?

As with other eBusiness solutions, adopting a CRM requires the proper diligence to find the right technology fit. Because they focus on the customer relationship, CRM tools can be relatively easier to deploy than Enterprise Resource Planning (ERP) systems. Deploying CRM systems with multiple sources of information that are relevant for interacting and serving customers can be critical to optimize interactions with customers. Examples of information flows that can be important to feed into CRM systems include accounting, inventory control, and delivery tracking.

To select and implement a CRM system that meets the needs of a particular business, it is important to conduct an internal analysis of challenges and opportunities in interactions with customers and the management of the sales force. There are both commercial CRM services from large providers such as Salesforce.com, as well as various open source CRM options that are available at low or no cost to SMEs.

It would be prudent to complete a business requirements document that outlines the business's current sales and marketing processes before selecting a particular CRM tool. Most CRM solutions can import data from legacy databases (Excel, Access etc.) to reduce the costs associated with re-entry. Nevertheless, ensuring interoperability of the CRM with existing databases and other process control technologies is important.

CRM tools are available in both cloud-based and premise-based formats. One key difference is that a premise-based solution will require a dedicated internal IT staff member to manage, whereas the cloud permits outsourcing support and management to a third party. The cloud solution resembles a lease, where access to use the system occurs as long as you pay the monthly fee. Responsibility for managing, updating, installing, and securing the relevant data is with the third party cloud vendor.

Potential risk and prospects

The risks in deploying CRM solution include selecting a solution that does not have the right functionalities for your business, is not intuitive to use by employees, or becomes too expensive to scale and reconfigure as your business grows and evolves. You may need to train and encourage the sales force to use the CRM. However, deploying CRM system also increases the range of information available for monitoring employees, which can be a disincentive for employees to use them. Coordinating formal training programs to motivate staff to embrace change can reduce this risk. It is also important to understand security standards of prospective vendors and develop internal policies on encrypting customers' private information.

The future of CRM will include applications of content analysis artificial intelligence ("AI") to collect and analyze data about customer interactions in real time. This will provide management with actionable insights for their marketing strategy. These applications include monitoring and dynamic management of sales and customer service teams, to improve efficiency, service delivery or to offer targeted promotions to retain and attract customers, for example. Many leading CRM platforms have mobile applications that allow for monitoring and control of the sales force outside of the office and provide them with access to information they need when serving your customers.

FURTHER RESOURCES:

Customer Relationship Management. Government of Ontario (2013): https://www.ontario.ca/page/customer-relationship-management

The 25 Best CRM Apps for Every Business. Guay, M. (2015): https://zapier.com/learn/ultimate-guide-to-crm-apps/best-crm-app/

The 10 Best Free and Open Source CRM Software Solution. Wood, C. (2016): http://blog.capterra.com/free-and-open-source-crm/

Case Studies: How Growing Companies Benefited From CRM Software. O' Loughlin, J. (2014): https://www.getapp.com/blog/case-studies-how-growing-companies-have-benefited-from-crm-software/

05 Project and Performance Management

In contrast to routine business processes and functions, projects tend to be unique initiatives that require special processes and expertise. Project Management (PM) is the discipline of initiating, planning, controlling the flow of resources required for fulfilling the objectives of projects. Basic concepts and tools in project management can be applied to any project. Traditionally there has been considerable specialization in PM systems for managing large and complex projects in particular industries such as construction and healthcare. Development of general purpose PM tools increasingly make them relevant and cost effective to utilize by smaller enterprises for organizing and optimizing smaller projects.

Project Management Information Systems (PMIS) are single software or multiple software applications designed to assist in the organization and management of tasks, such as scheduling, estimation, planning, costing, and budgeting and resource allocation. A PMIS allows project managers to effectively manage in-house staff, contractors, customers, and suppliers needed to execute a project. Project activity and other data regarding progress relative to planned benchmarks is the key input into PMIS. Collecting detailed and real-time information about progress by various entities involved in large and complex projects, and effectively analyzing and acting upon this information by project managers, is critical for their success.

Performance Management tools are used to gather relevant metrics from the project information system, which then enables the project team to analyze the results and adjust design and execution phases of the project. PM systems allow project managers to produce reports on key performance indicators and dashboards that provide management with visibility on how various teams are performing in completing their individual tasks and progress towards important project milestones.

Depending on the type of projects, these steps can be separated into different components. Traditionally PM breaks down a project into the following steps: Initiation -> Planning & Design -> Execution <-> Monitoring & Controlling -> Closing.

Performance management tools can play an integral role during the execution stage of the project cycle.

Why is Project and Performance Management Important for SMEs?

PM is important for SMEs because it allows the business to engage in increasingly complex initiatives in an organized manner that reduces errors and cost overruns. Knowing what tasks are going into a project and receiving the proper feedback will allow employees, contractors, and suppliers to coordinate their activities more effectively. These tools also minimize confusion over allocation of tasks within groups and enhance accountability of individual components, reducing the risk of time delays and cost overruns.

Performance management applications, such as Key Performance Indicators (KPI) or dashboards summarizing project performance, are great tools for management to see how

individual tasks influence the bigger picture. These tools allow management to determine accountability with specific project managers and teams, as well as to identify specific problems such as with individual sub-contractors or markets where their projects experience unexpected cost overruns. The option to take corrective action on underperforming projects is a valuable benefit of a performance management solution. These applications have a tendency to maintain the team's focus, enhancing their awareness of the overall strategy.

How can companies employ PMIS?

Companies can employ a PMIS by using a solution as simple as Microsoft Project. This add-on to Microsoft Office gives the project manager the ability to develop a plan, assign resources to tasks, track and monitor progress and analyze the workload. It lacks features such as document management (storage and management of paperwork digitally) and issue tracking (logging tickets for support). If managers are familiar with the rest of the Microsoft Office Suite (i.e. Excel, Word, Access) this can be a user-friendly and potentially cost-effective solution for SMEs. There is open-source PM software, as well as tools from Google and Apple/Mac available that integrate with their other commonly used applications such as calendar and documents.

Other free or low-cost options include hosted PM solutions that allow for unlimited users, albeit with limited storage for data (i.e. documents, work orders, contracts). These solutions are scalable and cost-effective for SMEs looking to use PM tools without a hefty price tag. They are also relatively easy to implement, allowing novice users to track projects and add project details including tasks, the timeline, and costing information. Performance management software is available, like most software, in a cloud version or premise-based version.

Potential risk and prospects

The risk in using PM software tools mimics the risk of other IT solutions (data loss and security), which can be managed with proper diligence. Very few risks would prevent even the smallest business from deploying eBusiness tools to improve project management and performance monitoring. The benefits outnumber the risks, as staying organized and methodical through the project cycle reduces the probability of error and unexpected costs.

The future of project and performance management will involve development of interfaces with other eBusiness, analytics, and communications media tools. Allowing virtual project teams to collaborate effectively in real time can improve efficiency and productivity for SMEs, particularly for projects requiring coordination and monitoring of multiple internal and external parties.

FURTHER RESOURCES:

The Best Project Management Software of 2016. Duffy, J. (2016). PC Magazine: http://www.pcmag.com/article2/0,2817,2380448,00.asp

The Top 6 Free and Open Source Project Management Software for Your Small Business. Burger, R. (2016): http://blog.capterra.com/free-open-source-project-management-software/

Top 10 ways to use Google Apps in Project management: https://apps.google.com/learning-center/use-at-work/project-management/

Measures of Project Management Performance and Value. Center for Business Practices: http://www.pmsolutions.com/audio/PM_Performance_and_Value_List_of_Measures.pdf

06 Online Banking and Payment Processing

Online banking is a customer interface that allows for financial transactions through a web-based form. Online banking reduces the need to consult a teller or customer service representative to request a balance, make a deposit or withdrawal, and transfer funds between accounts and pay bills. Online banking platforms can also make it easier and less costly for businesses to be paid by directing cash flows from multiple sales channels into one account.

Payment processing solutions are applications provided by a third-party service provider that allow businesses to process credit card, debit transactions, and electronic transfers. These solutions allow businesses to draw revenue from channels beyond cash and cheque in invoicing and allow for quicker processing time from invoice to cash flow. These solutions can take many forms from point-of-sale solutions such as debit or credit card processing, mobile phone magnetic strip payment processors, e-transfers, and Remote Deposit Capture (RDC) for depositing cheques.

Why are online banking and payment processing important for SMEs?

The key benefit of on-line banking services is more awareness of business accounts and cash flows. Here is a list of additional benefits for SMEs to adopt online banking systems:

- Service fees tend to be lower with online banking, for example making a bill payment with one of Canada's big banks currently has a transaction fee of around $1.25 CAD, plus an in-branch bill payment fee of $1.00 CAD, totalling $2.25 CAD per transaction at the branch. The fee can total around $1.50 if banking online. For a business completing an average of 10 transactions per month, this amounts to an annual cash savings of $100.
- On-line banking options are accessible 24/7 vs. branches that have standard operating hours. There are also no lineups with online banking.
- Customer service is available via online messaging and toll free with online banking operations, whereas with the branch it is limited to standard operating hours.
- Online banking provides on-demand access to the businesses transaction history, for lower stress book keeping.

For payment processing solutions, the benefits are: quicker processing times from invoice to cash flow; not missing potential sales because the SME cannot accept a customers' preferred mode of payment; better security compared to traditional paper based payment processing methods; and, the trail of private information left behind. Some solutions also offer analytics services that allow SMEs to better understand patterns and trends in their sales and cash flows by generating automated and web- based dashboards with some measure of real- time control capabilities.

How can companies employ online banking and payment processing?

All of the large Canadian Commercial banks (RBC, TD, Scotia, BMO, CIBC, National) and select credit unions (e.g. Meridian) offer a web-based banking solution for businesses providing checking and savings accounts. Smaller banks (Tangerine) offer small business savings and investment accounts, but do not offer checking accounts. Global banks have limited retail and commercial banking, which limits competition and increases transaction costs for SMEs, particularly for those selling or paying for goods and services abroad.

In Canada, large banks are beginning to offer Remote Deposit Capture (RDC) as a business service, which allows checks to be deposited from smartphones and other RDC- enabled devices. This can reduce relatively long processing periods for checks in the Canadian banking industry, which is particularly important for individuals and SMEs trying to balance cash flows. Large Canadian banks have implemented RDC for their personal accounts going back to 2014 and by the end of 2016, select banks plan to make it available to businesses using their online banking platforms.

Given the rise of the cashless economy and the shift in consumer preferences for electronic payments and online shopping, a wide range of hardware, software, and integrated point-of- sales services have become available over the past few years to serve the SME market. Installing a device at points-of-sale or scanners that operate as mobile phone attachments is now necessary for any business that receives payments from customers off premises. Non-bank financial intermediaries that accept global payments may enable SMEs to increase international sales via online retail shopping and Business-to-Business (B2B) portals.

Potential risk and prospects

Conducting transactions over the internet does come with some risks, which must be viewed in the context of security risks associated with traditional banking and paper trails involving sensitive customer information. Whether it is through online banking (making a deposit), or an electronic transfer (PayPal), it is critical for users to adopt strong security measures to prevent unauthorized use. For example, online banking over unsecured public Wi-Fi hotspots can leave the communications vulnerable to interception. Since information about account verification and authentication can be extracted from computers and other devices, SMEs should avoid keeping them in electronic form or communicating them via unencrypted email and other forms of messaging. Although banks and other financial institutions invest heavily in security and may accept liability if there are any breaches of their systems, users would be prudent to limit their potential liability by taking sufficient precaution on their end. This includes potential fraud by employees or third parties. Although security features of fixed and mobile point-of-sale payment processes are designed to minimize this risk, they may not be effective against innovative attempts by sophisticated criminals.

FURTHER RESOURCES:

Banking on size: An in-depth look at the banking behaviours of small and mid-sized enterprises, and how they matter to Canada's banks (2015). PwC: https://www.pwc.com/ca/en/banking-capital-markets/publications/pwc-banking-on-size-2015-12-en.pdf

Top five online payment systems for your small business. Lindzon, J. (2014): http://www.theglobeandmail.com/report-on-business/small-business/sb-money/top-five-online-payment-systems-for-your-small-business/article21553705/

PayPal Business Resource Centre, case studies: https://www.paypal.com/ca/webapps/mpp/brc/case-studies

Online Banking Best Practices for Businesses: http://krebsonsecurity.com/online-banking-best-practices-for-businesses/

07 Data Storage, Backup, and Recovery

Data storage is a form of technology that records digital data. The Central Processing Unit (CPU) of a computer manipulates data by performing computations. Almost all computers use a storage hierarchy, organizing fast and expensive small storage options close to the CPU (Random-Access Memory, RAM) and slower, larger and less expensive options away from the CPU (removable hard drives). Data is stored in bytes that make up the digital representations of audio files, documents, images, text, and video files. Databases compress data into an organized repository and allow users to create, edit and update files, and search for information they need.

Backup and recovery refers to creating a copy of data as a risk management tool, to avoid loss due to system failure, human error, or breach. By using a backup, an administrator can reconstruct data and begin to rebuild the system to its prior state. Recovery refers to reconstruction of lost files, using the backup files stored by the business on premises or on cloud-based Services.

Why are data storage, backup, and recovery important for SMEs?

eBusiness tools and information technology means collecting and archiving more information regarding internal processes and external relationships important to a business. More information allows the management to monitor these processes, identify problems, and make necessary adjustments. Having data stored and organized reduces the risk of papers being improperly filed or lost in clutter when they can be stored in a central database and retrieved on demand. This helps avoid errors and the use of scarce resources to find relevant information from piles of papers. Digital storage can help improve individual accountability within the business, as well as the improving how effectively it manages customers' needs, suppliers, and relationships with partners.

Having a recovery strategy is important because it ensures the relevant information is not lost when something goes seriously wrong by backing it up in premise-based server and/or cloud-based storage. Allowing companies to preserve their valuable data and transfer it easily as their business grows enables them to scale their processes as the volume of relevant information from internal and external relationships gets larger. Losing this data, or not being able to search and analyze it, limits the long-term ability of businesses to learn from their successes and mistakes to improve productivity. Retaining customer information in a secure and recoverable manner is also a legal obligation for many SMEs that collect sensitive private information, and for audit purposes. The increasing availability of broadband and cloud-based storage, backup, and recovery services significantly reduces the cost of doing business for SMEs.

How can companies employ data storage, backup, and recovery?

SMEs can employ data storage by using devices such as flash drives for mobile use, external hard drives, or cloud storage. Third-party storage, such as backing up a network to a remote data center server is another safe and reliable option for larger companies.

It would be most prudent for business to adopt a hybrid strategy for important business data that includes on-site storage needs that integrate with cloud storage facilities.

At the simplest level, online storage and backup services involve uploading files directly from computers and mobile devices to storage services in the cloud. This process can be automated by "syncing" information collected on multiple devices and applications through a common cloud- based storage service provider or installing software that automatically collects, compresses, encrypts, and uploads files to a secure location in the cloud.

There is often some confusion between cloud backup and cloud storage. Cloud storage is a way of storing data in the cloud. As a result, it can require manually selecting files that one intends to backup in the cloud. Alternatively, cloud backups allow for automated backup of all relevant data, except the operating system or other exceptions specified by the user. Consequently, it can require significantly more storage space than selectively collecting and backing up data that is considered relatively important. Third-party service providers typically compete on both the price of storage and on the features of their service plans.

Pricing for storage, backup, and recovery solutions is based on the amount of memory and storage required. There are many free or low-cost storage solutions available such as DropBox, Google Drive, SpiderOak, and OneDrive. However, these providers do not necessarily store the data in Canada, which might be required by law for certain types of sensitive information. Alternative Canadian storage solutions include Staples Online Backup, Storagepipe, TAPNET, Mastermind, and IT Cloud Solutions. Prices for cloud-storage can vary significantly among providers. Another important consideration is the interoperability of the applications that are used to create primary sources of data such as documents, spreadsheets and presentations with cloud-based backup and storage services.

Potential risk and prospects

It is important to know where critical business, customer and partner information is stored and secured. Any breaches can lead to significant loss of reputation and potentially legal liability. Some providers are shifting from charging a flat monthly fee for storage towards a tiered model based on exactly how much memory a business requires. This way, SMEs are not paying for excess memory that they are not using. The tiered-pricing model is flexible as it allows SMEs to adapt as their business grows. As this market matures, there might be some improvements in prices of services, as the cost per megabyte of storage should decline over time. There are already free and low-cost solutions available that should encourage smaller businesses to store and secure their important information.

FURTHER RESOURCES:

Free and low-cost online backup services for your business. BDC: https://www.bdc.ca/en/articles-tools/technology/free-low-cost-applications/pages/online-data-backup-free-low-cost-options.aspx

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08 Asset Tracking & Employee Monitoring

Asset tracking is a risk management method for monitoring and securing physical assets, for instance by attaching labels and scanning barcode labels to particular assets as they move through the organization or transport systems. For example, Radio Frequency Identification ("RFID") tags use radio waves to transmit information from tagged objects so they can announce and identify themselves. RFID's are increasingly cost effective for monitoring and managing particular assets, such as valuable equipment or customer orders, in real time and from end to end of the business process. These tags can be read from up to several feet away and do not need to be within direct line-of-sight of the reader to be tracked. Other technologies with a longer range and different functionalities are also available for particular applications.

Employee monitoring refers to a wide variety of workplace surveillance methods that gather information about the activities and locations of staff members. These include security cameras and tools for tracking the online activities of employees when they are at work. Beyond these traditional tools, increasing use of mobile devices and applications provides businesses with new options for collecting data on activities of its employees both within and outside of the workplace.

A business can monitor its employees to improve productivity, serve its customers better, and protect corporate resources. The primary goal is to prevent unacceptable behavior (e.g. delivering sub-standard services to customers, use of corporate resources for personal gain) and encourage those that add value to the business.

Why is asset tracking & employee monitoring important for SMEs?

Asset tracking can add the following benefits to its business:

- Using barcode labels can eliminate the need for manual documentation.
- Allows the company to gather data to better monitor assets for status updates (especially effective for assets that depreciate).
- Loss prevention and reducing unnecessary spending to replace misplaced assets.
- Automated inventory control; more efficient internal audits.
- Increased customer satisfaction by improving employee and firm performance.

Employee monitoring is important because just as asset tracking provides benefits with a company's physical capital, employee monitoring can improve the efficiency of the human capital in that business. Additionally, monitoring deters unethical practices such as theft or unacceptable behavior with customers, both of which can lead to direct financial loss. This is particularly the case in businesses dealing with perishable or otherwise valuable goods, as well as those delivering services to vulnerable clients, such as seniors or minors. Information collected from tracking and monitoring tools can be increasingly fed back to Customer Relationship Management (CRM) systems and performance monitoring applications.

How can SMEs employ asset & employee monitoring tools?

A company does not have to label every single asset that it owns. Examples of assets that could be tagged include:

- High-value assets, such as assets that are depreciated.
- Moveable assets, including paper and electronic files and documents.
- Assets that require regular maintenance (i.e. repairs, or replacement parts, such as equipment and machinery).

Some examples that a SME could consider labeling include:

- IT hardware, such as computers and servers
- Audio-visual equipment, such as projectors
- Fixed assets (Property, Plant, and Equipment – or PPE)
- Capital equipment, such as machines and tools
- Furnishings, such as desks and filing cabinets

Asset-tracking solutions come in various forms (web-based or premise-based) and some are tailored to specific industries (i.e. oil and gas). Interested companies should contact providers directly for a quote and inquire if the solutions include a mobile application.

Various free or low-cost employee-monitoring solutions are available to SMEs concerned with enhancing productivity, minimizing risks to clients and business relationships, and monitoring employees' actions on the job. However, it is important to note that collecting information that is not relevant to the business can make employees feel that they are not appreciated or that their civil liberties are threatened. It is therefore important to develop a policy that balances these considerations and informs employees about how they are expected to act and are being monitored to ensure the success of the business and potentially, the safety and security of customers.

Potential risk and prospects

In addition to demoralizing some employees, there are privacy concerns with the use of tagging technology and tracking tools that collect information without explicit consent of customers or employees. It is therefore necessary to establish limits regarding what type of information is collected from employees or customers.

Employee monitoring could include a personalized device that collects voice and video, such as those already in use by the police and others involved in high-risk jobs where there is a serious chance of things going wrong. Devices that provide employees real-time feedback on mobile devices via alerts and visual dashboards can help optimize how they use their time and business resources, and potentially improve the quality of customer service.

FURTHER RESOURCES:

Top Asset Tracking Software Products: http://www.capterra.com/asset-tracking-software/

Employee Monitoring Software Reviews (2016): http://employee-monitoring-software-review.toptenreviews.com/

Privacy in the Workplace. Office of the Privacy Commissioner of Canada: https://www.priv.gc.ca/resource/topic-sujet/pw-pnpt/index_e.asp

09 Cyber Security & Data Protection

Cyber security is the protection of information systems (hardware, software, and information on them) from damage, disruption, theft, and misdirection. This includes controlling physical access to the hardware, private data, and protecting against unauthorized network access.

With increasing reliance on information technology, ever-larger amounts of data are being collected by individual organizations. Some of this information can be particularly sensitive and valuable to the business and its customers. The growth of smartphones and smart devices that are connected to the internet (e.g. industrial equipment, cars, refrigerators, etc.) also involves particular security challenges that have to be considered.

Why is cyber security important for SMEs?

As the internet has become an indispensable tool for large and small businesses, securing information becomes more important. Compared to large enterprises that may collect substantial amounts of personal and financial data, SMEs represent smaller targets for breaches and probes by cybercriminals. On the other hand, relatively limited resources and expertise might make SME information system more vulnerable to becoming a relatively easy prey to various types of cyber threats.

These threats include losing information about your customers, which can have significant negative consequences on large and small businesses alike. Unscrupulous competitors can also hire hackers to probe for relevant business intelligence. In Canada, a business has a duty to protect customer information under the 2004 Personal Information Protection and Electronic Documents Act (PIPEDA).

There are a wide variety of security threats, which tend to evolve overtime as antivirus and malware technology companies learn to combat particular forms of threats. Malware could result in a virus infecting your system that leads to a full compromise and possible corruption of your business records. Phishing is a specific kind of spam that targets an individual or a business by simulating a message from a trusted organization (bank, government entity) in an attempt to acquire confidential information and verification credentials that can be used to enter other systems, such as a company's bank accounts.

How can SMEs enhance cyber security?

Given the potential for significant financial and reputational damage, developing a cyber security policy is essential as SMEs grow and become more information intensive. Canadian businesses also need to be aware of what they specifically need to secure to comply with PIPEDA. Answering the following questions should assist companies to be cyber aware:

- What kind of data does your business collect and manage?
- How is that data handled and protected?
- Who has access to this data?

These questions can serve as a basis in evaluating the extent to which a particular business is vulnerable, as well as the measures it should adopt to secure them. Answers to these questions can vary significantly across businesses. For example, establishing email policies and educating employees about strong passwords and encryption represent essential steps in ensuring security of communications and any personal information transmitted in any business. Firewalls between different components of business information system can further reduce the risk of malware compromising all of them, which are particularly relevant for mission critical operations.

Various integrated security software packages designed for the needs of SMEs are available that provide network and device monitoring and protection. While none of these offerings protect against all emerging threats, due diligence requires all users to use them. This is particularly the case for businesses that handle personal information of third parties for which they are legally responsible.

There are a wide range of commercial and open-source security options that address particular vulnerabilities of a business. For SMEs, investing in a more comprehensive solution that includes active monitoring and scanning by the security solution vendor is likely to represent a more robust and cost-effective option. Special business processes and types of information may require specific tools to secure adequately, an issue that answers to questions noted above should help identify.

Potential risk and prospects

There is always a risk that malware, spam, and other cyber security threats evolve faster than the network security companies can come up with defensive technologies to protect against them. However, most security software providers will rapidly adopt solutions by scanning and updating their clients' software and devices. Some of the emerging types of cyber security threats relevant for SMEs include:

- **Business email compromise scam (a.k.a. CEO scam):** A form of attack by which the perpetrator either mimics or hacks into a senior managers' email, sending instructions to relevant employees that allow for further exploitation by the attacker.

- **Ransomware:** A type of malware that encrypts information on the victims' computers, enabling the attacker to ask for a ransom in order to decrypt the data. Keeping redundant backups both "offline" and in cloud-based systems can address the risk of this type of attack.

- **Malvertising:** As with spam emails that deliver malware, attackers can inject malicious advertising into legitimate web pages and content. Keeping web browsers, security software, and operating systems updated is a relatively effective way to manage malware.

- **Man-in-the-middle:** Involves attackers "sniffing" unsecured communications to extract valuable information or otherwise alter it. Encryption of sensitive communications mitigates against the risks associated with this class of threats.

FURTHER RESOURCES:

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Cyber Safe Guide. Government of Canada:
http://www.getcybersafe.gc.ca/cnt/rsrcs/pblctns/smll-bsnss-gd/index-en.aspx

Privacy and your business. Canada Business Network:
http://www.canadabusiness.ca/eng/page/2694/

Tools to Grow Your Business

eBusiness Tool Kit for Small and Medium-Sized Enterprises

Tools to Grow Your Business

Canadians consumers have been early adopters of broadband internet and there continues to be significant demand for advanced applications and services in their personal lives. Although most Canadian SMEs and their leadership are connected, they continue to primarily use basic internet business applications such as email, banking, and searching for products (CIRA, 2015).

Data suggest only around half of small firms have websites (compared to 80% for medium size and 90% of larger ones). Furthermore, the vast majority of SMEs do not sell their products or services online (around 90%). However, those SMEs engaged in international trade and exports tend to heavily invest and rely on information technologies.

Although for some businesses just setting up a static website or selling online may not be relevant for future growth, for others, a methodical eBusiness strategy can open up vast new market opportunities, both locally and internationally. Given the diverse nature of SMEs, the extent to which scarce resources should be allocated to adoption of information and other technologies that promote revenue growth should be aligned with their unique objectives and capacity considerations.

If it is difficult to scale production and service delivery, then a traditional or web-based campaign to increase visibility and search for new customers may not be the most efficient use of resources. On the other hand, for SMEs that can scale their offerings easily, their products and services might be attractive to new consumers in both local and global markets. Reaching these customers can require substantive investments in web presence, social networking, and other promotional efforts, potentially in multiple markets and languages, Simple eBusiness platforms for global sales and delivery are becoming increasingly available to SMEs.

It is important to note that even for sole proprietorships and smaller businesses to grow, some degree of web presence is now almost essential. This may involve a simple standalone website, which can now be obtained from various providers for a few dollars a month (e.g. GoDaddy). Some degree of social network presence can help identify a business to suppliers and potential partners (e.g. LinkedIn) who increasingly rely on such networks. In these contexts, using information technology is not a business growth strategy, as much a necessity for maintaining existing social and economic relationship with others who are moving online. This is particularly the case for interacting with younger people, who are accustomed to online relationships and communications. For many SMEs, investing in some web presence and other eBusiness tools might be a matter of revenue maintenance and long-term survival.

FURTHER RESOURCES:

The Canadian Internet. CIRA (2015): https://cira.ca/factbook/current/the-canadian-internet.html

GoDaddy. The Garage: https://www.godaddy.com/garage/

ICT as facilitator of internationalisation in small and medium-sized firms. Hagsten & Kotnik. OECD (2014): http://www.oecd.org/sti/inno/6_2_eva_hagsten.pdf

10 Web Presence and Outreach

Over the past decade, web presence has evolved significantly beyond the basic applications of email and static websites. These include, blogs, profile pages, wiki pages, and social media point of presence (e.g. LinkedIn, Facebook, or Twitter, Instagram, Snapchat, etc.) that businesses employ to search for, identify, and interact with customers, suppliers, and partners.

Larger enterprises have been using these points of web presence, either by leveraging internal expertise or through third-party marketing firms, to enhance their competitive advantage. There are a wide range of strategies and eBusiness tools available to bring down the cost of using these platforms for web outreach. However, doing so effectively still requires some strategic planning and human resources. In addition to risk aversion, this is partly why many large resourceful enterprises outsource web presence and outreach strategy design to third-party service providers with expertise at developing an effective web outreach and communications strategy for the company. Many SMEs will obviously not have this luxury, but might be more innovative in utilizing available eBusiness tools and technologies.

Web presence can be either owned or unowned. Owned media is where a single entity controls the content (e.g. corporate website or a personal Twitter or Facebook account). Unowned media involves third-party content control such as Wikipedia or Yelp.

Why is web presence important to SME's?

Web presence and outreach is a strategic marketing and eCommerce tool for SMEs. A business cannot exist if a customer cannot find it. A good online strategy can open new markets anywhere in the world and make the business grow beyond its local potential. A simple website is the modern equivalent of a business card.

More complex websites and web-based outreach activities can provide a significantly broader range of functions. These include acting as a store with the potential to reach customers in faraway places, as well as certain back- office functions like payment processing, accounting, and analysis. Integrated sales platforms such as Shopify significantly extend the reach of these technologies through simple online tools designed for their usability and convenience for smaller businesses.

How can SMEs develop a web presence?

Although templates that are available free or from hosting providers makes it relatively easy for SMEs to start a website, designing an effective site requires a degree of strategic planning. Since this site will be what people will see when they search for the business, it is imperative to make the website user friendly, simple to find information, and interesting enough to differentiate the business to generate and capture leads.

Start by purchasing a unique domain name and sign up for a web host provider. Make sure the domain name is unique and relevant to the business. Some SMEs make their social network page their primary online profile, but social networks change in popularity. The social network page can link to the business URL. Having a domain name ensures your place on the Web is secure and under your control. Build a site that includes your business information, business brand, and informs the reader about unique reasons why they should buy from you or work with you. Including multiple methods for potential customers to contact you, order, and pay online might also be relevant depending on the business. Optimize your website for mobile devices such as tablets and smart phones to ensure you are not inadvertently turning mobile visitors away.

In addition to the usual elements of websites, for some businesses, maintaining a blog with insightful thoughts or links to useful information, can help make the website stand out and help potential consumers find and understand your business. For companies that aim to engage in a marketing campaign on the web, creating profiles on popular social networks such as Facebook, Twitter, and Google+ might be effective in generating further leads. Link any social network profiles to the main website and ensure that the website prominently features your social media profiles.

Potential risks and prospects

These considerations highlight that going beyond a basic website will require both fixed and variable resources. The extent to which SMEs should engage in particular web outreach activities should be based on the business' specific needs and resources.

A poorly designed web presence or outdated information can have a substantive negative impact on the credibility of a business. Companies need policies in place for monitoring, updating, and ensuring the integrity of information about you on the internet. Consider purchasing advertising on common industry sites, hyperlink your web site with similar sites, and use Search Engine Optimization (SEO) techniques so that others can find you. Tools such as Google Analytics offer an easy way of monitoring number and behavior of visitors to your site, providing a basis for optimizing your web presence and outreach.

FURTHER RESOURCES:

Creating a Dynamic Web Presence. Ontario Government: https://www.ontario.ca/page/creating-dynamic-web-presence

Free and low-cost e-commerce software for your business. BDC:
https://www.bdc.ca/en/articles-tools/technology/free-low-cost-applications/pages/e-commerce-free-low-cost-options.aspx

Search Engine Optimization Starter Guide, Google:
http://static.googleusercontent.com/media/www.google.com/en//webmasters/docs/search-engine-optimization-starter-guide.pdf

11 Social Media Engagement and Tracking

Developing a social media strategy is a good idea once an SME has decided that it wants to use social media and how much it wants to invest in the effort. As in the case of website analytics tools that allow businesses to monitor and optimize their proprietary web pages, tracking who views social media content will allow businesses to identify potential consumers and improve their online marketing strategies.

Social networks can be narrow and specialized in users that frequent them, or broad in reach across groups and geographic locations. For some businesses, there might be specialized social networks that might be more relevant than others to engage with and monitor, such as Yelp for small local businesses or Linkedin for professional service providers. It is important to track the right performance metrics, from all possible social media data, such as Facebook, Twitter, Pinterest, Google+, LinkedIn, and Instagram when investing in social media engagement.

Why is social media important to SMEs?

In addition to its core marketing function, social network engagement and tracking feedback from customers on social media can generate insights that help improve the capacity of a business to identify weaknesses in how it delivers its services to customers. Negative reviews by individual customers on social networks can have large adverse reputational and financial consequences for a small business, while positive experiences of customers expressed on relevant sites can lead a small business to go "viral".

If you cannot measure it, you cannot manage it. Social media tracking tools help SMEs understand successes and opportunities to get more followers, boost engagement, and increase the return on investment. Social media engagement measures track how others interact with your content. When someone posts a like, favorite, or comment on your postings, they are actively engaging with you. Engagement metrics indicate audience interaction, which is important for social media strategy and growth. Automated alerts and dashboards of activities can help sales and marketing teams identify potential customers in real time and respond to emerging trends and risks to the reputation of the business.

Furthermore, social media is becoming the next big frontier for customer contact, with millions of daily customer interactions occurring on social media platforms, rather than through traditional telephone, email, web forms, and other direct points of contact between customers and service departments. SMEs can also track competition, clients, influencers, and partners with social media tracking tools.

How can SMEs employ social media?

SMEs can begin improving their social media presence and customer engagement by tracking the various social media comments and shares. The simplest way to start is to set up a website and alert from search engine providers such as Google that scan the Web and can inform you when your name has been mentioned. Content on some social networks may not be searchable by such engines, requiring creating an account and using specific tools from social network providers such as Facebook and Twitter to track comments, replies, or other relevant information relating to your business.

Comments on Facebook and replies on Twitter are a step beyond likes and favorites. When your audience comments on a post or replies to a tweet, they are opening a dialogue that allows you to reach new levels of customer relations. Track Facebook shares and Twitter retweets. The best way to grow your social media reach is through your existing followers. Creating content designed to optimize shares and retweets allows SMEs to leverage its current followers' audience and reach new leads.

When done right, social media engagement can result in a purchase. Optimizing the way one engages with and generate these soft leads can help channel qualified leads to SMEs from its traditional customer base, as well as from unexpected places. Keeping track of engagement metrics such as likes, comments and shares can help you test and optimize these types of engagements.

Potential risks and prospects

The growing importance of online reputation can make it increasingly costly for many SMEs to avoid developing a social network engagement strategy, or at least contingency plans. Tracking "crowdsourcing" platforms that aggregate opinions of multiple customers and responding as appropriate to adverse information can be a matter of survival for many businesses that directly interface with retail customers. Although SMEs can automate much of this monitoring, doing so effectively can require dedicated personnel.

In addition to the risk of social media engagement not paying off in terms revenue growth for a particular business, poorly implemented engagement plans can have a negative impact on the reputation of large and small businesses alike. To mitigate this risk, there must be social media policies that ensure content is aligned with your broader business strategy and targets the right audience, without alienating others. Measure the success of product launches, and marketing campaigns. Listen to feedback to for future initiatives. Various integrated eCommerce platforms with built-in analytics increasingly enable SMEs to push out online marketing through multiple social networks, while tracking the effectiveness of the transition from social media engagement to paying customers.

FURTHER RESOURCES:

Social Media for Small Business. Ontario Government: https://www.ontario.ca/page/social-media-small-business

Yelp for Business Owners: https://biz.yelp.ca/support/what_is_yelp

Know What's Working on Social Media: 19 Free Social Media Analytics Tools: https://blog.bufferapp.com/social-media-analytics-tools

12 Search Engine Optimization (SEO) and Marketing

Search engine optimization (SEO) is the series of steps and practices intended to ensure that a company's website or other online assets are visible to those using major search engines such as Google, Bing, and Yahoo to find information.

In contrast to the marketing opportunities offered by search engine and social media marketing providers that involve advertising, SEO drives traffic to your website or online content from "organic" results generated by search engine algorithms.

Why is SEO important to SMEs?

Understanding SEO is important to SMEs because it helps attract quality internet traffic to your website or other points of web presence, for free or at very low cost. The objective of SEO should be to ensure that potential customers interested in your products, or products like yours, easily find their way to relevant information about your offerings and hopefully to your online or offline sales channels. A good SEO strategy can provide a SME with competitive advantage, particularly in relation to larger enterprises with more paid advertising.

SEO ultimately makes your website and other online information easy for users and search engine robots to discover and associate with each other. As this "connectedness" increases, indexing algorithms will consider the information related to you more relevant, moving this content higher in the "organic" rankings generated by searches.

Search engines cannot understand a web page like a human. Without SEO, a website can be invisible to search engines and become irrelevant as a tool that enables others to find you, unless they are first directed to the site through other methods of contact (e.g. in person, via social media). The same problem can exist with other content generated by you or others about your products and services; such as pictures, videos, maps, and other forms of information posted on your website or elsewhere on the web.

How can SMEs use SEO?

Competition by websites and businesses for attention, user traffic, and brand visibility makes SEO an evolving problem. Search engines operate on similar principles, using search engine robots crawling the web, following links, classifying content, and indexing content in databases. A good SEO strategy understands what the search engines are looking for. This includes a SEO-friendly website and marketing content. Some search engines try to evaluate quality of content on the web, for instance ranking pages from university websites higher than others. In general, however, these engines rely on a quantitative assessment of the relevance and connectedness of objects their web crawlers discover.

What these search engines are looking for is not that distinct from content, particularly key words, that are both relevant to describing your business and connected to concepts, keywords, links, places, and other attributes that web users are searching for.

Search engines use links to find further content. Linking your website or social profile pages to others increases their connectedness, and therefore relevance in search indexing. This is particularly relevant for new websites or social network participants to improve their discoverability. A crawlable link structure lets the SEO crawlers identify and follow pathways of a website, finding all of the pages and other sources of information such as the content of documents and metadata from pictures and videos.

As the search engine robots crawl and index web pages, they track pages in keyword-based indexes. They measure keyword use determining the relevance of a document to a query. You can optimize a page's rankings by ensuring that keywords are prominent in titles, and text. Services such as Google AdWords provide a market based approach to pricing these keywords that is particularly useful for SMEs; for both learning which keywords are relevant based on the monetary value in the paid adverting market, as well as a potentially low cost and effective approach to increasing search visibility. The page title tag appears at the top of Internet browser page, and is often what search engines preview and appears when the content is shared through social media. A good title tag is an important part of search engine optimization, needs to be concise, descriptive, and include keywords associated with your "brand" and marketing strategy. Creating a compelling description with keywords draws a higher searcher click-through rate. Clarity and consistency in the language a business uses to describe and present itself is a key ingredient in the art of SEO.

Potential risks and prospects

Many sites make the mistake of becoming too complex and non-standardized in their content and navigation structure, which makes them difficult to analyze by search engine robots, as well as human visitors. A simple and user-friendly website, using relevant concepts and keywords, is an effective basic approach to SEO requiring limited resources. For some SMEs this might be sufficient to provide the level of visibility needed to achieve their growth targets. More complex SEO strategies that require dedicated expertise and paid advertising would help some SMEs enhance their visibility

FURTHER RESOURCES:

The Beginners Guide to SEO: https://moz.com/beginners-guide-to-seo

Increasing traffic to your website through search engine optimization techniques. Ontario Government: https://www.ontario.ca/page/increasing-traffic-your-website-through-search-engine-optimization-techniques

SEO Analyzer. Bing: http://www.bing.com/toolbox/seo-analyzer

Analysis techniques for Google organic search SEO: https://support.google.com/analytics/answer/3306157?hl=en

10 Must Know Image Optimization Tips: https://www.shopify.ca/blog/7412852-10-must-know-image-optimization-tips

13 eReservation and Online Booking Systems

eReservation refers to an online reservation or booking system that allows a SME to accept bookings and orders online. These systems aggregate customers, rank particular options for them, and process their orders, for example to a hotel, a ticket to an event, or a service appointment.

Why is eReservation important to SMEs?

eReservation platforms enable SMEs in some service industries to outsource many of the processes and technologies associated with booking, monitoring, and managing service delivery. For these SMEs it is usually critical to develop an informative web presence and try to reach as many customers as possible.

Potential customers cannot become customers without booking software. An ability to secure a booking through an online reservation system creates a strategic advantage by allowing the customers to see the booking, making it easy to coordinate other trips or events, and update calendars of the parties in real time.

Customers pay and receive an instant reservation confirmation. With instant confirmation delivery, customers only have to worry about planning further events, which may also be bundled on the eReservation system with other offerings from your business or partners.

With instant and secure payment options, eReservation systems can also make it easy for customers to pay. Although some customers will continue to prefer talking to people, for many others the convenience of using aggregated eReservation systems and their capacity to allow for a degree of competition among alternatives makes them indispensable.

eReservation aggregators allow SMEs to implement a cancellation policy with an automatic penalty for last minute cancellations. These policies can be adjusted depending on the type of services you are offering. By adjusting prices in response to changes in demand, these platforms can have significant revenue potential. This is because these systems make it easy to increase prices when demand is high and reduce it when it is low, for instance through promotional offers that the eReservation system operator can push out to those searching for a service with similar characteristics.

How can SMEs employ an eReservation or online booking system?

The first thing is to understand the difference between paid and free online booking systems. There are many free online booking services that may be a good starting point for a SME. Specifically, low cost and open source applications are available for services such as medical services, dentists, hair & beauty salons, repair services, event planners, rental agencies, educational services, government agencies, school counsellors and more. However, they may be limited in functionality compared to paid services with better security and support.

Licensing costs occur either monthly or yearly, depending on the program.

Decide which features will be best for the type of business. If you depend on resources, you should have resource management features in your online booking software. Bookable resource examples include buses, boats, aircraft, speciality tours, rooms, golfing, etc.

High-resolution images allow potential customers to visualize an experience when booking. An image gallery allows you to highlight the best sites and activities for customers. Use an appealing, prominent Book Now button. Also use simple, actionable language to tell visitors what to do next (Make a Booking / Reserve Your Seat Now). Create a community of customers by integrating with social media. Social media integration allows your customers to link to your social networks such as Facebook, Instagram, Twitter, and Goggle+, allowing for consistency of marketing and pricing across multiple information platforms.

Consider your payment, and credit card storage options. PayPal is a universal, safe and easy way for your customers to pay for your services. Premium booking systems enable customers to store credit card information for those planning to book additional tours.

A visual calendar or dashboard can integrate with eReservation tools, allowing the service provider to plan for additional staff and other resources if demand is higher than expected, or reduce them as necessary.

Potential risks and prospects

Costs are an important consideration in selecting some eReservation and booking systems. Commission-based systems (per booking) may work for low-volume businesses, but not appropriate for growing high-volume businesses. Some companies charge additional fees for installation, training, and customer support, while some software providers charge per number of staff or concurrent sessions. For mission critical events and transactions, ensure you have access to online and telephone support in case operational and service issues arise.

FURTHER RESOURCES:

Hotel Booking Service Reviews (2016): http://hotel-booking-services-review.toptenreviews.com/

The Top 12 Free and Open Source Event Management Software: http://blog.capterra.com/free-event-management-software/

Amadeus e-Power: http://www.amadeus.com/msite/epower/index.html

Eventbrite: https://www.eventbrite.ca/

4 technologies that will revolutionize mobile bookings in travel. Prats, N. (2016): http://www.traveltripper.com/blog/4-technologies-that-will-revolutionize-mobile-bookings-in-travel/

14 eProcurement

What is eProcurement?

eProcurement systems support operational Business-to-Business (B2B), Business-to-Consumer (B2C), or Business-to-Government (B2G) procurement processes for the purchase and sale of goods and services. A wide range of new eProcurement software and service platforms have evolved that help organize and manage various steps in the Purchase-to-Pay (P2P) process, from requisitioning to payment.

The eProcurement value chain can consist of tendering, auctioning, vendor management, catalogue management, Purchase Order (PO) integration, order status, shipping notice, invoicing, payment, and contract management. Elements of eProcurement can also automate Request for Information (RFI), Request for Proposal (RFP), and Request for Quotation (RFQ) processes. Large enterprises and government organizations have been using eProcurement systems for a number of years. As they have become easier to configure and cheaper to use, eProcurement systems are increasingly being deployed by SMEs to both optimize procurement and increase sales outside of their traditional markets.

Why is eProcurement important to SMEs?

Businesses of any size can benefit from systematic archiving and control over procurement processes. eProcurement system enable spending control, matching purchases with purchase orders, receipts, job tickets, website tender management, and global accessibility.

For SMEs pursuing an aggressive growth strategy, using eProcurement systems both on the input and output side can be particularly relevant. On the input side, eProcurement systems may reduce costs. More importantly however, by improving the flow of information, they allow growing businesses to identify and address emerging bottlenecks in their sourcing processes more effectively. These technologies may help SMEs to address the growing pains, of becoming larger. On the sales front, eProcurement systems of large organizations, governments, and global platforms for B2B commerce may offer some SMEs material revenue growth opportunities, particularly from customers in faraway places.

How can SMEs employ eProcurement tools?

Most companies have procurement departments responsible for purchase of raw materials, office supplies, office equipment, and facility maintenance, and human resources. Procurement managers must have an understanding of eProcurement applications, processes, benefits, and risks to undertake an eProcurement implementation.

eProcurement solutions are available from two types of vendors: big Enterprise Resource Planning (ERP) providers that offer eProcurement as one of their services, and the niche providers focusing specifically on eProcurement. ERP systems have a separate module for the eProcurement function. Large and enterprise companies typically use an ERP system.

There are eProcurement internet based tools and resources, including email, internet-based Electronic Data Interchange (EDI), XML-based data exchange via the internet, etc. Various standalone tools or integrated software packages, as well as cloud-based solutions, are available for eSourcing, eTendering, eAuctioning, eOrdering, and eCatalogue. Larger businesses, and typically the purchasing department, use a web-based ERP tool for product-related purchases.

The first eProcurement tools were primarily for large business, on-premises systems maintained by internal staff. Emerging cloud technology is now making eProcurement software more affordable and gives users the ability to make data-driven procurement decisions from distributed locations. Cloud solutions require very little internal IT involvement.

eProcurement software has changed significantly in the last decade to resemble a modern eCommerce platform. Some tools also have big data analytics capabilities to help customers make informed, strategic purchases.

Potential risk and prospects

Organizations that recognize the need for eProcurement software typically find that the benefits of adopting eProcurement tools can greatly outweigh the costs. Even when we consider only the accounting costs they can save, the return on investment from eProcurement software can be compelling. More importantly, for growing companies, the monitoring and control capabilities they offer can identify errors and bottlenecks in supply chains that impede delivery to customer as promised..

An appropriate eProcurement strategy can help businesses reduce input costs and make them more competitive by ensuring that internal or external issues do not affect the customer service.

Actively searching for new customers via local and global eCommerce might also be a relevant growth strategy for some SMEs.

FURTHER RESOURCES:

E-commerce: purchasing and selling online. Ontario Government: https://www.ontario.ca/page/e-commerce-purchasing-and-selling-online

Electronic Procurement: Creating Buyer/Supplier Collaboration Through Procure-to-Pay Solutions: http://procure-to-pay.birchstreet.net/PayStream-Advisors-eProcurement-2013-Full-Report.pdf

Top Procurement Software Products (2016): http://www.capterra.com/procurement-software/

Alibaba, Canada Channel: https://www.alibaba.com/countrysearch/CA-Canada.html

E-Procurement: Its Future in the Digital World. Desharnais, D. (2015): http://www.ssonetwork.com/finance-accounting/articles/e-procurement-the-new-focus-for-b2b-commerce/

15 eEducation and certification

eEducation is the delivery of educational information from instructors to students via the internet instead of in a physical classroom. eEducation can also involve more collaborative forms and other media, such as online tutorials, videos and webinars. The internet further creates significant opportunities for self-education, which partially removes the need for an educator or educational institutions. eEducation enables students to upgrade their training by providing online high school, undergraduate, and post-graduate degrees in most disciplines. Businesses can offer online training to increase staff skills conveniently, anywhere in the world. While some vendors offer free training and education of their products, others require long and costly certification processes to be accredited as value-added service providers for their products.

The rapid growth of the internet in the 1990s created the e-learning industry. Advances in processing speeds and mobile computing, enabled many educational online start-ups. Most traditional educational institutions are also adopting eEducation to complement their curriculums, offering online courses or hybrid structures to serve the needs of adults and professional. Except perhaps for the exams, most professional certification programs can now be completed online.

Why is eEducation important to SMEs?

The internet offers various ways for people to develop a small business by offering their knowledge to others. A simple example would be tutoring students in the neighbourhood, or children in a country faraway. These opportunities can also take the form of producing and delivering educational information that target particular audiences, such as other businesses, public sector employees, or individuals searching for information about a particular topic. The internet allows for a wide range of methods for marketing, monetizing, and delivering educational content that others might find valuable and be willing to pay for. Advanced cloud-based tools and education-focused eCommerce platforms can help education-based SMEs to build their businesses, both locally and globally.

More broadly, eEducation tools reduce the cost and improve the accessibility of a formal educational degree, certifications, or other training material that can improve employee and management productivity and efficiency. For example, training all employees about the basics of cyber security should be a priority for any SME that is connected to the internet to ensure that user errors or lack of due diligence do not compromise the organization. A wide range of online health and safety training courses and tools are also available that can help the SMEs reduce costly errors in the workplace.

How can SMEs employ eEducation?

There are a number of steps a SME can follow to deploy eEducation and training programs:

1. Develop clear goals: What are basic areas of knowledge that your employees need? What specific degrees, certifications, and other knowledge does the business need to be competitive? In knowledge-based industries, offering employees tuition support and flexibility to obtain advanced degrees might be prudent.
2. Carefully define learning outcomes that are aligned with your organizational goals. Identify different sources of educational material and frequently asked questions that might be relevant from within and outside of the company. For example, customer feedback on social networks about your product and services might provide useful signals about what the right learning outcomes might be for employees that interact with your customers.
4. If it makes sense, consider partners. Develop policies and programs with local online education institutions and industry trade associations to provide staff with opportunities to upgrade their education and build collaborative networks.
5. Pick an internal or external eEducation software platform to deliver of educational material that provides your employees the opportunity to learn at their own pace, while allowing you to monitor their progress and ensure they develop a satisfactory understanding of the material.
6. Ensure quality assurance Quality assurance of the learning process is critical for employees engaged in potentially hazardous tasks that require health and safety training, or those dealing with customers, the most valuable asset in any business.

Learning Management Systems (LMS) are software applications for administrating, documenting, tracking, reporting, and delivering online training. They are a relatively easy and cost-effective tool for delivering off the shelf or customized educational material to employees and tracking their progress in achieving the learning outcomes.

Potential risks and prospects

Reputation problems are common among online educational products and services, making it critical to exercise due diligence regarding providers. eEducation and online interaction may also not be the most efficient way of conveying particular types of knowledge to people that prefer physical classrooms and interactive learning in person. The usability of the LMS software is critical for encouraging active learning and to minimize the time needed to achieve the desired learning outcomes.

FURTHER RESOURCES:

Small Business Program Certificates. Canadian Federation of Independent Business: http://www.cfib-fcei.ca/english/article/6057-small-business-program-certificates-vubiz.html

Health & Safety Ontario: http://www.healthandsafetyontario.ca/Resources/TopicList/e-Learning

10 Cloud-Based Learning Management Systems for Small Business Training: https://elearningindustry.com/10-cloud-based-learning-management-systems-small-business-training

Web 2.0 Teaching Tools http://edjudo.com/web-2-0-teaching-tools-links

16 Widgets, Dashboards, and Performance Management

Large amounts of internal and external information created by the use of information technologies can be hard to interpret and act upon by decision makers. Widgets and dashboards represent tools that enable extracting information that is relevant and actionable for particular users. Widgets represent the simplest form of single purpose programs that interact with larger systems to extract specific types of information and deliver user functionalities. Web 2.0 widgets are a small application with self-contained code that provides a window into a larger information system or other applications. Multiple widgets that extract information from particular information systems and functionalities can be aggregated into visual dashboards.

A basic example of a widget is a tool that extracts information from a particular aspect of a business processes and relays it to the responsible manager. An Executive Dashboard provides a visual representation of many widgets to provide higher-level decision makers with a real-time, concise overview of what they need to know. For example, a company's key performance indicators (KPI) can provide relevant metrics from across procurement, production, marketing, sales, human resources, etc. Actionable decision levers can also be incorporated into dashboards through specialized widgets, which can be designed to reflect the level of authority and responsibility of an individual within an organization.

Why are dashboards important to SMEs?

Back-end databases of Enterprise Resource Management (ERP) systems of large organizations have long enabled creation of widgets and dashboards that provide for real-time monitoring of critical operations, such as industrial processes and just-in-time supply chain management. Various companies offering such systems also provide, some for free and others for a fee, standardized or customizable widgets and dashboards that are relevant for controlling particular business processes.

eBusiness tools and cloud-based services are making it more affordable for smaller enterprises to adopt information technologies that allow organizations to design and deploy widgets and dashboards. For critical functions, these widgets can be designed to provide active alerts to employees that are relevant for doing their jobs more effectively. Given the relatively limited human resources in SMEs, using dashboards as means of monitoring and control can limit the need to create layers of middle management as a company grows and it becomes more difficult to effectively manage multiple departments and pieces of the business by the owners.

Widgets are commonly used in sales, marketing, call centres, social media, supply chain, and heath care businesses. Executive Dashboards (ED) provide SMEs with a number of enhanced capabilities that enable them to grow, including:

1. *Transparency:* EDs provide visibility and insight, making it easier for a smaller number of managers to monitor employees and performance.
2. *Just-in-time efficiency enhancements:* EDs allow SMEs to measure and improve performance throughout the organization by identifying emerging bottlenecks and discrepancies faster.
3. *Time Saving and Security:* Widgets and dashboards limit the need for multiple parties to log into multiple systems to extract the information they need to know.
4. *Performance management:* Dashboards can be designed to map actual performance indicators against their planned targets. They can also be configured to reflect the performance of particular departments and specific employees, providing the management with an empirical basis for their decisions about rewarding those performing well and adjusting processes when they are not.

How can SME's employ widgets and dashboards?

Many of the eBusiness tools and technologies reviewed in this toolkit now come with either preconfigured or customizable tools to create widgets and dashboards. Given the importance of performance measurement and control to adopting any of these technologies, evaluating their capabilities in this respect should be part of selecting appropriate tools for your business. Creating a performance dashboard requires identifying what data is available and relevant for the success of your business, as well as how different technologies can collect what is relevant. Once there is a catalogue of relevant information flows and how they interact, the more difficult tasks involve leadership decisions about what data and decision points should be allocated to particular managers and employees using the system.

In terms of broader performance management dashboards for owners and managers, SMEs can start with the most important company metrics such as Net Income. Determine the underlying Net Income metrics such as revenues, costs, number of generated leads, orders, and relevant ratios of key metrics, etc. as relevant for your business. Various stand-alone or application- specific widget and dashboard interfaces are available that are relatively easy to use by management and employees with limited technical knowledge.

Potential risks and prospects

While critical for certain operations, excessive and inappropriate use of widgets and dashboards can lead to "information overload" by managers responsible for monitoring and control. It can also lead to too much micromanagement, constraining initiative and innovation. Increasing automation of decision making and integration with external sources of data will continue to expand functionalities available for monitoring and managing SMEs using widgets and dashboards.

FURTHER RESOURCES:

A Guide to Creating Dashboards People Love to Use: http://www.cpoc.org/assets/Data/guide_to_dashboard_design1.pdf

WordPress Plugin Directory: https://wordpress.org/plugins/tags/widget

Top Reporting Software Products: http://www.capterra.com/reporting-software/

Disruptive technologies and rural business

eBusiness Tool Kit for Small and Medium-Sized Enterprises

Disruptive Technologies and Rural Business

eBusiness tools reviewed in previous sections represent only a small sample of the technologies that enable SMEs to improve productivity and growth.

While they can disrupt internal processes and make firms more competitive, by themselves they do not necessarily lead to significant market disruptions in terms of creating new value-added products that did not exist before or radically new ways of doing things. What is truly disruptive about the tools is that the expansion of broadband networks makes them more affordable by SMEs who cannot afford to build customized management information systems and maintain a dedicated IT department.

Internet access is the key underlying innovation that is increasingly allowing smaller businesses to become more competitive through data collection and analysis These tools are particularly relevant for businesses in rural communities, where physical distance from markets for supplies and potential customers can be a serious disadvantage.

Broadband Internet and the web are inspiring new technologies that may lead to the creation of new markets and business models for serving them. Elements of some of these technologies are already included in analytics engines that are part of many of the eBusiness tools, including so-called "Internet of Things" (IoT), "Big Data" and "Artificial Intelligence" methods for automating processes. These technologies are now more available and easy to deploy, providing large and small businesses alike with new opportunities to build new markets and grow rapidly. There are likely no better examples than how Uber and Airbnb are globally disrupting the legacy taxi service and hotel businesses.

This section provides an overview of some broader disruptive technologies that businesses can deploy. Some specific applications of these technologies highlight why deploying them can be particularly valuable to rural businesses and communities.

FURTHER RESOURCES:

Disruptive technology roadmaps. Kostoff, N., Boylan, R., & Simons, G. R. (2004). Technological Forecasting and Social Change, 71(1), 141-159: https://www.researchgate.net/profile/Bob_Boylan/publication/248497777_Disruptive_technology_roadmaps/links/54e5ec490cf2bff5a4f1cfb6.pdf

The changing pattern of SME's innovativeness through business model globalization. Lee, Y., Shin, J., & Park, Y. (2012). Technological Forecasting and Social Change, 79(5), 832-842.
https://www.researchgate.net/profile/Juneseuk_Shin/publication/251497781_The_changing_pattern_of_SME's_innovativeness_through_business_model_globalization/links/54091a7a0cf2718acd3cfecc.pdf

17 Internet of Things (IoT)

Although Machine-to-Machine (M2M) communications is nothing new, the development of fixed and wireless broadband networks creates the opportunity to connect, monitor, and control a wide range of objects or other "things". The Internet of Things (IoT) refers to the trend towards connecting low-cost sensors and processors that can be embedded in many things. The IoT extends internet connectivity beyond traditional devices like desktop, laptop computers, smartphones, and tablets to a wide range of devices and everyday objects using embedded technology to communicate through the internet.

The IoT is the network of physical devices, such as vehicles, buildings, computing devices, machines, animals, people, and other items, embedded with unique identifying electronics, software, sensors, and network connectivity enabling these objects to collect and exchange data, without requiring human-to-human or human-to-computer interaction. These applications include remote sensing and control of large and complex machines and processes, such as industrial systems, cars, and skyscrapers. Stand-alone sensors and processors can be attached to other objects for tracking them through the supply chain and delivery process. Specialized IoT sensor applications such as those relating to monitoring security, pollution, or structural health of objects are also available and are increasingly being deployed around the world.

The IoT creates opportunities for direct integration of the physical world into computer-based systems, resulting in improved efficiency, accuracy, and potential economic benefit.

The IoT is commonly associated with smart grids, smart homes, intelligent transportation, and smart cities. A "thing" in the IoT, can be a person with a heart monitor implant, a farm animal with a biochip transponder, an automobile with built-in sensors alerting the driver on the vehicle status. In the IoT, objects use the web and unique identifiers such as Internet Protocol addresses and RFID tags.

Why is IoT important for SMEs?

IoT is important to SMEs for a number of reasons, including:

1) *Untapped potential:* Given the limited IoT market development in many industries and the wide range of potential uses, investing in the know-how necessary to deploy IoT in particular contexts can offer extensive growth opportunities for SMEs. This can include installing and servicing systems as part of broader IoT ecosystems operated by large global hardware or software vendors, or procurement and development of IoT applications that fit the needs of a targeted group of customers.

2) *Productivity growth:* SME businesses will be significant adopters of IoT solutions to lower operating costs and increase productivity. The diffusion of connected devices and network sensors will reinvent and optimize the efficiency of business processes and global supply chains in sectors such as manufacturing, healthcare,

precision agriculture, energy management, transportation, building management, and countless others. The speed and extent to which SMEs use the new value-added applications and services enabled by IoT deployments can have a substantive impact in their competitive advantage relative to their larger counterparts with more resources to invest in these technologies.

Potential prospects and risks

Today, we are only scratching the surface of what is possible for deploying IoT. The IoT is dramatically accelerating the pace of innovation in the transportation industry. Autonomous vehicles and other kinds of intelligent machines are already available and likely to be more widely used in various capacities. These technologies provide commercial vehicles with sensors, enable monitoring, intelligent navigation, and fleet management.

IoT is also increasingly being used in construction for monitoring health of structures, environmental factors such as heat, lights, and pollution, and other areas where having a real-time understanding and control capabilities is critical. An example would be procedures that shut off power, gas, and alert emergency responders when there is an adverse event such as a fire in a factory, apartment building, or a car accident. "Smart refrigerators" that sense when the stock of a family's food is going bad or running low is a more futuristic example of the IoT.

IoT is also transforming the agriculture industry by helping farmers to be more productive in overcoming water shortages, land availability, and high costs, while meeting the increasing consumption needs of a global population. Farms can use the IoT to monitor sensors that can detect soil moisture, crop growth, livestock feed levels, and remotely manage and control smart connected harvesters, and irrigation equipment. The IoT enables the analysis of operational data with predictive risk factors such as the weather forecast.

Security may be a concern for some IoT applications, including the potential for third-party intrusions into information collection and control systems, as well the privacy of users about which the machines will be collecting data. Those contemplating IoT applications should consider the potential costs of getting locked into particular vendors' technologies and the extent to which open standards and open source alternatives are available.

FURTHER RESOURCES:

Is Canada falling behind with the Internet of Things? Dhunay, N. (2016):
http://www.theglobeandmail.com/report-on-business/small-business/sb-growth/is-canada-falling-behind-in-iot-technology/article29936602/

M2M and the Internet of Things: A guide. McLellan, C. (2013):
http://www.zdnet.com/article/m2m-and-the-internet-of-things-a-guide/

50 Sensor Applications for a Smarter World:
http://www.libelium.com/resources/top_50_iot_sensor_applications_ranking/

Animal wearables, robotic milking machines help farmers care for cows (2016):
http://www.cbc.ca/news/technology/wearables-farm-animals-1.3429116

18 Big Data Analytics and Artificial Intelligence

Big data analytics involves collecting, organizing, and analyzing large sets of data (called "Big Data") to discover hidden patterns, correlations, and other useful information to make intelligent business decisions. Sources of big data can be diverse and larger bodies of data are not always better than more refined measures collected for a specific purpose.

There is a wide range of new tools available to extract data from multiple internal and external sources in order to analyze relevant patterns and anomalies. In addition, these analytic tools are increasingly complemented with intelligent control systems that automate pattern recognition and "learn" to respond. For example, data from large systems of sensors can be used to "teach" intelligent control systems what is "normal" and then use this knowledge to identify and respond to "what is not usual".

Big data analytics can extract and analyze structured and unstructured data of various forms, ranging from quantitative metrics to text, speech, and video imagery. Structured data refers to any data that is in a fixed field within a record or file, including data in databases, and spreadsheets. Textual unstructured data examples include email and text messages, documents and presentations. Non-textual unstructured data contained in sources such as images, audio, and video can be incorporated as part of big data driven machine-learning processes in scientific, business, and public policy applications.

Why is big data analytics important for SMEs?

By enabling new avenues for pattern recognition, using big data to extract knowledge from narrower, more structured data sources can help all businesses improve their decision processes and identify new opportunities. For some SMEs improving the intelligence of their decisions can provide a competitive advantage. For others, learning to incorporate multiple sources of big and small data might be a matter of survival in markets where larger providers are already leveraging big data analytics to minimize costs and maximize revenues.

Many big data projects answer specific business questions. For example, data sets that combine multiple dimensions of socioeconomic status and preferences can be broken down to separate high and low value customers and segment markets.

How can SMEs employ big data analytics?

For most SMEs without specialized personnel in the area, setting up a big data analytics platform might be a challenge considering the vast amounts of internal and external data that can become relevant as the firm adopts more information technologies and eBusiness tools. The good news for SMEs is that many of eBusiness tools and cloud-based services are already pre-configured with some data analysis functionalities. At the same time, widgets and dashboards that help understand the outside world are becoming increasingly available based on open sources of data or those offered by large cloud-based service providers. Google Analytics tools, for instance, are valuable for understanding the interface of a company's Web presence with the outside world, and are available at no charge to SMEs.

Big data analytics tools have a lot to offer SMEs and come in many varieties. Understanding what internal and external data sources might be useful to compare is the first step in developing a data-driven business strategy. It is becoming more affordable for SMEs thanks to the availability of tool suites and cloud-based infrastructure, with more flexible pricing models. Various eBusiness analytics tool sets use interfaces that are increasingly usable and easy-to-configure.

Potential risks and prospects

Although there are some public data sources and methods for building relevant data sets for big data projects, data with substantive business value can be expensive to procure. This can put SMEs at a disadvantage compared to larger enterprises with the resources to generate more data internally and procure a number of relevant data sources. For example, operators of social media platforms are trying to monetize the big-data generated within their "walled gardens" and may not be willing to allow third parties to "mine" at a price that smaller enterprises can afford. SMEs may also have limited skills to use big data projects and processes, further putting SMEs at a disadvantage.

While generic big data analytics tools targeting SMEs are plentiful, the cost of industry specific applications optimized for particular tasks and relevant data to "mine" and use to "triangulate" will continue to put smaller businesses at a disadvantage. Innovative solutions around these two problems are necessary for success of SMEs in a world of big data.

FURTHER RESOURCES:

Business Intelligence and Analytics: From Big Data to Big Impact. Chen, H., Chiang, R. H., & Storey, V. C. (2012). MIS quarterly, 36(4), 1165-1188: https://ai.arizona.edu/sites/ai/files/MIS611D/chen-bi-december-2012.pdf

Advanced Technologies Supporting Big Data Utilization. NEC:
http://www.nec.com/en/global/solutions/bigdata/technology/index.html?

Guide to big data analytics tools, trends and best practices. Techtarget:
http://searchbusinessanalytics.techtarget.com/essentialguide/Guide-to-big-data-analytics-tools-trends-and-best-practices

8 Big Data Solutions for Small Businesses. Angeles, S. (2016):
http://www.businessnewsdaily.com/6358-big-data-solutions.html

19 Precision Agriculture

Precision has always been the key to success for farmers and the term precision agriculture is not new. However, development of low-cost sensors, specialized mechanical and software tools, location tracking, and cloud-based services that allow for integration of multiple data sources provide new opportunities for farmers to become even more precise, and therefore more profitable and risk tolerant. For example, sensing and control systems can optimize the use of scarce resources, such as water and labour, by targeting them to their most effective use in real time. This can generate significant cost savings. Proactive monitoring and just-in-time responses to hazards such as pests reduce the need to overuse countermeasures such as pesticides and enable a farmer to produce more "organic" products.

The term "precision agriculture" is used broadly and includes various applications of Internet of Things (IoT) in which objects in the farm are tagged with responders, sensors, and remote control systems. The Global Positioning System (GPS) and aerial drones make it increasingly feasible to track a larger number of things, while wireless internet technologies provide the tools to control them. Big data analytics methods can integrate internal data from this digitization and automation of farming processes. For example, with real-time data on weather, soil, air quality, crop maturity, equipment, and labor costs, predictive analytics can help farmers make smarter decisions.

Why is precision agriculture important to SMEs?

Due to the economic advantages of mechanization, biotechnology, and automation in farming, large farming enterprises have been some of the leading adopters of these disruptive technologies. These technological advantages often require resources and scale economies to deploy effectively, explaining some of the common challenges that small and medium-sized agricultural producers have in competing with larger agricultural enterprises.

With the development of broadband internet, cloud-based services, and low-cost sensors, smaller farms can have greater access to some of the precision agriculture techniques that were previously only available to larger factory farm operations. In addition to potentially enhancing their competitiveness, more precise monitoring and control can reduce the extent to which pesticides and biotechnology-enhanced crops are used to enhance yields. Technological innovation may therefore enable smaller farms to differentiate themselves in local and global markets by serving consumers with a preference for a wider variety and higher quality of food than available from large-scale agriculture.

How can SMEs employ precision agriculture?

Precision agriculture, which can collect and process data in real time, will help farmers make decisions. Field sensors measure temperature, humidity of the soil, and surrounding air. Field pictures using satellite imagery and robotic drones indicate crop maturity. Predictive weather modeling permits farmers to deploy strategies allowing for proactive and potentially automated responses to evolving conditions. Precision agriculture can be viewed as a three-stage process. The first step is usually to collect soil and crop data with in-vehicle GPS receivers (tractors, sprayers, and harvesters) and mapping the fields using aerial or satellite imagery. Then input variables reflective of the environment, crop, soil, and other relevant factors collected from sensors (e.g. soil moisture, responders tagged to animals, etc.) and external sources (e.g. weather forecasts). Depending on the extent of investments in sensors and other connected "things", they will produce a stream of information that can be delivered to the farmer via widgets and visual dashboards. The third step is to determine precision agriculture strategies using mapping to adjust/plot the field input and predictive analytics that enables crop cycle analysis and control. After harvesting, intelligent transport systems that minimize waste and help deliver fresh produce can further enhance the competitive advantage of smaller farms trying to differentiate themselves.

Potential risk and prospects

Deploying precision agriculture for SME farmers can be daunting in terms of fixed investments and the learning curve in operating new technologies. They should consult with neighbors, industry associations, precision agriculture vendors, to understand the range of available technologies and business models for delivering them. Cloud-based data processing services can reduce the burden of technology management, but are likely to require reliable broadband access to implement effectively.

By 2050, the world's population will likely reach up to 10 billion people. Most will live in urban centres and will be fed by basic produce from large agribusiness. However, some will continue to demand the variety and potentially higher quality of food that smaller farms can deliver. This can only happen if smaller farms invest in productivity enhancing technologies enabling them to compete with larger, lower cost producers. Given the long-term nature of investments in these technologies, there is a risk of getting locked into inefficient or expensive solutions. This should be seriously considered in technology and vendor selection of specific components required for building an "intelligent" farm.

FURTHER RESOURCES:

Twenty-five years of remote sensing in precision agriculture: Key advances and remaining knowledge gaps. Mulla, D. J. (2013). Biosystems Engineering, 114(4), 358-371: http://agri-sensing.technion.ac.il/Lectures%20PDF/PA/Mulla.pdf

Applications of low altitude remote sensing in agriculture upon farmers' requests–a case study in northeastern Ontario, Canada. Zhang, C., Walters, D., & Kovacs, J. M. (2014). PloS one, 9(11): http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0112894

Top Farm Management Software Products (2016): http://www.capterra.com/farm-management-software/

Agricultural Apps Worth Checking Out, Field Crop News (2016): http://fieldcropnews.com/2016/01/agriculture-apps-worth-checking-out/

How drones are quietly changing the face of Ontario agriculture (2016): http://www.cbc.ca/news/canada/kitchener-waterloo/drones-quietly-changing-agriculture-from-the-skies-1.3727976

20 Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) are developed using information technologies to enhance the efficiency of movement by persons and goods using various means of transport. This includes vehicle-to-vehicle modes of transport and the coordination of the use of fixed infrastructure, as well as other applications such as mobility-enhanced services for those with disabilities.

At a basic level, ITS use sensory capabilities, for instance GPS or cameras, to locate, track, and coordinate the movement of persons and objects as they travel. Information from these intelligent transport systems is then relayed back to users, who can adjust their own behavior accordingly. This type of information can be particularly valuable for addressing congestion and bottlenecks in transit networks. For businesses, relevant data from these systems can help identify potential problems in the supply chain or delivery of products to customers.

Other examples of intelligent transport technologies include traffic management systems coordinating light signals, advisory electronic road-sign and smartphone-based traveler information systems, automatic number plate recognition, speed cameras, accident detection, and electronic transit-fare collection systems.

Why is intelligent transport relevant to SMEs?

Through ITS, SMEs can better control how they procure and deliver goods and services. For smaller companies that have to differentiate themselves from larger competitors, information from transport providers about the status of inputs and outputs can be critical to their success. This information can offer important insights about what they could do better to reduce costs and improve service quality, which can be incorporated into business decisions in a real-time basis. Integration of this information into backend eProcurement and Customer Relationship Management (CRM) systems can provide SMEs with information that helps avoid supply bottlenecks and improves customer service.

A simple way for enabling delivery companies and customers to use ITS tools to find SMEs is to ensure their locations are clearly identified in widely used mapping platforms such as Google Maps. Use of tracking services for inputs and for outgoing sales and delivery calls are readily available, as are easy-to-use widgets and dashboards that allow for real-time optimization across delivery modes. In industries where time is of essence, such as delivery of health and emergency services or fresh food from the farm to the city, dynamic optimization of the transport path can be critical. In others, it is likely to reduce costs and improve productive efficiency.

Uber is the most notable example of how a small firm used ITS technologies to become very large. As a decentralized platform for finding and pricing transport services, the Uber highlights how these new technologies can enable new modes of transportation with potentially significant gains for some consumers. For example, in rural communities where traditional taxi services are hard to obtain, platforms like Uber have developed a new market for individual transport services that did not exist before.

How Can SMEs utilize ITS?

Disruptive innovations such as Uber are instructive, but not likely to be relevant to most companies as core growth strategies. Even for specialized transportation and logistics providers, intelligent process control systems are needed to minimize costs, not an explicit growth strategy.

Nevertheless, tools and data that optimize transportation process can help SMEs in some industries with capabilities to avoid bottlenecks that can hinder their growth both in terms of procuring inputs and reaching their customers. A good example of this can be found in the production of food and other perishable items, where freshness is of critical importance to the value that is delivered, and therefore the ability of the provider to keep and grow customers with better products and services. Another is in the delivery of services by qualified personnel with valuable skills such as those engaging in technical maintenance at businesses or health service delivery at home.

Potential risks and prospects

The risks of ITS are similar to that of other forms of information technology, including cybersecurity and implementation. If intelligent links between all aspects of transportation are established (vehicles, road, stoplights, tollbooths, highway exits, and other transit infrastructure), any unauthorized access could compromise the accuracy of data being relayed to emergency responders or autonomous vehicles, for example. Managing these and other security risks is important for transport companies and public policymakers.

From an SME perspective, relevant information from transport system and logistics can be integrated into other information systems and business processes. Adopting eBusiness tools and technologies that provide the data and information to reroute and reprioritize paths or modes of transport is not likely to involve significant risks. On the other hand, learning how to incorporate such systems in certain industries may accentuate the advantages of smaller enterprises compared to their larger competitors. Organic farming, pizza delivery, healthcare, and other maintenance services to homes and businesses represent some areas where improving intelligence in transportation can offer substantial gains in terms of cost savings and service quality improvements in SMEs.

FURTHER RESOURCES:

Google Maps for Work: Transportation https://www.google.ca/work/mapsearth/transportation/

Mobilizing Intelligent Transportation Systems. GSMA, (2015):
http://www.gsma.com/connectedliving/wp-content/uploads/2015/09/ITS-report-new.pdf

Uber for Business: https://www.uber.com/business

Top Shipping Software Products: http://www.capterra.com/shipping-software/

Reducing food losses by intelligent food logistics Jedermann, R., Nicometo, M., Uysal, I., & Lang. Philosophical Transactions of the Royal Society. Mathematical, Physical and Engineering Sciences (2014):
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4006167/

Appendix A:
Glossary of Terms

Analytics – the systematic computational analysis of data for patterns and associations.

Artificial Intelligence – intelligence exhibited by machines that can learn and act upon real-world data, mimicking cognitive functions of humans to "understand" and solve problems.

Application Program Interface (API) – a set of routines and tools for building a software application.

Asset Tracking – methods of tracking physical assets, either by scanning barcode labels attached to the assets or by using tags using GPS or RFID, which broadcast their location.

Backup – involves copying and archiving computer data so it may be used to restore the original data if it is lost.

Big Data – a term for constructing and analyzing large data sets to search for hidden patterns and correlations with other sources of data. The term often is used in the context of predictive analytics

Broadband – refers to high-speed internet access that is always on and faster than dial-up access.

Business 2 Business (B2B) – refers to a situation where one business engages in commercial transactions with another business.

Business 2 Consumer (B2C) – refers to a situation where one business engages in commercial transactions with customers typically through a retail channel.

Business 2 Government (B2G) – refers to a situation where one business engages in commercial transactions with various levels of the government.

Business process – a relatively well-defined and self-contained set of tasks to complete an organizational goal.

Business requirements – a business's critical activities that must be met to meet an organizational objective.

Byte – a unit of digital information that most commonly consists of eight bits.

Central Processing Unit (CPU) – the electronic circuitry carrying out software instructions. Traditionally, the term CPU refers to a processor.

Click Through Rate – the ratio of users who click on a specific link to the number of total users who view the objects that include that link (e.g. webpage, email, or advertisement).

Cloud-based services – applications, services, and other resources provided over the internet using equipment and software maintained offsite by third parties.

Configuration – the manner in which a system, service, or other resource is set up for use.

Crawlable Link Structure – a structure that makes it easy for internet search robots browse the pathways of a website in order to discover content.

Crowdsourcing – the process of obtaining needed services, ideas, or content by soliciting contributions from a large group of people, especially an online community, rather than from employees or suppliers.

Customization – process of making a software or service meet specific requirements of a process or a particular business.

Cybersecurity – the protection of systems and information they contain from theft, damage, and disruption.

Dashboards – an easy to read, often real-time, user interface that extracts and presents information considered important from business information systems, such as performance indicators.

Database – an organized collection of data.

Decentralization – the process of redistributing or dispersing functions, powers, people, or things away from a central location or authority.

Disruptive Technology – a technological innovation that creates a new market and value network and eventually disrupts an existing market and value network, displacing established market leaders and alliances.

Economies of Scale – the cost advantages that enterprises obtain due to size, output, or scale of operation, with cost per unit of output generally decreasing with increasing scale, as fixed costs are spread out over more units of output.

Electronic Data Interchange (EDI) – the transfer of data from one computer system to another by standardized message formatting, without the need for human intervention. EDI permits multiple companies, possibly in different countries, to exchange documents electronically.

Employee Monitoring – the use of various methods of workplace surveillance to gather information about the activities and locations of staff members.

Enterprise Resource Planning (ERP) – business process management software that allows an organization to use a system of integrated applications to manage the business and automate many back office functions related to technology, services, and human resources.

eReservation – also referred to as "eBooking", is a form of computerized system used to store and retrieve information and conduct transactions related to air travel, hotels, car rental, or activities.

Firewalls – a network security system that monitors and controls the incoming and outgoing network traffic based on predetermined security rules.

Global Positioning System (GPS) – a global satellite navigation system that that provides location and time information in all weather conditions.

Hardware – the physical elements of technology that makeup a computer and/or network system.

Information and Communication Technology (ICT) – the application of computers to store, retrieve, transmit and manipulate data, often in the context of a business or other enterprise.

Integration – process of unifying different systems.

Internet of Things (IoT) – the network of physical devices, vehicles, buildings and other items; embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

Internet Protocol (IP) – a set of rules governing the format of data sent over the internet or other networks.

Interoperability – the capacity of one system, application, or resource to function with others.

Just In Time – a manufacturing system in which materials or components are delivered immediately before they are required in order to minimize inventory costs.

Key Performance Indicators (KPI) – a set of high-level business metrics used to evaluate factors that are crucial to the success of an organization.

Keywords – a descriptive word used in an information retrieval system to indicate the content of a document.

Learning Management System (LMS) – software applications for the administration, documentation, tracking, reporting, and delivery of electronic educational technology (called e-learning) courses or training programs.

Legacy – an old method, technology, computer system, or application program that has been in use, which might be becoming outdated.

Location Based Services – services using real time geo-data to provide information, entertainment, or other services; location information is usually gathered from a smartphone or mobile device.

Machine 2 Machine (M2M) – a broad label that can be used to describe any technology that enables networked devices to exchange information and perform actions without the manual assistance of humans.

Malvertising – the use of online advertising to spread viruses, malware, and other cybersecurity threats involving injection of malicious software into legitimate online advertising networks and webpages.

Malware – term used to refer to a variety of forms of hostile or intrusive software, including computer viruses, worms, Trojan horses, ransomware, spyware, adware, scareware, and other malicious programs. It can take the form of executable code, scripts, active content, and other software applications.

Off-the-Shelf – generic version of a product or service as it is sold, without specific customization or configuration.

Open source – refers to software that can be used, shared or changed freely.

Personal Information Protection and Electronic Documents Act (PIPEDA) – a Canadian law relating to data privacy. It governs how private sector organizations collect, use and disclose personal information in the course of commercial business.

Request for Proposal (RFP) – is a formal request for a business proposal to potential suppliers.

Radio Frequency Identification (RFID) – tags employing radio waves to transmit information stored on a tag attached to an object that allows objects to announce and identify themselves.

SaaS (Software-as-a-solution) – on-demand software procurement model licensed on a subscription basis that is centrally hosted and typically accessed by users via a web browser or personal device.

Sharing Economy – an economic model in which individuals are able to borrow or rent assets.

Standalone – product or service that does not depend on complementary products or services.

XML – a coding language formatted to be both human and machine-readable.

Web 2.0 – the transition from static web pages to a dynamic web presence including advanced applications.

Appendix B:
Other eBusiness learning resources and tool kits for entrepreneurs and SMBs

Canada Business Network: Using technology in your daily operations

Ontario Government eBusiness toolkit

Ontario Network of Entrepreneurs eBusiness toolkit

Extending Your Reach

- Creating a Dynamic Web Presence
  Explains how business owners can create interactive web sites to engage their target audiences.
- Increasing Traffic to Your Website through Search Engine Optimization Techniques
  Explores techniques to increase the volume of traffic to your website from potential customers using search engine optimization techniques.
- Integrating Mobile with Your Marketing Strategy
  Describes how businesses can integrate mobile platforms with their marketing strategies to reach out to their customers and strengthen relationships.
- Social Media for Small Business
  Focuses on using social media techniques to help you promote your business online.
- Blogs for Small Business
  Examines the opportunities, benefits and how to of creating a successful blog to market your business.

Increasing Your Sales

- E-Commerce: Purchasing and Selling Online
  Provides tips and strategies for attracting, serving and keeping your online customers.
- E-Exporting
  Examines how to use the internet to sell your products and services to customers in other countries.
- Internet Auctions and Virtual Malls
  Explains how businesses can sell or buy online using internet auctions or virtual malls, where many sites are listed together.
- Customer Relationship Management
  Helps business owners to understand the basics of customer relationship management.
- Successful Online Display Advertising
  Discusses techniques to advertise your business over the internet.

Reducing Your Costs

- Cloud Computing
  Describes the benefits of cloud computing and what to consider when moving your business to the cloud.
- Open-Source Software
  Reviews the benefits and limitations of the open source approach and includes a reference list of some of the most commonly used free software.
- Integrating Back Office Systems with E-Commerce
  Explains how to integrate existing back office systems with e-commerce solutions such as online ordering and selling.
- How Business Can Use Internet Technology for Voice Communications
  Describes using internet technology for voice communication and discusses the kinds of options available and their benefits.

Informing Your Decisions

- Benefiting from accessible e-business practices
  Explains why e-business and accessibility complement each other, and how you can begin to integrate accessibility into online activities. Part of Ontario's e-Business Toolkit.
- The Legal and Privacy Issues of Doing E-Business
  Discusses the legal and privacy considerations of doing business over the internet.
- Online Sources of E-Business Information
  Provides an overview of online information and resources on the topics covered in this set of booklets.

Benefiting from accessible e-business practices

Topic: Business and economy
… Explains why e-business and accessibility complement each other, and how you can begin to integrate accessibility into online activities. Part of Ontario's e-Business Toolkit. …

Blogs for small business

Topic: Business and economy
… Focuses on the opportunities, benefits and how-to's of creating a successful blog to market your business. Part of Ontario's e-Business Toolkit. …

Cloud computing

Topic: Business and economy
… Describes cloud computing and explains the benefits, concerns, types of cloud computing and what to consider when moving your business to the cloud. Part of Ontario's e-Business Toolkit. …

Creating a dynamic web presence

Topic: Business and economy
… Small businesses can easily create more interactive sites to engage their target audiences. Part of Ontario's e-Business Toolkit. …

Customer relationship management

Topic: Business and economy
… Helps business owners to understand the basics of customer relationship management. Part of Ontario's e-Business Toolkit. …

E-commerce: Purchasing and Selling Online

Topic: Business and economy
… Includes tips and strategies for attracting, serving and keeping your online customers. Part of Ontario's e-Business Toolkit.

How business can use internet technology for voice communications

Topic: Business and economy
… Describes using internet technology for voice communication and discusses the kinds of options available and their benefits. Part of Ontario's e-Business Toolkit. …

How you can profit from e-business

Topic: Business and economy
… Demonstrates that not all e-business activities have to be complex or costly to achieve benefits. Those who are new to the world of e-business will find information and tools to help them get started. Part of Ontario's e-Business Toolkit. …

Increasing traffic to your website through search engine optimization techniques

Topic: Business and economy
… Examines techniques to increase the volume of traffic to your website from potential customers using search engines. Part of Ontario's e-Business Toolkit. …

Integrating back office systems with e-commerce

Topic: Business and economy
… Explains how to integrate existing back office systems with e-commerce solutions such as on-line ordering and on-line selling. Part of Ontario's e-Business Toolkit. …

Integrating mobile with your marketing strategy

Topic: Business and economy
… Explains how small businesses can integrate mobile with their marketing strategies to gain an edge in reaching out to and strengthening relationships with customers. Part of Ontario's e-Business Toolkit. …

Internet auctions and virtual malls

Topic: Business and economy
… Explains how businesses can sell or buy online using internet auctions or virtual malls, where many sites are listed together. Part of Ontario's e-Business Toolkit. …

Online sources of e-business information

Topic: Business and economy
… Provides an overview of online information and resources on the topics covered in this set of booklets. Part of Ontario's e-Business Toolkit. …

Open-source software

Topic: Business and economy
… Reviews the benefits and limitations of the open source approach and includes a reference list of some of the most commonly used free software. Part of Ontario's e-Business Toolkit. …

Social media for small business

Topic: Business and economy
… Focuses on using social media techniques to promote your business online. Part of Ontario's e-Business Toolkit. …

Successful online display advertising

Topic: Business and economy
… Discusses techniques to advertise your business over the internet. Part of Ontario's e-Business Toolkit. …

The legal and privacy issues of doing e-business

Topic: Business and economy
… Discusses the legal and privacy considerations of doing business over the internet. Part of Ontario's e-Business Toolkit. …

How you can profit from e-business

(less detailed summary of above Ontario Government sites)

Demonstrates that not all e-business activities have to be complex or costly to achieve benefits. Those who are new to the world of e-business will find information and tools to help them get started. Part of Ontario's e-Business Toolkit. On this page:

1. Introduction
2. Defining e-business
3. Assessing relevancy and readiness for e-business
4. Investing in e-business
5. Finding business information online
6. Addressing e-business challenges
7. Protecting your business – privacy, security and legal issues
8. Working with e-business service providers
9. Creating a web presence
10. The basics of internet advertising, social media and mobile technology to market your business
11. Integrating e-commerce into your business
12. Wrap-up
13. Glossary of common internet terms

E-Business Toolkits, PEI

Innovation PEI: E-Business Toolkits

Online Sources of E-Business Information

Provides other interesting e-business sites.

PDF Files:

- Successful Online Display Advertising
- E-Business Handbook
- Open Source Software (OSS)
- Social Media Marketing
- Search Engine Optimization (SEO) Techniques
- E-Exporting
- Voice Over Internet Protocol (VoIP) for Small Businesses
- Customer Relationship Management
- E-Commerce: Purchasing and Selling Online
- Integrating Back Office Systems with E-Commerce
- Internet Auctions and Virtual Malls

Business Development Bank of Canada (BDC) - E-Business Toolkits:

PROFITING FROM TECHNOLOGY: A GUIDE FOR ENTREPRENEURS

Click here for a link to the FREE "Profiting from Technology" E-Book

This E-book will teach you:

- How to select the systems best suited to your needs.
- 7 major business functions technology can improve.
- 10 steps to a successful tech investment.
- Why training is critical.
- Common pitfalls to avoid.

SOCIAL MEDIA: A GUIDE FOR ENTREPRENEURS

Click here for a link to the FREE **"Social Media" E-Book** prepared by BDC - Smart Tech.

This E-book will teach you:

- How to create a social media strategy.
- Best practices for producing content.
- How to establish a presence on social media sites.
- How to monitor, measure and analyze your results.

PROFIT FROM E-COMMERCE

Click here for a link to **"How You Can Profit from E-Business"** prepared by The Ontario Government.

ONLINE MARKETING

Click here for a link to the FREE **"Online Marketing" E-Book** prepared by BDC.

This E-Book divulges strategies to assist businesses with:

- Creating an online presence.
- Driving customers to your website.
- Measure the success of your efforts.
- Using analysis to adapt and optimize your online efforts.

Government of Canada. Canada Business Network - Using technology in your daily operations

Smart Insights

For more information, contact:

Lisa Severson
Communications & Stakeholder
Relations Officer

Eastern Ontario Regional Network

Email: info@eorn.ca

www.eorn.ca