Internet of Things (IoT)

ICTC CTIC

Trend Focus: Issue 3

Monetizing IoT: Capitalizing on Connectivity

It's not often we stumble upon a $19 trillion economy. That's the projected size of the global market for the Internet of Things (IOT), which describes the extension of the internet to the physical world through embedded technology that can communicate without human intervention. Smartphones that track your movements and location, wearable sensors that can remotely monitor a patient's biometrics and smart outlets that allow you to turn on and off plugged devices from across the world are just some examples of IOT hyper connectivity [1]. According to estimates, up to 50 billion devices will be connected to the internet by 2020. [2] These devices aren't limited to smartphones or personal computers, but anything with an on-off switch, including automobiles, appliances, lamps and coffeemakers.

With the cost of broadband internet declining and innovations in smart technology driving an explosion in Wi-Fi capability, the ability to extract knowledge from data and transform it into business intelligence is changing the way organizations operate in an increasingly competitive global market. It's also creating a new class of entrepreneurs looking to generate business opportunity through hyper connectivity. This has spurred a new generation of technologies designed specifically to maximize what we can do with the enormous amount of data being collected daily by IOT and conventional computing. While these new enterprises are working hard to convert this data into business opportunity, early signs indicate that around three-quarters of traditional organizations are not in a position to generate service revenues from IOT due to a combination of external and internal challenges (see figure 1). [3,4]

Business Challenges of Monetizing IoT

Organizations face several interconnected challenges in monetizing the sheer volumes of data they are already collecting, let alone building a business around connected devices. Market fragmentation, limitations to existing infrastructure and managing machine-to-machine devices are central concerns for organizations looking to generate revenue through connected devices and the data they generate.

In addition to the business, technological and operational challenges, consumer privacy concerns will add another layer of complexity to the monetization debate. With organizations collecting trillions of bytes of information from their existing and potential end-users, notice and consent become more critical. Although consumers are routinely presented with long and complex privacy notices before they access a service, it's not always clear whether this applies to the processing of their personal data when it reaches the big data stage.

Figure 1. Monetizing IoT Challenges
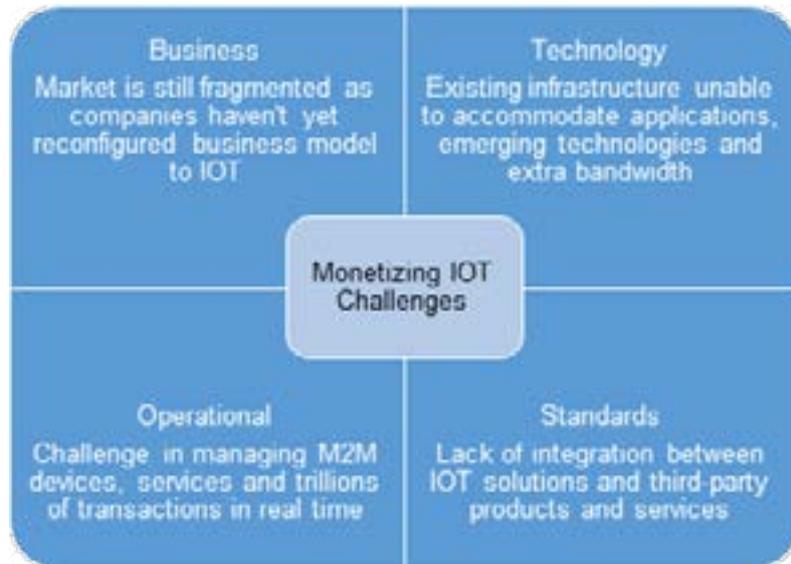
Business Challenges of Monetizing IoT

Although no one-size-fits-all model exists for capitalizing on the Internet of Things, any IOT business model entails three essential steps [5]:

Launching connected service: Organizations must identify a relevant IOT business model, such as service revenue, data intelligence or hardware premium [6], enable devices to connect wirelessly to the internet and integrate their services into mobile networks.

Managing connected service: After launching a connected service, organizations must monitor connected devices in real-time, track data usage and deploy diagnostics to troubleshoot issues.

Monetizing connected service: Once the IOT business model is established and easily manageable, organizations must develop a business model (e.g. rates, service fees, etc.) for monetizing these services.

Reliable connectivity from a service provider is critical for monetization to be successful, given that the IOT value proposition depends largely on our ability to extract value from interconnectivity (i.e. machine-to-machine communication).

IoT Business Models

There are several ways businesses can package and monetize IOT solutions, including integrating software and hardware systems into physical locations, bundling services to consumers and other businesses and creating marketable intelligence out of the data that is being collected.

Monetizing IOT creates value for organizations, service providers and customers.

Connecting to the Internet of Things creates an economy of value for organizations looking to connect to their customers at all times, for service providers that enable organizations to monetize M2M services and for customers who enjoy new experiences as a result of hyper connectivity.

1. Harvesting data and intelligence: With up to 50 billion devices connected to the internet by 2020, there is a huge opportunity for third party organizations to capture, package and sell data generated through IOT in the form of marketable intelligence. For example, capturing big data from wearable devices and monitoring systems can reveal patterns about owners' habits and activity levels that can then be sold to healthcare providers, the fitness industry or any other consumer-oriented sector.

2. Service bundling: This business model involves creating recurring revenue streams through long-term consumer or business engagement. For example, telecommunications companies can provide home automation and energy management solutions in addition to traditional media services. This allows them to not only up-sell services to end-users, but also provide intelligence on consumer energy consumption to the utilities sector. As a result, this monetization model leverages business-to-consumer and business-to-business relationships. US-based Nest has already started monetizing the data collected from its smart thermostat products by making some of its data available to utilities companies. [7]

3. Building connectivity: The most basic of all the business models, business connectivity involves hardware and software integration into key retail facilities, banks and other businesses. For example, building in-store wireless sensing and tracking monitors such as Bluetooth beacons, coupled with radio-frequency identification (RFID) tags for product identification and panoramic virtual reality, can offer enhanced retail experience that meshes e-commerce with real-life shopping. [8]

Key Industries to be Impacted by IoT

The Internet of Things is a rapidly expanding economy that has only recently made its imprint on the globe. The proliferation of smart devices, applications, cloud computing and data analytics is creating an extremely competitive environment for organizations looking to develop a deeper, richer understanding of their market.

Figure 2. Impact on:

Health	Transportation	Retail	Manufacturing
- Advanced health monitoring	- Real-time journey mapping	- Deeper insights to sell & upsell	- Smarter industrial networks
- Reduced hospital stays	- Improved logistics	- Real-time inventory tracking	- Improved workflow & efficiency
- Lower transmission of disease	- Personalized travel news & ads	- Personalized customer experience	- Reduced operational expenditures
- Deep patient analytics to improve treatment	- Efficient response to unexpected events	- Streamlined POS & inventory management	- Improved yield through data visualization & correlation analysis

Although every industry has something to gain from big data analytics (and this will certainly increase tenfold once IOT connectivity expands beyond the small fraction of devices currently communicating over the internet), health, transportation, retail and manufacturing could provide the most immediate opportunity (see figure 2). Collectively, these sectors account for more than one-quarter of Canada's gross domestic product [9].

These industries as well as many others are fertile ground for companies and entrepreneurs looking to build wireless connectivity, bundle B2B and B2C services and harvest the intelligence of data. Fortunately, these industries have already been exposed to the digital revolution. Digital health is one of the biggest trends impacting Canada's health sector, automation and robotics have already been integrated into manufacturing and transportation value chains and big data analytics has long been used in the e-commerce world.

Third party players have tremendous opportunity to help organizations add connectivity options to their services as well as leverage the torrents of data being collected now and under the hyper connected modality. Although it's difficult to say for certain when this massive valuation to be actualized, all signs point to an incredible opportunity for Canadian businesses, entrepreneurs and service providers.

Another element of the market that will be impacted by the IOT expansion is digital technology professionals. As connectivity expands into virtual reality, additive manufacturing, smart grids, green technology and services, the demand for ICT professionals will continue to grow beyond traditional job descriptions. ICTC estimates that the combined offering of digital technologies under the larger umbrella of IOT will create more than 182,000 jobs in Canada by 2019.

Industry	Contribution to Canadian GDP (%)
Health	7 %
Transportation	4 %
Retail	6 %
Manufacturing	10 %

To learn more about ICTC's forthcoming initiatives around the Internet of Things, contact Sam Bourgi (s.bourgi@ictc-ctic.ca).

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2. Cisco. Seize New IoT Opportunities with the Cisco IoT System.

3. Capgemini Consulting. Monetizing the Internet of Things: Extracting Value
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4. Yossi Abraham (July 20, 2015). Overcoming Challenges to Monetize the IOT.

5. Jasper. Capitalizing on The Internet of Things: A Primer.

6. Capgemini Consulting. Monetizing the Internet of Things: Extracting Value from the Connectivity Opportunity.

7. Romain Dillet (April 18, 2014). "Next Uses Its Data To Turn Electric Utilities Into Cash Cows." Tech Crunch.

8. Piya Sinha-Roy and Lisa Richwine (June 23, 2015). "Virtual reality sweeps shoppers into new retail dimension." Reuters.

9. Statistics Canada. Gross domestic product at basic prices, by industry (monthly).