

A LITTLE FATTER & A LOT SMARTER: ENHANCING PROCESSES THROUGH TRANSITIONAL TECHNOLOGY IN PUBLIC WORKS

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Setting the Stage

In 2015, the Town of Newmarket's Information Technology (IT) and Public Works Services (PWS) departments embarked on an exciting project, which not only introduced a new piece of technology to daily operations, but enhanced the existing partnership between the two areas. Harnessing the power of the mighty digital pen through the Town's *Digital Pen Project*, IT and PWS used transitional technology to strengthen collaboration, increase efficiency by 500 per cent, and reduce duplication of efforts for water/wastewater and administrative staff working on Locate Services Requests.

The Town of Newmarket views technology as an investment with long-term returns, and as such, the



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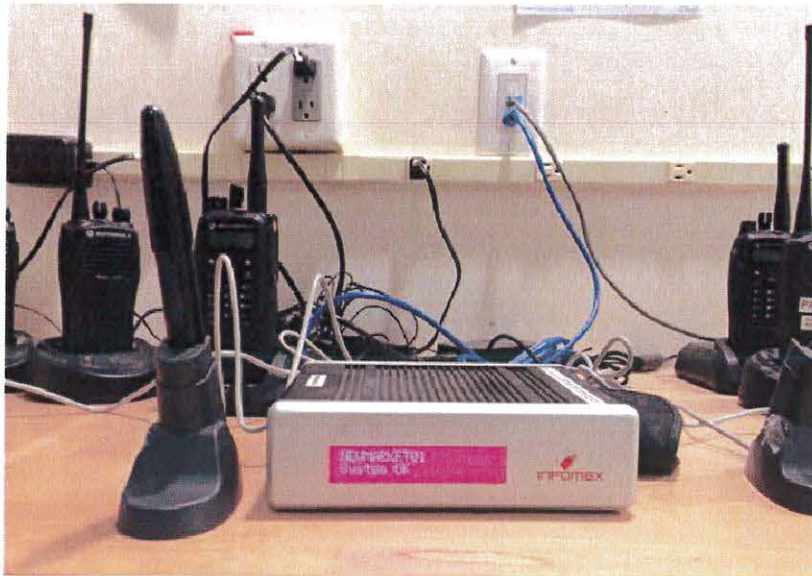
IT department strives to align all business units with technology while focusing on collaboration and innovation in all aspects of the organization. The IT department has expanded and matured significantly over the years to support community growth. IT supports a number of enterprise wide systems on multiple platform technologies to keep up with the increasing demands and expectations in the workplace. One of the biggest areas IT works with is the Town's Public Works Services department.

Public Works Services maintains infrastructure and services (such as roads, parks and property, facilities, waste and

recycling and water/wastewater) throughout Newmarket. Over the past five years, PWS has focused on increasing efficiency in regular activities, becoming more hands-on with enterprise technology and computers, and automating manual processes. One strategic step that the PWS management team made was to identify process improvements through digitization and to introduce elegant transitional technology. In pursuing these project improvements, PWS approached IT with an idea for optimizing how staff manually complete forms – transitioning from a paper only process to a more efficient digital one using a Digital Pen.

The Power of the Pen: Locate Services Business Process – Pre-Pen

Public Works Services' Water/Wastewater staff is responsible for providing Locate Services, which are issued by service provider ON1Call. Digging on any property can be dangerous when not understanding what may be beneath the land. Contractors are responsible for requesting locate services before digging. Newmarket staff provide a carbon copy sheet for the contractor, detailing the locate request information and outlining any municipal infrastructure owned by the Town. A copy is retained and submitted to the administrative team for scanning,



inventorying both in paper and digitally, and then filling out an electronic ticket process with ON1Call – demonstrating that the work is complete. This process was time consuming for administrative staff as it required a lot of scanning and the tedious submission of tickets. The need for a more effective and efficient process was identified. IT and PWS worked together to find a solution in the form of a Digital Pen. Administrative Assistant Pauline Pierce notes that “there was time investment requiring everyone work together to implement and launch the pen, but the outcome of that investment resulted in our own jobs becoming easier and more efficient in the long run. The results were certainly worth the effort.”

Locate Services Business Process – Post-Pen

With the introduction of new technology, Newmarket staff still provide a carbon copy to the Contractor, but everything else changed for the better. The locator fills out the form using a Digital Pen supplied by the vendor. The pens are docked at the Public Works Services’ Operations Centre during a lunch break or at the end of the day. The data recorded during that workday is uploaded to a secure cloud platform. The pen’s recorded data is inventoried and searchable through an easy-to-use web interface, and the resulting templated form is viewable on any mobile device or computer as if it was scanned after completed. The Locate Form is then checked for any digital translation errors and approved with ease directly to ON1Call – closing the ticket and emailing the contractor a digital version of the Locate Form. Thanks to the pen, over 85 per cent of tickets are now submitted within two minutes instead of 10 and administrative time has been reduced by 500 per cent per ticket.

The Technology

The technology provided by the vendor is based on a ballpoint pen and paper concept. The solution is developed by InfoMax Technologies, a Canadian-based company located in Markham, Ontario. Their solution involves software as a service and physical hardware for clients. The

Town of Newmarket - Locate
(Municipal Water, Sanitary, & Storm Sewers)

Name: *A. Devereaux* Telephone #: *905-895-5319* Date requested (yyyy/mm/dd): *2016/04/14* Ticket #: *2016-025-2890*

Nature of work: *Water (blue)* Location of work: *786 Bellingham Hill Road*

Hand dig within one meter (3.28 FT) of all markings

Fax number: 905-953-5319 Email: *locate@newmarket.ca*

Locate valid for 90 days from date of issue. Municipal infrastructure marked only to the limit of the property line and in municipal easements.

Sanitary main	- SAN -	Manhole	O	San sewer lateral	- SL -
Force main	- FM -	Storm sewer	- STM -	Catch basin	CB
Hydrant	HD	Valve box	VB	Valve chamber	VC
Watermain	- WM -	Water service	- WS -	Curb box	CB
				Property line	PL

Legend

786 Bellingham Hill Road

Water (blue)

Sketch not drawn to scale

Comments: *Sanitary main located by hand force on 4/14/16*

It is understood that the above information has been provided from our records and represents our knowledge of the approximate location of water mains/services, sanitary, & storm sewers owned/maintained by the Town of Newmarket only. The excavator should request locates from other utilities to establish the location of their infrastructure. The responsibility is that of the excavator to use extreme caution when mechanical equipment is used in the vicinity of the underground infrastructure, and where necessary to locate by hand its actual position. Liability for damage to municipal infrastructure rests with the excavator. If excavation is undertaken in other than the designated area, or if the excavation has not started within 90 days of this report, the excavator shall contact the Town of Newmarket for additional locates. Please contact the Operations Centre at 905.895.5193 extension 2890 with any enquiries.

I acknowledge receipt of a copy of this report and I have read and fully understand the above warnings and information.

Person receiving locate (print/sign) _____ Contractor's representative on site (print/sign) _____

P: *[Signature]* S: *[Signature]* P: *[Signature]* S: *[Signature]*

Signature of locator: _____ Date (yyyy/mm/dd): *2016/04/14* Time (hh:mm): *2:00 PM*

digital pen is a ballpoint pen with a rechargeable battery, storage memory, and an optical module. The optical module, memory and battery of each pen add a little bit of size compared to a regular pen, making the device slightly fatter but comparable to the size of a marker. Staff members write with the pen comfortably through its ergonomic design nonetheless.

The pen battery is charged and the recorded data is uploaded through a USB dock attached to and managed by the PenStation appliance. Standard legal sized paper is used for the Locate Process. PostScript 3 Printers print unique dot patterns on each sheet with a unique identifier. Unique dot patterns printed on the background of each page serve as mapped coordinates for the pen to capture handwriting, drawings, checkmarks, signatures, and other items. The optical module attached to each pen recognizes the coordinate of each dot in respect to the position on the sheet of paper.

Recorded pen data is uploaded to Infomax's iFORMATION Platform Server securely through an encrypted Internet connection when the pen is docked to the PenStation appliance. The platform recognizes different revisions of each form and tracks with time-stamps and an auditing record down to a pen stroke level – tying all the data to a singular unique digital record. Edits to the form can occur at any point and be uploaded to the iFORMATION platform for review. A side-by-side validation screen is used to show a carbon copy of the form electronically alongside a form with converted text and data, allowing staff to quickly validate and update the information as needed.

The staff administrator can commit the data to be managed through configured workflows into others systems such as ONICall's ticket submission system, once the validation is complete. The workflows behind the scenes are highly customizable allowing the technology to support any practice that involves filling out information on paper. Information is processed and stored in the platform database as a unique record and can be further re-routed to other systems or other standard outputs such as PDF, image, email, printout and fax based on the configured workflow. The number of pens



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and PenStation appliances that support them is highly scalable; there is a five pen to one PenStation ratio. Each pen can be assigned to a person by signing in and out with an identification card, which can help identify when each line is written and by whom. Overall, this technology brought a welcome change to administrative manual processes and minimal change to the front-line staff.

Organizational Impact

Implementing this technology helped PWS build datasets that would not otherwise exist, as in the past, locates were stored in an office cabinet and seldom referenced. This data continues to grow, and provides locators the ability to pull up completed Locates on a tablet in the field without having to come back to the office. Operator III Don Jackman finds this technology encouraging because his "knowledge will be available to future locators long after [his] retirement." The paper records are still available to staff in the event that systems are down, bringing added comfort. The business impact reflects the solution, requires minimal training, and is stable and easy to use without bringing large-scale change to the frontline staff experience.

The technology has been embraced by staff and management and is being requested in other areas. President of Infomax Technologies Ambrose Au believes "it is a pleasure to be working with a forward thinking and tech savvy group in Newmarket, to apply our digital pen technology solution to streamline existing process with minimal changes to daily routine." For example, the Fleet service area is currently piloting another implementation effort, which involves supplying their work order management process with data through the pen and paper forms, and uploading into Newmarket's financial management system – JD Edwards. These steps in focused areas help Newmarket prepare for initiatives such as Big Data, Open Data, and Asset Management in the context of work order management.

The Partnership

Infomax offered an attractive business solution not yet proven to work within the municipal sector. Their business focus is largely supplying the healthcare industry with this Digital Pen technology. PWS management saw a partnership opportunity with Infomax that was explored shortly thereafter. Infomax and PWS bridged a mutual interest

that allowed them to explore the municipal government sector while PWS was able to pilot new technology.

The Digital Pen pilot project is one initiative that PWS brought forward to the IT-PWS steering committee, which is jointly managed by a strategic partnership between IT-PWS staff. The IT-PWS steering committee has evolved through formal meetings regarding project initiatives. This group discusses PWS needs and how IT can support and guide collective resources to meet them. Staff from IT frequently work directly with PWS management, administrative staff, and front-line employees to find new and innovative ways to support their work requirements aside from the pen project. The PWS champion and IT support effort is leading to a very successful model in Newmarket. It is truly amazing how a strategic partnership and a pen that is "a little fatter and a lot smarter" can dramatically improve a core business practice. We are looking forward to exploring how else we can leverage the Digital Pen.

The Town of Newmarket, located in northern York Region, is home to almost 90,000 residents in approximately 28,000 households. In late 2014, Newmarket was one of only five communities in Canada to be recognized with a Google eTown Award as a community whose businesses are leading the way in embracing the opportunities of the internet, and utilizing online resources to succeed in an increasingly connected world. For more information on the Town, visit www.newmarket.ca

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