

A WEB-BASED SOURCE-TO-TAP WATER DATA MANAGEMENT PLATFORM FOR SMART & LEARNING CITIES



MAIN CHALLENGES FOR MANAGERS

- Huge quantity of data from different sources
- Lack of information on water quality in the distribution system due to a limited number of sampling points
- No holistic view of emerging problems in the distribution system, partly due to a lack of integrated data and complaint management
- Time-consuming decision-making processes
- Difficulty in communicating alerts on drinking water effectively



INTRODUCTION

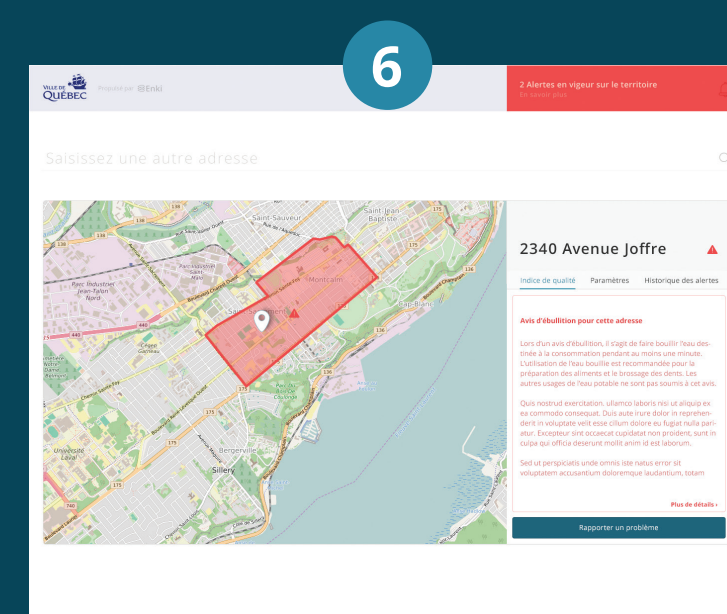
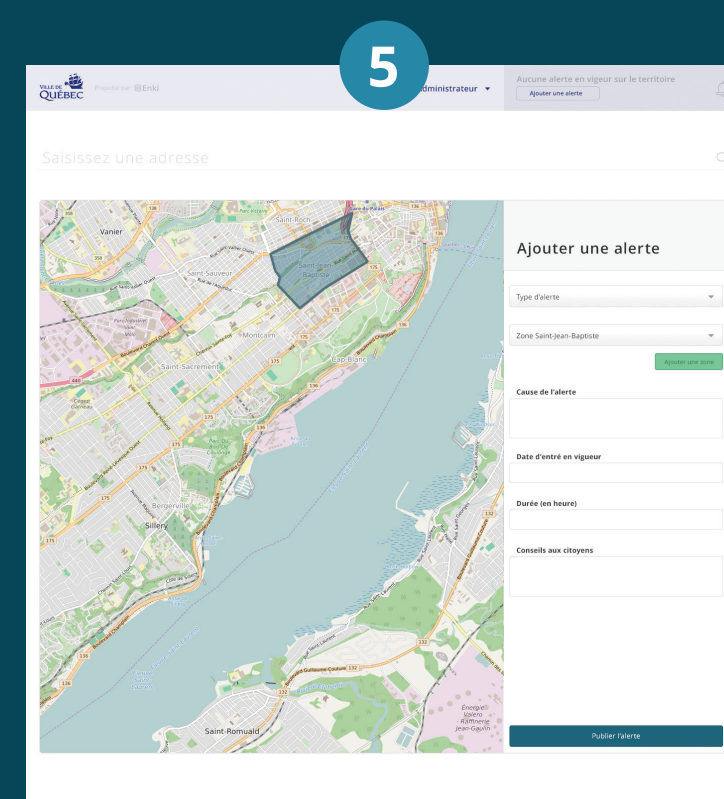
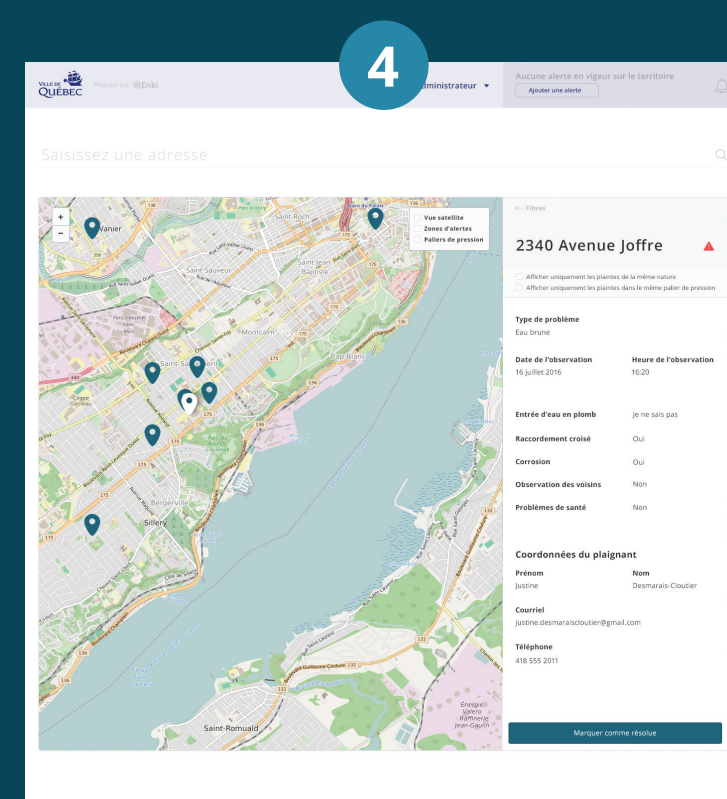
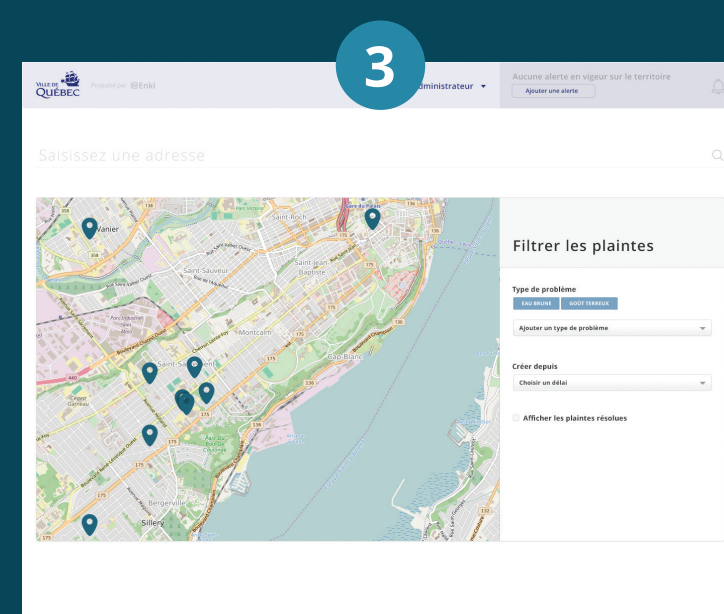
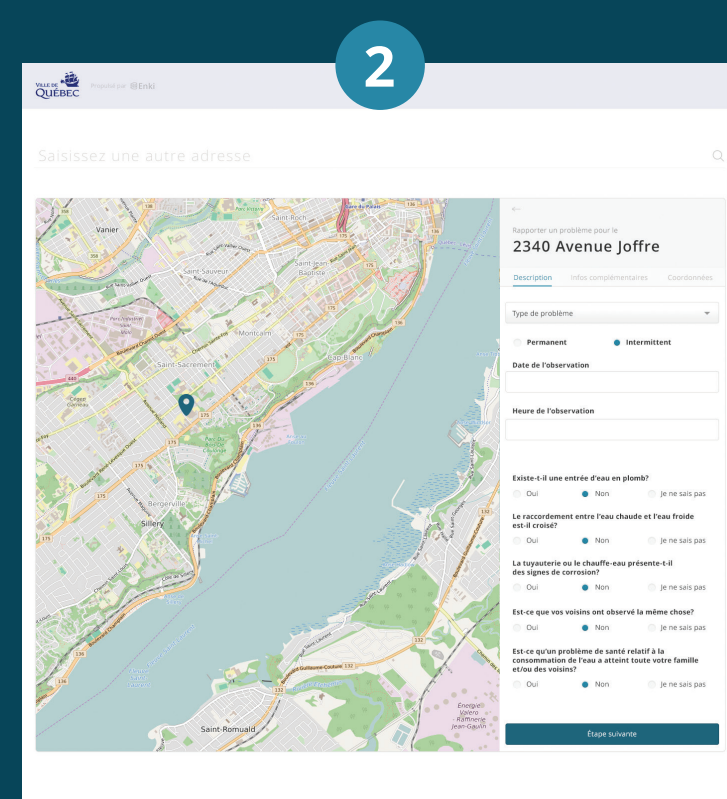
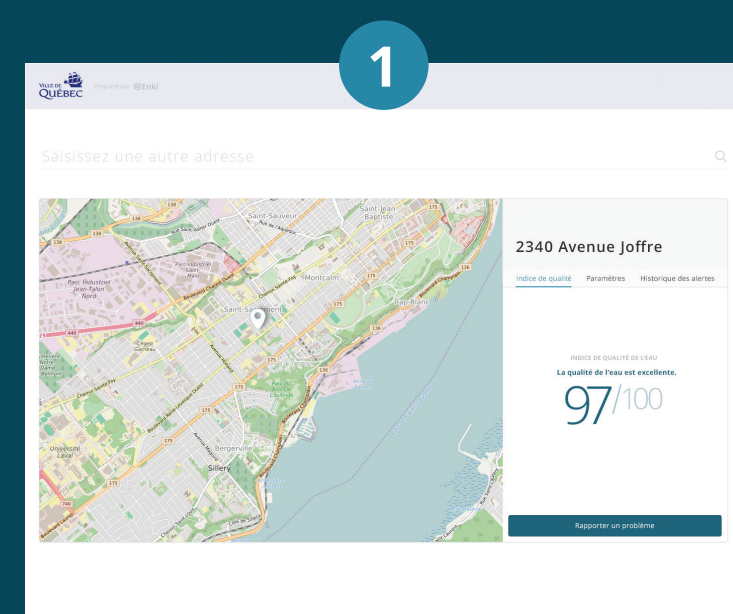
Drinking water is a main issue for municipalities, and both managers and citizens are concerned about its quality. While national and provincial drinking water quality standards require extensive monitoring, the processes involved in communicating and using the information on water quality from source to tap are often not adequate to fully address the needs and expectations of municipal managers and citizens. Several studies report a loss of public confidence due to tastes or odours in tap water, while others highlight the low efficiency of complaint management (Turgeon et al., 2004; Doria, 2006; Montenegro et al., 2009; Matos de Queiroz, et al., 2013). As part of a technological showcase project with the City of Québec, WaterShed Monitoring has adapted its web-based software Enki™ to enable a better exchange of information about drinking water quality between citizens and water managers, thereby improving managerial decision-making and strengthening the public's confidence.

SOLUTIONS FOR MANAGERS

- Gathering of all water-related data in one place
- Visualization and sorting of complaints on one map (Figure 3)
- Visualization of all details of a complaint (Figure 4)
- Possibility to easily issue an alert by choosing the sector and the type of advisory (Figure 5)

TECHNOLOGICAL SHOWCASE PROJECT METHODOLOGY

- Consultation with the Water Department of the City of Québec
- Elaboration of a drinking water quality index (Scheili et al., 2015):
 - Consultation of citizens for identifying and integrating their needs and concerns
 - Consultation of a scientific expert committee for the validation of the index
 - Consultation of a municipal operation committee for a feasibility assessment of the index
- Integration into Enki™ of:
 - drinking water quality data
 - geographical characteristics of the distribution system
 - drinking water quality index
- Development of an algorithm for the implementation of all functions described below



MAIN CONCERNS OF CITIZENS

- No easily understandable and customized information on drinking water quality
- Difficulties in directly reporting perceived problems
- Little trust in drinking water quality



SOLUTIONS FOR CITIZENS

- Interactive, up-to-date and customized information on drinking water quality in their own sector (Figure 1)
- Direct communication of observations and concerns (Figure 2)
- Precise cartographic information and details on drinking water advisories (Figure 6)

ENKI™ IN A NUTSHELL

- Developed by WaterShed Monitoring, Enki™ is the first cloud-based platform designed to store, organize, contextualize, analyze, publish and share all types of water quality data.
- Enki™ is approaching water quality monitoring in an innovative way as it integrates the joint use of geomatics and decision support in the treatment of data.
- By helping overcome organizational, technological and technical challenges in water quality data handling and sharing in an efficient and cost-effective way, Enki™ thus provides added value to municipal water managers.

CONCLUSION

Innovative technologies do not necessarily make a municipality smarter. True smart and learning cities rather leverage technology to create cooperative interactions between the physical city, its citizens and its managers. With its two-way exchange capabilities, Enki™ allows to better use concerns and observations of citizens to improve day-to-day decision-making, while providing more understandable and relevant information on drinking water quality. By doing so, Enki™ helps to build trust and stands out as a leading strategic partner for both **water managers and citizens**.

ACKNOWLEDGEMENTS

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