

Geographic Information System Cloud for Sustainable Digital Water Management: A Case Study

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Abstract : Water is one of the most crucial elements which influence human lives and development. Noteworthy, over the last few years, GIS plays a significant role in optimizing water management systems, especially after exponential developing in this sector. In this context, the Egyptian government initiated an advanced 'GIS-Web Based System'. This system is efficiently designed to tangibly assist and optimize the complement and integration of data between departments of Call Center, Operation and Maintenance, and laboratory. The core of this system is a unified 'Data Model' for all the spatial and tabular data of the corresponding departments. The system is professionally built to provide advanced functionalities such as interactive data collection, dynamic monitoring, multi-user editing capabilities, enhancing data retrieval, integrated work-flow, different access levels, and correlative information record/track. Noteworthy, this cost-effective system contributes significantly not only in the completeness of the base-map (93%), the water network (87%) in high level of details GIS format, enhancement of the performance of the customer service, but also in reducing the operating costs/day-to-day operations (~5-10 %). In addition, the proposed system facilitates data exchange between different departments (Call Center, Operation and Maintenance, and laboratory), which allowed a better understanding/analyzing of complex situations. Furthermore, this system reflected tangibly on: (i) dynamic environmental monitor/water quality indicators (ammonia, turbidity, TDS, sulfate, iron, pH, etc.), (ii) improved effectiveness of the different water departments, (iii) efficient deep advanced analysis, (iv) advanced web-reporting tools (daily, weekly, monthly, quarterly, and annually), (v) tangible planning synthesizing spatial and tabular data; and finally, (vi) scalable decision support system. It is worth to highlight that the proposed future plan (second phase) of this system encompasses scalability will extend to include integration with departments of Billing and SCADA. This scalability will comprise advanced functionalities in association with the existing one to allow further sustainable contributions.

Keywords : GIS Web-Based, base-map, water network, decision support system

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