

Improving Sustainability of Smart Cities through Visualization Techniques for Big Data from IoT Devices

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Resumen(Abstract). Fostering sustainability is paramount for Smart Cities development. Lately, Smart Cities are benefiting from the rising of Big Data coming from IoT devices, leading to improvements on monitoring and prevention. However, monitoring and prevention processes require visualization techniques as a key component. Indeed, in order to prevent possible hazards (such as fires, leaks, etc.) and optimize their resources, Smart Cities require adequate visualizations that provide insights to decision makers. Nevertheless, visualization of Big Data has always been a challenging issue, especially when such data are originated in real-time. This problem becomes even bigger in Smart City environments since we have to deal with many different groups of users and multiple heterogeneous data sources. Without a proper visualization methodology, complex dashboards including data from different nature are difficult to understand. In order to tackle this issue, we propose a methodology based on visualization techniques for Big Data, aimed at improving the evidence-gathering process by assisting users in the decision making in the context of Smart Cities. Moreover, in order to assess the impact of our proposal, a case study based on service calls for a fire department is presented. In this sense, our findings will be applied to data coming from citizen calls. Thus, the results of this work will contribute to the optimization of resources, namely fire extinguishing battalions, helping to improve their effectiveness and, as a result, the sustainability of a Smart City, operating better with less resources. Finally, in order to evaluate the impact of our proposal, we have performed an experiment, with non-expert users in data visualization.