

2nd Service Systems Forum – Abstract

Toward a Personal Resource Planning (PRP) Schema in Data Contextualization through the Hub-of-all-Things (HAT)

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Big Data, along with the Internet of Things (IoT), permeates almost all organizational, social, and economic dimensions in today's society. The rapid development of internet-based applications, smart gadgets, and distributed devices has enhanced how data can be obtained about end-users. This has been fueled by extant information systems (IS) research explaining how organizations can organize, synthesize, and benefit from this data (Agarwal and Dhar 2014). However, the growth of IoT and mobile device usage has also complicated how database developers involve end-users in database schema and architecture. Furthermore, attempts to capture and include end-user data are limited by increasing data privacy concerns and personal contexts that are continually changing (Scoble and Israel 2013). The area of IS research most relevant for addressing these issues is that of Enterprise Resource Planning (ERP), which focuses on software that integrates business processes and enables database sharing within an organization (Schlichter and Kraemmergaard 2010). Traditional ERP database design focuses on the needs of organizations, however, database design in Big Data and IoT requires a more comprehensive approach that includes more fully the needs, and perspectives of end-users. In fact, much of ERP practice and research has assumed a passive – if not minimal - role of end-users in organizational databases. Consequently, little research examines – from an IS perspective – how end-users capture, organize and synthesize their own data, and how this involvement can influence organizational database design. Based on these issues, the purpose of this paper is to propose a Personal Resource Planning (PRP) approach to end-user centered database design and schema in Big Data and IoT settings. To this end, we conduct an extended case study on a research project, the Hub-of-all-Things (HAT). The HAT is the first-ever personal data platform specifically created to exchange individuals' own data for services in a structured manner (Hub-of-all-Things 2015). In this context, we examine end-user privacy and data security issues facing developers who design databases for Big Data and IoT settings. Our findings suggest that database developers mitigate vulnerabilities and potentialities related to end-user data by taking a PRP approach to database design. Rather than assuming passive or absent end-users according to the traditional ERP approach, the PRP approach encourages active end-user participation in data

configuration through data contextualization. Data contextualization occurs when end-users insert their uniquely defined contextual parameters into the database architecture and cluster data points according to events and situations in their personal lives. These “contextual” parameters are based on end-user defined events (e.g., heart rate of a triathlete while running on a hot day). Data contextualization inherent in the PRP approach contrasts the traditional “acontextual” approach in which millions of isolated data points are extracted from the end-user contexts; the acontextual approach precipitates data analysis solely of specific persons, objects or traits (e.g., heart rate only). We find that enabling end-user participation in this way can generate fruitful database queries and mitigate end-user privacy issues by cultivating peer-to-peer (or, actor to actor) data exchange possibilities and extend traditional database schema beyond strict organization-to-end-user interactions.