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Abstract

Due to innovation and technological improvements, organizations can now capture and store massive amounts of data from various sources and domains. This increase in data volume resulted in traditional tools used for processing, storing, and analyzing big data becoming increasingly inefficient. Grounded in the Extended Technology Acceptance Model (TAM2), this qualitative multiple case study explored the strategies data managers use to transition from data warehousing to big data technologies. Participants included data managers from organizations based in Munich, Germany. Four major themes emerged. Organizations can use these findings to implement best practices for successful big data implementations as well as improve products and services offered.

Doctoral Capstone

Problem

Because of the limitations in DW technologies to process unstructured data and limited knowledge in big data technologies (Coleman et al., 2016), data managers are having problems transitioning to big data technologies from DW technologies (Bansal & Rana, 2014). Due to the limitations in DW technologies to handle and process high volumes of data (Win & Thein, 2015), coupled with the lack of support for evolving business needs like support of real-time and ad-hoc customer analytics, 40-50% of DW initiatives have ended in failure (Asrani & Jain, 2016; Kimpel & Morris, 2013).

- The **general IT problem** is that limited knowledge in big data technologies is negatively affecting IT performance and efficiency in organizations.

- The **specific IT problem** is that some data managers lack strategies to transition to big data technologies from DW technologies.

Purpose

The purpose of this qualitative multiple case study was to explore the strategies data managers use to transition to big data technologies from DW technologies.

Significance

Over the last decade or further even back, over 60% of Data Warehouse initiatives have either failed or have been discontinued. Big data can be a transformative, knowledge and wealth-creating force like the 19th century focus on oil. So understanding the strategies to transition to big data from data warehouse technology may have a positive impact on the practice of IT.

Transitioning to big data technologies may help in facilitating information exchange by providing new interactive platforms designed to connect citizens and service users with organizations that are conducting interventions or representing their needs.

Theory or Framework

The TAM2, which is an extension of the TAM, was originally conceived by Fred Davis in 1986 and considered in the literature as the most influential extensions of the theory of reasoned action (TRA; Fayolle & Liñán, 2014).

TAM2 depicts the impact of three social influence processes—**subjective norm**, **voluntariness**, and **image**—as influencing an individual's decision to adopt or reject a system (Ramírez-Correa, Mariano-Melo, & Alfaro-Pérez, 2019; Yoon, 2018).

TAM2 also reflects the influences of four cognitive instrumental processes—**job relevance**, **output quality**, **result demonstrability**, and **perceived ease of use**—that technology users use for assessing the match between essential or critical work objective and their perception of the usefulness of the technology (Marangunić & Granić, 2015).

Relevant Scholarship

Between 40-50% of data warehouse initiatives have ended in failure (Asrani & Jain, 2016; Kimpel & Morris, 2013) due to the technological limitations in traditional data warehouses.

The development of technologies like Apache Hadoop has enabled organizations of various sizes and from different sectors to capture and analyze an unprecedented amount of datasets (Chen, 2015; Elgendy & Elragal, 2014).

Because technology has become more accessible and data more available in massive amounts, most organizations understand they can get significant value from data by applying analytics to it. (Wang, Gunasekaran, Ngai, & Papadopoulos, 2016)

Research Question

What strategies do data managers use to transition to big data technologies from DW technologies?

Participants

The participants consisted of data managers located in Germany who have successfully transitioned to big data technologies from data warehousing technologies. Census sampling was incorporated into participant selection.

Characteristics	Descriptive Information
No. of Sites	6
Geographic Location	Munich, Germany
No. participants	10
Participants titles	CTOs, Data Managers, Senior Data scientists,
No of Documents reviewed	15

Procedures

I developed 7 interview questions including follow-up questions to support the rich exploration of lived experiences of data managers as they transitioned to big data from DW technologies

All 10 study participants participated in semi-structured, in-person interviews and answered all interview questions including follow-up questions. Each interview lasted between 40 – 55 minutes and follow-up interviews between 10 -15 minutes. I also reviewed supportive organizational documentation.

Analysis

After each interview, member checking was conducted. The interviews were transcribed and loaded into NVivo for analysis.

Data analysis including analysis of the transcribed interviews as well as organization documents. The analysis revealed themes and augmented my understanding of successful transition strategies.

Findings

The Themes that emerged from the data analysis included:

Theme	Brief Description
Identify Business Need – Use Case	organizations need to identify their business needs (use case) before embarking on the big data transition process.
Identify Data Sources	Identifying all potential data sources is critical for a successful transition to big data technologies
Top Management or Executive support	Embarking on a big data transition project from DW not only requires technical skills and commitment from all stakeholders but most importantly executive involvement to provide strategic leadership in terms of communication and project execution.
Create a Data Lake – Big data in the Cloud	an organization aspiring to transition to big data technologies from DW technologies should start by creating or using a data lake offering from the cloud.

Interpretation

Apart from adding to existing knowledge in scientific research and literature in the field of big data, the results from this study could serve as a premise to raise awareness in support of developing effective strategies and policies to transition from traditional DW technologies to big data technologies.

Limitations

This study was only limited to exploring strategies data managers use to transition to big data technology from traditional DW technologies without considering any security and privacy implications for the data owners.

Recommendations

For Senior Leadership

- Understand that gone are the days where having more expensive and powerful machines or computer hardware gave you a competitive edge and view their data (structured and unstructured) not just as random storage, but as an asset.

- As such, clarify strategic objectives that highlight goals and desired outcomes and secure necessary resources to meet those goals as far as using their data asset to increase or maintain their competitive advantage.

For Organizations

- Undergo a cultural change and be willing and open to using new technologies

- Implement new processes and explore new business models.

For Future Research

- Investigate the appropriate privacy and access control policies to be enforced to ensure big data usage does not infringe on the privacy of data owners and is used only for legitimate purposes.

Social Change Implications

An implications for positive social change is that data managers and organizational leaders might use the research findings to optimize their data management strategies and implementation decisions which will have a significant benefit to consumers using their services.

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