

Fujitsu Lab Magdeburg

SAP Landscape Optimization through Big Data Analytics

Statistical analyzes and predictions can help optimizing SAP system operations

Research Project Overview

Although outsourcing is a viable instrument to save operational costs, the majority of ERP systems is still operated in-house due to privacy, security and dependency concerns coupled with ERP's exceptional significance for business continuity. Within a current research project, the Fujitsu Lab Magdeburg designed an alternative option to classical in-house or off-premises operation models that enables fully controlled in-house operation with cloud-supported performance analyses. Therefore, 230 million performance log entries of about 8,700 SAP systems have been analyzed and evaluated with respect to their suitability for a value creating Big Data scenario. Integrating performance data and hardware information of ERP systems enables cross-system analyses and delivers additional knowledge to ERP operating IT departments through a web service. Making use of this

unique knowledge base through statistical analyses and mathematical prediction models, brings Fujitsu and its customers closer to the original motivation for the ongoing research collaboration – innovative and efficient self-optimizing operations.

Using predictive analytics of performance logs, Fujitsu offers most valuable and reliable decision support to their SAP customers.

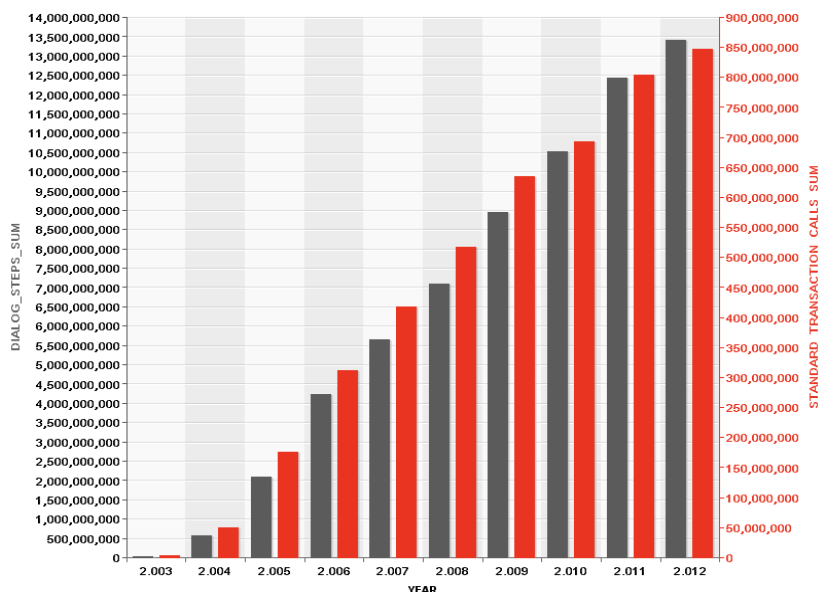
Measuring the SAP World

Fujitsu is a major provider of integrated infrastructure solutions for SAP customers. For decades, Fujitsu measured and benchmarked SAP systems of all conceivable and often

heterogeneous configurations. The Fujitsu "SystemInspection service" analyzes operational SAP IT infrastructures on various levels of granularity, ranging from system performance bottlenecks to the quality of single dialog steps. Fujitsu's experience on SAP system analyses enabled the Fujitsu Lab Magdeburg to investigate SAP system performance logs and to design and develop a prototype within an ongoing research collaboration between Fujitsu and the Magdeburg Research and Competence Cluster.

Big Data on SAP Performance

SAP system performance can be monitored by analyzing statistical records, which are written for each user action and contain various metrics, such as response and request times. When adding additional knowledge about hardware capacity, utilization and software configurations, and integrating information from different sources, statistical analyses can be performed – resulting in a Big Data scenario, defined by three Vs: Volume, Variety and Velocity. Thus, a huge and rapidly increasing amount of monitoring data from different SAP systems needs to be analyzed. The Figure on the left shows the increasing amount of dialog steps (grey) and standard transaction calls (red) inside the Fujitsu SAP knowledge base. Based on millions of statistical records, prediction models can be trained and system comparisons can be made; in turn, its results are beneficial for every single customer who contributes to the knowledge base and, in this way, supports our overarching goal of highly efficient and self-optimizing operations.

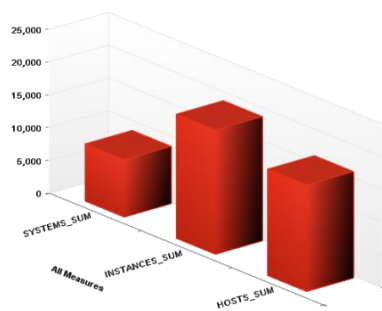


Prototype Development

In order to benefit from statistical analyses of SAP performance logs in terms of valuable and reliable decision support, the Fujitsu Lab Magdeburg cleaned and imported SAP monitoring data, gathered from more than 18,000 SAP instances (see Figure on the bottom) into one single source of truth. Using in-memory technology, provided by three SAP HANA database servers as part of a Fujitsu FlexFrame infrastructure, data is available for rapid analyzes and results can be presented through the integrated web server. We are highly confident that our designed analytical toolset can help customers to optimize their SAP operations, thus, a prototype that delivers knowledge directly through a web service, was developed by the Fujitsu Lab Magdeburg (see Figure on the right). It addresses use cases such as continuous benchmarking, hardware mining, performance predictions, SAP HANA migration checks and energy management of SAP systems. The following sections briefly introduce some of these previews of the lab's research results.

Continuous Benchmarking

To increase the efficiency and effectiveness of IT processes and services, according to ITIL, a continual service improvement needs to be implemented. Only 37% of recently surveyed companies (Gadatsch et al.) perform permanent benchmarking for IT, usually due to its complexity. By



means of the developed prototype, customers can easily log in to their benchmarking section and compare key performance indicators of their own SAP systems with average, best or worst values of anonymized other systems.

Hardware Mining

Within a three-step sizing approach, the developed prototype enables SAP system administrators to identify critical transaction response times and to choose a desired target value from a possible range of response times. Based on an empirical distribution function across the strong and widespread database, hardware configurations and monitored parameters of systems, which frequently fulfill the intended performance, are presented.

SAP HANA Migration Check

SAP HANA currently is attracting significant interest from various industries. IT departments evaluate the potential of migrating their business warehouse and ERP systems to the SAP HANA platform to benefit, among others, from performance boost. The Fujitsu Lab Magdeburg developed an algorithm that calculates for any SAP system the amount of currently used processing time which can potentially benefit from SAP HANA. Based on an analysis of the individual transaction usage profile of a customer and publicly available information on SAP HANA-optimized transactions, a guide value is determined. In case of performance gains that are expected to affect a significant amount of system users, a proof-of-value service can be offered, which verifies the actual benefit. Fujitsu uses what it sells, so when Fujitsu itself faced this strategic decision, the Fujitsu Lab Magdeburg contributed analyses of actual used SAP transactions inside one of Fujitsu's productively used SAP systems.

Outlook: Predictive Performance

Response times of SAP system dialog steps depend on a variety of influencing factors that range from the dialog step complexity, system utilization and hardware characteristics up to the system release. In a current research project, the Fujitsu Lab Magdeburg builds a prediction model, which is based on classification and regression trees and can be used for simulating alternative system and landscape setups with respect to the resulting performance.



About Fujitsu

Fujitsu is one of the largest IT-Service providers worldwide with its headquarters in Japan. Founded in 1935 the company supports customers in over 100 countries with approximately 162.000 employees. Fujitsu's core business is centered on information and communication technology based solutions, products, devices and services.

About the Fujitsu Lab Magdeburg

The Fujitsu Lab Magdeburg is a research laboratory and belongs to the Magdeburg research association MRCC. It was founded in September 2012 with a focus on innovation projects with its industry partner to investigate in practical relevant research topics.

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