

Chapter 12

Enterprise Tomography: An Efficient Approach for Semi- Automatic Localization of Integration Concepts in VLBA

Jan Aalmink

Carl von Ossietzky University Oldenburg, Germany

Jorge Marx Gómez

Carl von Ossietzky University Oldenburg, Germany

ABSTRACT

Enterprise tomography is an interdisciplinary approach for an efficient application lifecycle management of enterprise platforms and very large business applications (VLBA). Enterprise tomography semi-automatically identifies and localizes semantic integration concepts and visualizes integration ontologies in semantic genres. Especially delta determination of integration concepts is performed in dimension space and time. Enterprise tomography supports software and data comprehension. SMEs, large scaled development organizations and maintenance organizations can benefit from this new approach. This methodology is useful for tracking database changes of business processes or coding changes within a specific domain. In this way root cause analysis is supported.

INTRODUCTION

This chapter covers an interdisciplinary approach for an efficient Application Lifecycle Management of Very Large Business Applications (VLBA) and Enterprise Platforms.

To be more precise, Enterprise Tomography is primarily seen as a new methodology for supporting distributed software engineering teams in their incremental business development tasks and during

their enterprise software maintenance phases. We regard enterprise software along with its meta-data, business data and contextual data as an abstract information source. In this extended abstract data universe our approach semi-automatically identifies semantic coherent entities of interest. We propose an algorithm for tracking the changes in this data universe in the dimension time and space. In contrast to Web 2.0 search engines, we apply advanced indexing techniques. To meet developers and maintainers needs to the greatest extent possible, we take integration ontology extraction

DOI: 10.4018/978-1-60566-856-7.ch012

algorithms into consideration, enable controllable domain-specific indexing, apply delta analysis based on indices and visualizes search results of the Delta-Operator in semantic categories. Furthermore, Enterprise Tomography includes sharing of integration knowledge from individual integration experts across the enterprise development and maintenance community.

In Enterprise Software Industry development and maintenance of VLBA and Enterprise Platforms is getting more and more complex. Large and distributed teams are involved, teams are changing and division of labor proceeds. Agile development methods assume efficient development and maintenance means for software and business data evaluation.

Without knowing the semantic integration of enterprise software it is inherently difficult to control and orchestrate large scaled development and maintenance processes. Domain-specific enterprise integration knowledge, coded in enterprise software, is normally not instantaneously available for development teams. Lack of precise knowledge of integration concepts in development and maintenance phases results in erroneous software, is risky and might have negative business impact for both the software manufacturer and the consumer.

In this paper we present a semi-automatic environment for Application Lifecycle Management of VLBA and Enterprise Platforms based on enhanced standard scientific algorithms. In accordance with medicine diagnostics, we utilize the metaphor Enterprise Tomography for scanning, indexing, identifying, visualization and delta visualization of enterprise integration knowledge containing in enterprise software conglomerates. Based on the results of the Enterprise Tomograph the operating teams are in the position to make efficient decisions and have a reliable foundation for incremental steps of the development and maintenance life cycle.

The Enterprise Tomograph represents a central ecosystem for sharing domain specific integra-

tion knowledge across the development teams. Because of sharing and socializing of integration knowledge across SCRUM teams, the Enterprise Tomography approach can be incorporated in the Enterprise 2.0 initiative.

In the research area VLBA (Very Large Business Applications) located within business informatics, Application Lifecycle Management is the center of attention (Grabski, et. al, 2007). A real life VLBA, in dimension time, is in a permanent flux: Gradual development to meet business requirements, continuous improvements to exploit innovation, continuous maintenance to keep consistent business processing, horizontal connection of software systems to scale data processing and to extend business scope, recombination of loosely coupled services to exploit new business functionality, re-configuration and personalization, data evolution resulting from service calls and business transactions and background processing, just to name a few.

VLBA are not usually built from scratch and deployed in an immutable stadium (Opferkuch, 2004; Ludewig & Opferkuch, 2004). VLBA are not monomorphic. Some of the characteristics of VLBA are: Complexity, a long life-cycle, huge continuous development and maintenance efforts, large user groups, inter- and intra-enterprise coupling.

Today, in business reality, VLBA are conglomerates of inter-operating software systems. Technical and semantic integration are the 'DNA' of a VLBA. Integration can cross both system and system boundaries. In this chapter we want to propose and outline a generic algorithm that makes this VLBA integration visible and tangible from different perspectives in different semantic genres. Moreover, a delta operator is supposed to make the integration difference between points of time t_0 and t_1 visible. Having in mind that VLBA consist of heterogeneous constituents, we need to have an abstract holistic view on the normalized integration aspects. Beyond software, we also take persistent data, meta data, system logs, business

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