

## Chapter 1.10

# 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

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

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 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's 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's 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 integration 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's are not usually built from scratch and deployed in an immutable stadium (Opferkuch, 2004; Ludewig & Opferkuch, 2004). VLBA's are not monomorphic. Some of the characteristics of VLBA's 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's 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

18 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/enterprise-tomography-efficient-approach-semi/48539](http://www.igi-global.com/chapter/enterprise-tomography-efficient-approach-semi/48539)

## Related Content

---

### Whole-of-Enterprise Approach to Government Architecture Applied for Implementing a Directive of EU

Ivo Velitchkov (2012). *Enterprise Architecture for Connected E-Government: Practices and Innovations* (pp. 247-261).

[www.irma-international.org/chapter/whole-enterprise-approach-government-architecture/67025](http://www.irma-international.org/chapter/whole-enterprise-approach-government-architecture/67025)

### Security Engineering: It Is All About Control and Assurance Objectives

Ronda R. Henning (2006). *Enterprise Information Systems Assurance and System Security: Managerial and Technical Issues* (pp. 168-181).

[www.irma-international.org/chapter/security-engineering-all-control-assurance/18387](http://www.irma-international.org/chapter/security-engineering-all-control-assurance/18387)

### Relationship among Project Management Processes and Knowledge Repository for Project Success

Samer Alhawari (2016). *International Journal of Enterprise Information Systems* (pp. 16-30).

[www.irma-international.org/article/relationship-among-project-management-processes-and-knowledge-repository-for-project-success/167634](http://www.irma-international.org/article/relationship-among-project-management-processes-and-knowledge-repository-for-project-success/167634)

### Developing and Customizing Federated ERP Systems

Daniel Lübkeand Jorge Marx Gómez (2009). *International Journal of Enterprise Information Systems* (pp. 47-59).

[www.irma-international.org/article/developing-customizing-federated-erp-systems/37200](http://www.irma-international.org/article/developing-customizing-federated-erp-systems/37200)

### Interoperability Middleware for Federated Business Services in Web-Pilarcos

Lea Kutvonen, Toni Ruokolainenand Janne Metso (2007). *International Journal of Enterprise Information Systems* (pp. 1-21).

[www.irma-international.org/article/interoperability-middleware-federated-business-services/2113](http://www.irma-international.org/article/interoperability-middleware-federated-business-services/2113)