

Universität Heidelberg
Institut für Informatik
Arbeitsgruppe Datenbanksysteme

Bachelor-Arbeit

Messaging Architecture for Integration of Customer Self-Services

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| Name: | Jonas Gann |
| Matriculation number: | 3367576 |
| Supervisor: | Prof. Dr. Michael Gertz |
| Date of submission: | October 7, 2020 |

I assure that I have written this bachelor thesis on my own and only used the specified sources and resources and that I followed the principles and recommendations "Responsibility in Science" of the University of Heidelberg.

Date of Submission: October 7, 2020

Zusammenfassung

Abstract

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1 Introduction

1.1 Motivation

1. Example(s) of CSS Problems Today
 - a) CSS incomplete in governmental administration
 - i. identity card renewal
 - ii. change of home address
 - iii. change of residency status
 - b) CSS incomplete in universities
 - i. transfer of profile: grades, certificates, etc. between universities
 - ii. applications in general (study place, semester abroad, ...)
 - c) CSS different for each enterprise / organization
 - i. multiple identities
 - ii. multiple profiles => addresses, phone numbers, mail address
 - iii. time consuming to manage same information in all systems
2. Solution for CSS Problems
 - a) One CSS providing company, which integrates multiple / all EA
 - b) One identity, profile, address, phone number, location, ...
 - c) Easy management of identity used by multiple enterprises / organizations
3. Why is integration necessary?
 - a) Each enterprise / organization has its own identities, profiles, etc. in multiple systems
 - b) The CSS providing company needs to manage those systems / data of each enterprise / organization
 - c) Enterprise Integration solves this Problem

1.2 Goals of the work

1. What are challenges of integration?
 - a) Heterogeneous Enterprise Architecture Systems
 - i. Different Applications
 - ii. Different Application Vendors
 - iii. Different / No Application Interfaces
 - iv. Legacy Systems
 - b) Different (proprietary) data models within and between Enterprises and Organizations
 - i. Different (property)name for same data objects (syntactic integration)
 - ii. Different meanings for same (property)name (semantic integration)
 - c) Stability of Integration
 - i. Future Changes of EA
 - ii. Scalability
 - iii. Failure of EA or Integration Components
 - d) Scarce Resources
 - i. Integration Development Speed
 - A. Necessary Development \Leftrightarrow Reuse of existing Technology
 - B. Complexity / Size of Integration
 - ii. Maintenance of finished Integration
 - iii. Hardware / Software Costs of Integration
 - A. Licenses for Software
 - B. Scalability of Integration \Rightarrow Necessary Computing Power
2. How does the thesis solve the problems?
 - a) Messaging Integration
 - i. Loose Coupling
 - A. Loose Coupling simplifies adaption to changing EA \Rightarrow simpler Maintenance
 - B. Loose Coupling simplifies integration of new EA systems \Rightarrow integration of heterogeneous EA

- C. Loose Coupling allows Reuse of "Modules" => faster development
- ii. Messaging enables communication with many systems through Adapters
- iii. Messaging provides mechanisms for Stability
 - A. Store-and-Forward
 - B. Load Balancing
- b) Integration Patterns
 - i. Patterns speed up construction of Integration Architecture
 - ii. Patterns are proven solutions
 - iii. Patterns abstract from concrete technologies
 - A. Simplifies understanding of integration concept
 - B. Allows implementation with different technologies

1.3 Structure of the work

2 Foundation and related work

2.1 Customer Self-Service

1. What is CSS
 - a) Definition in the context of the thesis
2. How to document CSS-Scenarios
3. List of CSS-Scenarios
4. Purpose of CSS-Scenarios in the thesis
 - a) Finding relevant EAPs
 - b) Requirement analysis of business Connector
 - c) Interface definition of business connector

2.2 Architecture Patterns

1. What is an EAP
 - a) Definition
 - b) Metadata
 - c) Views
 - d) Architecture bricks
 - e) Data bricks
 - f) Business processes
2. Purpose of an EAP in this context
 - a) Basis for real-life enterprise architectures
 - b) Provides architecture and data bricks the integration can build up on
3. Short description of EAPs in the book

4. Patterns relevant for CSS
 - a) Derived by comparing CSS-Scenarios with business processes
5. Relevant Architecture bricks and data bricks for CSS-Scenarios
6. How to document relevant bricks for usage of the integration Architecture
7. Documentation of relevant bricks
8. List of requirements regarding the integration Architecture
9.
 - a) Adapters for systems
 - b) Required Format of incoming data

2.3 Business Connector

1. What is a business connector?
 - a) Provides functionality of "external" service provider
 - b) Purpose is to simplify integration
 - c) Can be assumed to provide sufficient interfaces
2. Purpose of business connector in context of the thesis
 - a) Provides interface for CSS functionalities
 - b) Should be integrated in architecture and data bricks
3. How to document the business Connector in this context
 - a) List of provided functionalities along with their interfaces
 - i. Derived from CSS-Scenarios
 - ii. Derived from IDAS Connector
 - b) List of requirements regarding the EA
 - i. Access to architecture and data bricks
 - c) List of requirements regarding the integration Architecture
 - i. Format of data
 - ii. Order of delivery
 - iii. Time relevance of data
 - iv. Guaranteed delivery of data

2.4 Integration Patterns

1. What are Integration Patterns?
 - a) Messaging Methodology
 - b) Patterns describe often solved messaging problems
2. What is their purpose in this context
 - a) Already explained in Motivation?
3. Description of Patterns later used in the integration architecture

3 My contribution

3.1 Overview

4 Experimental evaluation

5 Summary and outlook

Bibliography