Universität Heidelberg
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Bachelor-Arbeit

Messaging Architecture for Integration of Customer Self-Services

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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.

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Zusammenfassung

Abstract

Contents

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 <=> 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 => 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 => simpler Maintenance
            B. Loose Coupling simplifies integration of new EA systems => 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