University of Heidelberg

Institute for Computer Science

Working group database systems

Bachelor thesis

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

1.1.1 Evolution of digital Customer Self-Service

1. Increasing consumer standards

    a) Passwordless sign in

    b) instant updates

2. New regulations

    a) DSGVO

    b) Onlinezugangsgesetz

    c) DVG (eAU, eRezept)

    d) psd2

1.1.2 CSS as a Service

1. Enterprises can offer CSS service, satisfying modern requirements and regulations

1.1.3 Service Integration

1. The provided CSS service has to be integrated into existing enterprise architecture

1.2 Goals of the work

Solution for integration challenges

1. Heterogeneous Enterprise Architecture Systems

    a) Different Applications

    b) Different Application Vendors

    c) Different / No Application Interfaces

    d) Legacy Systems

2. Different (proprietary) data models within and between Enterprises and Organizations

    a) Different (property)name for same data objects (syntactic integration)

    b) Different meanings for same (property)name (semantic integration)

3. Stability of Integration

    a) Future Changes of EA

    b) Scalability

    c) Failure of EA or Integration Components

4. Scarce Resources

    a) Integration Development Speed

        i. Necessary Development $<=>$ Reuse of existing Technology

        ii. Complexity / Size of Integration

    b) Maintenance of finished Integration

    c) Hardware / Software Costs of Integration

        i. Licenses for Software

        ii. Scalability of Integration $=>$ Necessary Computing Power

1.3 Structure of the work

2 Foundation and related work

2.1 Customer Self-Service

1. Definition in the context of the thesis

2. Purpose in Thesis

3. Overview of CSS-Scenarios found in literature

2.2 Architecture Patterns

1. Definition

2. Purpose in Thesis

3. Explanation of used Patterns

2.2.1 Business Connector

1. Definition in context of the thesis

2. Purpose in Thesis

2.3 Messaging Patterns

1. Definition

2. Messaging

   a) Answer: Why is messaging used?

3. Patterns

   a) Answer: Why are patterns used?

4. Explanation of used patterns

3 Groundwork

3.0.1 CSS-Scenarios

1. Categorization of Scenarios

2. Combining similar scenarios (into a more general one)

3. Prioritization

4. ToDo: How to document?

5. Documentation of final list

3.0.2 Enterprise Architecture

1. Architecture- and Data bricks

    a) Selection of EAPs relevant for CSS

        i. Derived by comparing CSS-Scenarios with business processes

    b) Evaluation of Architecture bricks and data bricks of EAPs relevant for CSS-Scenarios

    c) Documentation of resulting Architecture and data bricks

2. Requirements of Enterprise Architecture

    a) List of requirements towards the integration Architecture

        i. Adapters for systems

        ii. Required Format of incoming data

3.1 Business Connector

1. How to document the business Connector

2. List of provided functionalities along with their interfaces

  a) Derived from CSS-Scenarios

  b) Derived from IDAS Connector

3. List of requirements regarding the EA

  a) Access to architecture and data bricks

4. List of requirements regarding the integration Architecture

  a) Format of data

  b) Order of delivery

  c) Time relevance of data

  d) Guaranteed delivery of data

4 Integration Architecture

4.1 Overview

4.2 Requirements

1. Requirements of Enterprise Architecture

2. Requirements of Business Connector

3. Requirements of Integration System

4.2.1 Requirements of Enterprise Architecture

4.2.2 Requirements of Business Connector

4.2.3 Requirements of Integration System

4.3 Scenario Integrations

1. Look at integration architecture for each CSS-Scenario

4.3.1 Integration Architecture Documentation Method

1. Entity Diagram(s)

2. Flow Diagram(s)

3. etc.

4.3.2 Scenario1

1. Description of Scenario

Scenario1 Integration Architecture

1. Entity Diagram(s)

2. Flow Diagram(s)

3. etc.

System Integration

1. Explanation how the systems are integrated

2. Why was each pattern used?

3. How are requirements met?

Data Integration

1. Explanation how the data objects are integrated

2. Why was data transformed / mapped?

3. How are requirements met

4.3.3 Scenario2

Scenario2 Integration Architecture

System Integration

Data Integration

5 Evaluation

5.1 Technological Evaluation

5.1.1 Available Messaging Technologies

5.1.2 Implementation of Integration Architecture

5.1.3 Evaluation of result

5.2 Experimental Evaluation

5.2.1 Customer Example

5.2.2 Application of Integration Architecture

5.2.3 Evaluation of result

5.3 Operation Manual

1. Guide on how to implement and deploy the integration architecture

2. incorporates results of previous evaluations

6 Summary and outlook

Bibliography