Service Oriented Computing (CSC 4222)

Assignment 4 – Sri Tel - New Customer Experience

1. Objective

The primary objective is to implement a technology solution based on the knowledge and understanding of middleware architectures and related technologies to realise a prototype solution for a given business scenario.

2. Introduction

This assignment should be completed as a group effort. The objective is to stimulate collective work in realising a solution based on the knowledge and understanding of middleware architecture and related technologies. All teams are given the same scenario to model the solution. The solution should be implemented using open-source technologies. You can find many open-source tools and frameworks that contain standard components to create SOAP/JSON-RESTful services, configure service orchestrations (Enterprise Service Bus technology), publish-subscribe message brokers, registry services, micro-services frameworks and persistence. Teams can use any of these available technologies to arrive at the most suitable architecture to implement a solution for the given business scenario.

3. Duration and Team Composition

The duration for the assignment is **6 weeks** and should be done in teams of **2-3 students**.

4. Submission Guidelines

The submission should comply with these three guidelines. The source code, documentation and the presentation screencast should be emailed to crc@ucsc.cmb.ac.lk.

1. The **Solution Documentation** should be submitted in PDF format. The index number of each group member who contributed should be stated in the documentation.

2. The **Source Code** of the solution should be compressed and submitted together with the project documentation.

3. **Presentation of the solution** – An overall presentation (less than 10 minutes) of the proposed solution architecture and technology should be recorded as a screencast and uploaded to the VLE. The presentation should primarily focus on a detailed description of the solution architecture, the rationale for the amalgamation of the architectural patterns to solve the overall solution and a brief functional demo. The screencast presentation

should be voiced/narrated by the team members.

5. Evaluation Guidelines

The evaluation of the assignment would be done based on the following criteria.

1. **Evaluation of the solution documentation - The documentation should cover the following aspects.**

    a. Introduction to the solution.

    b. The architecture of the solution – conceptual and implementation architectures to be drawn and discussed. Propose 2 alternative architectures that could be used to implement the solution and state the rationale for using the proposed final architecture for the implementation.

    c. The Architectural Patterns used in the solution. You should also describe the Integration Patterns that were used to connect the components of the overall architecture. Describe the rationale for selecting the proposed Architectural and Integration Patterns.

    d. List the information security considerations taken during the design and implementation of the solution.

2. **Evaluation of the solution through a group presentation.**

    a. The group members should use a voiced/narrated screencast video to describe the aspects described in section (1) above.

    b. Each member of the group should participate in the presentation.

6. Assignment Scenario: Sri Tel Ltd (STL)

Sri Tel Ltd (STL), is a Sri Lankan-based Telecommunication company offering mobile communication services to the citizens of Sri Lanka. It offers GSM/3G/4G/LTE-based services related to voice and data. STL is the latest entrant to an already saturated telecommunication market and is on the lookout for any opportunities to increase its market share. The senior management of STL has decided to focus primarily on improving customer care and customer experience to attract new customers. One of the initiatives for realising this plan is to provide a state-of-the-art Internet-based Customer Care Web Portal(thin-client) and Smartphone Apps(iOS and Android) for customers to configure and pay for their services.

The newly conceptualised Portal and Apps are to be branded as "Sri-Care". Any existing customer of STL should be able to create an account and log into the portal/App. A new account could be created by any existing customer. A simple and secure methodology for online Account Creation/Registration should be proposed, which should exclude interaction with STL service staff for assistance (i.e. Account creation should not contain any manual steps). There should also be a simple and secure method for recovering and changing user passwords in the solution.

STL management has identified that most customer frustrations were related to bill payments, activating of services (VAS - Value Added Services, Voice, Data) and uninformed service disconnections due to delays in bill payments. Hence, the new solution should facilitate suitable functionalities to remedy these drawbacks. Some of the high-level functions of the expected solution are as follows:

1. Activating and deactivating Telco services – e.g. International Roaming service when travelling abroad, Ring-in Tone personalisation, data top-ups and activating other VAS services.

2. View current and past bills.

3. Pay for bills online using credit and debit cards.

4. Receive email/SMS/Push alerts on bills, service issues, disconnections, etc. The volume of alerts during monthly pre-paid bill generation would be high, hence, a proper method to deliver notifications based on "best effort", without hindering the primary functions of the solution should be architecturally selected.

5. Chat online with customer care agents to resolve problems. The proposed architecture should facilitate instant messaging that would require customer care agents and customers to chat over a longer period.

It should be noted that activation and deactivation of services happen in the telecom network switching elements. However, STL has already implemented a best-of-the-breed Provisioning System from an international telecom vendor. This Provisioning System performs the overall communication with the network elements while exposing a simple RESTful interface to the external applications. Further, an external Payment Gateway should be selected and integrated to accept Credit and Debit card transactions. Assume that the Provisioning System and the Payment Gateway expose services in a RESTful manner. You are only expected to implement a minimal prototype of the solution to mock up the functionality of the Provisioning and Payment Gateway services. The architecture should scale and accommodate the implementation of self-care functionalities using smartphone applications on iOS and Android platforms and the Web Portal. Business logic should be implemented in a manner that can be commonly consumed by both Web Portal and Smartphone Apps.

The above scenario should be implemented and documented using suitable technology preferred by each group. Any assumptions taken should be stated in the documentation. The presentation tier of the solution needs to only reflect the functional aspect of the solution, hence, extensive effort on UX/UI refinements is not expected. The implementation of the chat functionality is not essential, however, the architectural aspect of implementing the chat module should be clearly described in the solution documentation.