SAI Final Assignment:

Business Travel Booking System

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# 1. Introduction

In this assignment you will integrate a system of several applications for getting booking offers for business trips of Fontys employees. This system is used to gather booking offers from several travel agencies when employees travel abroad for their work. The whole scenario for the Business Trip Booking system is shown in Figure 1.

The **Booking Client** application sends a *ClientBookingRequest* which has the following data: (1) the name of the origin international airport, (2) the name of the destination international airport, and (3) the number of employees who will travel (e.g., from Schiphol to Heathrow for three passengers). In addition, a booking request may also include a transfer from the destination airport to a specific address (e.g., transfer from Heathrow to address 30 Portman Square, London).

The *ClientBookingRequest* is then forwarded to the **Travel Agency** applications as an *AgencyRequest*. The *AgencyRequest* contains the same airport names from the original *ClientBookingRequest*. However, if a transfer is necessary, the *AgencyRequest* contains the transfer distance in kilometres. This distance is calculated by the Google Maps Distance Matrix Api as the distance between the destination airport and the transfer address from the *ClientBookingRequest.*

Each *AgencyRequest* is forwarded to the three travel agencies applications according to following rules:

|  |  |
| --- | --- |
| travel agency application | processes AgencyRequest |
| Book Cheap | The booking includes a transfer between 10 km and 50 km. |
| Book Good Service | The booking is either without a transfer, or it includes a transfer not longer than 40 km. |
| Book Fast | The booking does not include a transfer. |

Each travel agency application sends back *AgencyReply* containing the name of the agency and the offered total price for this business trip (i.e., the total price for airplane tickets and transfer for all employees). For each *ClientBookingRequest*, the Booking Client application finally receives a *ClientBookingReply,* which contains the offer of the agency which offered the lowest total price.



Figure 1. The Business Trip Booking integration system

# 2. Start-up Code

Download the following from the SharePoint:

* **“booking\_client.zip”**: Startup code for the Booking Client application with the frame and model classes (*ClientBookingRequest*, *ClientBoorkingReply* and *Address*). Note that the frame is made in NetBeans.
* **“travel\_agency.zip”**: Startup code for three travel agencies applications (Book Cheap, Book Fast and Book Good Service). The code contains the frame and model classes (*AgencyRequest* and *AgencyReply*). Note that these forms are made in NetBeans.
* **Tip about “google distance”**: You cannot download this ☺. You can retrieve the distance between the origin and destination from Google Maps Distance Matrix API. The classes you downloaded can be used to de-serialize the result of the Google Maps Distance Matrix API. You can access this API as a RESTfull service like this: <https://maps.googleapis.com/maps/api/distancematrix/xml?origins=Heathrow+Airport&destinations=30+Portman+Square+London>.

# 3. Assignment

This assignment is made in groups of two students. The mark you get for this assignment is between 1 and 10, and this will be your mark for the Software Applications Integration (SAI) course.

Implement the Business Travel Booking integration system as described in this document. You should make use of the following integration patterns:

* Message Broker
* Correlation Identifier (for asynchronous request-reply communication with JMS),
* Return Address (for asynchronous request-reply communication with JMS)
* Messaging Gateway
* Chained Gateways
* Content-Based Router,
* Content Enricher,
* Recipient List,
* Aggregator,
* Scatter-Gather,
* Channel Adapter,
* Guaranteed Deleivery, and
* Re-delivery.

# 4. Grading Criteria

SAI grades will be determined based on implemented Application Integration Patterns in the following way:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | SAI grades | | | | |
|  | 6 | 7 | 8 | 9 | 10 |
| The system works correctly with one agency application | x | x | x | x | x |
| Message Broker | x | x | x | x | x |
| Correlation Identifier | x | x | x | x | x |
| Return Address | x | x | x | x | x |
| Messaging Gateway | x | x | x | x | x |
| Chained Gateways | x | x | x | x | x |
| Content-Based Router |  | x | x | x | x |
| Content Enricher |  | x | x | x | x |
| The system works correctly with three agency applications |  |  | x | x | x |
| Recipient List |  |  | x | x | x |
| Aggregator |  |  | x | x | x |
| Scatter-Gather |  |  | x | x | x |
| Use of Jeval (or similar) instead of  hard-coded bank rules. |  |  |  | x | x |
| Channel Adapter |  |  |  |  | x |
| Guaranteed Deleivery |  |  |  |  | x |
| Re-delivery |  |  |  |  | x |
| Well organized code, with comments, proper variable and method names, no redundant code. |  |  |  |  | x |

# 5. The way of working, Submission and Deadlines

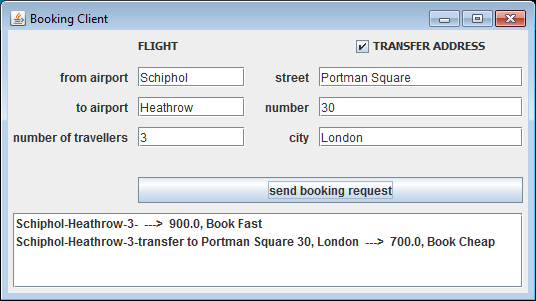
All groups must work on their final assignments in Fontys GIT repository. In week 5 each group must give the teacher access to their SAI final assignment in Fontys GIT repository. Teacher will (at any point of time) see individual contribution (for code implementation) in the repository of each student, and this will be used to grade students individually for SAI (ideally, all group members should contribute evenly to the final assignment).

SAI defence of this assignment is in the class schedules. At the beginning of the defence the teacher will “pull” your code from your Fontys GIT (that will be your submission). During this defence you will give a demo of your assignment. Also, you will speak in person to the teacher about your assignment: you will be asked to explain your code, suggest ideas for improvement, etc. If you are not present during this defence, then your submission will not be taken into consideration and you will get mark 1 (insufficient) for SAI.

# 6. Example Screen Shots

Below you can see examples of GUI of applications you downloaded:

A) Booking Client



B) Three approval applications

