



## TogethAir Exercises

Text: EN

Software: EN

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## 1. TogethAir



## 1.1. Context

TogethAir is an airline ticket broker that works with airline companies (partners) all over the world to offer tickets services to customers. They handle hundreds of thousands of tickets handlings a day. TogethAir can offer competitive prices because they can negotiate serious discounts. TogethAir constantly evaluates the prices of the different flights of all the airlines it works with and therefore can offer the flight at the best price for its customers.

TogethAir allows customers to book flights by means of an online reservation system.

The partners (the different air lines) can manage the destinations, prices and discounts. The TogethAir employees have a user interface to evaluate margins, sales and purchases and do price overrides.

## 1.2. Requirements

### Airline flight administration

As mentioned, TogethAir can sell flights offered by airline companies all over the world. Each airline offers flights for combinations of two locations: a departure and destination. The partners are offered a graphical user interface which allows them to enter (and manage) the information about flights.

A flight can occur multiple times, each time, they can have a different combination of:

- Departure time
- Flight duration
- Pricing information (base price, and volume discounts)
- Remaining seats per traveling class (business, economy, first class)

### Employee flight administration

TogethAir employees have a graphical user interface in which they can enter (and manage) information about:

- The available locations used as destinations and departure airports
- Flight price-overrides
- Available partner airline information

A location can be used as a destination as well as a departure. For each location the system needs to store:

- The name of the airport
- The country of the airport
- The international airport code
- The global region of the location (e.g. Eastern Europe, Western Europe, Middle America, ...)

The user interface for the management of the global regions is out of scope (these will be pre-loaded in the database), but the system must allow the user to link one of these regions to a location.

### Pricing

The base price of a flight is controlled by the airlines. This will be the price they charge for a booking. The prices of occurrences of flights can be different depending on time (weekends, holidays, nightly, ...). Also, the price is different per traveling class (e.g. Booking a ticket on a flight in economy class is less expensive than first class).

Partners can also offer multiple volume discounts per flight occurrence. This discount is offered as a percentage of the normal price and is granted from a minimum seat threshold for volume sales. (For example, an airline may grant a discount of 5% for bookings 2+ seats and 10% for bookings of 5+ seats).

De default price that TogethAir charges to the travel agencies is 5% higher than the base price. This margin is the primary way TogethAir makes money. TogethAir employees can override this 5% default with a custom set price (not a percentage). By allowing this price to be overridden, TogethAir has the flexibility to launch special promotions and optimize revenue.

TogethAir employees can't change the base price (this is controlled by the partner airline), nor can a partner change the price overrides of TogethAir.

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## Reporting

TogethAir employees and partners have access to a reporting feature, which offers a graphical user interface to display statistics about bookings. This feature is useful for a different cases, and must therefore be quite flexible. Some cases this could be used for are:

- Evaluating sales quantities
- Evaluating cost and margins

The user can display a summary of the following information:

- The number of paid and pending bookings
- The average price of the sold bookings
- The min and maximum prices of the sold bookings
- The average margin TogethAir had on these bookings

Make sure the displayed results include any price discounts correctly.

These summaries can be generated based on a number of (optional) filter criteria:

- A range of dates (lower and upper boundary) to indicate the period to include
- A list of global departure regions of the booked flight
- A list of global destination regions of the booked flight
- The airline company that offered the booked flight
- Payment status (pending or success)

The user also has the option to group the displayed results based on:

- The period
- The airline company
- The global departure region of the booked flight
- The global destination region of the booked flight

In this case the displayed summary must be extended with said fields.

The partner airlines can also access this reporting feature. However, in this case a few restrictions apply:

- Partner airlines cannot filter nor group by airline. In this case the system automatically sets the filter to the partner airline itself. This way, partners can only see information regarding themselves.
- Partner airlines cannot see the margins as this is private to TogethAir personnel.

The reports must also have a "print" option, in which the page is printed without unnecessary application menus, headers, logos, etc...

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## Searching for flights

The TogethAir application has a module for searching available flights. This module is available to everyone, the user does not need to be logged on first.

When the application is accessed, the landing page shows a visually inviting screen that prompts the user to enter search criteria for looking up available flights. The search criteria include:

- How many seats the user would like to book
- The traveling class
- An airline company that is preferred
- An option to enter either a departure and destination location or global region
- The date of departure
- Optionally a date of return in case the user chooses to book a return flight as well

When the user presses the search button, results of all matching flights are shown with the following information:

- The price (this should be the price including margin and discounts)
- The amount of discount in case where a discount is applicable
- The exact departure and arrival times
- The airline company

The user can sort the list based on departure time, airline company and price.

When the user selects a flight from the list, a details page is shown, displaying all relevant information about the chosen flight, including:

- Number of seats
- Price for all tickets and per ticket
- Traveling class
- Times of departure and arrival
- Flight duration
- Airline company
- Destination and departure locations (with airport codes)
- ...

The user is allowed to navigate back to the list page or select a "book now" option. When the "book now" option is selected, the booking procedure will be initiated.

## Booking flights

Once the user activates the "book now" feature, logging on is required. The system remembers the user's selected flight after logging on. If the user is not known yet in the system, a registration procedure is executed.

The user will be presented with a number of payment options:

- Credit card
- Endorsement

If the user chooses to pay with credit card, a 10% discount is granted on top of any other discounts. The credit card number must be entered here alongside with an expiration date. Credit card information is then processed by a payment service, which either accepts or rejects the transaction. TogethAir assumes here that rejection is not likely to happen, and in this case the transaction will be cancelled and the user will be redirected to the landing page. If credit card payment is accepted, the booking will immediately be marked with a status "Payment Succeed".

If the user chooses to pay with endorsement, the booking will still be registered, but marked with "Payment Pending". Registering the offline payment through endorsement is out of scope.

After either type of payment, the user is shown an invoice, which includes a QR code with an URL to the transaction details (only accessible for the user if logged on). The invoice can also be printed which removes all page menus, headers and other irrelevant information. When, the transaction is complete, all booking information is registered in the database. At this point, the user can reference it back by means of the QR code and/or URL. The reporting tools will

also include this information in the statistics.

Finally, the user will be sent an email (based on his/her registration details) showing the details of the invoice. Then the user is directed to a "thank you" page.

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## User access

Both partner users (airline administrative employees) and TogethAir employees need to be logged on. Registration of the users is done through an interface with the ERP and HR systems that uploads the user data into the database, and is out of scope.

TogethAir employees have access to different parts of the application than partner users:

- The flight administration module is available only to partners
  - The location and price-override modules are available to TogethAir employees only
  - The reporting modules are available to both TogethAir employees as partner users, with a number of restrictions.
  - The search module is available to everyone and does not require logging on first.
  - The booking procedure is only available to users after logging on. Registration is required for this.
  - Invoices can only be viewed by a registered user after logging on.
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## User experience

This application will be a very important tool for employees and partner employees, and we want the user interface to be inviting to use. The responsiveness when entering and managing the data will be a very important factor for users accepting the solution proposed. TogethAir also wants the users to be able to view the pages reasonably well on tablets and smartphones.

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## Exporting bookings

Every day, a differential export is generated from booking information. This should generate an XML file, and publish the results to an export directory on the server running the application. This XML file is used by the ERP software used by the book keeping department, which is out of scope.

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# Technologies & Requirements

## JEE7

View layer: JSF

Persistence layer: JPA

Middleware layer: CDI en/of EJB

Application server: Wildfly

And everything you have learned so far...

JAXP, Servlets & JSP, Git, Maven, JUnit, ...

## Optioneel

Continuous Integration (Travis? Jenkins?)

## SourceCode Management:

Gitlab

## Attention:

- Everything has to be CRUD-able
- Annulation of a booked flight has to be possible upto a configurable set amount of days before the departure date (Ui message at time of the booking)
- Email confirmation with booking details then redirect to 'thank you' page
- Departure and Arrival: don't forget hours minutes...  
(possibility to see the arrival time of the chosen destination in the correct timezone)
- CONCURRENCY!!!
- UX is **important**
- Mobile friendly
- All messages have to be readable for the user (error, info etc) not technical
- Exceptionhandlers (ex global), NO STACKSTRACES catch them
- Validation (watch out for negative values etc)
- ALL CHANGES NOT IN SCOPE OR NOT CLEAR, ASK THE PRODUCT OWNER  
NO SURPRISES DURING PRESENTATION
- Global test coverage of atleast 75%

## Definiton of Done:

- Functionality implemented
- Screens / views have to be user & mobile friendly (chrome devtools)
- Functionality === tested