WeSAHMI Messaging System

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1 Introduction

In the WeSAHMI project, we are defining an infrastructure for interactive wireless applications that can operate also in an ad-hoc networks. Especially, server-side initiated interaction is studied in the project. The infrastructure is demonstrated through a use case, which is an airline company's messaging system. In this document, the system is described as it would be implemented in real life. In the project, the system will be implemented to the appropriate extent.

The message system is made of business logic, which utilize a traveler and a flight data from an airline operational data store and sessions with travelers. The sessions rely heavily on above mentioned server-side initiated interaction.

2 ODS Architecture

In the Operational Data Store (ODS) architecture, the existing applications feed the ODS database with operational data. The different operational data are consolidated inside the ODS database, hence providing a unified source of aggregated operational data to airline. The ODS architecture is depicted in Figure 1.

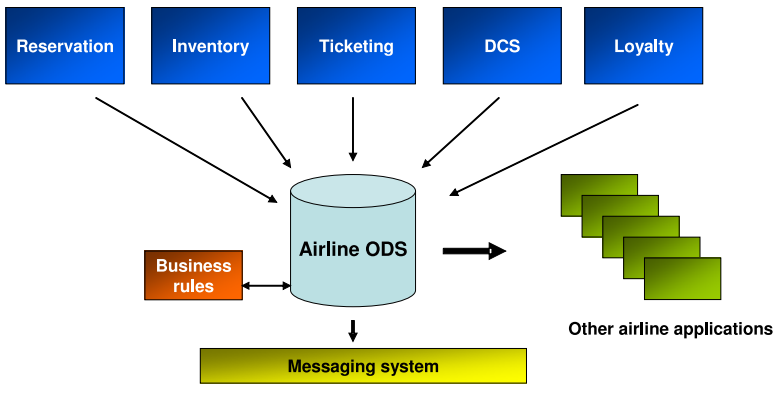

Figure 1: The ODS Architecture.

In addition to the messaging system, several other applications are utilizing the ODS. Along with the business rules, ODS creates actions to inform the applications. In order to enable a great variety of actions, ODS needs to gather data from multiple sources. Among them we can list:

- Reservation information (bookings)
- Inventory information (availability, schedule)
- Ticketing information
- DCS information (Check-in, flight status)
- Loyalty information (passenger profile)

Data is related to:

- Travelers
  - Static customer info from airline Loyalty system (frequent flyer number, mobile phone number, E-mail address, seat preferences, other user preferences)
  - Journey based customer info from booking (booking reference, name, flight segments, flight dates etc.)
  - Past and future customer activity: bookings, segments, check-in channels and check-in activities (baggage etc.).
  - Traveler history: disruption events for a given traveler
- Flights
  - Flight configuration, aircraft type
  - Flight schedule
  - Flight movement

3 Publication mechanisms

ODS provides a number of mechanisms for the airline internal applications to retrieve data. Besides these main areas, the ODS platform also offers publication mechanisms.

The publication mechanisms are based on ODS' ability to store criteria as business rules (cf. Figure 1) to trigger specific services, such as sending a message to another system if certain conditions are met. That is, an event-driven ODS monitors specific business operations, which relates ongoing data events or changes to business rules, and generates messages when appropriate.

For instance, past and future customer activity data is used to determine to which travelers a specific message should be sent. Business rules are set so that the airline inform a gate change of a certain flight to only those travelers who have already checked in for that flight.

Flight movement data could be used to trigger a notification of a delayed departure.

4 Messaging systems

ODS publication mechanism is utilized by new messaging systems, which may simply pass messages from ODS to traveler's mobile device or have links to other applications for a more complicated customer transactions. Examples of the messages are:

- Proactive mobile check-in
- Notify customer of gate changes
- Notify customers of last minute changes to their flight
- Notify customers about disruptions or potential problems identified regarding the journey and open online web update possibility for rerouting
- Send informative messages regarding the check-in gates, timetables, connecting flights etc.
- Schedule changes, lost baggages, waitlist acceptances etc.

In addition, an airline may deliver marketing communications to travelers based on their preferences. Travelers can define if they want to receive marketing communications and what kind products they are interested in. The system enables to target the marketing communication only to the potential customers, since the system can provide information on travelers' preferences and their journey.

5 Travel sessions

System-wise, there are ongoing sessions for each traveler registered to the mobile service with at least one open ticketed flight segment. A possible timeline of a travel session is shown in Figure 2. The external events are shown below the timeline and the system events above it. Mostly, the system messages are activated by the external event.

The travel session begins when a traveler books a flight. Usually, there are no system messages before check-in in the sessions. The system asks a passenger to check-in before a flight. The request can be sent based on passenger's location (e.g., when she enters into the airport) or on time (fixed period before departure). However, if, for instance, a flight is delayed, the system can provide this information for all the passengers eventhough they would not have checked in yet.

Other system messages during the session relate to updates on flight information, upgrade by points during the trip, marketing communications, and information on possible changes to the original travel plan. All the use cases are described in detail in the WeSAHMI Use Cases document [1].

The system messages can be created automatically or by users with admin rights depending on a message type. Typically, request for check-in is sent automatically, whereas proposal for substitutive travel plan is created and sent by the airline call center agent.

The travel session finishes when the trip has finished and there are no remaining system messages for the traveler. A possible post-trip message could

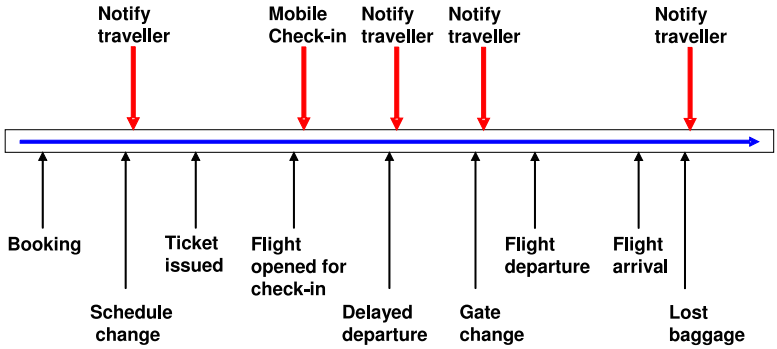

Figure 2: Possible events on a traveler's journey.

be for instance a baggage lost message, in which the system informs the traveler about lost baggage and later about arrival time of the baggage etc.

References

[1] M. Pohja. WeSAHMI Use Cases. Technical report, WeSAHMI Project, April 2006.