Use cases

December 9, 2010

What is CHOReOS?

- CHOReOS is a joint IT research and development project, whose sixteen members consist of companies, universities and research centers from six European countries and Brazil.

- CHOReOS is a high-technology software project addressing one of the most acute challenges of the future Internet of Services: the design and management of Ultra Large-scale Web Services Coordination.

- CHOReOS is an open source project, the technology developed by the project will be publicly accessible from software repositories hosted on the OW2 Forge.

What is expected from CHOReOS?

CHOReOS will define a model-driven process and provide the necessary tools to enable rigorous and systematized development, as well as requirements specifications and choreography modelling by domain experts (as opposed to IT professionals) including further synthesis of concrete adaptable, QoS-aware choreographies built on top of an ultra-large repository of services (service base).

CHOReOS will implement service middleware support, effectively enabling the deployment of adaptable, QoS-aware choreographies in the ULS Future Internet, integrating and further evolving the latest research advances in the area of Grid and Cloud computing, Enterprise Service Bus (ESB), and pervasive computing. Service-oriented middleware enables adaptable choreographies over ESB-based middleware, Grids, Clouds, and technologies for the Internet of Things, thus overcoming scalability and heterogeneity issues of the Future Internet

Besides, CHOreOS will also define a V&V model-driven process for development

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Use Cases

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- Passenger-friendly airport

- Mobile-enabled coordination of people

- DynaRoute

Passenger-friendly airport

Passenger-friendly airport

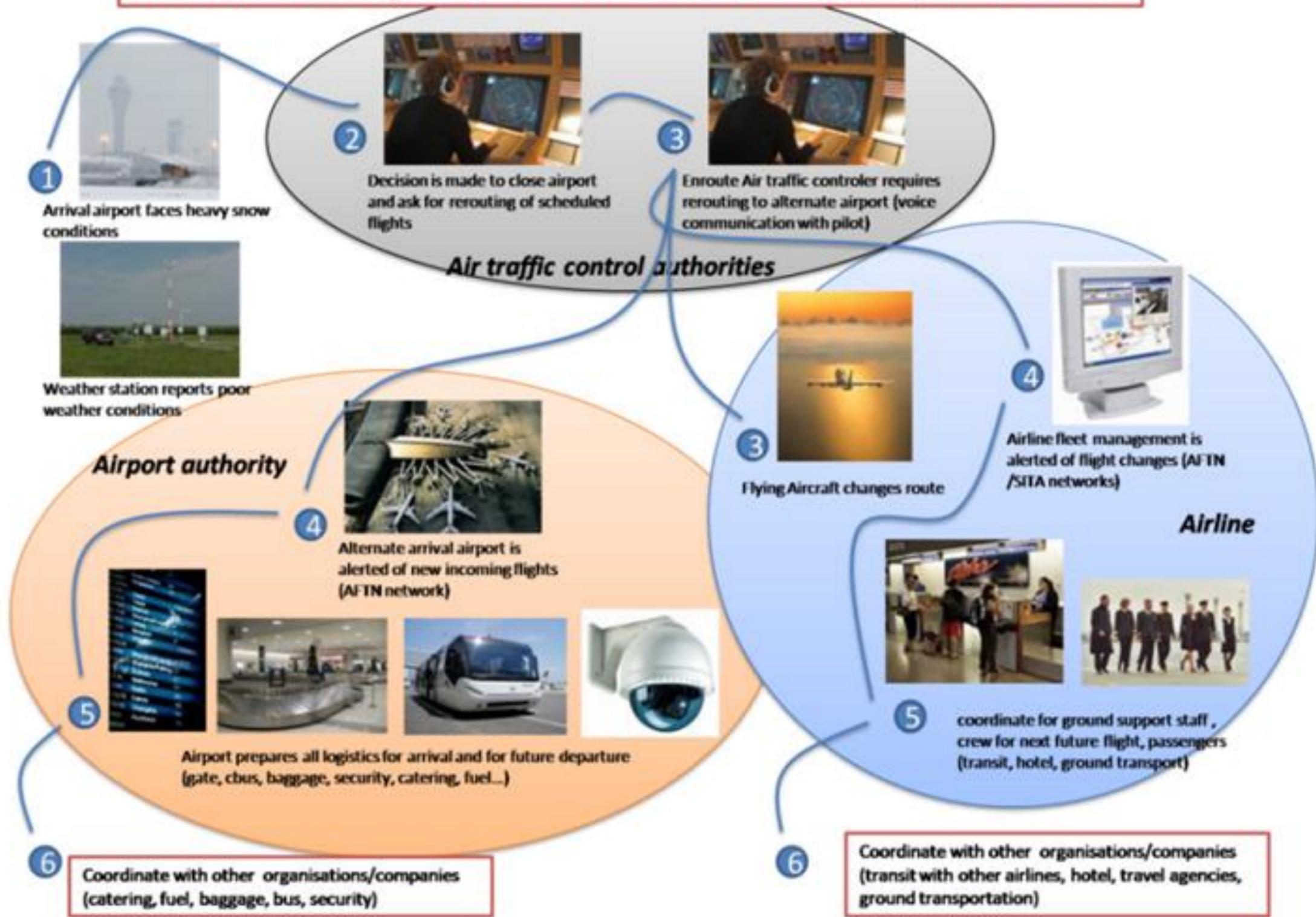# Passenger-friendly airport

Scenario:

Passenger-friendly airport

Scenario:

Due to a bad weather condition, a flight is rerouted.

The lack of information the passengers has, creates stress, thoughts that the Airport people are ineficient, and also cerates delays everywhere(disembark, luggage, hotel room, flight connection etc)

Scenario: Aircraft rerouting due to bad weather conditions – Coordinate consequences for all actors

Air traffic control authorities

1. Arrival airport faces heavy snow conditions
   Weather station reports poor weather conditions
2. Decision is made to close airport and ask for rerouting of scheduled flights
3. Enroute Air traffic controler requires rerouting to alternate airport (voice communication with pilot)

Airport authority

4. Alternate arrival airport is alerted of new incoming flights (AFTN network)
5. Airport prepares all logistics for arrival and for future departure (gate, cbus, baggage, security, catering, fuel...)
6. Coordinate with other organisations/companies (catering, fuel, baggage, bus, security)

Airline

3. Flying Aircraft changes route
4. Airline fleet management is alerted of flight changes (AFTN /SITA networks)
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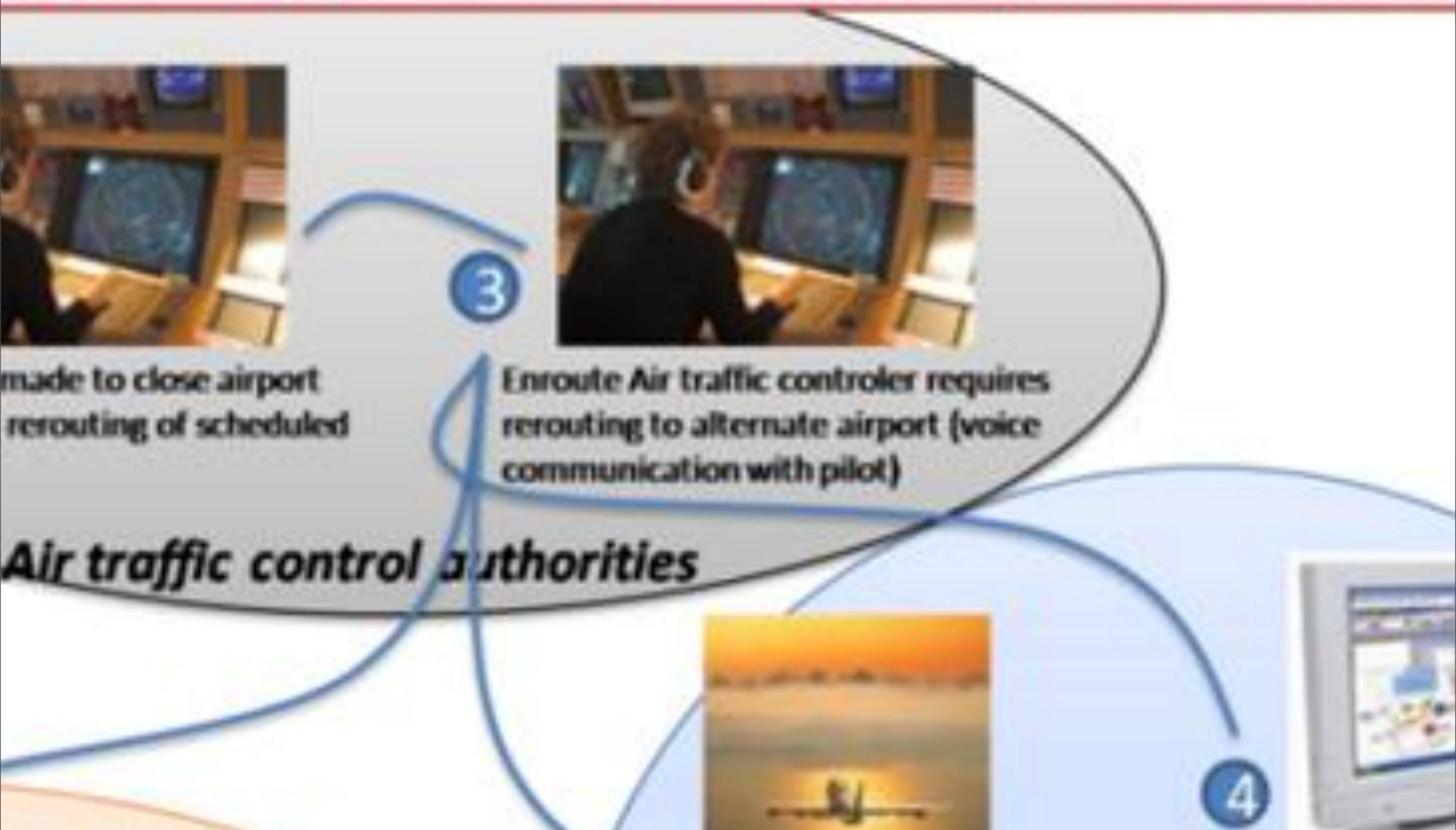
8

First part: Steps 1, 2, 3 -> immediate response
● ARRIVAL Airport faces heavy snow conditions
● Decision is made to close airport and ask for rerouting of scheduled flights
● Enroute Air Traffic controller requires rerouting to alternate airport (voice communication with pilot)
●Flying Aircraft changes route

Scenario: Aircraft rerouting due to bad [weather]

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2. Decision is made to [close airport] and ask for rerouting [of scheduled] flights

Weather station reports poor [...]

Air tr[affic]

First part: Steps 1, 2, 3 -> immediate response
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to bad weather conditions – Coordinate consequences for all actors

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Air traffic control authorities

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Two main actors to cooperate:

Passenger-friendly airport

Two main actors to cooperate:
- Pilot

Passenger-friendly airport

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- Pilot
- Air traffic control authorities

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Based upon many parameters:

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Based upon many parameters:
- Fuel
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- Airport congestion

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Based upon many parameters:
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- etc

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High Business Policies

Passenger-friendly airport

Two main actors to cooperate:
- Pilot
- Air traffic control authorities *Choreographies can help*

Based upon many parameters:
- Fuel
- Weather *High Business Policies*
- Airport congestion
- etc

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We've talked about the first part (Air Traffic Controller)
Now we're going to see the other two parts:

- Airport Authorities
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Passenger-friendly airport

Airport Authorities

•bus transportation company will provide appropriate means from airplane to terminal,

•luggage handling company will provide personnel and means for luggage handling,

•airport systems will provide airport display terminals with up-to-date information,

•the airport information desk will get up-to-date information to deal with inquiring passengers,

•the airport security company will be informed of flight arrival, number of passengers to adapt its logistic,

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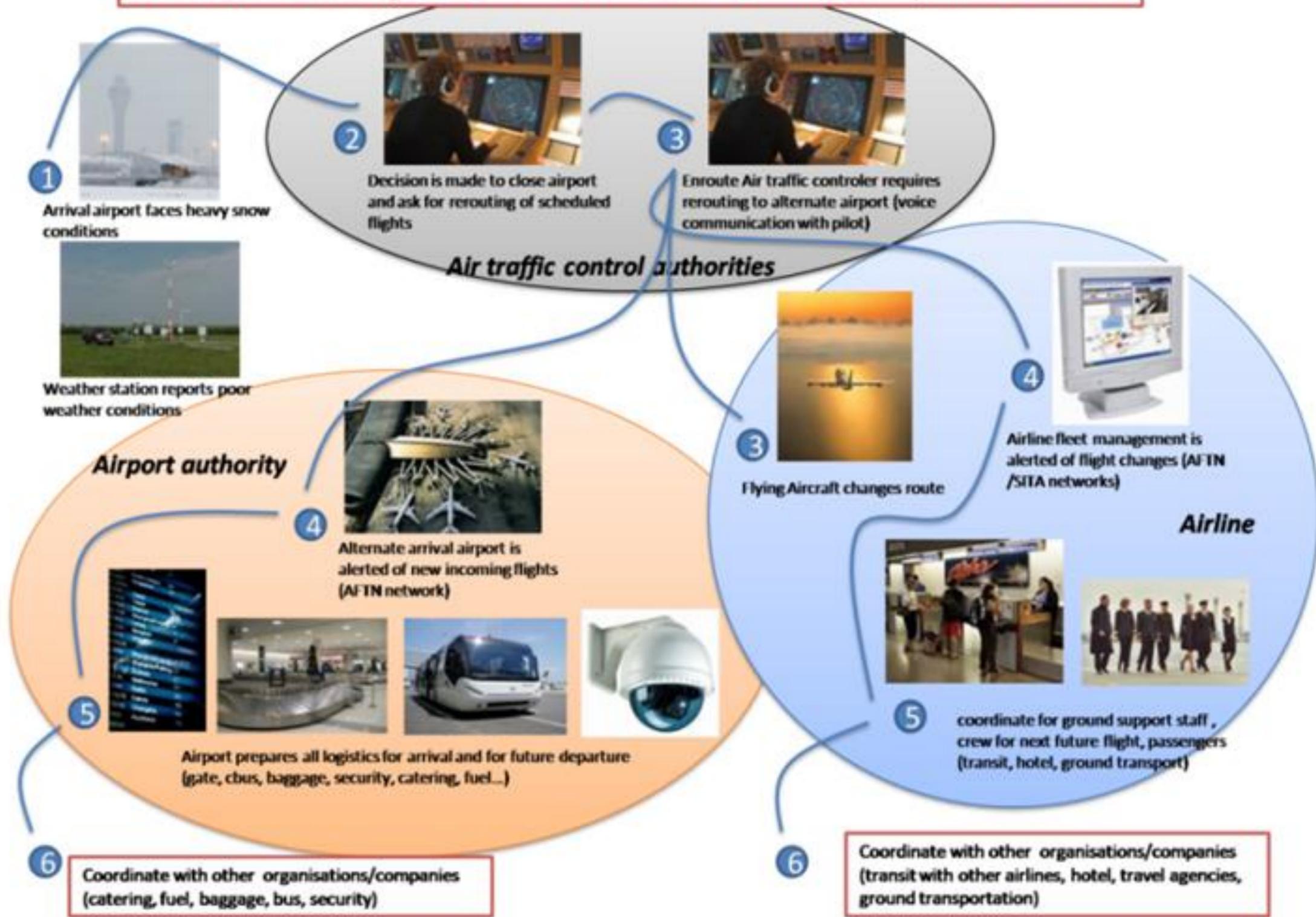
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Airline and associated business counterparts
- Management and alerting of the rest of the fleet (frota de aeronaves)
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Passenger-friendly airport

Airline

●the airline ground staff will be kept informed and prepare itself to deal with passengers: coordinate with hotels for rooms, coordinate with ground transportation for bus transport to hotel, coordinate with other airlines for connecting flights, inform travel agencies

●the ground transportation company will be planned to allocate appropriate buses to transport passengers to hotels,

●hotels providing rooms for passengers are coordinated and kept informed of passenger arrival and of the list of passengers allocated to their hotel,

●other airlines involved in connecting flights are kept aware of passengers that will be allocated to them,

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Passenger

Bonus:
In addition, people needing to be kept informed of a flight arrival can be put in the loop as soon as possible: passenger buddy coming to airport to pick him up for example

Choreography usage:
The role that choreography plays in the scenario is to provide to domain experts an efficient means to design the coordination of all actors and provide them with accurate means of governance

Passenger-friendly airport

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Technology == Information

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Passenger-friendly airport

Passenger

Technology == Information

- AirPort Displays
- SMS

- Change of connecting flights
- New boarding card

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Mobile-enabled coordination of people

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This use case develops two scenarios in which

• the first one illustrates the ultra-large-scale of a QoS-aware system in terms of concurrent users,

• the second one illustrates the case of an agility-based choreography.

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Mobile-enabled coordination of people

Divided in two scenarios:

1. Citizen Journalism

2. Coordination of Large-scale Brainstormings

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Citizen Journalism

With "citizen journalism", we refer to the emerging practice of members of the public that play an active role in the process of collecting, reporting, analyzing and disseminating news and information. This trend is gaining particular importance thanks to the diffusion of social networks, blogs and internet enabled mobile devices with photo and video capabilities

Citizen Journalism

A user, through his mobile, accesses the community portal and reports that an extraordinary event is happening nearby.

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Citizen Journalism

Another user finds it interesting and decides to start a media coverage of the event to be included in his/her blog. A predefined choreography starts executing:

- Other users close to the event are found,
- If possible, the available information about their online reputation as media providers is checked,
- Their device capabilities and their availability to provide multimedia information are checked, so that they can be contacted by a specialized service that assigns them a certain role,
- If the minimum number of users that play the required roles agrees, all the users are notified (and asked for confirmation) that their multimedia contributions are being published on the fly to the blog web page,
- The contributions are displayed on-the-fly on the blog page together with a map of the geolocation of the media information sources,
- During the event users can join, leave or change their role.

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Coordination of Large-scale Brainstormings

Lots of times, companies need to know users experience and get feedback over a product or ask for new ideas.

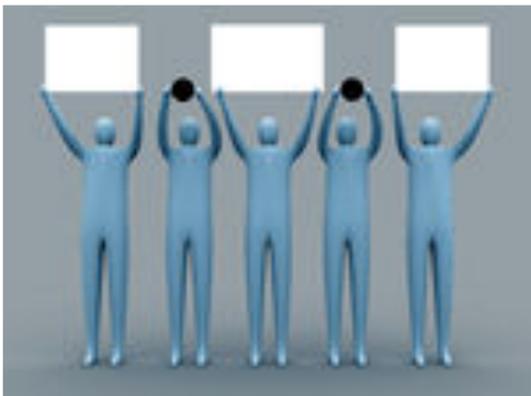# Coordination of Large-scale Brainstormings

- ◦ When too many people post their comments to the blog, relevant contributions are lost;
- ◦ People with different standpoints often are unable to discuss and contribute constructively;
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- ◦ Even introducing moderators, it is difficult to provide proper input to foster discussion;
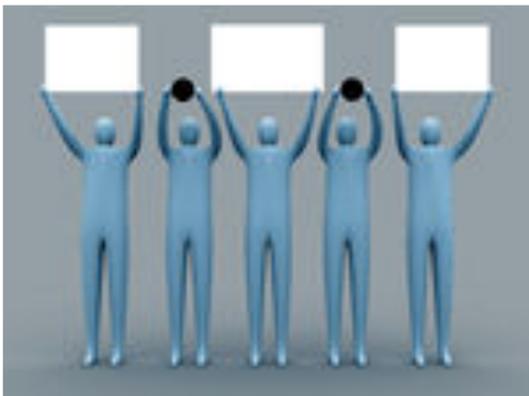- ◦ etc.

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Super Blog

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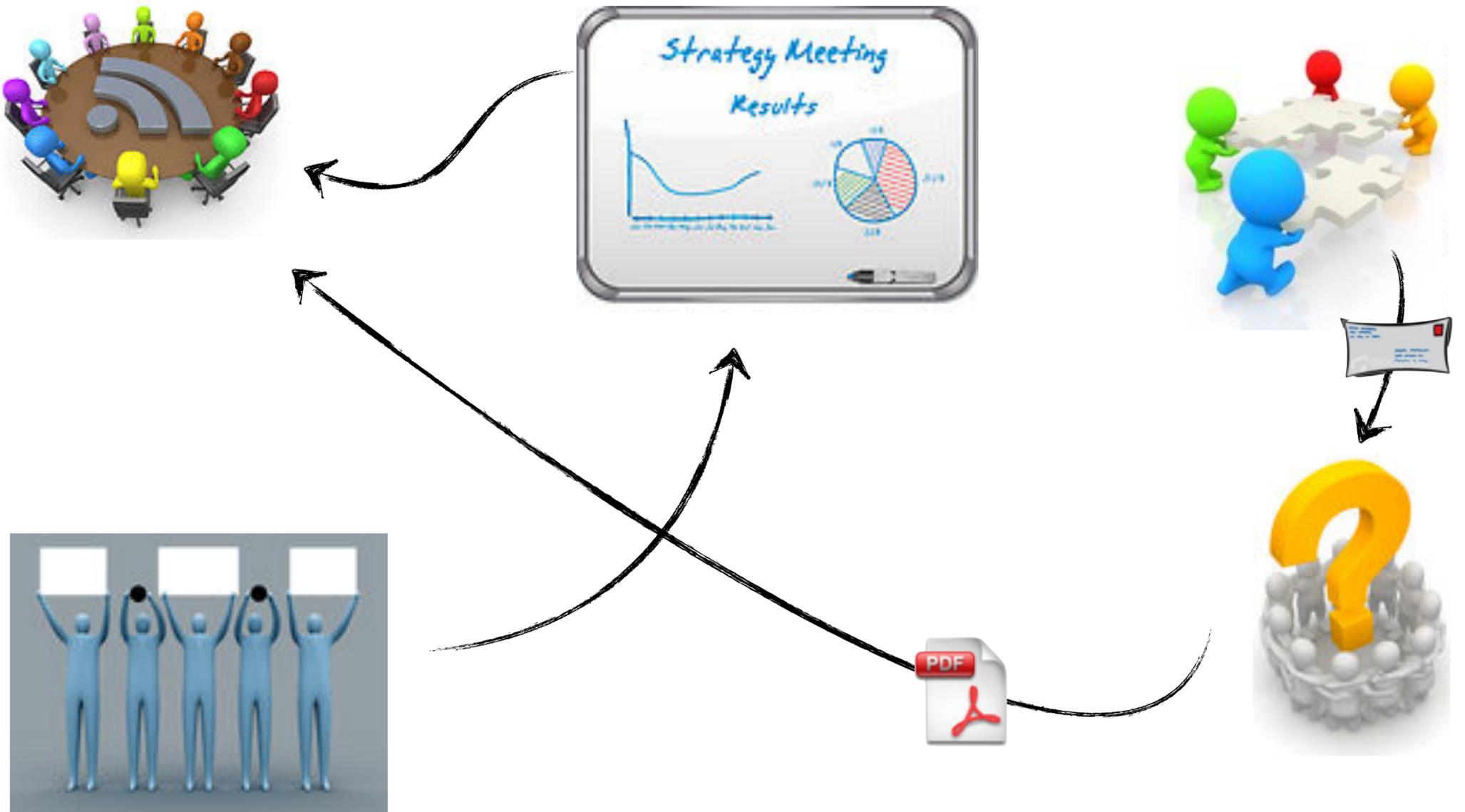# Coordination of Large-scale Brainstormings

A Collaborative distributed, choreography based, tool is able to support discussions among groups of users by means of online tools such as shared whiteboards, outliner, videochats. Each group has a profile, and one or more declared "goals". Moreover, each group can provide the "results" of their discussion in terms of documents, images, links etc. that can be tagged and classified by the group itself or in an automated way

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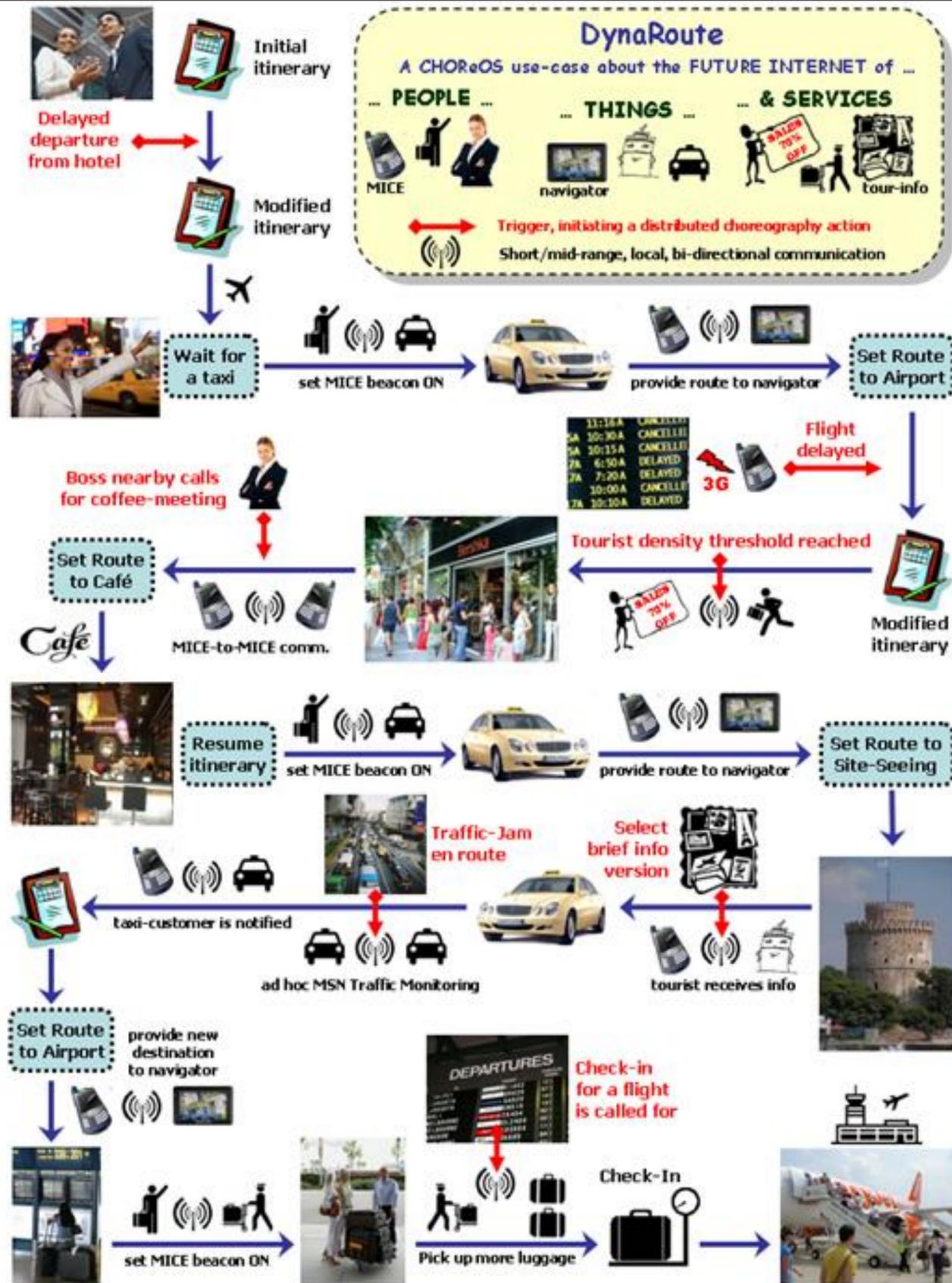
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DynaRoute

24

The DynaRoute use-case depicts a realistic situation of a person following a predefined "itinerary" (i.e. a scheduled sequence of activities) on her way from her hotel to the airport.

All intermediate activities involve the dynamic synthesis and adaptation of choreographies which are controlled and modified on-the-fly, based on external triggers and condition changes.

DynaRoute involves People, Things and Services of the Future Internet, harmoniously coordinated together, in a distributed fashion, in **order to achieve multiple goals**.
 Choreographies are adapting within a very dynamic environment, in a scalable and efficient manner.
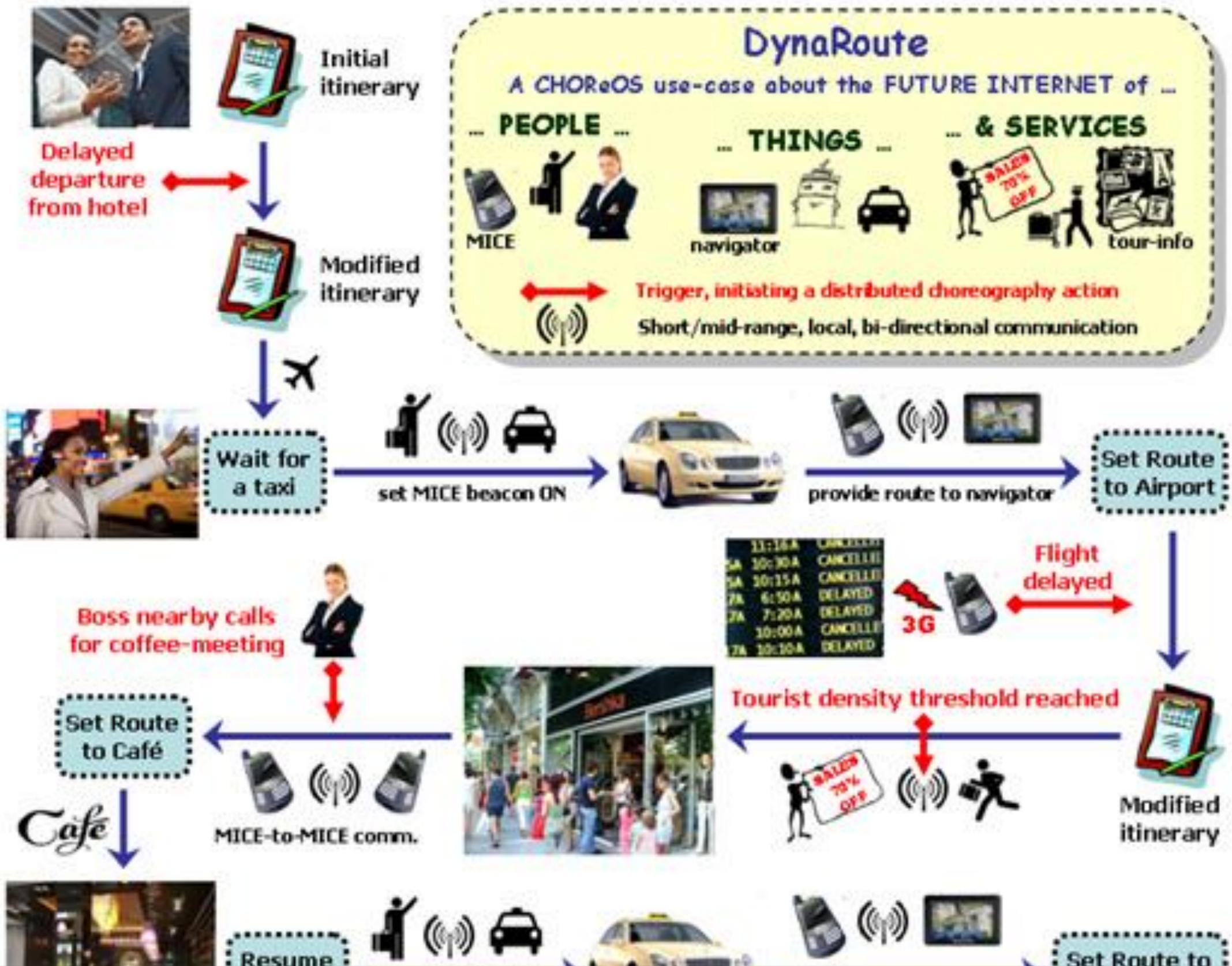
- ◦ People (Colista, Valeria, the taxi driver, the porter)
- ◦ Things (the taxis, the navigators, the monument, the airline), and
- ◦ Services (the navigation, relaying traffic information, the store (sales) announcements, the tour-guide, the luggage transfer, the departures timetable)

What distinguishes this use case is the fact that it utilizes mostly local, bidirectional communications between various actors, as well as location-based services.

In this way, thousands of actors (people, things or services) can interact with each other in a variety of ways, maintaining low service complexity, faster response times and truly feasible scalability.

Alternatively, mobile users would have to spend valuable, costly and limited global bandwidth, in order to access centralized Internet servers.

Moreover, with our distributed approach, local information (such as, people densities) can trigger local reaction in a more direct and responsive way, while alike global changes most often need time to be registered, validated and propagate through.
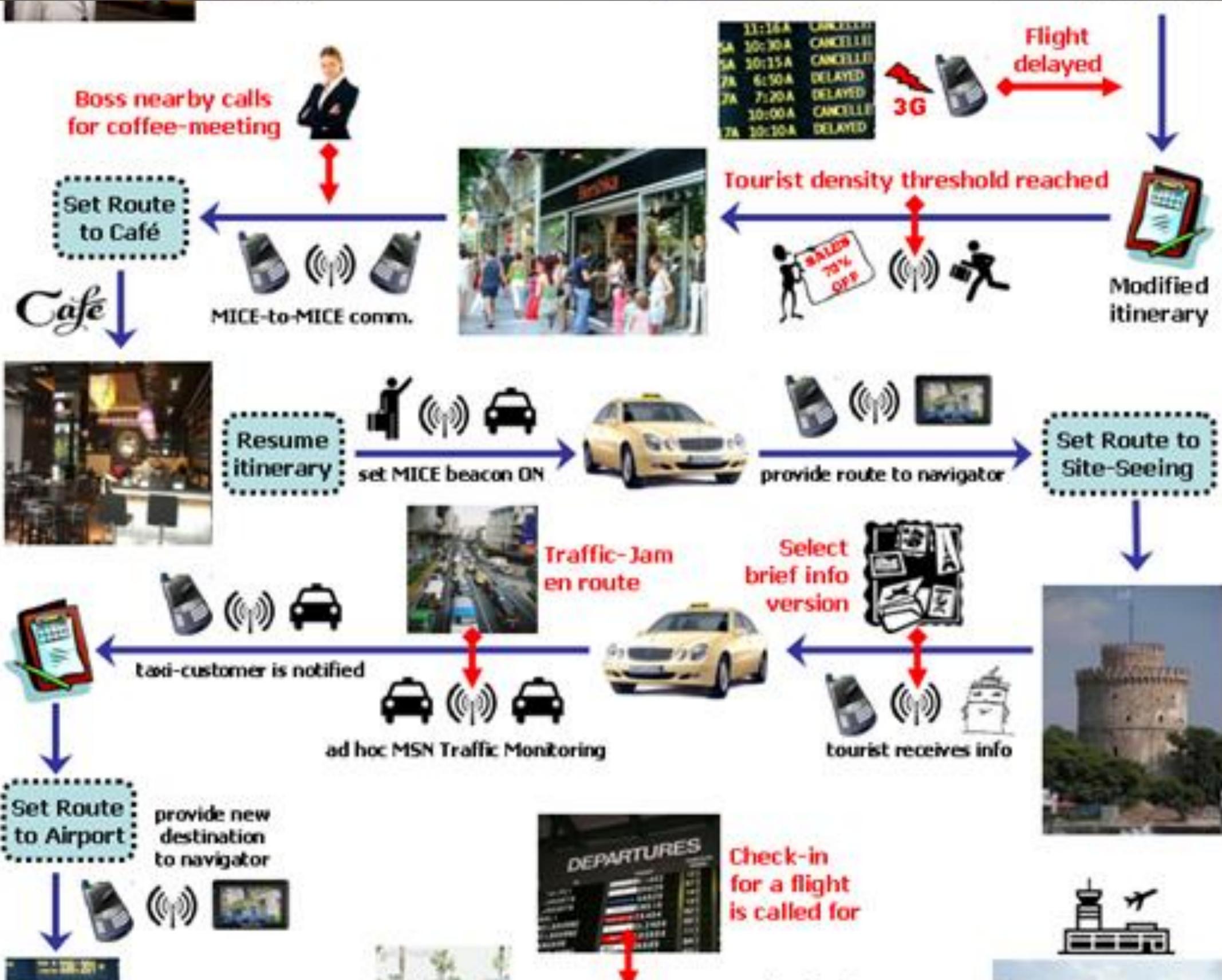
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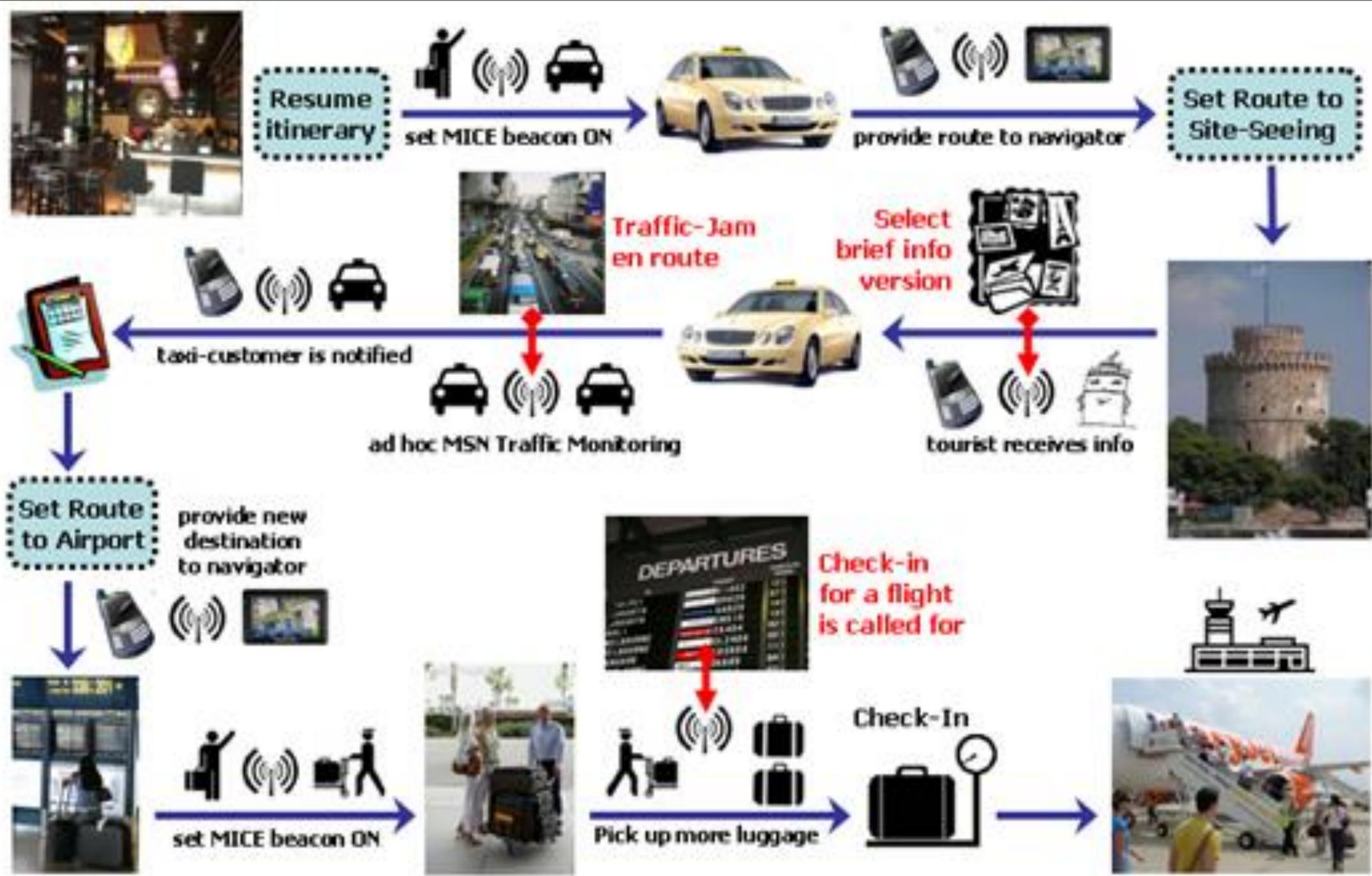
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References

- http://www.choreos.eu/

Thank You

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