Service Integration Platform
- An Inter-EAI Architecture -

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The Evolution of Cyber Service

Service Images

Integration of Services
- Provide one service using Web etc.
- Include web-enabling, wrapping, etc.
- Provide several individual services using Web etc.
- No integration between the individual services

Mediation of Services
- Provide several mediating services using Web etc.
- No integration between the mediating services.

Collection of Services
- Provide cooperating integrated services by connecting and cooperating several mediating services

Service Provision
- Provide one service using Web etc.
- Include web-enabling, wrapping, etc.

Examples of travel mediation
- XX Airline Reservation Service
- YY Air Reservation Service
- ZZ Hotel Reservation Service
- WW Inn Reservation Service

A user can get services whenever & wherever s/he wants. However, s/he needs to access several websites.

No integration between the individual services
The Evolution of Cyber Service

Service Images

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Collection of Services
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Service Provision
- Provide one service using Web etc.
- Include web-enabling, wrapping, etc.

Examples of travel mediation
- Travel Reservation Service
- Flight Reservation
- Hotel Reservation
- Rent-a-car Reservation

A user can get several services in one place. However, the service menu is fixed, and the services are not related to each other.
The Evolution of Cyber Service

- **Service Provision**
  - Provide one service using Web etc.
  - Include web-enabling, wrapping, etc.
  - Provide several individual services using Web etc.
  - No integration between the individual services.
  - Provide several mediating services using Web etc.
  - No integration between the mediating services.
  - Provide cooperating integrated services by connecting and cooperating several mediating services.

- **Collection of Services**

- **Mediation of Services**
- **Integration of Services**

**Examples of travel mediation**
Service menu can be easily changed (by joining and resigning of providers). However, the adjustment between services needs to be made by the user.

- Brokering Flight Reservation
  - XX Airline
  - ZZ Hotel
- Brokering Hotel Reservation
  - YY Air
  - WW Inn
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Integration of Services
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Mediation of Services

Collection of Services

Service Provision

Service Images

Description

- Provide cooperating integrated services by connecting and cooperating several mediating services.

Examples of travel mediation

Unspecified Requests
To Hawaii, About 100,000yen

Integrator

Flight Reservation

XX Airline

YY Air

Inter-EAI

Hotel Reservation

ZZ Hotel

WW Inn

Local Sight-seeing

Diving Tour

Helicopter Tour

The collaborative integrated service, which meets the user’s needs and has total integrity, is provided.
Community consists of 3 types of players:

Requester: An Agent or a System who requests and consumes Service

Provider: An Agent or a System who provides Service

Mediator: An Agent or a System who retails, mediates and integrates Service / Service Information
Requirements for Service Integration Platform

Travel Mediation Service

Service Process
- Reserve Hotel
- Reserve Flight
- Reserve Ground Transportation (To Airport)

Service Category & Providers
- Hotel Service
  - Hilton
  - Sheraton
- Flight Service
  - Japan Airlines
  - American Airlines
- Train Service
  - Japan Railway
  - Keisei Railway
- Bus Service
  - Shuttle Bus

Service Execution
- Hotel Service: Sheraton
  - OK
- Flight Service: American Airlines
  - OK
- Train Service: Japan Railway
  - NG
- Train Service: Keisei Railway
  - NG
- Bus Service: Shuttle Bus
  - OK

Alternative Provider Assignment

Alternative Service Category Assignment

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Requirements for Service Integration Platform

Travel Mediation Service

Service Process
- Reserve Hotel
- Reserve Flight
- Reserve Ground Transportation (To Airport)

Service Category & Providers
- Hotel Service
  - Hilton
  - Sheraton
- Flight Service
  - Japan Airlines
  - United Airlines
  - American Airlines
- Train Service
  - Japan Railway
  - Keisei Railway
- Bus Service
  - Shuttle Bus

Dynamic Service Selection

Service Business Operation
- Alternative Provider Assignment
- Alternative Service Category Assignment

Flexible Business Process Integration

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Service Integration Platform and Inter-EAI

Dynamic Service Selection

Inter-EAI Technologies

Flexible Business Process Integration

Intra-EAI Technologies

Service Business Operation

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Key Technologies of Service Integration Platform

- **Dynamic Service Selection**
  - **Profile Management**
    - Modeling the Description of Service features by using a common set of properties
  - **Dynamic Brokering**
    - Match Making using Profiles defined by Provider / Requester

- **Flexible Business Process Integration**
  - **Business Process Control**
    - Business Process Integration of Heterogeneous Systems / Services
  - **Dynamic Integration Management**
    - Changes and reassignment of integrated services depending on a provider’s status.

- **Service Business Operation**
  - **Accounting in Distributed Environment**
    - Collection of Information on Service Usage in Distributed Environment
  - **Integrated Management of Inter-Enterprise Application Systems**
## Integration Technologies

### Scope of Cooperation

#### Inter-EAI
- **Dynamic Integration Management**
- **Business Process Control**
- **Dynamic Brokering**

#### Intra-EAI
- **Data Integration**: Data Hub
- **Process Integration**: Messaging
- **UI Integration**: Web AP server
- **Transformer**
- **Adapter**

### Technology Elements

<table>
<thead>
<tr>
<th>Execution Environment / Platform</th>
<th>Management</th>
<th>Security</th>
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<tbody>
<tr>
<td><strong>Dynamic Integration Management</strong></td>
<td><strong>Profile Management</strong></td>
<td>Security Policy Federation</td>
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<td><strong>Business Process Control</strong></td>
<td><strong>Integrated Management</strong></td>
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<td><strong>Dynamic Brokering</strong></td>
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### Security
- **Authentication**
- **Encryption**
- **...**

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Dynamic Brokering using Profile

Request Service
- Request Profile

Mediator
- Service Profile Template
- Match Making
- Dynamic Brokering
- Policy

Register Service Offer
- Offer Profile

Requester

Provider

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Profile items managed by the community
Process Management and Dynamic Brokering

Dynamic Integration Management & Business Process Control

Dynamic Brokering

Client

Request for planning, quotation, and reservation

Travel quotation

Selection

Front End System (Web base etc.)

Start

Quotation

Visa?

Hotel Reservation

Flight Reservation

Ground Transportation

End

Policy Based Selection

Wrapping

Wrapping

Wrapping

Wrapping

Wrapping

Wrapping

Wrapping

Wrapping

Wrapping

Wrapping

Availability, rate, temporary reservation

Airlines

Hotels

Embassy

Sheraton

American Airlines

Japan Railway

Keisei Railway

Shuttle Bus

Service Integration Platform

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Activities

Implementation

- Analyses of actual applications
- Prototyping of Platform
  - Profile Management and Dynamic Brokering
  - 99/05 Demonstration at OMG Tokyo Meeting
  - 99/10 Demonstration at 5th ICECCS at Las Vegas

Standardization in OMG

- Profile Management
  - ADSS DSIG, Telecom DTF
    (Telecom Service Access & Subscription)
- Business Process Control
  - Workflow 1.3 RTF, Workflow WG, BO DTF

ICECCS : International Conference on Engineering of Complex Computer Systems
ADSS : Autonomous Decentralized Service System
Next Steps

**Standardization in OMG**
- Dynamic Integration Management
  - Representation of flow control and reassignment (ADSS DSIG)
- Accounting in Distributed Environment
  - Representation of information on service usage (ADSS DSIG, Telecom DTF)

**Enhancement and Evaluation**
- Security Integration
  - Existing technologies (CORBA Security Service, SSL, ...)
  - Other requirements
- Performance Evaluation
Thank you!

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