Gärtner Markus, Seidel Ingo, Berger Helmut

Matrixware Information Systems GmbH
Information Retrieval Group
Lehargasse 11/8
A-1060 Vienna, Austria
Agenda

- Introduction
- Itchy Feet
- Electronic Institutions
- Conceptual Design
- Implementation
- Scenario
- Future Work
Number of booking platforms increases steadily

Internet: main source for information gathering

Tourists exchange their travel experiences and document their trips in online tourism communities

Tourism demonstrates the importance of emotional aspects in commerce

A tourism product can not be tested in advance, it is a confidence product
Introduction – 3D virtual worlds

- Realistic and immersive experience
- Implicitly address social interaction
- 10 million people regularly connect to online 3D virtual worlds
- Example Second Life
Introduction – Agents

- In an e-Market environment business is primarily conducted by software agents.
- A software agent can be as simple as a subroutine, but typically they are larger entities with some sort of persistent control.
- An agent is an individual that acts on behalf of another person, performing duties and work for its client.
- Software agents are also able to act on behalf of themselves on a more or less intelligent way.
- The type of agent and the complexity of a task influences the resulting quality of the outcome.
With “itchy feet” we provide a 3D e-Tourism environment for providers and consumers that enables versatile interaction between participants including the trade in tourism products. That is information-rich and multimedia-based to offer transparent and unified access to disparate information sources. That uses 3D virtual worlds and agent technology to create a lively community and provide insights on the interaction between humans and agents.
Itchy Feet - Framework

- Based on a three layered architecture
- Uses a Multi Agent System to secure the environment and validate all tourist's actions
- Every user is the principal of an agent
Consists of three buildings and a communication service provider

- Travel Agency
- Forum
- Auction House
- Ether
Electronic Institutions

- Computational realization of a real-world institution
- Enables agents to interact with each other according to predefined conventions and rules
- Guard who ensures that all actions performed by agents are in line with the rules and regulations that apply in the institution

Building blocks of Electronic Institutions are

- Dialogical Framework
- Performative Structure
- Norms and behavioral rules
Electronic Institutions – Dialogical Framework

- Defines the ontology, social structure and language conventions

<table>
<thead>
<tr>
<th>agent role</th>
<th>illocutionary particle</th>
<th>ontology term</th>
<th>parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer (Seller)</td>
<td>inform</td>
<td>offer</td>
<td>amount, price and offer</td>
</tr>
<tr>
<td>Customer (Buyer)</td>
<td>inform</td>
<td>demand</td>
<td>amount, price and offer</td>
</tr>
</tbody>
</table>

![Diagram](image_url)
The Performative Structure is a network of scenes linked by transitions.

Scenes are role-based interaction protocols specified by means of Finite State Machines.
Duties

- Registering customers and managing customer accounts
- Keep customers informed
- Manage auctions, oversee demand and supply
- Lead auction
- Bring products into institution, deliver purchased products
- Accept payment
Conceptual Design – Implementation Process

1. Room Blueprint

2. Roles Duty Descriptions

Scene Specification
Scene Transitions

Scene Protocol
Implementation – Auction House Roles

Offer Manager
Auctioneer
DataScout
Account Manager
Information Assistant

Staff

Customer

Seller
Buyer

*ssd = static separation of duties
Implementation - Auction House Performative Structure
Implementation – Connect 3D world with Electronic Institution

- Electronic Institutions are visualized as buildings in the 3D world
- Scenes are mapped on rooms and transition are mapped on doors
- Actions of the user in the 3D world are transformed into actions in the Electronic Institution and vice versa
- Every user is assigned an agent
- Message exchange is carried out by the Connection Server
Scenario

The 'Christine:Customer' has been entered in the scene '((0)/EnglishAuctionScene:EnglishAuction'.

The 'Christine' has been exited of the transition '((2/Lounge2EnglishAuction:And)@(-1)/ItchyFeet)

The message '(inform (Christine:Customer) (Auctioneer:Auctioneer) willParticipate[Customer])'.
Scenario

The message 'Inform (Auctioneer:Auctioneer) (all:Customer) startAuction[CommonTheme, []]
The message 'Inform (Auctioneer:Auctioneer) (all:Customer) startRound[Offer:destination=Scotland, price=600.0, d...]
The message 'Inform (Christine:Customer) (Auctioneer:Auctioneer) bid[610.0] ' has been said.
The message 'Inform (Auctioneer:Auctioneer) (all:Customer) currentOffer[610.0, Christine] '.
Scenario
Scenario

The message "(inform Jill:Customer) (Auctioneer:Auctioneer) bid(620.0)" has been said in the scene 'State'.

The message "(inform Auctioneer:Auctioneer) (all:Customer) currentOffer(620.0, Jill)" has been said in the scene 'State'.

The message "(inform Auctioneer:Auctioneer) (Jill:Customer) transferTicket(Ticket.offerID=1, signature)" has been said in the scene 'State'.

The agent Jill has synchronized the movements from the transition '(S1, English:English: Auctioneer: English And)(X-1, itchy Fee Performative Structure: itchy Fee Performative Structure)' of (S1, English:English: Auctioneer: English And).
Future Work

- Implementation of the Travel Agency, Forum and Ether Electronic Institution
- Full implementation of agents
- Design of an appealing 3D virtual world
- Comprehensive usability test and evaluation of the system
- Final system:
  - A test bed for assessing the acceptance of virtual environments, as medium to overcome the non-tangible nature of tourism products
Acknowledgements:

Web Site: www.itchy-feet.org

Contact: mgaertner@itchy-feet.org