I-Room: A Virtual Space for Intelligent Interaction

An intelligent environment which acts as a knowledge aid to support collaborative teleconferences and meetings

Austin Tate
AIAI, University of Edinburgh

Ai Austin
Virtual University of Edinburgh
I-Room: A Virtual Space for Intelligent Interaction

Low cost, simple setup, mixed-reality meetings spaces
I-Room: A Virtual Space for Intelligent Interaction

Distributed collaborative team support for production and review in the creative industries
I-Room: A Virtual Space for Intelligent Interaction

Tutorial and commercial spaces
I-Room: A Virtual Space for Intelligent Interaction

Operations Centres, Brainstorming Spaces, Team Meeting Rooms, Training and Review Areas
Sensing and Situation Analysis
Planning, Evaluation Option Argumentation
Briefing and Decision Making
Central Meeting Area
Acting, Reacting and Communication
Sensing and Situation Analysis
OpenVCE
open virtual collaboration environment

Virtual Collaboration Environment - Team A

Team A

View  Edit  Revisions

No public posts in this group.

Collaboration Facilities

- Team E-mail: Send an e-mail to the team
- Current team member roles
- Team protocol: the Virtual Collaboration Protocol (VCP)
- Team protocol: video introduction (Win and MacOS) - download [backup 1] [backup 2] (Hampton.gov users local link)
- Team 3D Space: I zone located at: http://blurl.com/secondlife/VCE/18/80/22 [Dav Apple]
- Doodle Polls (none)
- Post personal blog entry
- Team Wiki

3D space

[Map of Team A]

Access: [file, edit, view] [registrar, review, register etc.]
[Further, Presenter, Blogger]

Team A

This is a closed group. The group administrators add/remove members as needed.

My groups

Not a member of any groups.

Attachment

Size

categorised_dimensions.jpg 93.5 KB

VCP Progress: Overview

Case: Reindeer Flu

[Help; SDF]

VCP Task

Before Meeting 1:

- Process coordinator: introduce themselves, communicate case to team; introduce individual problem map
- Team members: complete individual problem maps
- Process coordinator: organize team meeting; create draft integrated problem map

Meeting 1:

- Process coordinator: welcome
- Team: introduce case to team; discuss and agree on integrated problem map
- Process coordinator: lay out timeline; reference process norms
- Team: agree project roles

Before Meeting 2:

- Team members: complete individual experience matrix
- Process coordinator: organize team meeting; generate experience skills (from accountability matrix)

Meeting 2:

- Process coordinator: reference discussion norms; introduce the problem dimension solution template
- Team: discuss individual experiences (by dimension)
- Team: discuss and agree on template
- Case planner: complete accountability matrix
- Case planner: generate empty solution pages (from accountability matrix)

Before Meeting 3:

- Gatekeeper: monitor process

Who's online

There are currently 7 users and 1 guest online.

- admin
- guest
- ufo
- xan
- jan
- and 2 others

OpenVCE Presenter v.1.1: Now showing http://restate.aii.aed.ae/uk/http://a.berhardt/VCP_team_experience/slide09.html
### Issues

<table>
<thead>
<tr>
<th>Description</th>
<th>Annotations</th>
<th>Priority</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider how to handle newcomers</td>
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### Activities

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td>hold-meeting I-Room-Demo</td>
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<td>Normal</td>
<td>Refine using hold-meeting</td>
</tr>
<tr>
<td>start-meeting I-Room-Demo</td>
<td></td>
<td>Normal</td>
<td>Refine using start-meeting</td>
</tr>
<tr>
<td>welcome-participants I-Room-Demo</td>
<td></td>
<td>Normal</td>
<td>Done</td>
</tr>
<tr>
<td>note-apologies I-Room-Demo</td>
<td></td>
<td>Normal</td>
<td>Done</td>
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<tr>
<td>agree-end I-Room-Demo</td>
<td></td>
<td>Normal</td>
<td>Done</td>
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<tr>
<td>agree-previous-minutes I-Room-Demo</td>
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<tr>
<td>address-action-items I-Room-Demo</td>
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<td>Refine using address-action-items</td>
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<td>Normal</td>
<td></td>
</tr>
<tr>
<td>discuss-action &quot;Ai Austin&quot; &quot;Read Ops Pineapple Briefing&quot;</td>
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<tr>
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<tr>
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<tr>
<td>finish-meeting I-Room-Demo</td>
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<td>Normal</td>
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<tr>
<td>setup-next-meeting</td>
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<td>discuss-action &quot;Ai Austin&quot; &quot;Read Ops Pineapple Briefing&quot;</td>
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<td><strong>Pass to MoD</strong></td>
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<tr>
<td>finish-meeting I-Room-Demo</td>
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<td>Normal</td>
<td><strong>Pass to OGD</strong></td>
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<tr>
<td>setup-next-meeting</td>
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<td>Normal</td>
<td><strong>Delegate to Local Government</strong></td>
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<td><strong>Delegate to Emergency Services</strong></td>
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<td><strong>Delegate to Security Service</strong></td>
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<td></td>
<td><strong>Carry to next meeting</strong></td>
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</table>
<I-N-C-A> Framework

- Common conceptual basis for sharing information on processes and process products
- Shared, intelligible to humans and machines, easily communicated, formal or informal and extendible
- Set of restrictions on things of interest:
  - I Issues e.g. what to do? How to do it?
  - N Nodes e.g. include activities or product parts
  - C Constraints e.g. state, time, spatial, resource, ...
  - A Annotations e.g. rationale, provenance, reports, ...
- Shared collaborative processes to manipulate these:
  - Issue-based sense-making (e.g. glIBIS, 7 issue types)
  - Activity Planning and Execution (e.g. mixed-initiative planning)
  - Constraint Satisfaction (e.g. AI and OR methods, simulation)
  - Note making, rationale capture, logging, reporting, etc.
- Maintain state of current status, models and knowledge
- I-X Process Panels (I-P²) use representation and reasoning together with state to present current, context sensitive, options for action

Mixed-initiative collaboration model of “mutually constraining things”
I-P² aim is a Planning, Workflow and Task Messaging “Catch All”

- Can take ANY requirement to:
  - Handle an issue
  - Perform an activity
  - Respect a constraint
  - Note an annotation

- Deals with these via:
  - Manual activity
  - Internal capabilities
  - External capabilities
  - Reroute or delegate to other panels or agents
  - Plan and execute a composite of these capabilities (I-Plan)

- Receives reports and interprets them to:
  - Understand current status of issues, activities and constraints
  - Understand current world state, especially status of process products
  - Help user control the situation

- Copes with partial knowledge of processes and organizations
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More information and papers at http://openvce.net/iroom

YouTube video at http://openvce.net/iroom-tour
I-Room: Further Technical Detail

• Mixed Initiative Task Support
• I-Room Underlying Concepts
• I-X Task Support
• Further Images
• FVWC 2010 Larger Version
• Proposal for work on “Language Games” for interaction protocols for virtual collaboration
I-Room: Mixed-initiative Collaboration

Truly distributed mixed initiative collaboration and task support is the focus of the I-Room, allowing for the following tasks:

- situation monitoring
- sense-making
- analysis and simulation
- planning
- option analysis
- briefing
- decision making
- responsive enactment
I-Room: Underlying Concepts for Effective Collaboration

Underlying the use of the I-Room for collaboration and its ability to link human participants to a range of computational services and intelligent systems support are the following concepts:

• A mixed-initiative collaborative model for refining and constraining processes and products;
• Principled communication based on sharing issues, activities/processes, state, event, agents, options, argumentation, rationale, presence information and reports through the <I-N-C-A> ontology;
• The use of the <I-N-C-A> ontology also for representing the products that are developed during meetings and through the collaborative process;
• The use of I-X Technology and its suite of tools to provide task support;
• The use of issue-based argumentation, through the use of the Questions-Options-Criteria (QOC) methodology and links to the Compendium sense-making tool;
• The use of agent presence models as in instant messaging;
• The use of I-X “I-Space” to support awareness of agent context, status, relationships within an organisational framework, capabilities and authorities;
• The use of an “I-World” of discovery of relevant agents and services, along with their capabilities, authorities and availability;
• The use of the “Beliefs-Desires-Intentions” (BDI) model of agents and their relationship to world state, context and other agents.
• The use of external shared repositories of processes, products, media and other resources.
• These technologies, methodologies and ontologies will form the platform on which the research can be based.
I-Room: I-X Task Support

I-X is a suite of tools designed to aid in processes that create or modify one or more “products” (such as a document, a plan, a physical entity or even some desired changes in the world state). The I-X approach involves the use of shared models for task-directed communication between human and computer agents.

An I-X agent (or system of agents) carries out a process, which leads to the production of (one or more alternative options for) a product. The I-X agent/system considers this synthesised artefact to be represented by a set of constraints on the space of all possible artefacts in the application domain. This provides a common conceptual basis for sharing information on processes and process products. It is intended to provide a framework that is shared, intelligible to humans and machines, easily communicated, as formal or informal as the situation demands, and extendible.

The underlying conceptual information-sharing model on which I-X is based is the <I-N-C-A> (Issues-Nodes-Constraints-Annotations) ontology which represents a set of restrictions on processes or products:

- **Issues**: e.g. what to do? How to do it?
- **Nodes**: e.g. include specified activities or product parts
- **Constraints**: e.g. temporal, spatial, or on resources
- **Annotations**: e.g. rationale, provenance, progress

To move towards achieving the goals of the collaboration, an I-X agent or system repeatedly moves through cycles of handling issues and managing domain constraints. To do this, a number of differing ‘mixed-initiative’ collaborative processes can be invoked, including:

- **Issue-based sense-making**, e.g. such as the gIBIS approach with its 7 question types
- **Activity planning and execution**
- **Constraint Satisfaction**, using AI and OR methods, or simulation
- **Note-making**, rationale capture, logging, reporting

The I-X Process Panel (I-P2) (Tate et al. 2002) provides the principal interface for a human user of an I-X system; its underlying representation and reasoning act on the current world state to present the user with context-sensitive options for action. The aim is to provide a planning, workflow and communications ‘catch all’ for the user. On behalf of its user, an I-P2 can accept process-level activities to:

- Handle an issue
- Perform an activity
- Respect a constraint
- Note an annotation

Where appropriate, it can suggest performing these activities through:

- Manual performance
- The invocation of internal or external capabilities
- Delegation to other agents or services
- Planning and executing a composite of these approaches