

Providing a 'COMPASS' for mobile services and users in smart spaces

Context-aware, Ontology-based, Managed,
Person-centric Adaptive ServiceS

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M-Zones - Managed Smart Spaces

Smart Spaces are environments with traditional computing hardware as well as embedded computers, information appliances, and multi-modal sensors allowing people to perform tasks efficiently by offering unprecedented levels of access to information and assistance from computers.

e.g. MIT Oxygen, Georgia Tech's Smart Living Room,
IBM T-Spaces

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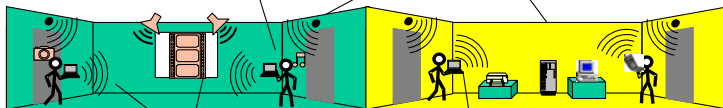
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Adaptive Smart Space Services support contextual personalisation across integrated heterogeneous services & resources

Users can cooperate by sharing resources and participating in group work

Each Smart Space could be administered by a different operator



Dynamic administered & Shared facilities

Users receive personalised Textual, audio and visual And kinesthetic service

A task in one Smart Space might be supported by a different set of services in another space

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Why traditional solutions won't work:

- Far greater degree of dynamism & heterogeneity
- A blurring of division between control plane, management plane, and service-logic/ knowledge
 - the objects are getting smarter!
- Unlikely to be realised via single uniform middleware/computing infrastructure

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- **Managed Smart-Space Services are typically:**
 - Dynamically Adaptive
 - Context aware
 - Support high level of Mobility (networks, services, devices & users)
 - High degree of autonomy (Self management)
 - Highly interoperable
 - Proactive
- **Challenges traditional 'layers' & research groupings!**
 - Network & H/w infrastructure
 - Device & embeded s/w services
 - Enabling services
 - Application Services

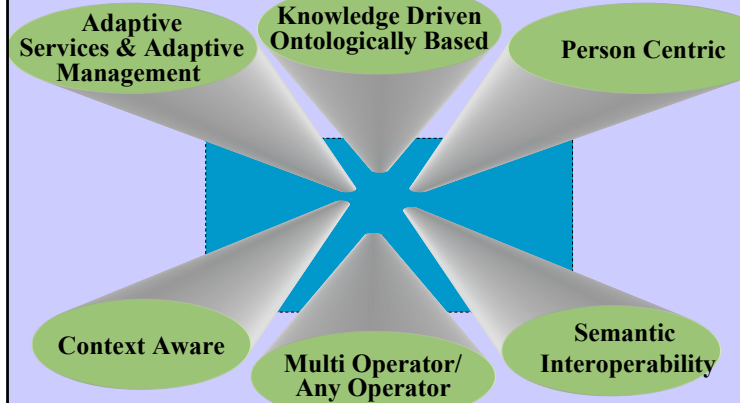
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Issues in Managed Smart Spaces



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Ontology Based Semantics

- **Metadata**
 - Data describing the content and meaning of resources and services.
 - But everyone must speak the same language...
- **Terminologies**
 - Shared and common vocabularies
 - For search engines, agents, curators, authors and users
 - But everyone must mean the same thing...
- **Ontologies**
 - Shared and common understanding of a domain
 - Essential for search, exchange and discovery
 - ➔ Ontologies aim at sharing meaning

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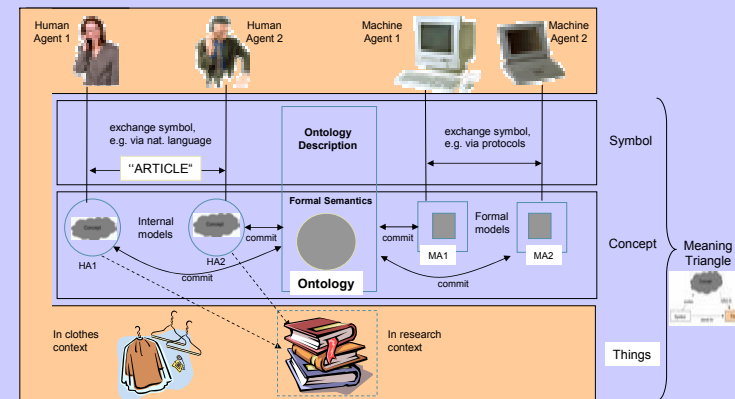
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[Carole Goble, Nigel Shadbolt, Ontologies and the Grid Tutorial]

Semantic understanding for Human/Human and Machine/Machine Communication



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[Maedche et al., 2002]

M-Zones Presentations - Session 1

“Person-Centric Service Adaptation

Dave Lewis

“Anatomy of Adaptive Services for Ubiquitous
Computing Environments”

Owen Conlan

“Bridging Heterogeneous Autonomous Dynamic
Knowledge Sources at Runtime”

Declan O Sullivan