

ASSETS IN WONDERLAND

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Agenda

- Background**
- Synthetic Environments at DERA**
- Total Virtuality**
- F&C - An Example**
- Research Challenges**
- Outlook**

Background - Proposition

Theoretically grounded or abstract synthetic environments - “total virtuality” - are emerging as valuable tools for creating business advantage through research, simulation, development and training

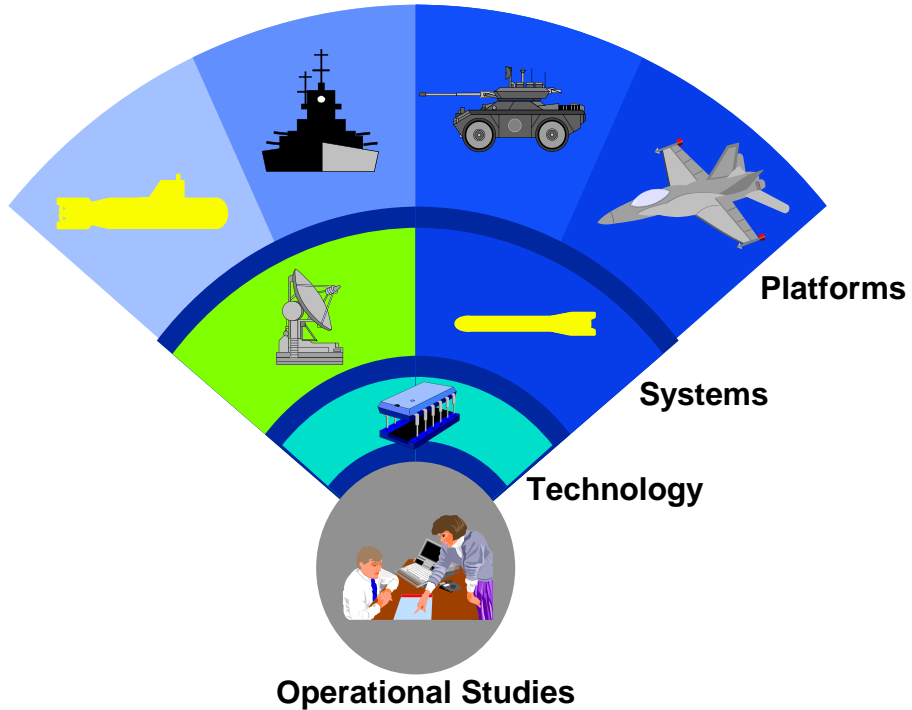
which means

an explosion of exploration of solutions

Background - DERA

- ❑ **Big in size (>£1billion, >12,000 people, >60 sites) and long in timescales**
- ❑ **Big in scope (physics, life sciences, test ranges, international stage)**
- ❑ **Innovative and world class (carbon fibre, liquid crystal displays, thermal imaging)**
- ❑ **Unique in facilities - supercomputing, satellites, networks, laboratories**
- ❑ **Commercial - UK Ministry of Defence Trading Fund Agency**

DERA Roles



Synthetic Environments at DERA - Scale

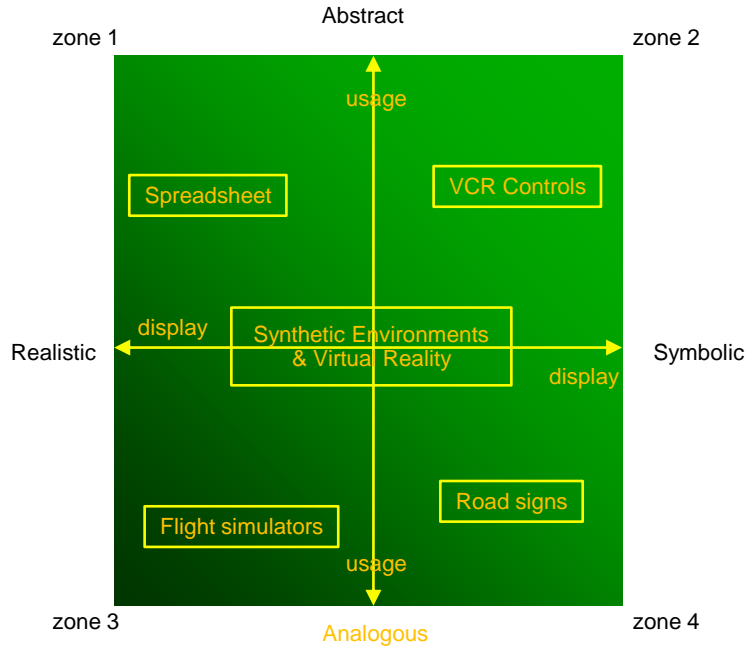
Pervasive - all technology areas

- Large-scale - equipment & networks -
(Distributed Interactive Simulations)**
- Research domains**
 - ➔ physiology and motion sickness
 - ➔ information systems architectures, complex computing
 - ➔ psychology/framing of risk-taking and team risks inside and outside simulations
 - ➔ validity of synthetic environments
- International**

Synthetic Environments at DERA - Benefits

- Supporting acquisition/procurement**
 - ➔ concept
 - ➔ operational analysis simulation & modeling
 - ➔ development
 - ➔ training
 - ➔ enhancement
- Integration through procurement cycle**
- Integration of platforms and systems**
- More rapid development**
- More worlds explored - sensitivity to innovation**

Visualisation



Total Virtuality

Synthetic Environment applications in totally abstract domains, e.g. finance, data mining, military strategy, IS systems

- ➔ Finding analogous and realistic expressions for abstract concepts
- ➔ Permitting interaction with abstract models
- ➔ Abstract thinking spaces
- ➔ Measurement of virtual value chains
- ➔ Multi-player abstract fora - Gibson again

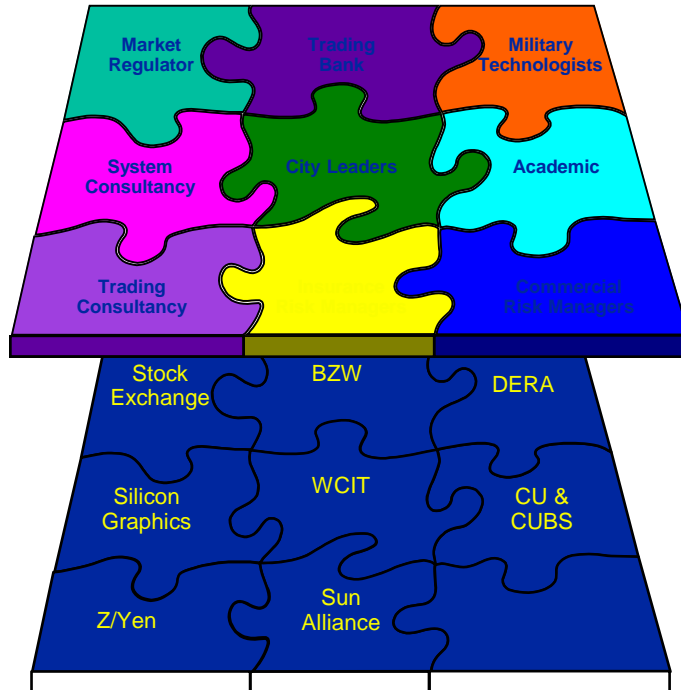
F£C - An Example of TV

DERA has formed a collaborative research agreement called

“The Financial Laboratory Club” (F£C)
which will

- ➔ Research the problems of financial risk management
- ➔ Use VR/Synthetic Environments to model finance
- ➔ Mix resources from members to achieve its goals
- ➔ Achieve intellectual leadership in risk management techniques and applications

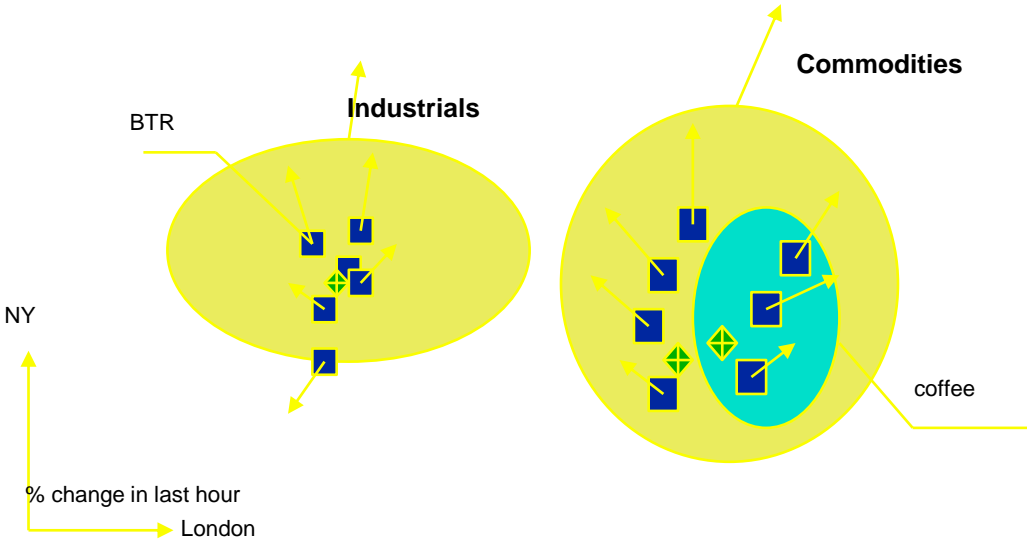
Partners In The F&C



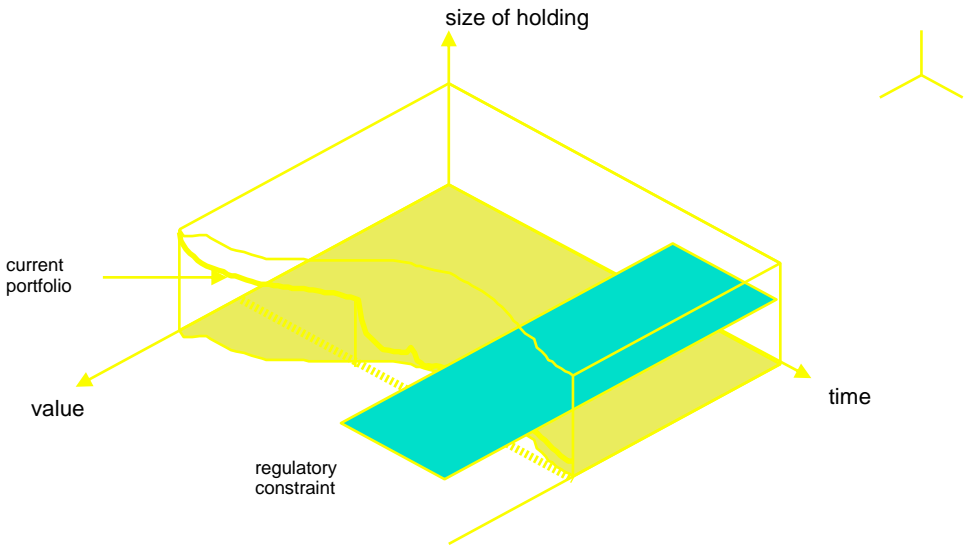
F&C : Research Issues

Issue	Goal
3D, VR, Synthetic Environments, and Man Machine Interface	Morphology / Landscape standards
Statistical and mathematical underlying theory	New 'physics' for risk environments
Human psychology of risk	Models of human behaviour for risk sensitive environments
Team psychology of risk	Group decision modelling heuristics
Safe development environments	Technical leadership and authoritative laboratory standards, e.g. for regulators

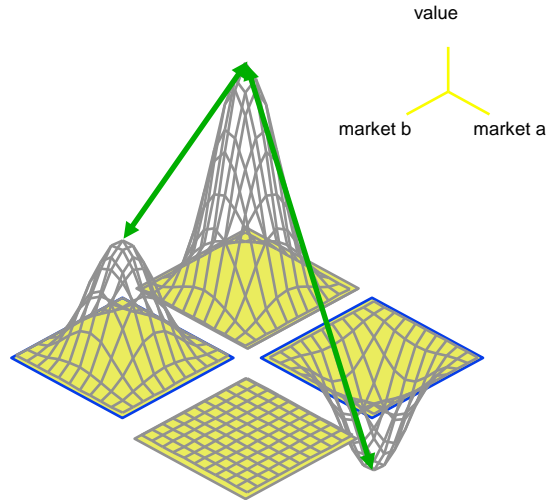
Variability In/Between, Sectors (zone 4)



Threat Avoidance (zone 1)



Rubber Sheet Methods (zone 3)



Research Challenges - Total Virtuality

- Constructing abstract synthetic environments which permit interaction and multiple players
- Understanding/sharing/delivering across the boundary between total abstraction and human senses
- Verifying totally abstract models
- Evaluating total virtuality - is one synthetic environment better - where, when, why?
- Adoption process for abstract models in real-life

Outlook

- Threat - uncooperative enemies**
- Innovation as a destabilising force - leaping intermediate stages**
- Economy, efficiency - faster, smaller, cheaper**
- Networkable**
- Fashionable**

Cray T3D

