EPSRC Systems Integration Programme

COMPANION

COmmon Model for PArtNers in AutomatION

An integrated engineering environment offering greater agility in the lifecycle of automotive manufacturing machinery

Grant GR/M53042

3 Year Project Starts July 1999

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COMPANION

Industrial Collaborators

End Users
Ford Motor Company Ltd
Jaguar Cars Ltd

Machine Builders
Giddings & Lewis Ltd
Johann A Krause UK Ltd

Machine Component Suppliers
Parker Hannifin Ltd
Mannesmann Rexroth Group

Technology Vendors
Oracle Corporation UK Ltd
Echelon UK Ltd
FDS Ltd
Hopkinson Computing Ltd
TLON GmbH

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COMPANION

- The Problem
- Current Engineering Process
- New Process (COMPANION)
- Project Overview
- Research Issues
- Generic Applicability

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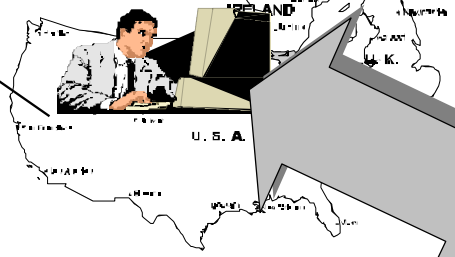
The Problem

70% Europe
25% USA
5% Other

Japan
Germany
USA / UK

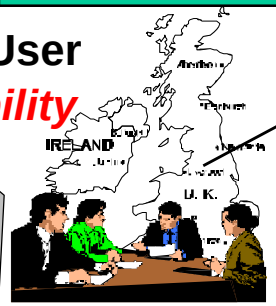
Many Machine Builders



Machine Design
Machine Implementation

End User

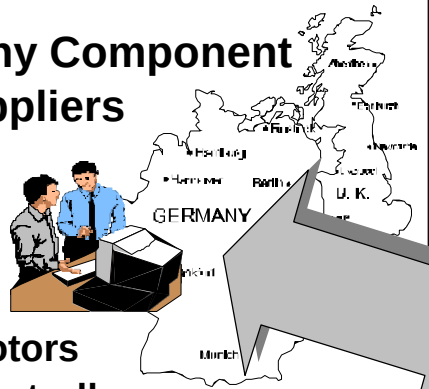
Project responsibility



Customer Requirement
Process Engineering
Product Engineering

- **Continual Change**
- **Communications Culture, Language, Time Difference**
- **Skills & Knowledge Shortages**
- **Lack of Design Tools**
- **Ad Hoc Integration**

Many Component Suppliers



Motors
Controllers
Sensors
Actuators

Many Production Lines

Virtual Organisation

Mexico, USA, Japan, Europe, USA

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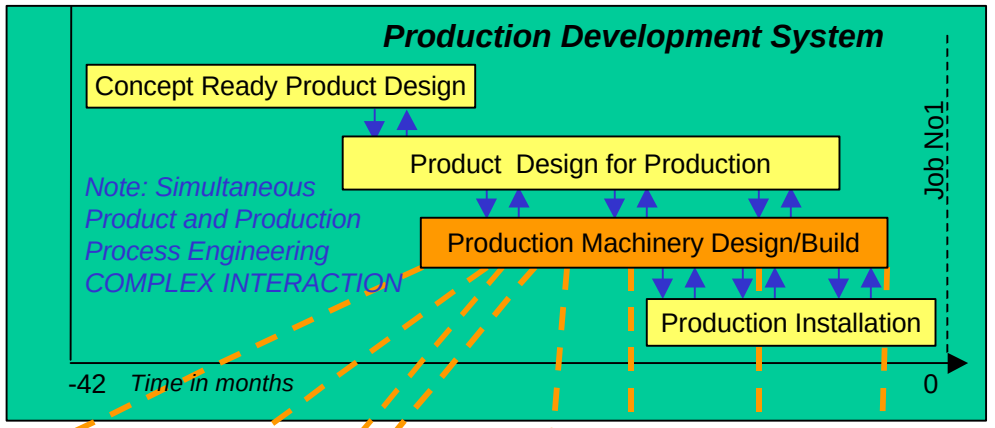
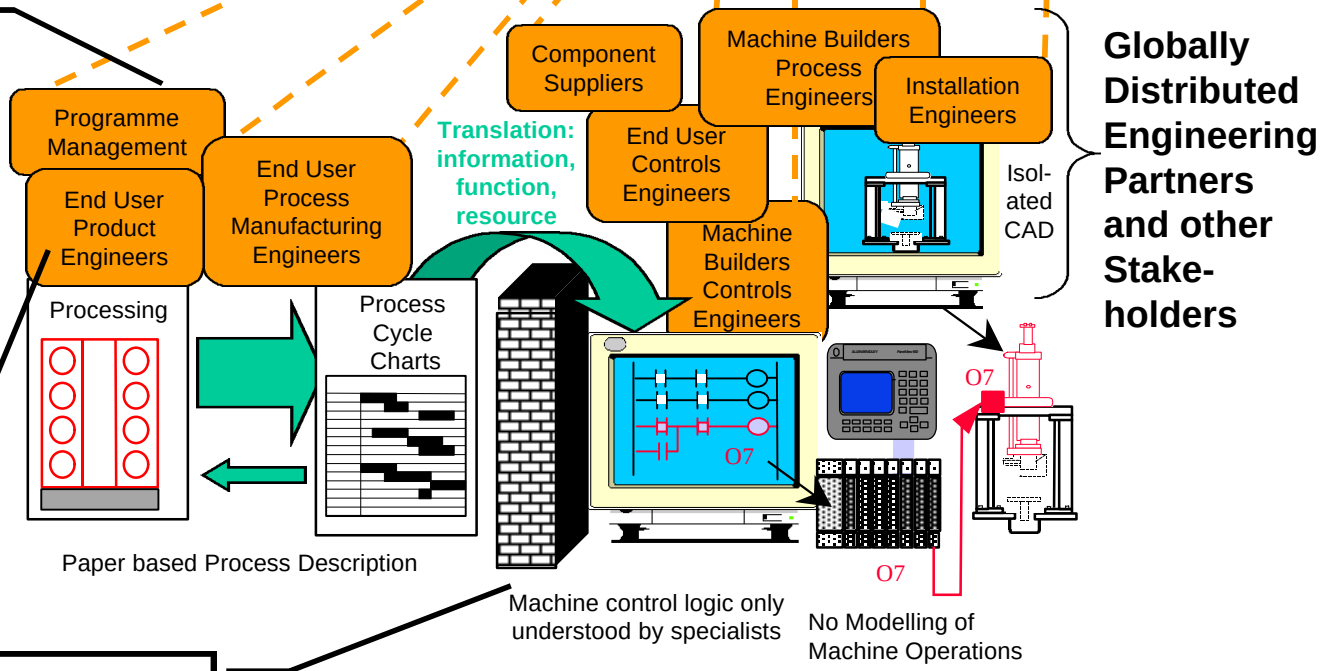
Current Engineering Process



Ad Hoc Integration of Engineering Partners

No Common System Representation

Model is not Directly Executable



Globally Distributed Engineering Partners and other Stake-holders

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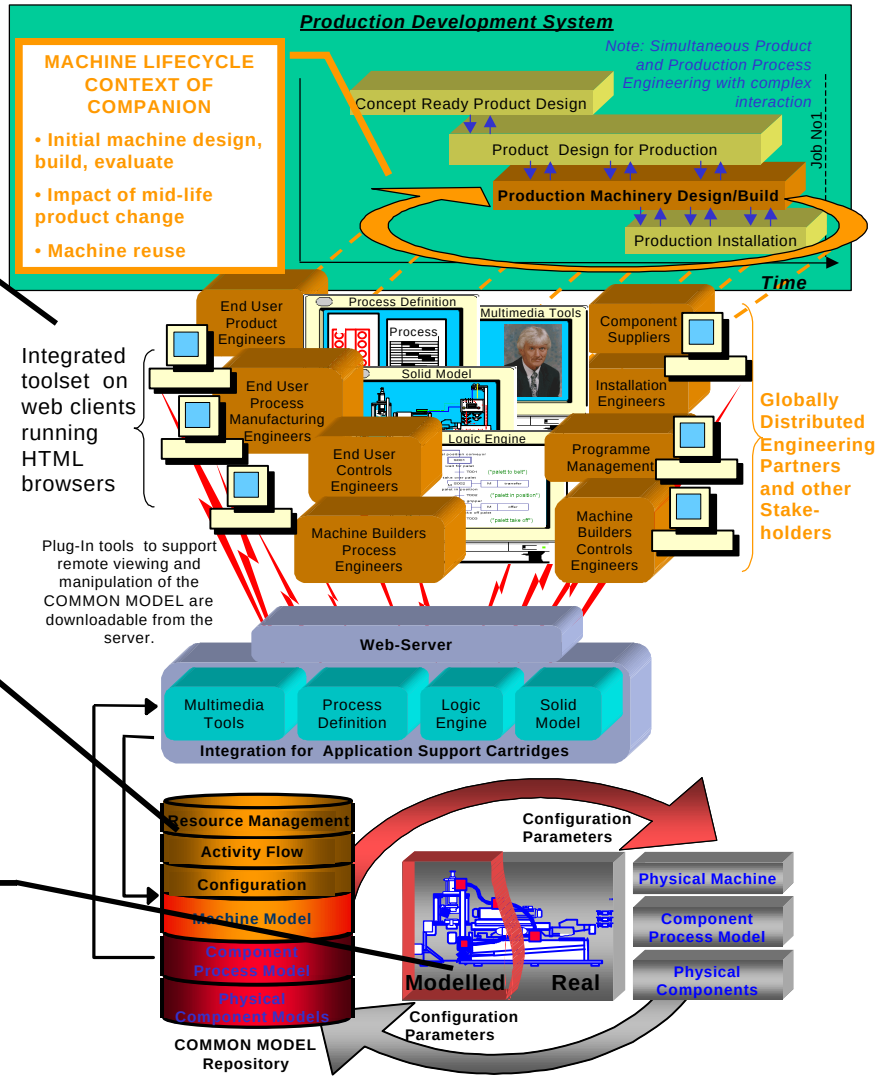
Schematic of COMPANION Environment

Engineering partners use Integrated Toolset on Web based clients

Common System Representation

Model is directly executable i.e. no translation



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Important Features

- Integrated Engineering Environment
- Advanced Design Tools
  - Process Definition
  - Solid Modelling
  - Logic Engine / Logic Analysis
- Web Based User Support
- Possible addition of Multimedia Tools

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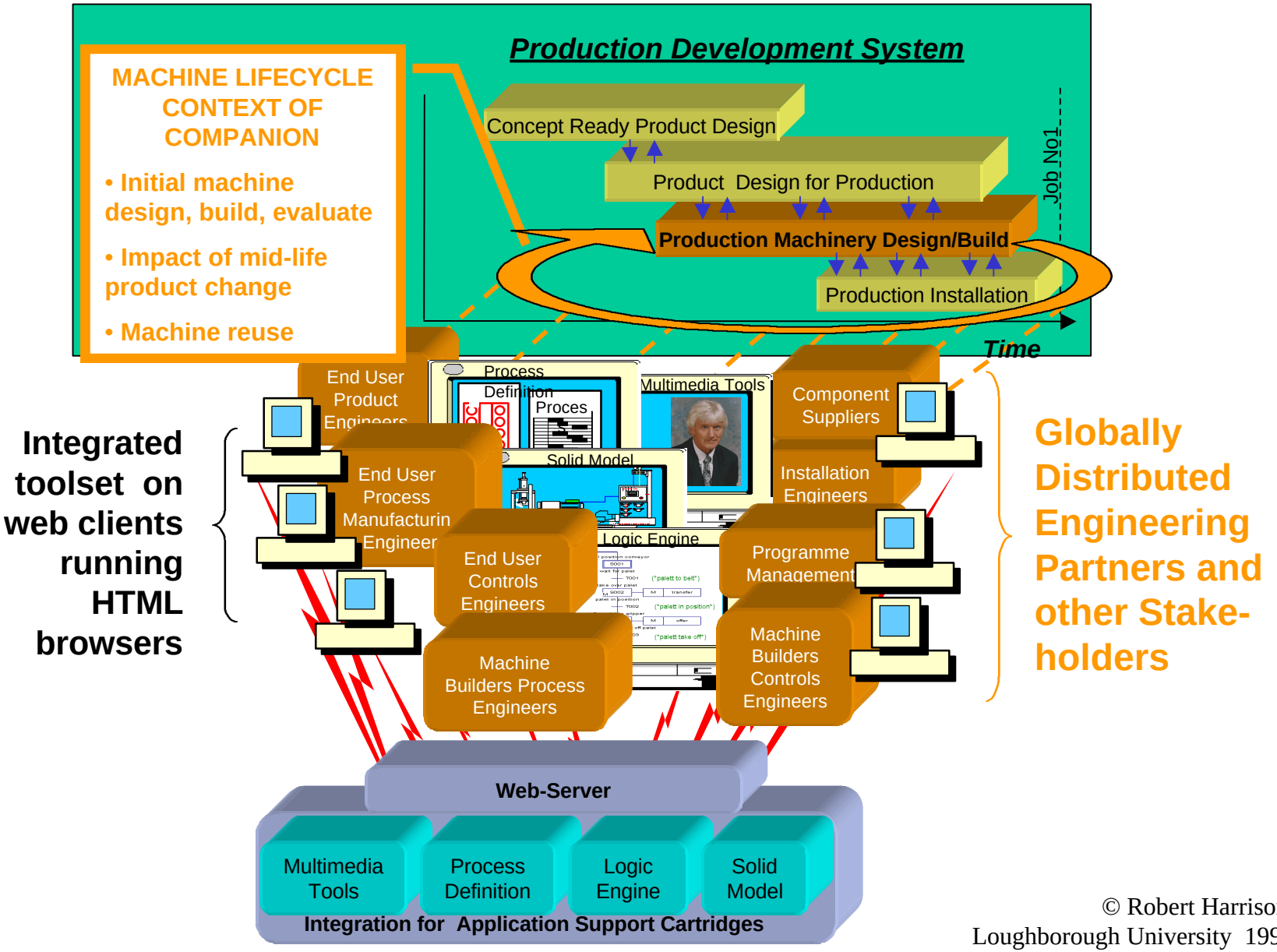
COMPANION: Context and Integration of Partners



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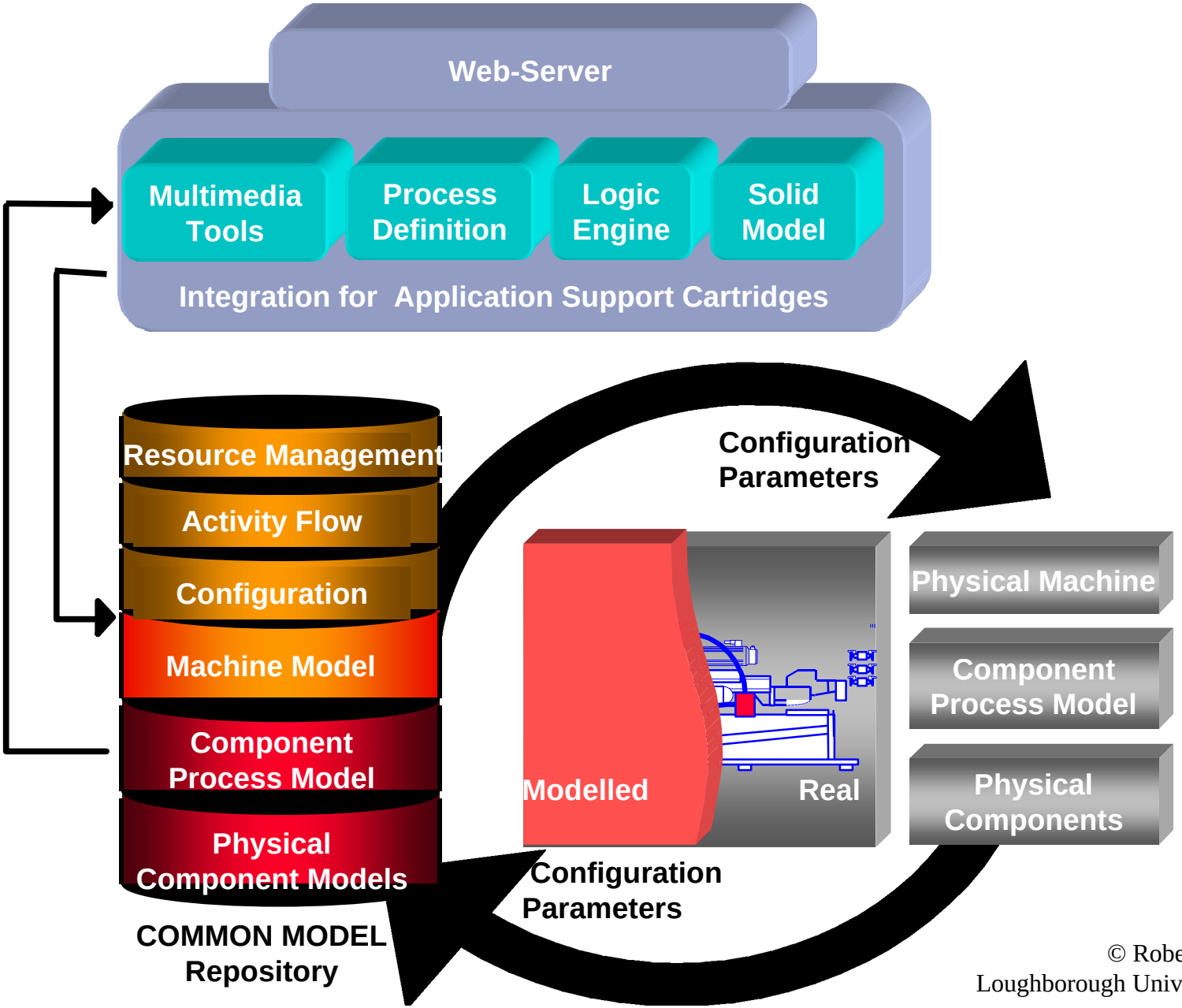
COMPANION: Common System Representation



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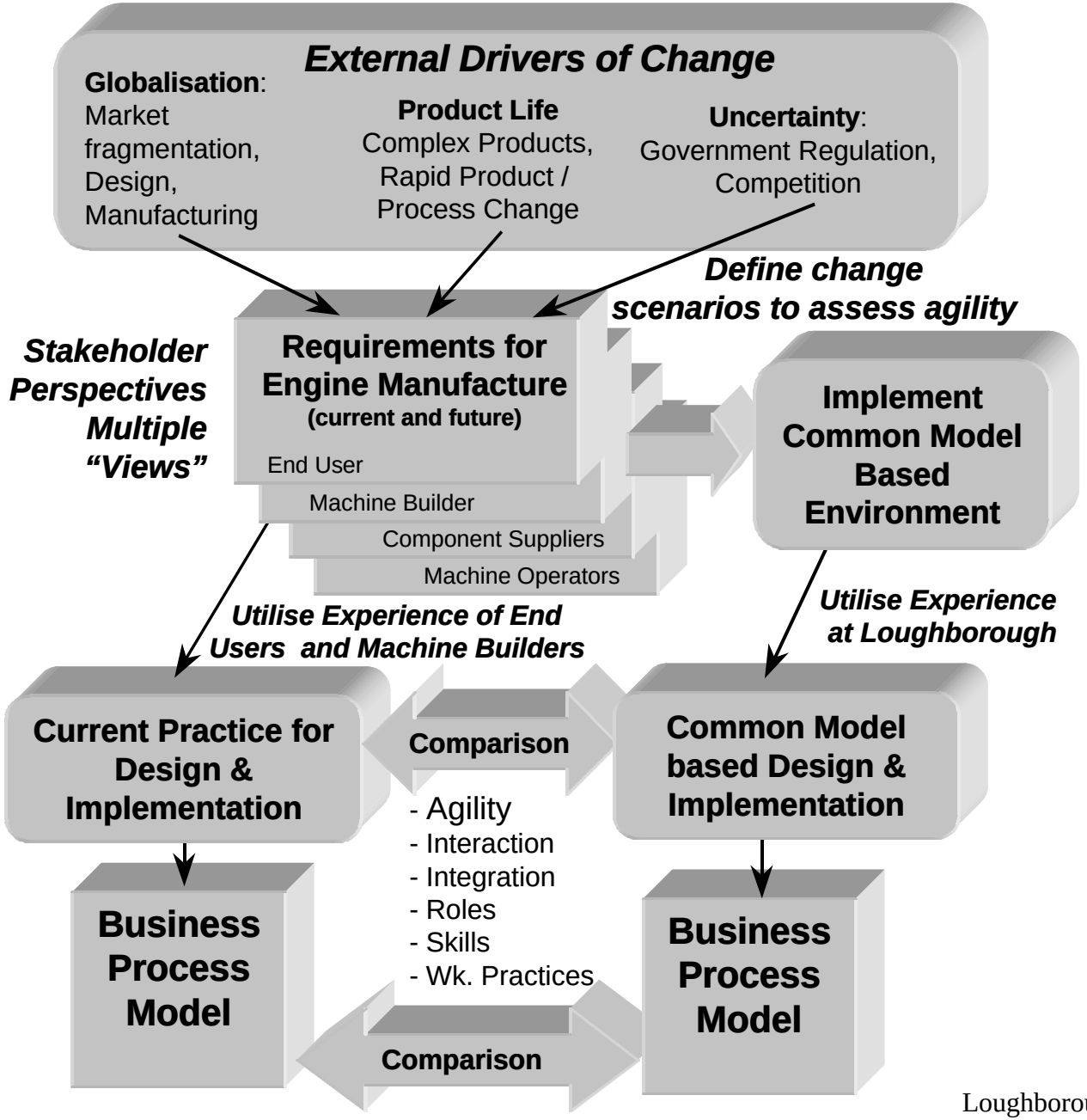
COMPANION Project Overview



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Research Issues

Business/Process-Engineering Integration Issues

- What are the strategic benefits of a new integrated development process?
- How will organisations migrate activities to the new process?

Human Integration Issues

- How do partners share, communicate, and visualise requirements and solutions?
- What are the human roles in the production machinery lifecycle?
- How can access to a common model lead to new collective behaviours?

Technical Issues

- Does the component architecture for machines adequately support the business, human and technical needs of COMPANION?
- What are the architectural requirements to adequately support change?
- What do we need to model to meet the engineering need?
- What system management support is required?
- What tools are required?

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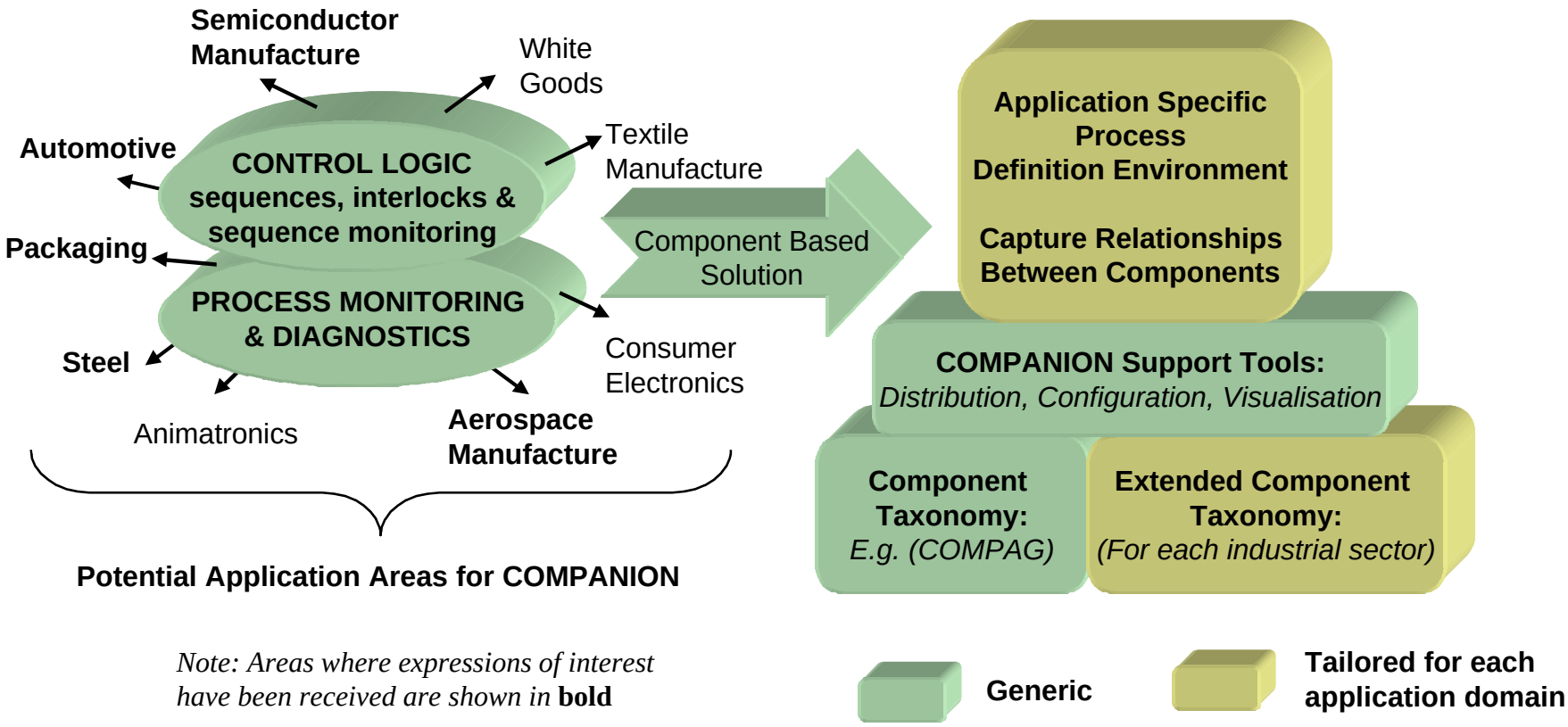
Generic Applicability of the Concepts and Methods of COMPANION



Note: Areas where expressions of interest have been received are shown in **bold**

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