

UNIVERSITY OF  
STRATHCLYDE

EPSRC

DESIGN MANUFACTURE  
ENGINEERING MANAGEMENT

DMEM

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or refer to the project  
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www.spmacg.com

Please turn over for  
details of the  
prescription stage of  
the KITE project.

KITE

Knowledge Integration & Transfer for Engineering design

www.spmacg.com

## Improving distributed engineering design projects by the effective utilisation of knowledge

### Main study fields

*Computer Supported Co-operative Work (CSCW)* which studies how people work together using computer technology, specifically in distributed situations, and *Knowledge Management* which is the study of the capture and re-use of organisational knowledge. Both of these study domains are applied within an Engineering Design context.

### Design level background

Within the distributed design space many 'islands' of knowledge exist externally (organisational) and internally (departmental) within projects which have to be integrated and transferred adequately to all design team members.

### General background

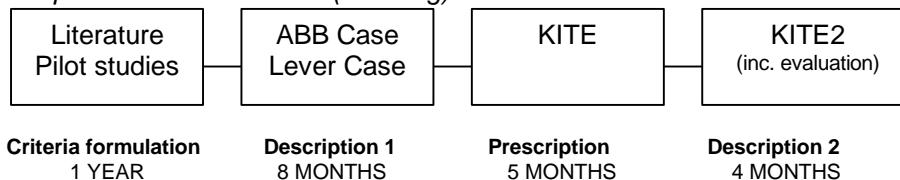
Mergers, take-overs and a general lack of consistency are the hallmarks of present day industry. Work teams are constantly changing and companies are outsourcing more and more, resulting in complex supply chain management and a need for stability.

### Hypotheses

- 1) Inconsistencies (problems) arise in the distributed design process due to isolated islands of knowledge which exist in the project space.
- 2) Distributed design does not reach its full potential due to a lack of understanding of distributed work, characteristics of successful and unsuccessful projects and a propensity to throw tools at a process not fully understood.

### Methodology

*Description based framework (Blessing)*



### Themes and issues

Emergent themes and issues from the industrial case studies so far include:

- A study of the end phases of design;
- A comparison of original v variant design (revolutionary v evolutionary);
- A comparison of engineering design and product design;
- An appreciation of the importance of physical *interfaces* of a product;
- An understanding of different *levels* of distributed work;
- Characteristics of successful and unsuccessful distributed projects.

### Contribution

Some of the above themes address gaps in the literature and a general understanding of distributed design in industry will help industrialists leverage the potential benefits of distributed work.

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KITE

Prescription Stateside

<http://www-cdr.stanford.edu/~macgregor>

## Examining collaboration worldwide through worldwide collaboration

### Motivation

In order to satisfactorily conduct research on distributed collaboration it is necessary to study at different locations around the world. This has been initiated through conducting research at industrial sites throughout the UK and will be continued through collaboration with world class research centres in North America. Not only will this aid the prescription stage of the project through worldwide perspectives on distributed work, but also through an appreciation of similar research being conducted at the collaborating sites.

### Main study groups

Center for Design Research, Stanford University, Stanford, CA (13 weeks residency)

<http://www-cdr.stanford.edu/cdr.html>

GroupLab, University of Calgary, Calgary, Canada (4 weeks residency)

<http://www.cpsc.ucalgary.ca/grouplab/>

n-dim, Carnegie-Mellon University, Pittsburgh, PA (4 weeks residency)

<http://www.ndim.edrc.cmu.edu/>

### Conference attendance

The research trip will also be exploited through conference attendance. Papers have been accepted and will be presented at the following conferences:

CSCW in Design, London, Ontario, Canada

<http://206.248.115.115:4080/cscwd2001/>

ASME Design Engineering and Technical Conferences, Pittsburgh, PA

<http://www.me.cmu.edu/DETC2001/>

### Other movements

The trip will be further exploited where possible in each of the residencies through general networking with industry and academia. This is anticipated to be particularly fruitful in the Silicon Valley area while at Stanford University. A short term trip is also planned to Houston, Texas to visit the worldwide headquarters of the first industrial case study company – ABB Vetco Gray.

### Acknowledgements

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