

# Software Systems Centre and Software Engineering Research in the UK and Europe

Keith Phalp, Sheridan Jeary, Roberto Lopez-Herrejón  
and Val Casey.

- Keith Phalp – Associate Dean: Head of Software Systems and Psychology, BU, and co-director of SSRC.
- Sheridan Jeary – Director of the Software Systems Research Centre (SSRC).
- Roberto Lopez-Herrejon – Lecturer in Software Systems Modelling in SSRC
- Val Casey – Lecturer in Software Quality within SSRC

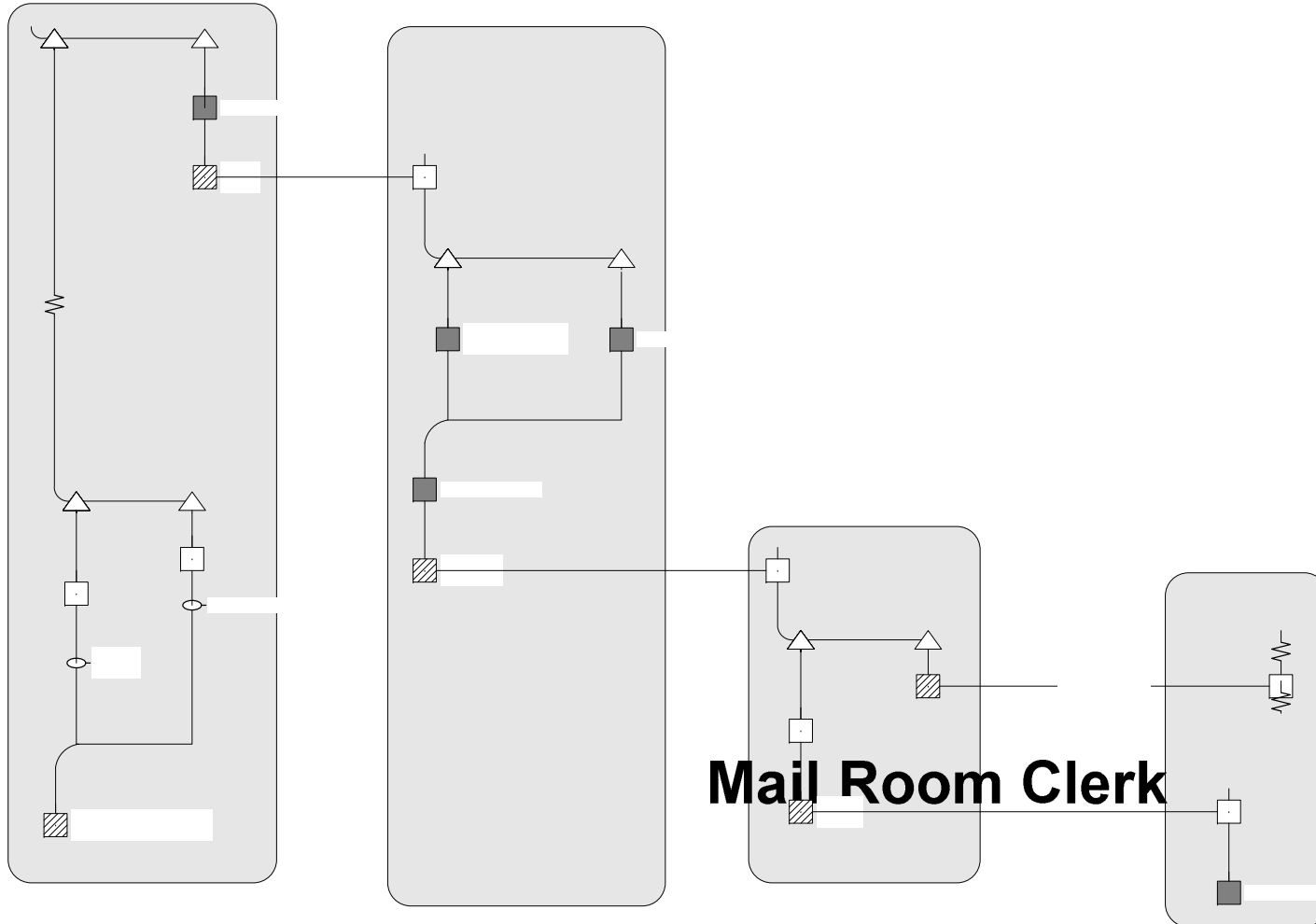
- ***Research relevant to the profession of Computing.***
  - ***Requirements Engineering***
    - Alignment of Business and IT
    - Process modelling and Process Oriented Requirements.
    - Requirements within a Model Driven Development Process
  - **Software Modelling**
    - Model Driven Development
    - Domain Specific Languages
    - ***Software Product Lines***
      - Automotive Software Engineering, Bosch, Germany
  - **Software Process and Quality**
  - **Global Software Systems**
    - Data Mining
    - Web Systems
    - ***Global Software Development***

# Requirements Issues in the UK and Europe

- In the UK and Europe, the requirements phase is recognised as the most costly and problematic, i.e., most frequent technical cause of project failure.
- A major issue is that of business and IT alignment.
  - That is, IT systems are delivered which do not support business strategy and goals.
  - Business stakeholders are not involved sufficiently in the specification of software systems.
  - Models presented are often not amenable to validation by the non-IT specialist.
- Work in the centre to address such issues.

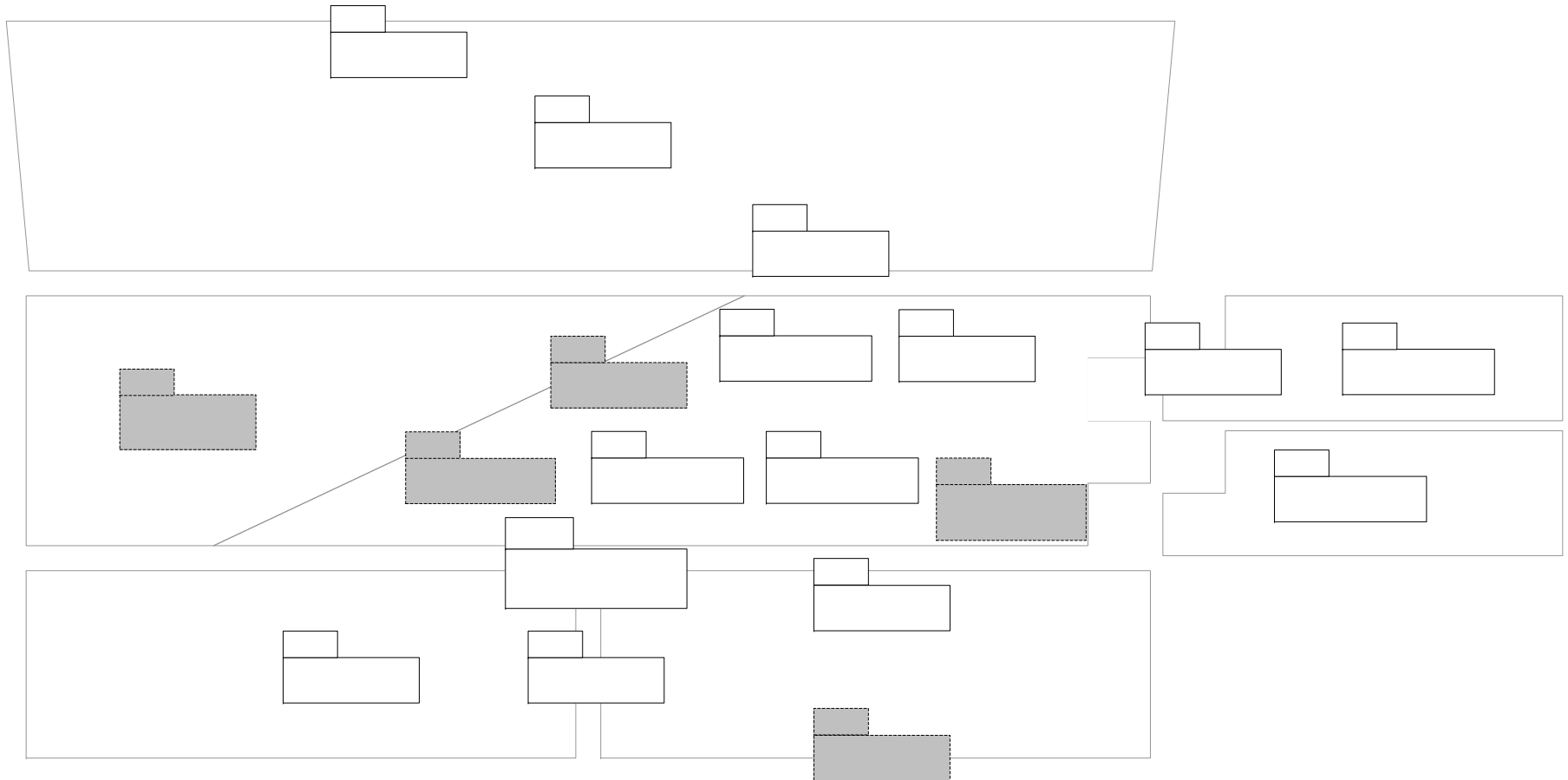
- Process Oriented Requirements Engineering.
  - We use (research and consultancy) and teach these approaches.
- Process models (Role Activity Diagrams) are used to model the problem domain (and thus to inform requirements).
- Process models mapped to (augmented) use case specification (EDUCATOR), such that process information can be represented and retained (REBNITA).
  - Extended (in collaboration with NICTA- Australia) to align business strategy, context and process (B-SCP) with IT.
- CIM models (as requirements) within MDA.
  - VIDE project provides accessible models (as part of an MDA process) – including pre-CIM in order to increase involvement of breadth of stakeholders.

# Role Activity Diagrams



- Worth 2.95 million US dollars
- 10 partners including: SAP, 2 divisions of Fraunhofer, Softeam and Rodan (tool developers).
- Project overall: to make model driven development fulfil business needs.
- Many perspectives including: accessibility to stakeholders (CIM), Aspects, Quality defect detection, rapid transformations (via wizards), action semantics.
- BU focus specifically on accessibility of notation, particularly at the CIM level.

# VIDE Project Components





# Software Product Lines: Product Lines. A Perspective

Dr. Roberto E. Lopez-Herrejon

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Software Systems Research Group

Bournemouth University

- Assistant Professor (Lecturer)
  - Bournemouth University
- Adjunct Professor (External Lecturer)
  - University of Oxford
- HEFCE CD Fellow (2005-2008)
  - University of Oxford
- PhD. University of Texas at Austin (2006)
  - Fulbright scholar 1998-2001

# What is a Product Line?

- A **Product Line** is a set of related products

**Base**  
Choosing a faster Processor will increase the speed and performance of your system.

AMD® Sempron Mobile Technology 3500+

[? Learn More](#)

- AMD® Sempron Mobile Technology 3500+ [Included in Price]
- AMD® Turion 64 X2 Mobile Technology TL50 [add £70.50 or £1/month<sup>1</sup>]  
**Dual-Core: Processes power as fast as your imagination: Two processors woking as one.**
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- AMD® Turion 64 X2 Mobile Technology TL56 [add £164.50 or £4/month<sup>1</sup>]

**Operating System**  
Dell PCs use Genuine Microsoft® Windows® <http://www.microsoft.com/piracy/howtotell>

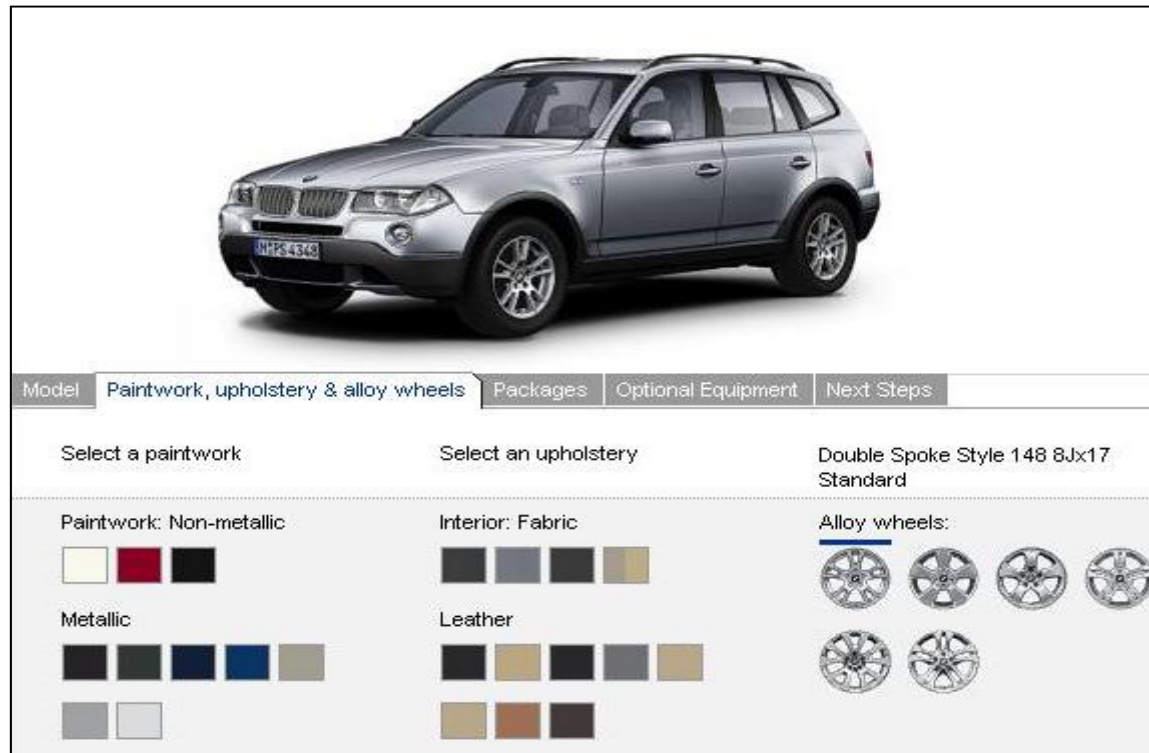
Genuine Windows® XP Home Edition - English

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- Genuine Windows® XP Professional - English [add £58.75 or £1/month<sup>1</sup>]

## Dell's Laptop Product Line

# Product Lines are Pervasive



BMW Car Configurator

# How Do Products Relate?

- Products are distinguished by their **features**
- Oxford English Dictionary

*A feature is a distinctive or characteristic part of a thing; some part which arrests the attention by its conspicuousness or prominence*

# Why Product Lines?

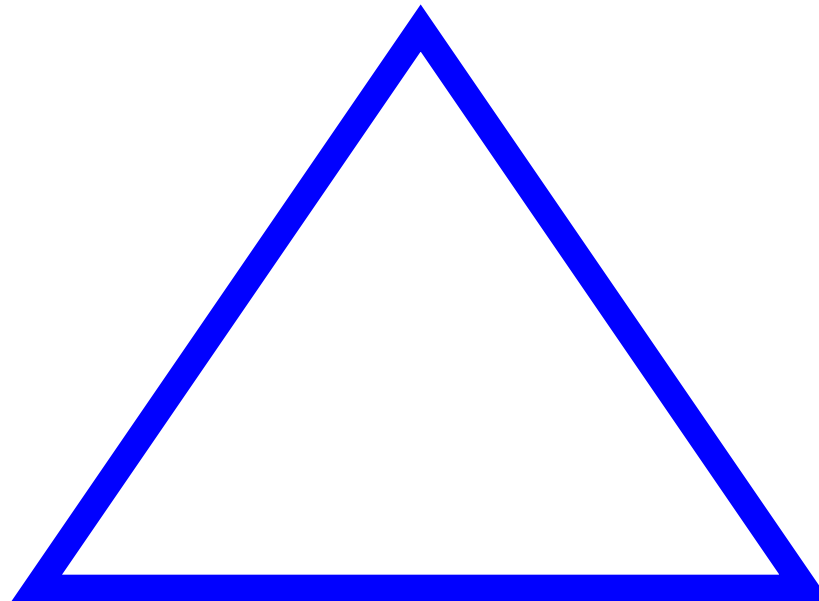


- Supports Customization
  - Different products for different clients
- Improves Reuse
  - Use your assets for different products
- Reduces Time to Market
  - Know how to build similar products

# Factors for Success of Product Lines

Economics

Technology



Management

- More than 3 decades of research in Software Product Lines (SPL)
- Results
  - Many SPL methodologies
    - Different terminology, perspectives, views, etc.
  - Multiple implementation technologies
    - From pre-processors to advanced modularization.
  - Successful application studies
    - In multiple application domains for companies of all sizes.



- Key question:
  - When does it make sense to use product lines?
- For customers – already a common practice
  - many programs come in academic, enterprise, professional, deluxe, etc. versions
    - Different set of features
- For developers
  - Some cost models and guidelines exist
  - Some markets are already ripe for product lines
    - mobile phones

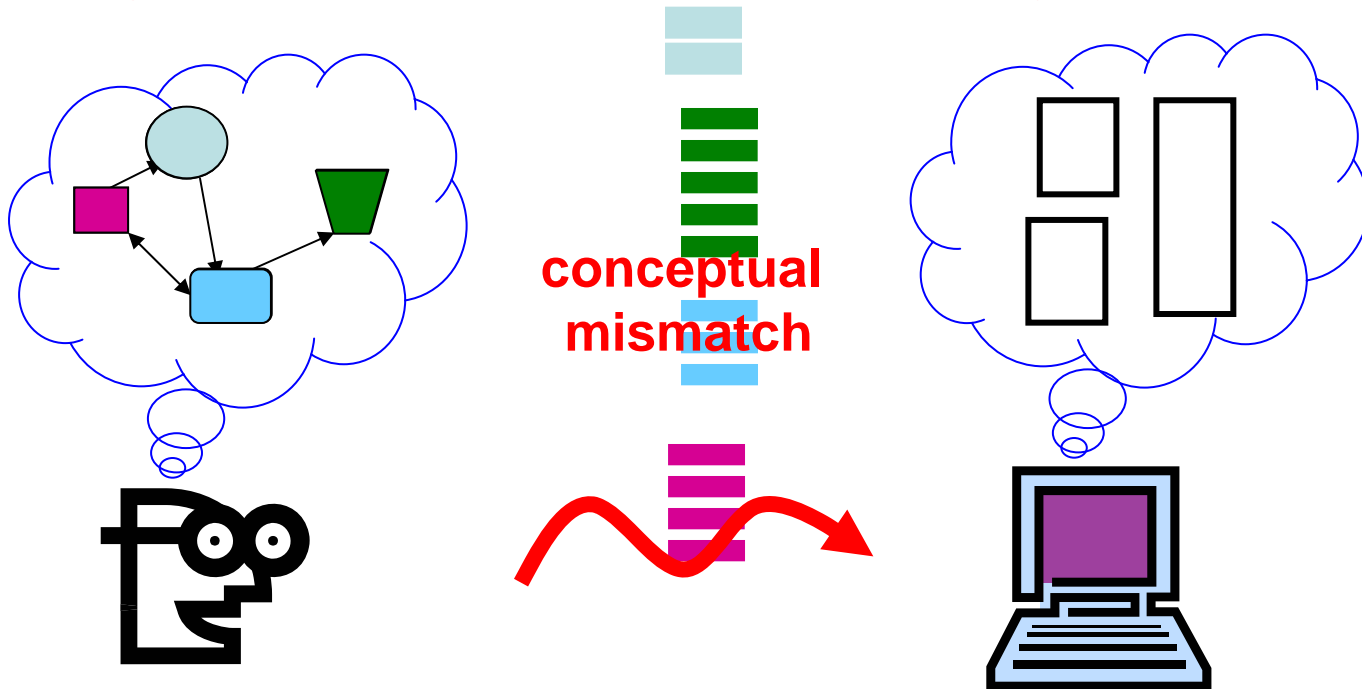
- Some key questions:
  - How to adopt SPL?
  - How to assign resources?
  - How to integrate and reuse existing assets?
- Methodology specific guidelines
  - Anecdotic and empirical results – no general
- Technical probes
  - Assess if and how a company can implement a SPL

- Increasingly improving ideas, concepts, theories, methodologies
- Increasing robust tool support
- Increasing accumulated experience on building commercial product lines
  - More empirical evidence is needed ...

# My Research – Feature Modularization

✓ Programs are abstracted by features

✗ Programs are NOT modularized by features



- Current SPL practice
  - Different modularization used at different stages
  - Terribly impedes feature traceability
- FOSD goal
  - Robust support for feature modularization throughout the SPL development cycle

# Global Software Development In The UK

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**Bournemouth  
University**

**Global Software  
Development (GSD)  
continues to be an  
expanding trend  
in the Software  
Industry today**









**Off shoring / Outsourcing continues to be a popular strategy in the UK software Industry**

**While this is the situation very mixed results are still being achieved**

**There is still a clear requirement for direction on how best to develop implement and manage an effective GSD strategy**

# The Reality - GSD Is A Difficult Task

**GSD is a complex and difficult endeavour**

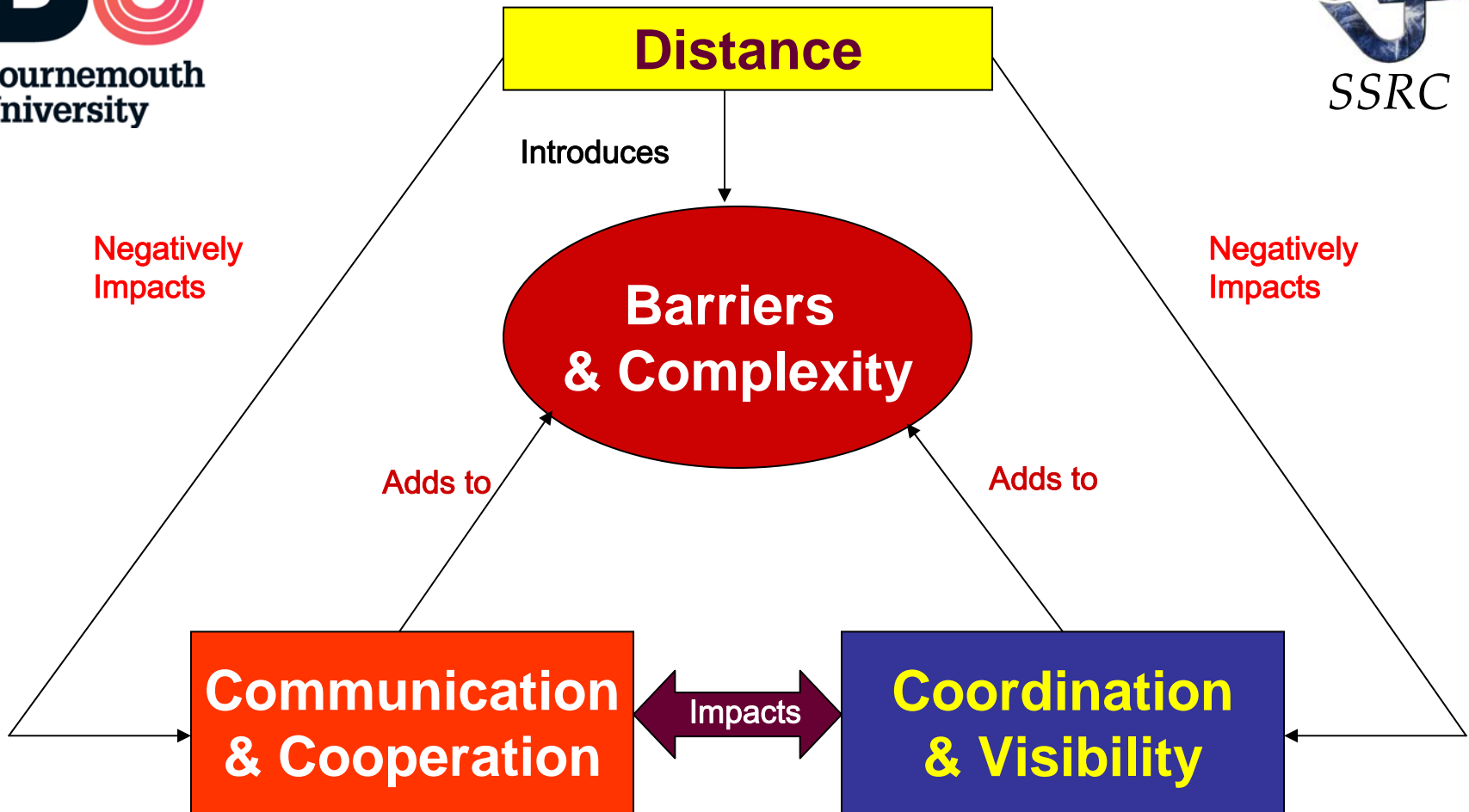
**Never mind the hype there are lots of problems and failures**

**Not the same as collocated development**

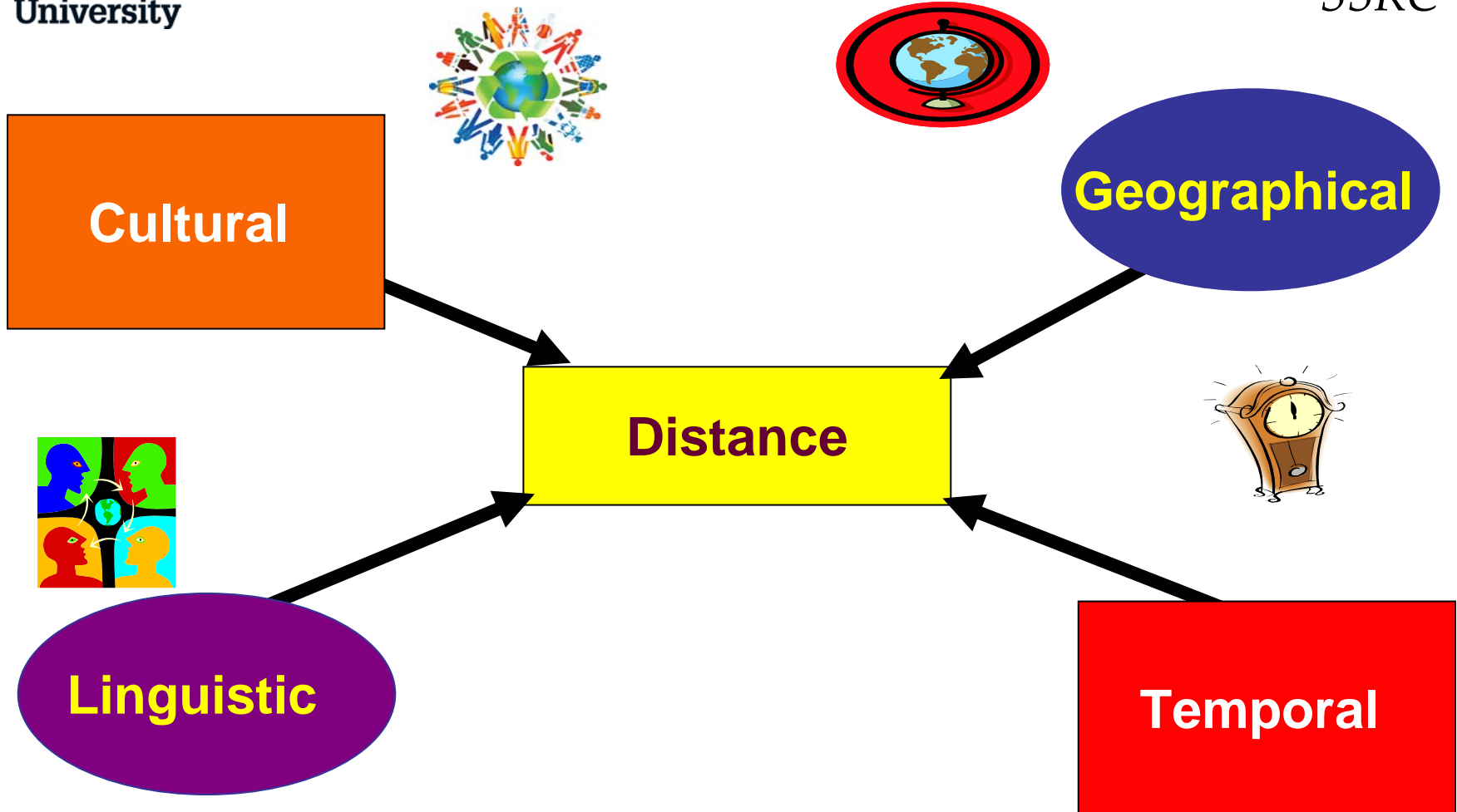
**Costs are not just Salary there are other important costs -  
Training, Travel, Coordination, Delayed Delivery, Product  
Quality, Human!**

**Need for individuals at different and remote locations to  
operate as unified teams**

**All the negative factors associated with distance come into  
play**



# Types of GSD

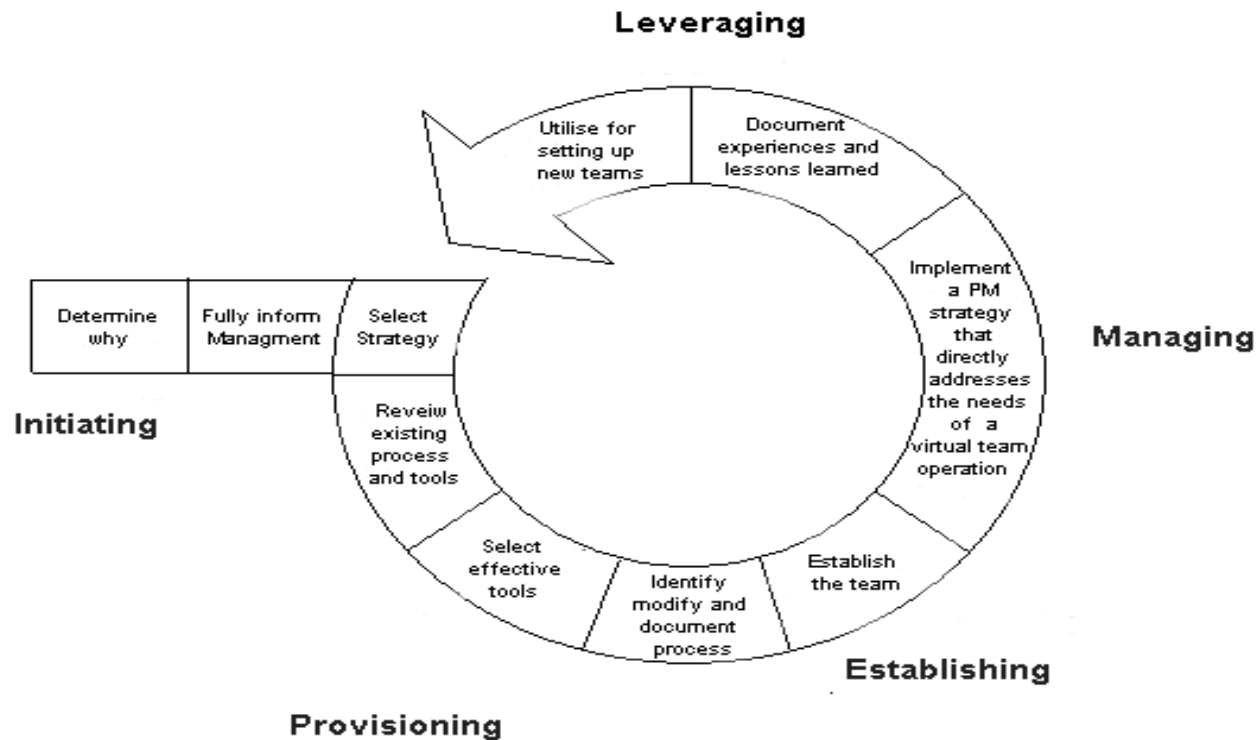




**There is a particular requirement for GSD research to be undertaken with the Banking and Financial sectors here in the UK**

**Based on the GSD research which I have undertaken over the last 10 years my focus is now centred on developing my research further in these areas**

# GSD Implementation Model



**More details can be found in my paper *A Structured Approach to Global Software Development*” (EuroSPI) 2008, Dublin, Ireland**

**I have a number of other publication this year**

**The most important is my book *“Software Testing And Global Industry: Future Paradigms”* due in the Book shops in January**

Today software development has truly become a globally sourced commodity. This trend has been facilitated by the availability of highly skilled software professionals in low cost locations in Eastern Europe, Latin America and the Far East. Organisations endeavouring to leverage the opportunities this provides and to avail of the benefits of establishing operations close to emerging markets have embraced this strategy in large numbers.

Software testing plays a key role in delivering high quality products and is a labour intensive, complex and expensive activity. In the context of Global Software Development (GSD) to date testing has been perceived as a well defined task that is relatively straightforward and lends itself to being outsourced or offshored. This volume considers this specific topic and demonstrates that testing in a GSD environment is not a simple activity. It is prone to be negatively impacted by all the factors associated with distributed software development. This work also provides practical solutions which can be utilised to address these important issues.

While the primary focus of this work is software testing it is also the culmination of 10 years research by the author in the area of GSD. During this period he has considered all aspects of the software development life cycle. This experience and knowledge has been incorporated into this volume. It is therefore relevant to note this work is of value to the wider software community not just to those interested in testing. It specifically considers the establishment of virtual teams and their efficient and effective operation. Therefore this book has relevance to all those interested in implementing or improving a GSD strategy. Its particular strengths are that while it is a scholarly work it is industry based and practical.

**Dr. Val Casey** is a lecturer in Systems Analysis and a researcher in Bournemouth University. His previous academic position was as a research fellow with Lero—The Irish Software Engineering Research Centre at the University of Limerick. He has published widely in a number of different areas of Software Engineering. He has over 20 years experience working in software development where his roles have included Software Engineer, Team Leader and Project Manager. He has also lectured in the University of Limerick where he received his PhD in Computer Science. He is a Software Engineering Institute trained CMM assessor and holds a MSc. in Software Re-Engineering and a BSc. in Economics and Management from London University. His last industrial role was that of Software Quality Manager. He has also provided consultancy services focusing on Distributed Software Development, Software Process Improvement, Software Quality and Testing to the financial and telecom sectors.

Cover image: Killkee Bay in September 2007 by Gloria Casey

978-1-4438-0109-6  
[www.c-s-p.org](http://www.c-s-p.org)



Valentine Casey

SOFTWARE TESTING AND GLOBAL INDUSTRY

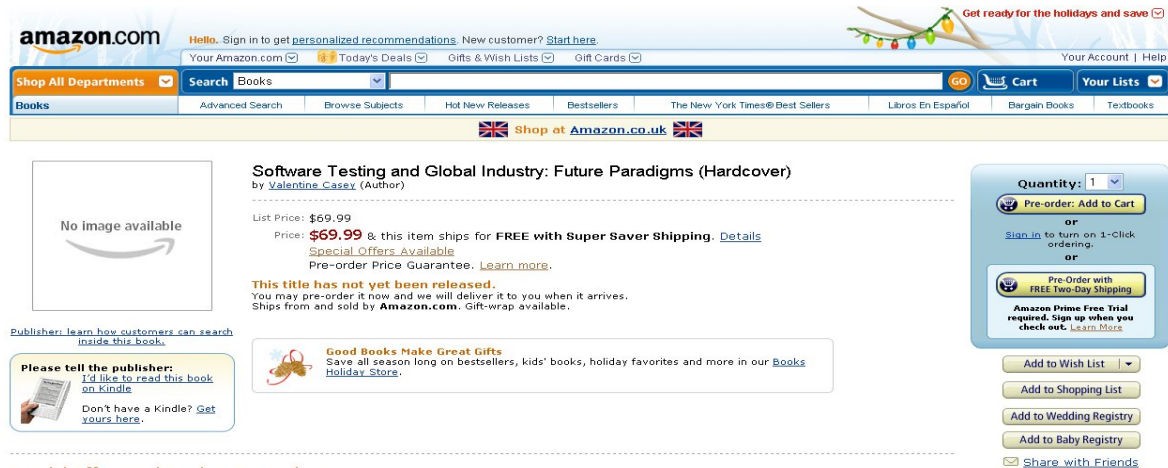
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# SOFTWARE TESTING AND GLOBAL INDUSTRY FUTURE PARADIGMS

By

**VALENTINE CASEY**





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**Editorial Reviews**

**Product Description**

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**Software Testing and Global Industry: Future Paradigms**  
by *Valentine Casey* (Hardcover)

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**Reader Rating:**  [Write a Review](#)

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**ICGSE 2009 is taking place in the University of Limerick, Ireland on the 13 -16 July 2009**

**Invitation for proposals for tutorials of three and a half hours duration on topics relevant to GSD**

**Proposals should be sent to me as Tutorial Chair  
vcasey@bournemouth.ac.uk**

**Full details can be found on conference website**

**<http://www.lero.ie/icgse2009>**



Bournemouth  
University



SSRC



**Thank You**

# Questions For The Panel



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