UCL

# SOFTWARE ECOSYSTEMS: A NEW RESEARCH AGENDA

Anthony Finkelstein

# Agenda

- A <span style="color:red">speculative</span> sketch for a new research agenda

- Comprising:
    - Motivation
    - Context
    - Progress
    - Questions
    - Analyses [*]
    - Outcomes [*]

# Motivating Example I

- European Commission Decision of 24th March 2004:
  - Microsoft Corporation shall […] make the Interoperability Information available to any undertaking having an interest in developing and distributing work group server operating system products and shall […] allow the use of the Interoperability Information by such undertakings for the purpose of developing and distributing work group server operating system products.



COURTESY: EUROPEAN COMMISSION

# Motivating Example I



- Interoperability Information means the complete and accurate specifications for all the Protocols implemented in Windows Work Group Server Operating Systems […]

- Protocol means a set of rules of interconnection and interaction between various instances of Windows Work Group Server Operating Systems and Windows Client PC Operating Systems running on different computers in a Windows Work Group Network
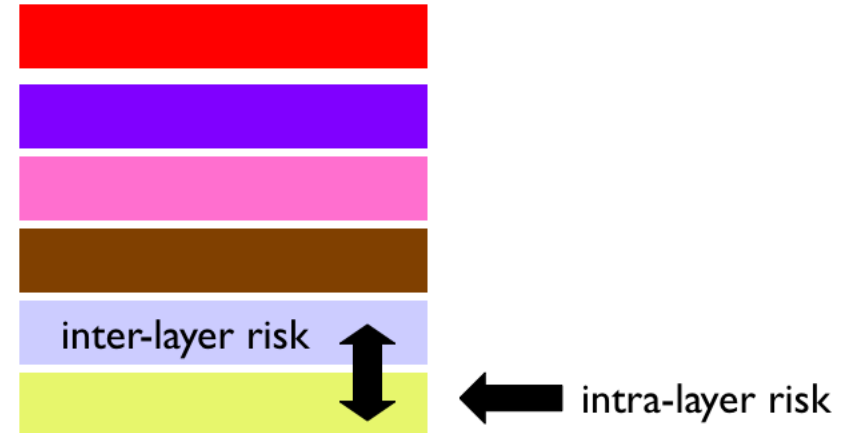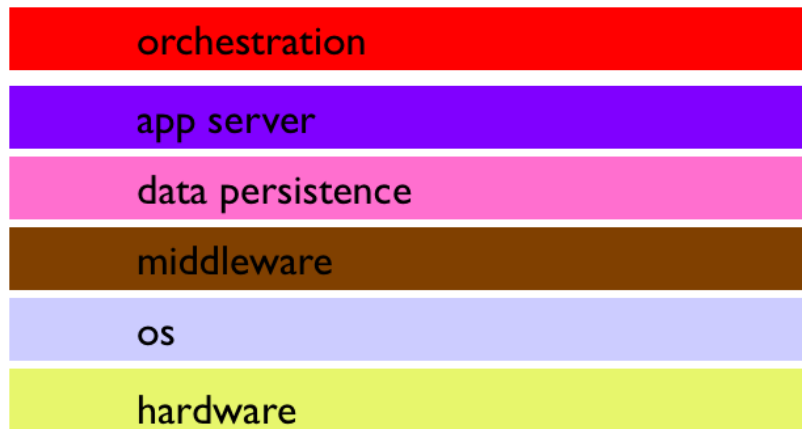
# Motivating Example II



- Customers
- Partners
- Developers
- [Architecture]

# Motivating Example III

- Logispring / Ad Eundem
  - 'The Platform Gamble'

| orchestration |
| app server |
| data persistence |
| middleware |
| os |
| hardware |

| |
| |
| |
| |
| inter-layer risk |
| intra-layer risk |

- ERP spheres of influence

# Context

- 'Monolithic' systems

- Component reuse

- Component market places

- Service broking
  - Fine-grain, lots of research, limited use

# Context

- 'Built for purpose' systems

- Package acquisition (+ 'glueware')

- Supply chains

- *Ecosystems*

  - *Coarse grain, very little research, lots of use*

# A slight digression

- On the boundaries between software engineering research and 'business' research …
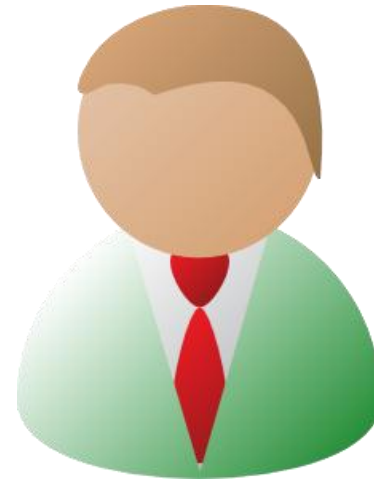
# Acquisition

- Distinguishing offerings (default based specification)
- Balancing mutability
- Aligning ontologies

# Supply Chains

- Introducing the supply chain viewpoint
  - The 'laptop example'
- Managing across supply chains
  - Control of evolution
  - Risk

# Ecosystems

- 'a biological community of interacting organisms and their physical environment'

- cf ecology – the study of the interactions among organisms and with their environment

- cf symbiosis – interaction between two different organisms living in close physical association, typically to the advantage of both.

# Partnership

# Plugins

**3D Invigorator**
by Digital Anarchy

Artists can easily create complex 3D logos, text and objects using vector artwork. Turn flat 2D art into dynamic 3D objects!

★★★★★ 5.0  10 ratings

**ContrastMaster**
by The Plugin Site

ContrastMaster is a plugin for effective contrast enhancement, creating dramatic contrast looks and HDR-like effects.

★★★★☆ 3.8  6 ratings

**Bleach Bypass Action**
by Curvemedia

This action quickly transforms your images giving them the look of the traditional cross process

★★★★★ 4.7  3 ratings

**Retina**
by XtraSens Ltd.

Retina maximizes the perceived contrast, brightness, sharpness, depth and resolution using a proprietary model of human vision.

★★★★★ 4.6  16 ratings

**PhotoTools 2 lite**
by onOne Software

Free Photographic Effects Plug-in for Photoshop

★★★☆☆ 3.0  1 ratings

**Eye Candy 6**
by Alien Skin Software

Eye Candy 6 is a set of Photoshop filters that handle a wide range of design tasks, from Web interfaces to logos to titles.

★★★★★ 4.9  7 ratings

**PhotoPresets for Photoshop Lightroom**
by onOne Software

Over 140 FREE presets for Photoshop Lightroom!

★★★★☆ 4.0  4 ratings

**B/W Styler**
by The Plugin Site

B/W Styler is a plugin for B&W conversion, creating traditional B&W effects and styling B&W photos.

★★★★☆ 4.0  4 ratings

**FREE - 3DVIA plugin - Search & Import 3D models**
by 3DVIA

A plug-in to search over 20,000 premium and user-generated 3D models and import them directly inside of Photoshop

★★★★★ 5.0  2 ratings

**3D Bridge for Photoshop**
by DAZ 3D

The 3D Bridge is a plug-in designed to connect the power of Photoshop with the unlimited content possibilities of DAZ Studio.

☆☆☆☆☆ 0.0  0 ratings

# Skills

# APIs

# Research Challenges

- How to enable an ecosystem around your offering?
- Complementarity vs Substitutability
- How to leverage an ecosystem?
- How to identify viable niches within ecosystems?

# Research Challenges

- What makes a 'community' live?

- How do we look at 'trajectories'
    - Interface options

- Open standards – norms vs skeletons

# Possible Approaches

- API usage
- Plugin – architectures & markets
- Social network analyses
  - StakeSource
- Sentiment analyses
  - MeaningMine
- Ethnographic analyses

# Outcomes

- Ability to engineer ecosystems
- Ability to manage ecosystems
- A new synthesis of research on business models and software engineering