Agile Architecture
how much is enough?

EAC2007

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Introductions

- I'm a stream technical architect for UBS Investment Bank
  - Our organisation includes technology architects, software (system) architects and stream architects
  - I'm one of the architects responsible for the ETD area
- Software architect for ~9 years
  - Plus enterprise architecture for ~2 years
- Author of "*Software Systems Architecture*" book with Nick Rozanski
- IASA Fellow

Enterprise Architecture

- IT strategy / business alignment
- Technology strategy and standards
- Functional architecture
  - System responsibilities
- Integration architecture
  - System interfaces
  - Inter-system flow
- Cross system common design

Our focus as stream architects

Agile Principles

- The agile manifesto values
  - **Individuals** and **interactions** over processes & tools
  - **Working software** over comprehensive documentation
  - **Customer collaboration** over contract negotiation
  - **Responding to change** over following a plan
- Key motivation is to facilitate efficient delivery and change

Agile Practices

Release frequently	Integrate changes often
Iterative delivery	Collective ownership
Customer is available	Customer prioritises
Simplest thing possible	Collaborative design
Specify via “stories”	Small teams
Test driven	Automate routine tasks
Refactor when needed	Shared workspace

Common Priorities

- Architects and agile teams have many of the same priorities
  - Focus on the consumers of the systems
  - Efficient delivery of valuable software
  - Simplification and reduction of cost
  - Quality & reliability of delivered software
  - Supporting efficient change
  - Effectiveness of communication

Architecture / Agile Conflicts

- With shared priorities, why can there be conflict?
  - “Big Up Front Design” (BUFD - large documents)
  - Document centric vs. delivery centric
  - Separation of decision making from delivery responsibility
  - Different views on processes and controls
  - Differing time horizons for return on investment
  - Architectural priorities vs. “customer” (user) priorities
  - Agile deliveries in larger change programmes

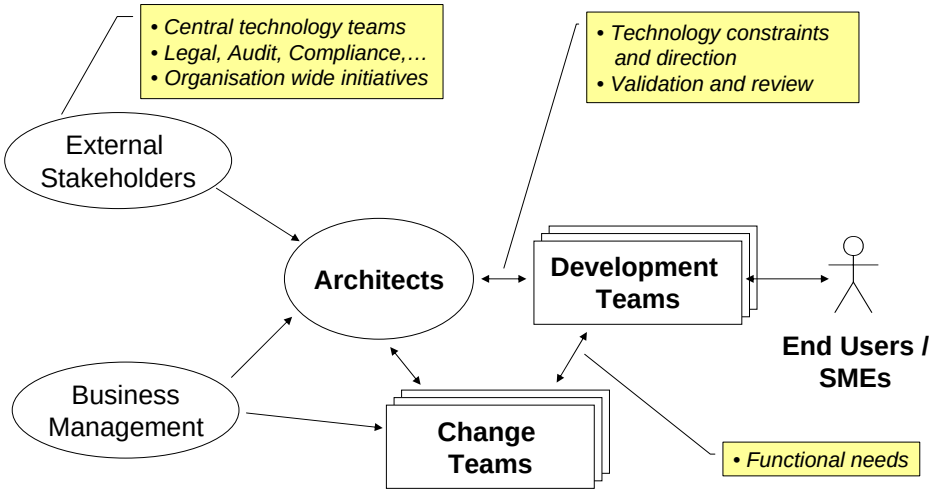
Why Agile Architecture?

- Avoid retreat to the “ivory tower”
  - Ensure relevance of what we do
- Focus on stakeholders
  - Make sure we deliver value
- Support change
  - So we deal with the realities of our environment
- Work well with development teams
  - Shared values and priorities
- Focus on delivery
  - Ensures the right priorities

Making Architecture Agile

- Expect change, allow for it
  - Work incrementally
- Be demand driven
  - Prioritise by customer needs
- Be delivery (not document) focused
- Make information relevant and accessible
- Produce working “software” regularly
- Simple, simple, simple (but not naïve)
  - Process, artefacts, solutions
  - Simplicity is a precursor for agility

Organisational Environment



Architecture Effectiveness Index

- Level 0 – no architectural impact
  - Architecture largely ignored, seen as irrelevant
- Level 1 – Stopping things getting worse
  - Essential decisions coordinated
- Level 2 – Stable and organised
  - Architecture understood, shared, aids change
- Level 3 – Architecture centric
  - Architecture is the point of reference for change

Agile Architecture Practices

Allow for Change

•Deliver Incrementally
•Allow reprioritisation
•Identify clear system responsibilities
•Design a catalogue of integration options

People not Process

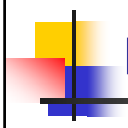
• Work with development teams
• Keep backlog visible

Software not Documents

• Good enough models & docs
• Regularly deliver something that "runs"
• Have solutions for security/DR/HA/…
• Build PoCs for credibility

Collaboration

• Identify *minimal* principles and share them
• Share information online
• Focus on x-system concerns



Practices – Allow for Change

- Deliver Incrementally
  - Visible progress, early feedback
- Allow reprioritisation
  - As your customer priorities change
- Identify clear system responsibilities
  - Allow confident extension
- Design a catalogue of proven integration options
  - Limit the choice while solving the problem
  - Provide clear rationale for making choices
  - Allow for the special cases as they're inevitable

Practices – People not Process

- Work with development teams
  - Don't drop documents, talk to the teams
  - Develop things jointly
  - Great source of knowledge and resources
- Keep backlog visible
  - Let people know what you're planning

Practices – Software not Docs

- Good enough models & docs
  - But make sure they *are* good enough!
- Regularly deliver something that "runs"
  - If not raw code, something else that works
  - Something useful directly or for research purposes
- Have solutions for security/DR/HA/…
  - Rarely solved well by the individual teams
  - Typically need to work across systems
- Build PoCs for credibility
  - Yours *and* the solution's!

Aside: Good Enough Modelling

- What is good enough?
  - Consider currency, precision, detail, completeness
- Our experience suggests
  - Focus on models where systems are components
  - Prefer models & databases to pictures
  - Be precise, even when abstract
  - Ensure models can be updated easily
  - Model with a purpose (audience and use)
- Areas to consider
  - Systems, responsibilities, inter-system connections
  - Shared domain model (so allowing integration)

Practices - Collaboration

- Define minimal principles & share them
  - Small set easily understood & accepted
  - Choose your battles (high value decisions)
- Share information online (e.g. Wikis)
  - Allow easy access, comment and update
- Focus on cross-system concerns
  - Avoid the system's areas of responsibility

Aside: Engaging Teams

- Solve their problems
  - Have proven solutions for integration, security, DR, …
  - Immediate value to development teams
- Jointly develop your architectural principles
  - Ensure they are understood and agreed
- Collaborate rather than police
  - Review to share & improve, not to govern
- Stay out of internal decisions
  - Unless invited or you need to avert catastrophe
  - Collaboration will mean that you have input anyway

Examples

1. Defining a catalogue of integration options
2. Agile modelling
3. Common solutions for family of systems

Example 1 – Integration Options

- Improving an environment with “light touch” EA
- Context of many systems linked in many ways
- Integration had evolved organically over years
  - Largely predated messaging
  - Perl scripts, shell scripts, direct database access, stored procedures, pub/sub, file unload/load, …
- Each feed worked perfectly well in its own way
  - But little or no commonality
  - Difficult to understand, monitor, debug
  - Very brittle making change difficult

Example 1 – Solution

- Apply *minimal architecture principles* practice to define how to integrate systems
  - Producers independent of consumers
  - Publish once in neutral form
  - Identify each interface as bulk or event oriented
- Apply *catalogue of integration options* practice to give set to choose from, with rationale for each
  - **Bulk**: db to file / file to db via ETL tool in CSV form
  - **Event**: messaging via pub/sub product, XML or 3rd party formats used (e.g. FIX based)
  - **Other** options on a case-by-case basis

Example 1 - Result

- Given a set of options and strong rationale, people have reacted positively
  - Previous situation due to lack of existing principles
  - Never had time (or motivation) for standardising
- Still have tactical work going on but the standard options are considered first
  - Choose a standard option if possible
  - If not, then allow a custom approach but with a plan for future rectification
- As feeds are rebuilt, we are moving towards our desired standardised future state

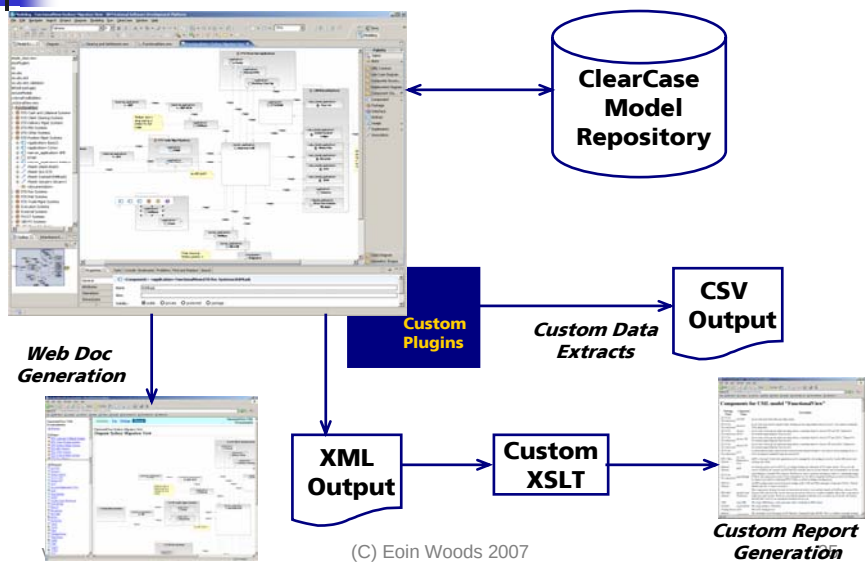
Example 2 – Agile Modelling

- Context is UBS acquisition of a competitor FCM
  - UBS ETD had ~50 systems
  - Acquired organisation had ~50 systems
  - Both complex individually and no one with deep knowledge of both
  - Lots of change needed to achieve integration
  - Difficult to understand existing and future state systems landscapes

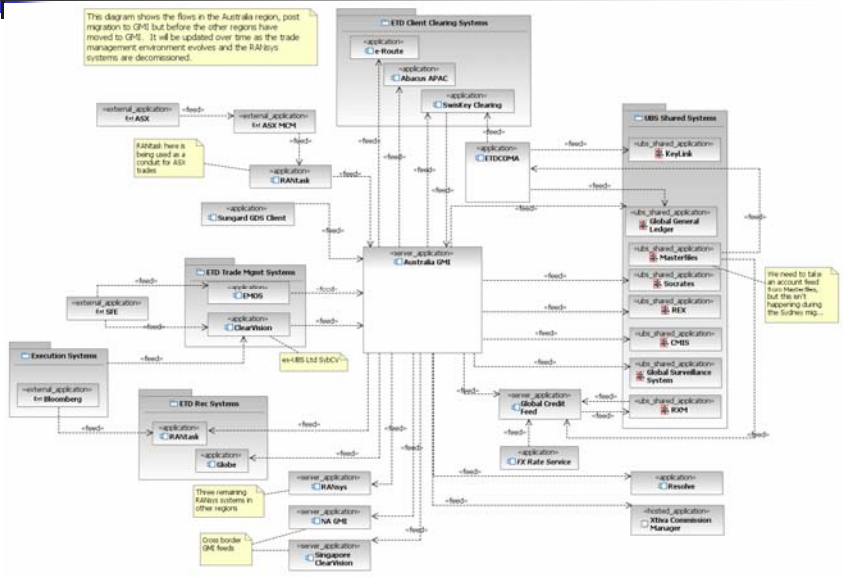
Example 2 - Agile Modelling

- Applied the *good enough modelling* practice
  - Not enough time for exhaustive modelling exercise
  - Identified what would deliver value quickly
    - System level future state (systems and flows)
    - Just built a model to meet this need
  - Created a precise, but abstract systems and interconnections model in UML using IBM RSM
  - Created a model (not a picture) to allow multiple uses and motivate updates
    - Never published as a document, just model outputs

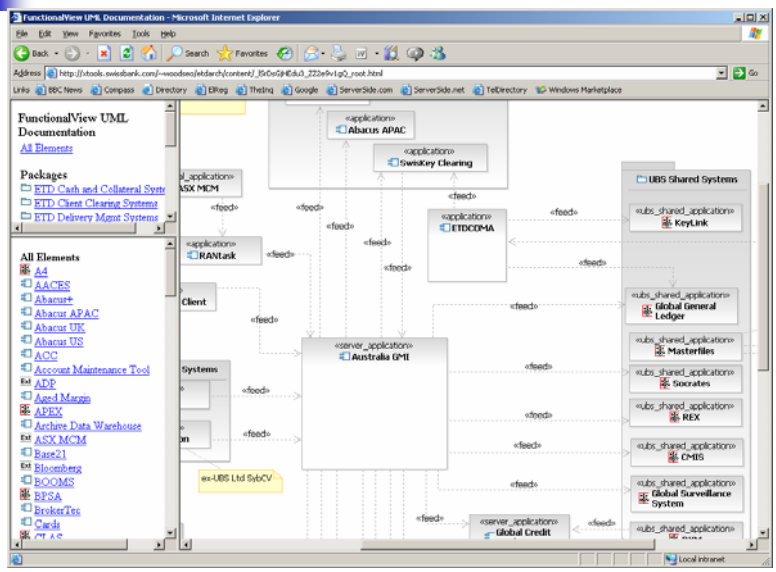
Example 2 - Tool Support



Example 2 - Example Model View



Example 2 – Generation to Web



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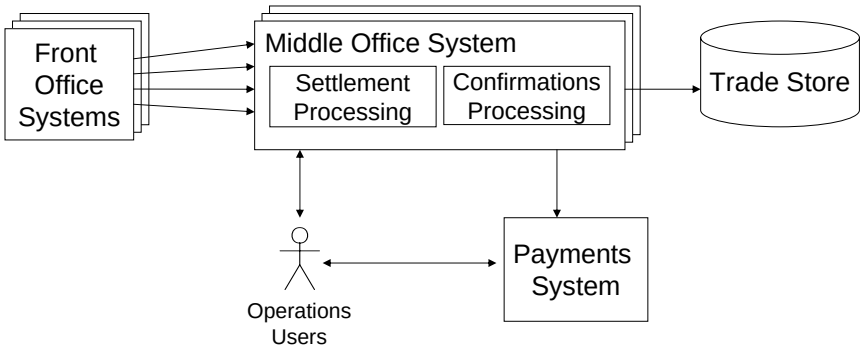
Example 2 – Progress & Results

- The model web site is becoming a reference point for change teams
  - Provides database of system & connection definitions
- Our RSM extensions allow data to be extracted
  - So providing motivation for maintenance and use
- Use of model allows many views to be quickly created from the content
  - Although Powerpoint/Visio integration still problematic
- Keeping currency is a constant challenge

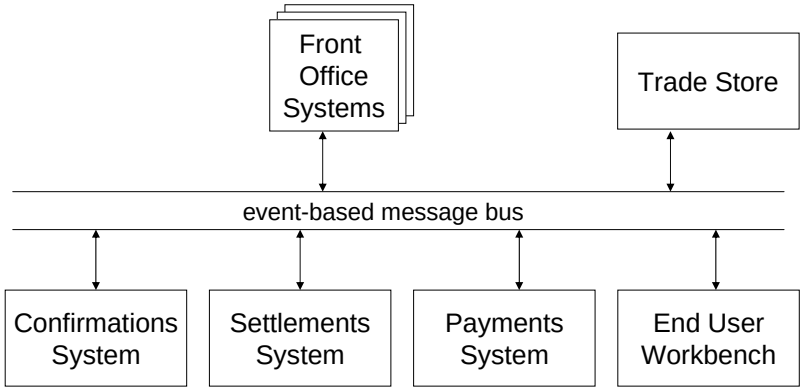
Example 3 – Common Solutions

- Example of focused architecture making agile development more effective
- Context was large tightly coupled systems
- Applied focused set of architecture practices
  - Defining clear system responsibilities
  - Defining clear, minimal architectural principles
  - Small amount of common design (messaging)
  - Provided solution patterns for DR, integration, security
  - Worked directly with (in) the first teams

Example 3 – Starting Point



Example 3 – Result



Example 3 - Results

- The architecture work resulted in
  - Smaller systems, better defined responsibilities
  - Looser coupling via well defined neutral event model
  - Development team independence
- Has allowed much easier change
  - Systems can have own development & release cycles
  - The architecture has enabled overall agility
  - Overall result is more effective delivery and change

Summary

- Making architecture more agile benefits everyone (architects, users, dev teams)
- Architects share many priorities with the agile movement
- Small number of effective practices improve agility immensely
- Agile architecture has worked well in practice and made architecture relevant
- It's all about delivering valuable working systems

Questions and Comments?

- Now or to Eoin.Woods@ubs.com