



Institute and Faculty of Actuaries

Capital Modelling Seminar

Model design and lessons from IT

Tim Thornham
Financial Modelling Solutions (FMS) Director, Aviva

01 December 2015

Model design and lessons from IT

What lessons are there from large IT projects that can be used to improve the design and change management processes around Financial Models?

This is a potentially huge topic

..... but its one I've been fascinated by for some time.

In other words, how can actuaries/modellers, change professionals and IT professionals work better together?



01 December 2015

2

Presentation outline

1. The FMS team and the financial models we look after
2. The move towards 'enterprise' financial modelling systems
 - and some key challenges
3. How do we run model development work?
4. Lessons learnt / take-aways



01 December 2015

3

1. FMS and the models we look after (1 of 2)

"We develop and support leading-edge, innovative and cost-effective solutions to empower our customers to measure and manage their risk and capital position to support decision making"

We develop and support four modelling 'suites' in production:

Model	Business units	Users
Capital aggregation engine (internal model)	7	c. 80
Capital aggregation engine (standard formula, PIM, QRT)	c. 25	c.100
GI risk calibration and stochastic projection systems	3	c. 30
Credit risk calibration at portfolio level (* in process of being rolled-out from central to distributed user base)	c. 10	c. 10(*)

01 December 2015

4

1. FMS and the models we look after (2 of 2)

We have a team drawn from Finance and IT, across two sites (London and Norwich).

The team is (mostly) co-located and covers the following disciplines:

- Management
- Actuarial
- Quants
- Operations
- Project (and test) management
- IT developers
- Compliance



01 December 2015

5

2. 'Enterprise' financial modelling systems (1 of 6)

Each of our systems has its own:

- Distributed user base who can use our production systems 24 / 7
- Service agreement, service levels and support arrangements
- Regular and controlled development and release cycles
- Governance, documentation and compliance infrastructure



01 December 2015

6

2. 'Enterprise' financial modelling systems (2 of 6)

An example extract from the monthly Algo (IM capital aggregation engine) service report.

Service Target	Target	R2.3		R2.4				R2.5
		Aug	Sept	Jun	Jul	Aug	Sept	Oct
3- Service availability*	99.00%	98.8%	99.0%	98.5%	98.8%	98.8%	99.0%	100.00%
2a - BU	Simulations ¹	100%	100%	98.97%	98.94%	97.11%	98.24%	98.93%
	Report Requests ²	100%	99.93%	100%	100%	100%	99.98%	100.00%
2b - GROUP	Simulations ¹	100%	100%	100%	100%	100%	91.67%	92.05%
	Report Requests ²	97.73%	98.24%	97.67%	100%	93%	91.13%	98.25%
3- Failed runs ³	Less than 2% failed	0.56%	0.27%	0.28%	0.13%	0.12%	0.14%	
4- New reporting period requests	Within 4 working hours	7	4	22	29	40	49	51
5- User Access Requests	Within 5 working days	7	7	4	8	4	5	11
6a - Benchmark time - BU ⁴	Less than 20 minutes end-to-end	12 Min Avg	18 Min Avg	17 Min Avg	15 Min Avg	11 Min Avg	13 Min Avg	15 Min Avg
6b - Benchmark time - Group ⁴	Less than 60 minutes end-to-end	14 Min Avg	26 Min Avg	17 Min Avg	20 Min Avg	13 Min Avg	23 Min Avg	21 Min Avg

01 December 2015

7

2. 'Enterprise' financial modelling systems (3 of 6)

To support our users 24/7, the production modelling systems:

- Have segregated user access by BU, Group and Operations.
- Have segregated areas for official reporting exercises and less formal investigative work
- Have associated FMS data preparation tools, e.g. loss function fitting, asset data preparation, GI model class inputs
- Flex to allow users to submit, queue, prioritise and cancel run requests (to varying degrees).
- The results are easily accessible to support user analysis using standard FMS reporting tools



01 December 2015

8

2. 'Enterprise' financial modelling systems (4 of 6)

Some key challenges - I

- General purpose modelling-friendly user interface
 - We have agility in our modelling engines and flexibility and speed of change using excel for some user interfaces
 - However, ideally we need new solutions to create more robust user interfaces and workflows/actions, with little more than drag and drop, that can be easily updated as modelling processes and data / result flows change – and that can work as a common platform across multiple financial modelling products sets.
- The actuarial platforms are starting to address this need (through products such as Integrate and Unify), but it is early days and its unclear who the winners will be.

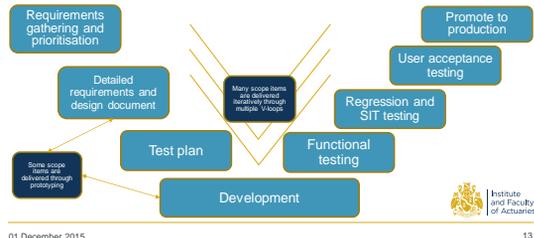


01 December 2015

9

3. How do we run development work? (2 of 5)

- Until this year we tended to use an 'iterative waterfall' method with some aspects of the 'V-model' and some items following a prototyping approach.



01 December 2015

13

3. How do we run development work? (3 of 5)

- In 2015, we adopted Agile across Aviva:

Manifesto for Agile Software Development

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

Individuals and interactions	over	processes and tools
Working software	over	comprehensive documentation
Customer collaboration	over	contract negotiation
Responding to change	over	following a plan

That is, while there is value in the items on the right, we value the items on the left more.

01 December 2015

14

3. How do we run development work? (4 of 5)

Twelve Principles behind the Agile Manifesto

- Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
- Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
- Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
- Business people and developers must work together daily throughout the project.
- Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
- The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
- Working software is the primary measure of progress.
- Agile processes promote sustainable development. The sponsors, developers and users should be able to maintain a constant pace indefinitely.
- Continuous attention to technical excellence and good design enhances agility.
- Simplicity - the art of maximizing the amount of work not done - is essential.
- The best architectures, requirements and designs emerge from self-organizing teams.
- At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

01 December 2015

15

3. How do we run development work? (5 of 5)

- With Agile, we benefit from:
 - Standardized processes and support tools across our four product suites
 - Clear roles and responsibilities – particularly key are the product owner and the scrum master
 - Each product team is focused on fortnightly sprints covering prioritised stories (features), discussed in daily (15 minute) scrums
 - Delivery of valuable features in each sprint
 - Fast feedback to correct course / build incrementally on firmer foundations
- Our 'iterative waterfall' method was trying to achieve a similar outcome, but Agile (scrum) provides a better framework for success.



01 December 2015

16

4. Lessons learnt / take-aways

- A large-scale modelling systems development and support team needs to embrace a multi-disciplinary approach
- Running distributed enterprise capital models requires a focus on the support model and service levels that customers expect
- Whilst we have many and varied modelling tools that can perform the calculations, it's the interface / input / output management that is less developed and we continue to struggle with – but we will find solution(s)
- Agile works, but it is a discipline that requires time to learn
- Cloud is where modelling will increasingly take place



01 December 2015

17



The views expressed in this presentation are those of the presenter.



01 December 2015

18
