CAI's IT METRICS & PRODUCTIVITY INSTITUTE

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Ethical Consulting
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CIO's Guide to Risk Management

Making the Change
The Management Context

Sue Rule – Managing Director

Phil Standing – Managing Partner Business Effectiveness

SMS Exemplar Ltd.

Quantity Surveyors of Information Systems

Quantifying Risk

- Risk needs to be not only recognised, but also quantified

- Quantitative Methods can mitigate risk

- Direct aid to out - source / task management in:
  - Supplier selection and management
  - Requirements initiation and management
  - Cost
  - Change control
  - Steering away from inherently risky areas

Systemic Risk Reduction through Predictability

QM can lead the way in understanding how to set up development projects and understand risk in:

- Timescale
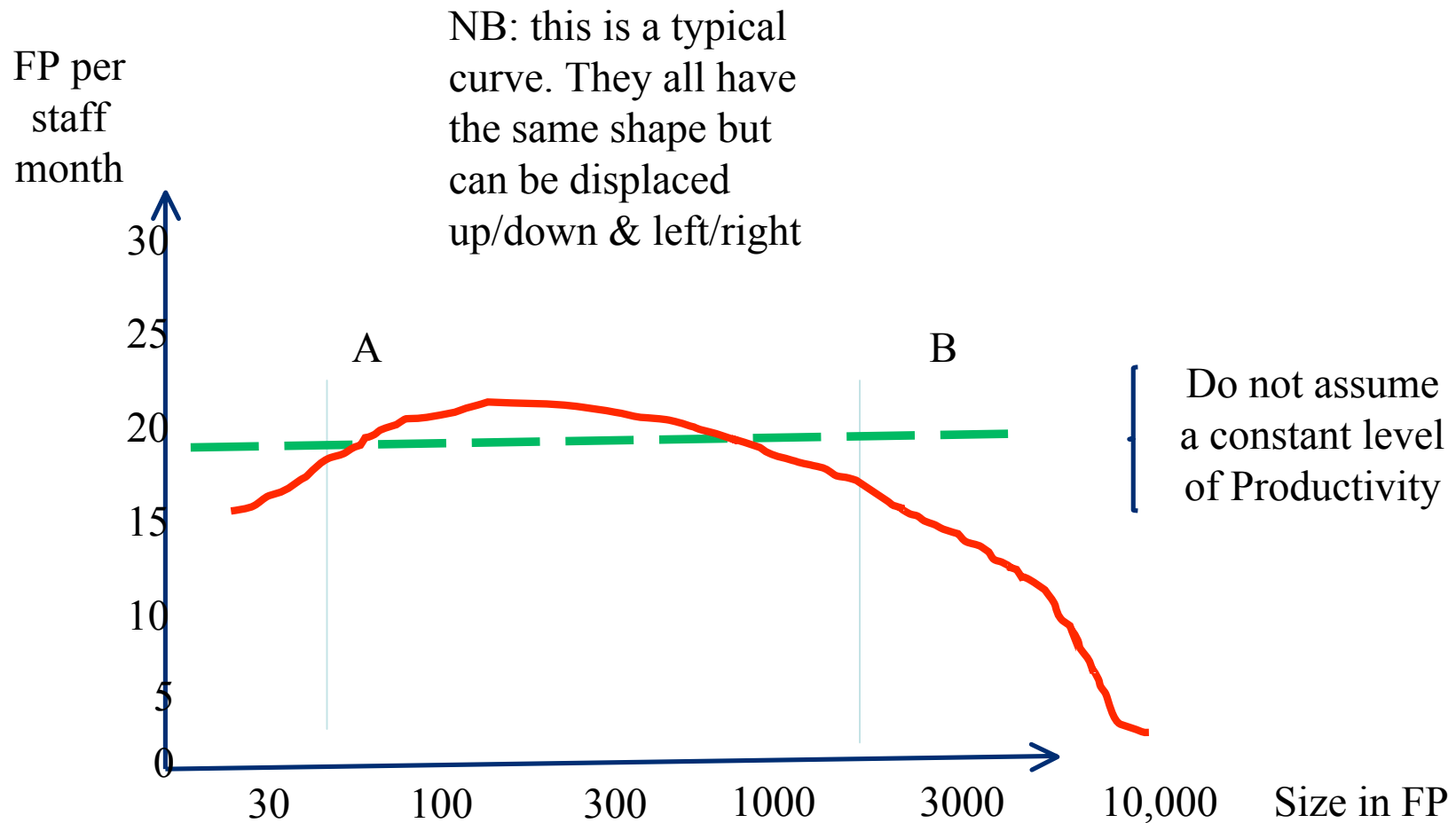- Cost
- Quality
- Change
- Velocity

Quantitative insights into Actual Performance

- Recent work now available leads us to new:
  - Insights into risk
  - Guidelines for management
  - Useful parameters and "rules of thumb"

  And ultimately better Predictability and Cost

- Major surveys of QM driven projects; the good, the bad and the inbetweeners – no selection criteria or sample bias - except use of QM

- Performance has been analysed countless times before but now we have QM.......

Principles of QM

- The starting point is measuring the Functional Size of the work in some absolute terms - [FSM]
- When this measure is compared to actual outputs achieved, we can predict future:
  - Timescales
  - Costs
- And we can easily derive real measures of :
  - Productivity   - very useful measure
  - Quality
  - Velocity
- All these can, and should, be contractual KPIs if out-sourced & agreed KPIs if in-sourced.

- Input measures (effort, lines of code) are not a proxy for output measures (functions points)

Productivity – Functional Size is the main determinant.

FP per staff month

NB: this is a typical curve. They all have the same shape but can be displaced up/down & left/right

30

25

A

B

20

Do not assume a constant level of Productivity

15

10

5

0

30   100   300   1000   3000   10,000   Size in FP

One Productivity DOESN'T Fit All

- What likely happens if you use one to fit all for both large and small projects:
  - Squeezes larger projects, lax on smaller ones
  - With large squeezed projects, the pressure usually results in high levels of Defect Density
  - Small projects become overpriced
  - Annual improvements impossible due to high end squeeze
  - Encourages dysfunctional supplier behaviour

The need for accuracy

Typical string of jobs:
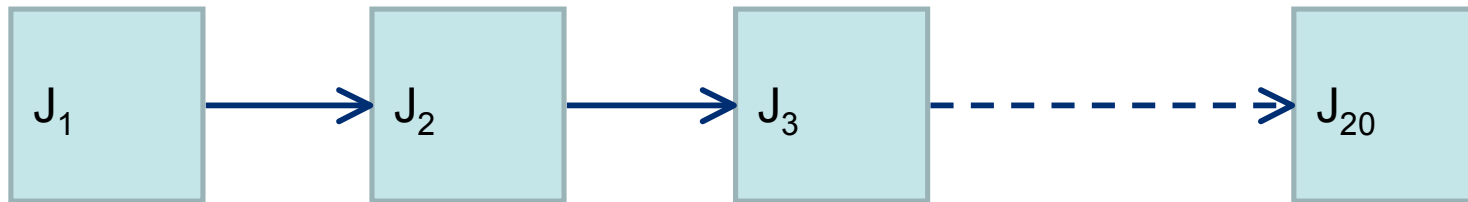
You can win if you use the "slack time."

If estimation accuracy = 95% ie one in 20 jobs overrun -

You are now arbitraging the probability of 19 underruns will exceed the 1 overrun, which will bring you in on time.

$$P_{overrun} = P\ _1\Sigma_{19}(^nT_{est} - {}^nT_{act}) \geq (^{20}T_{act} - {}^{20}T_{est})$$

Increased Predictability = Decreased Risk

Use Productivity levels as the basis to :-

1. Contract for variable productivity levels using industry data to recognise the productivity characteristic
2. Concentrate on commissioning projects where possible around high productivity sizes
3. Modify contracted productivity levels according to your experience in, say, the first year or first 30 projects
4. Thereafter, increase contracted productivity levels annually by at least 5% p.a. in real terms

Project Performance Limitations
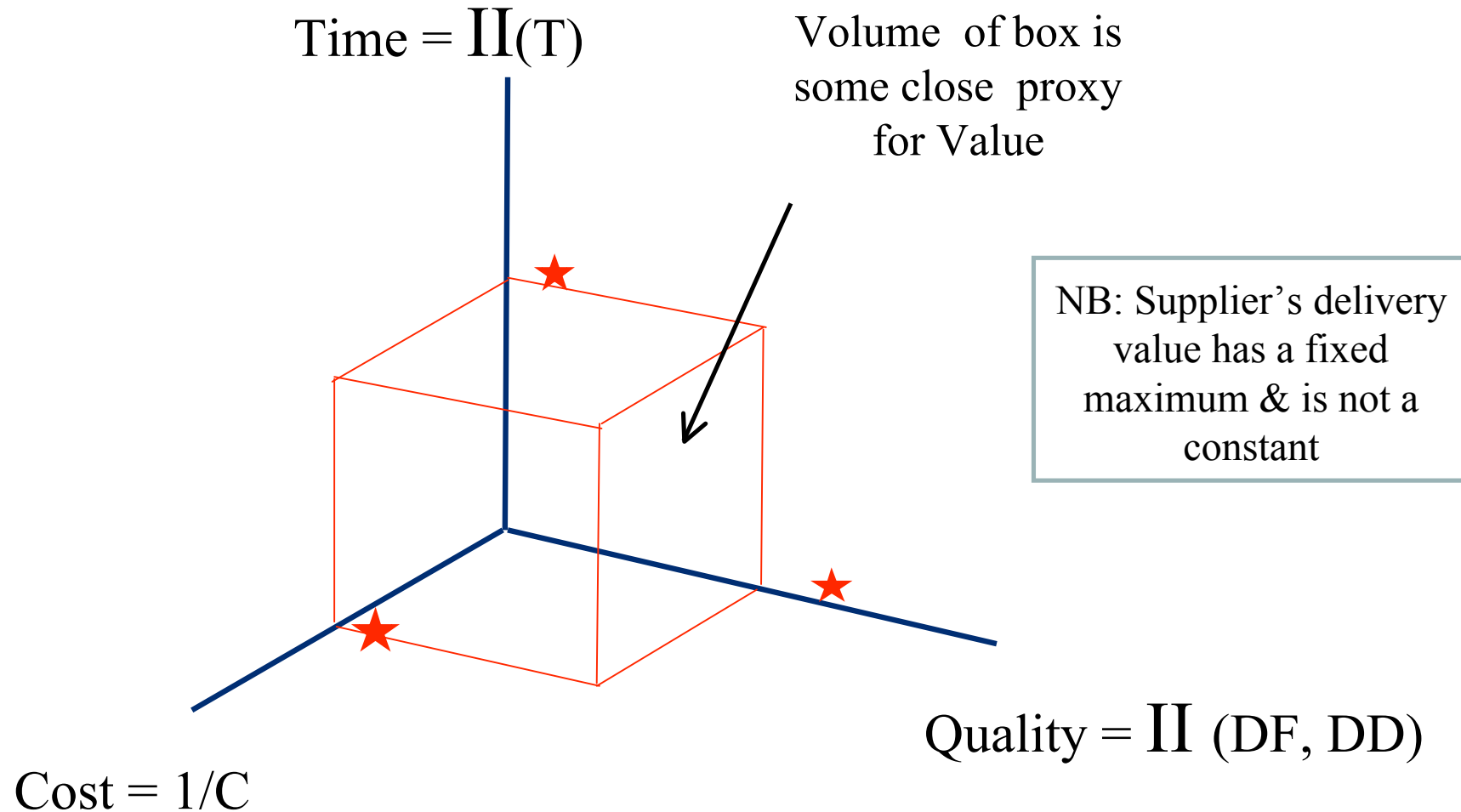
Risks in Change Management

- How big is a change, how much code does it affect?

- How to get a accurate estimate of cost and timescale?

- Using FSM and Structured Requirements, the view is straightforward

Change Management

Point of impact

Requirements Tree

★ x,y

Implementation

Affected Product
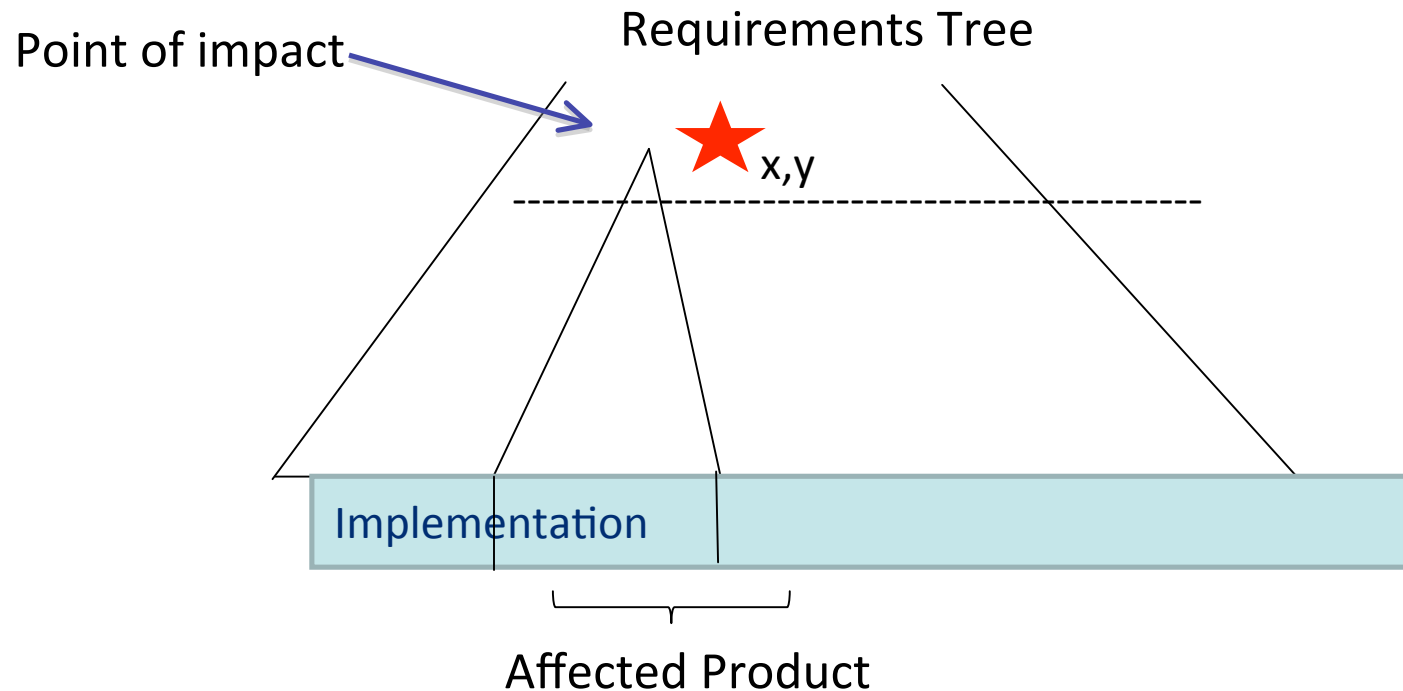
Identification of code exposed to change, ie deletion, change or new
Rapid and accurate forecasts of consequential cost / time / waste

Rate of Change

- In some sectors, handling change is a critical capability

- Even so, buyer needs to understand the limits of the possible.

- The industry Rate of Change averages 2% per month

- So in a 9 month project, expect 18% of requirements by FSM to change between requirements and UAT.

- That's usually about a 24-25% cost increase.

- **Mitigation**: Use methodologies and project sizes to accommodate change most easily, Agility helps.

Other Forms of Risk

Serious risk has many sources, including:

- Corporate turbulence in some sectors, eg FMCG, Retail, etc

- Market or regulatory change

- High levels of staff churn :
  - poor productivity and quality in supplier
  - poor business management and requirements in buyer

Summary

Quantitative methods are a :

- Cornerstone for consistent reduction in systemic risk
- Means of optimising time, cost and quality
- <u>Normal industrial process</u>

Above all, QM empowers and enthuses people

And now I'd like to hand over to Sue Rule....

De-Risking Change:
SMS Lean & Agile Method for Improvement Teams

- Quantitative methods give assurance of success
- Lean management minimises risk of adverse impact
  - on staff
  - on BAU
- Iterative change manages risk of change programme being de-railed by external factors
- Incremental change minimises risk of loss of engagement by management & staff

The biggest factor in striving for excellence… PEOPLE

Ability to cope with change

Good morale **Average process**	**Good morale** **Good process**
Poor morale **Poor process**	**Average morale** **Average process**

Predictability

0

'95% of variation is in the PROCESS not the PEOPLE'
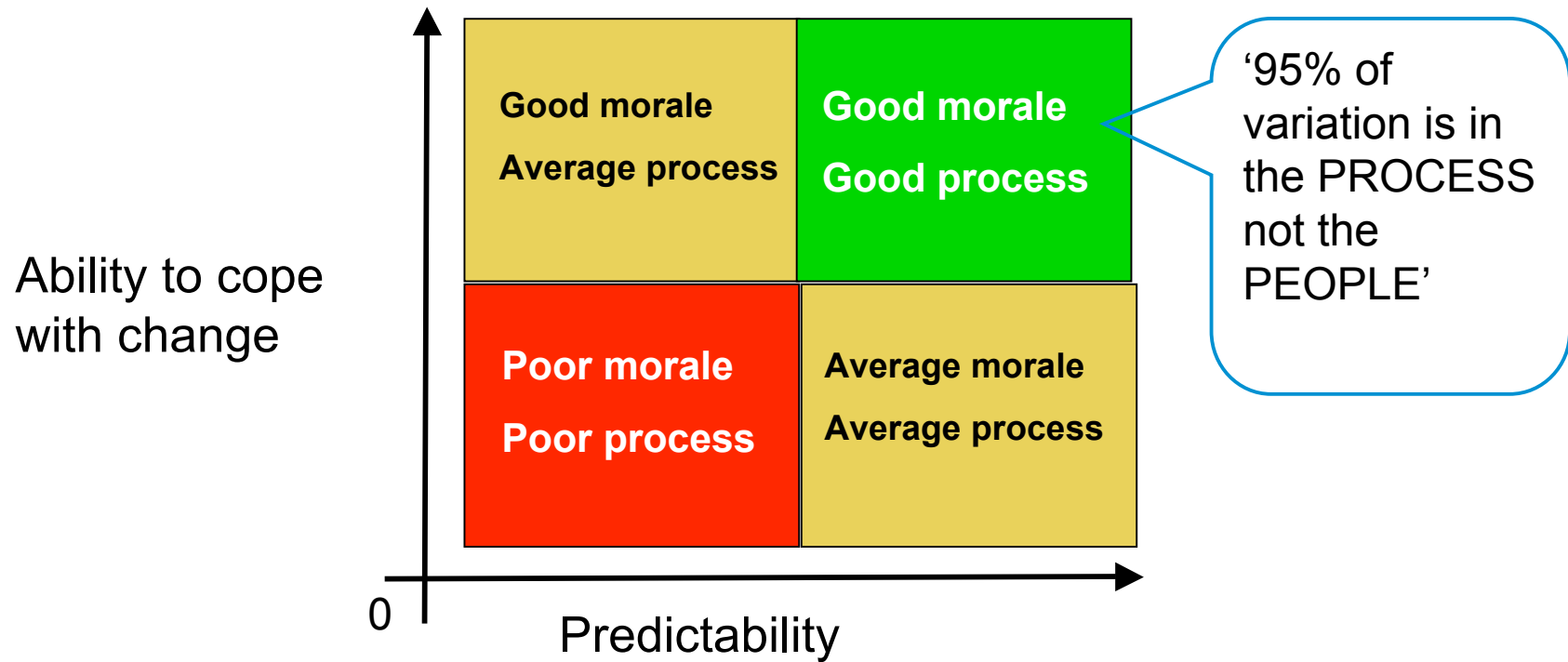
How do you get your people to change?

SMS Lean-Agile Roadmap:
Build on our experience

1. Initiate & Organise

Define True North: establish business priorities, scope, timescales, budgets & plans.

2. Engage

Establish a Guiding Coalition: executive commitment & budget authority

3. Baseline

Vision & Strategy: assess current capability, establish process baseline; identify gaps; determine improvement measures

4. Prioritise

Communicate: Make gaps visible, discuss and agree priorities, identify training needs & schedule training

5. Plan

Assign & Enable Teams: assign Process Action Teams, agree product backlog, timebox improvements

6. Iterate

Deliver incremental change: deliver process modifications in accordance with agreed priorities

Continue the cycle of **Plan, Do, Check, Act** activities embodied in Steps 6 through 8

7. Consolidate

Consolidate Progress: mini-assessment to analyse new state, document lessons learned, review PATs and modify Product Backlogs

8. Integrate

Measure success: publish progress against plan, celebrate successes, integrate lessons learned. Renew focus on goals and business value.

Assess & adjust

Quantify the objectives

Quantitative Methods:

- Define the desired state
- Baseline the current state
- Track progress
- Deliver a *real change* in behaviour
- Software Process Improvement is not a goal in itself. It is a means to achieve better business results by continuously improving the performance of the software processes.
- *Benchmark* against a standard; *Measure* by results
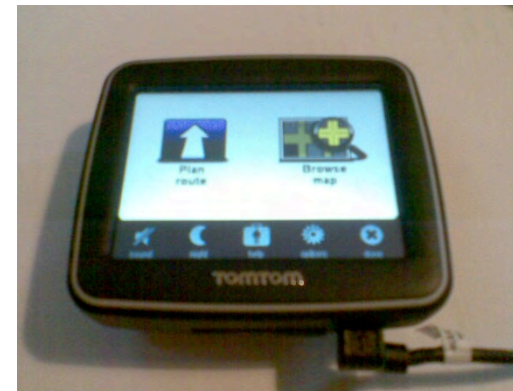
Liberty IT
The Business Case for SPI

True North

COSTS & PRODUCTIVITY (CP)

Productivity Improvement
Better Understanding of Requirements

Reduced Budget Variance
Consistent Performance

HUMAN DEVELOPMENT (HD)

Increased Staff Morale
Smooth transition of staff between projects due to common software development and project management practices

Motivated and productive workforce
'Best in Class' IT Supplier

DELIVERY & CYCLE TIME (DC)

Delivery Cycle Time Reduction
Better Estimates

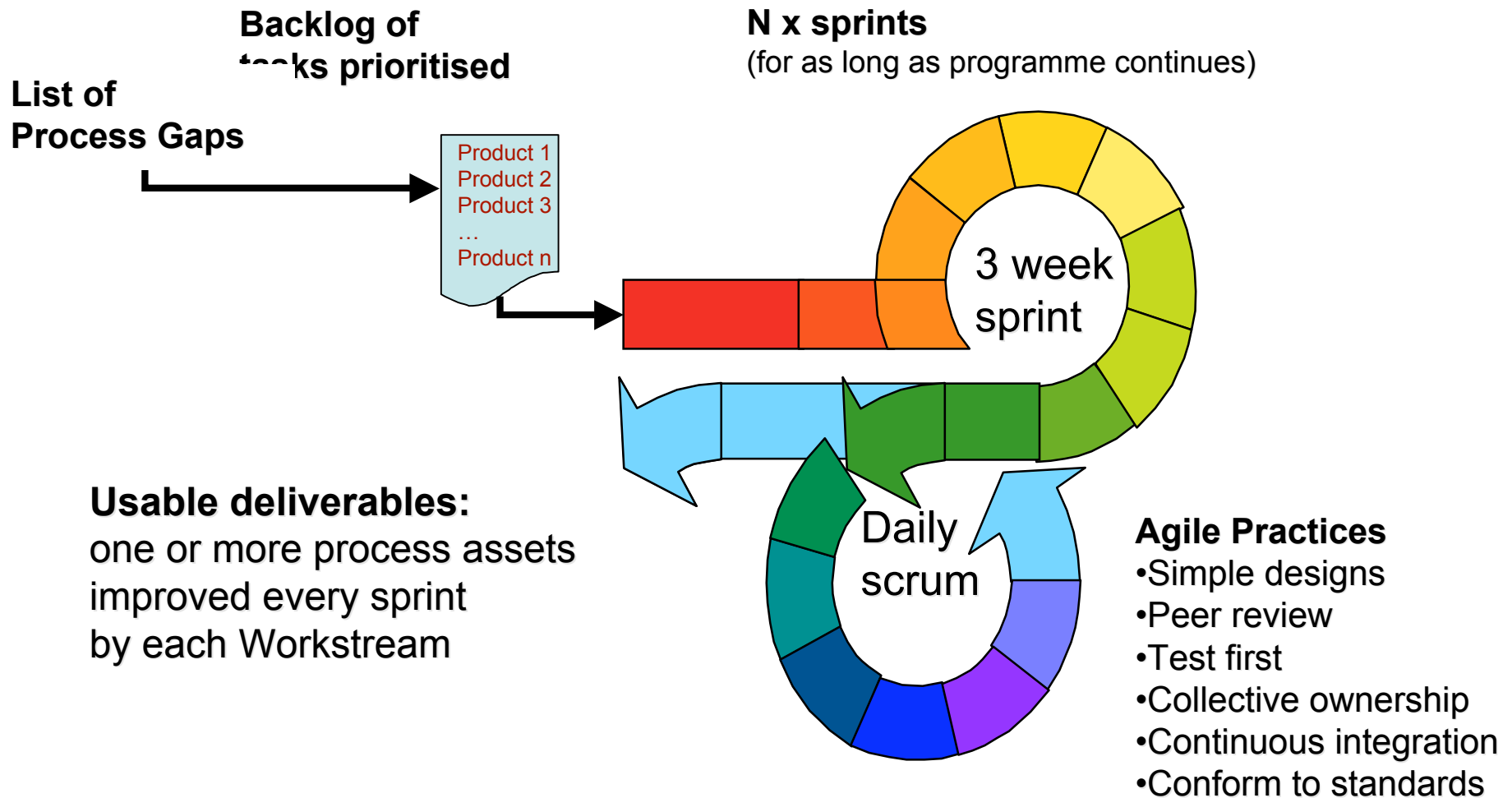*Reduced Schedule Variance*
Reduced Demand-to-Deployment Time

QUALITY PERFORMANCE (QP)

Quality Improvement in Delivered Products
Reduced Rework and Wasted Effort

Satisfied Customers
Products fit-for-purpose

Priority Priority Priority

Lean-Agile Plan-Do-Check-Act Approach

SLAMit! iterate deliver change

Backlog of tasks prioritised

N x sprints
(for as long as programme continues)

List of Process Gaps

Product 1
Product 2
Product 3
…
Product n

3 week sprint

Daily scrum

Usable deliverables:
one or more process assets
improved every sprint
by each Workstream

Agile Practices
- Simple designs
- Peer review
- Test first
- Collective ownership
- Continuous integration
- Conform to standards

LIT: Measure Results Against The 'True North'

True North

COSTS & PRODUCTIVITY (CP)

Reduction in wasted effort: savings of more than $8 million over 4 years

Commensurate increase in effort available for value-added work

HUMAN DEVELOPMENT (HD)

Staff satisfaction: improved to have parity in High Performing Companies benchmark; reduced staff churn

DELIVERY & CYCLE TIME (DC)

Schedule Variance: actuals now less than +/–10% variance from post-requirements estimate

QUALITY PERFORMANCE (QP)

Delivered Defects: moved from 4sigma to between 5 – 6sigma levels

Customer Satisfaction mean score : 5.25 (5= Satisfied, 6= Completely Satisfied)

Priority Priority Priority Priority

The Quality/Value Jigsaw:
Do the *Right Thing* Right

Value

Focus on CONTINUOUS process improvement

Level 5
Optimizing

Process QUANTITATIVELY measured and controlled

Level 4
Quantitatively Managed

Level 3
Defined

Process characterized for the ORGANIZATION and is PROACTIVE

Level 2
Managed

Process characterized for PROJECTS and is MANAGED

Level 1
Initial

Process unpredictable, poorly controlled and REACTIVE

CMMI

'The Proof'
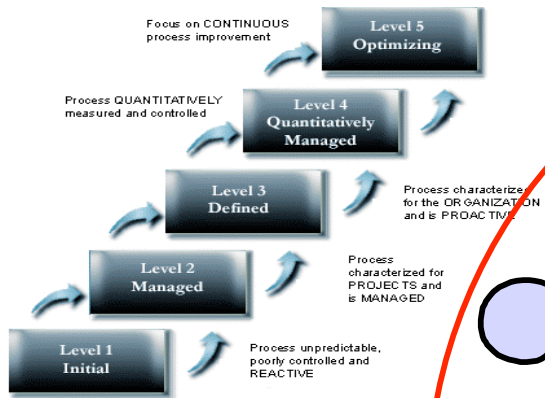
Scorecards, Assessments, & Benchmarks

Framework

People

Measu... ...ols & Techniques

& ...alysis

Know-how & capability

Lean

Liberty IT

Executives

Resource Management

Portfolio Management

Team Members

Managers

Strategic Alignment

Project Management

Collaboration & Communication

Partners

Customers
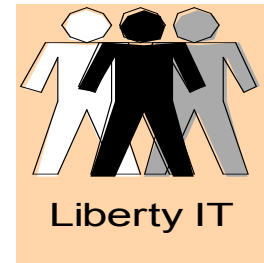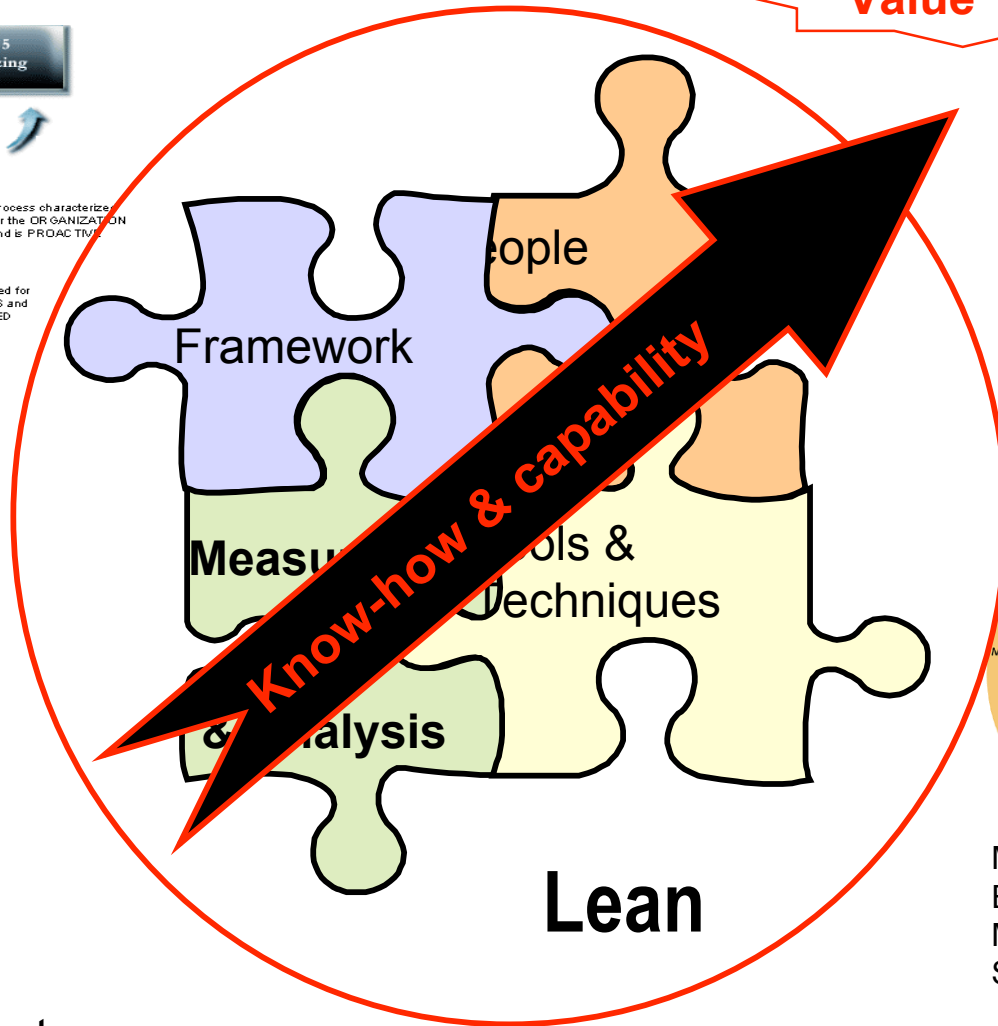
Microsoft Office Enterprise Project Management (EPM) Solution

Lean & Agile Improvement Results - People

Client quote from SMS-Serco Technology joint presentation on the results of a pilot programme using the SLAMit approach:

- **"There was a visible change in the attitudes of both Staff and Management.**
- They both have a better appreciation of their respective roles and responsibilities within the Organisation. People are happier as a result.
- It was not always the people expected who rose to the challenges presented by the change programme."

Lean & Agile Improvement Results: Cost & Quality

Liberty IT - 4-year Lean-CMMI programme:

Based on industry standard costs, LIT saved more than **$8 million in wasted effort over 4 years (defects found/fixed before testing)**

… increasing **productivity** & **capacity**

… improving **QUALITY** – fewer defects released into production

Serco Technology PRISM programme:

- The first 6 figure project to use the full end-to-end life cycle came in on time and under budget by 29%

- 25% staff effort allocated to the project; <4% actually used. Staff fears that a change project would interfere with their day jobs were proved to be unfounded.

- Improved requirements documentation - errors no longer continued into development

Lean & Agile Improvement Results: Delivery

Liberty IT - 4-year Lean-CMMI programme:

- Decreased project risk by identifying and eliminating defects earlier in the lifecycle

- Improved productivity due to emphasis on 'right first time design' and minimal rework
  - Industry data: reworking defective requirements, design and code typically consumes 40-50% of the system development effort
  - published ROI 37:1 (benefit/cost ratio)

- Assurance that products delivered by LIT are 'fit for purpose'

- Improved quality of products delivered into production

Focus on end-to-end value
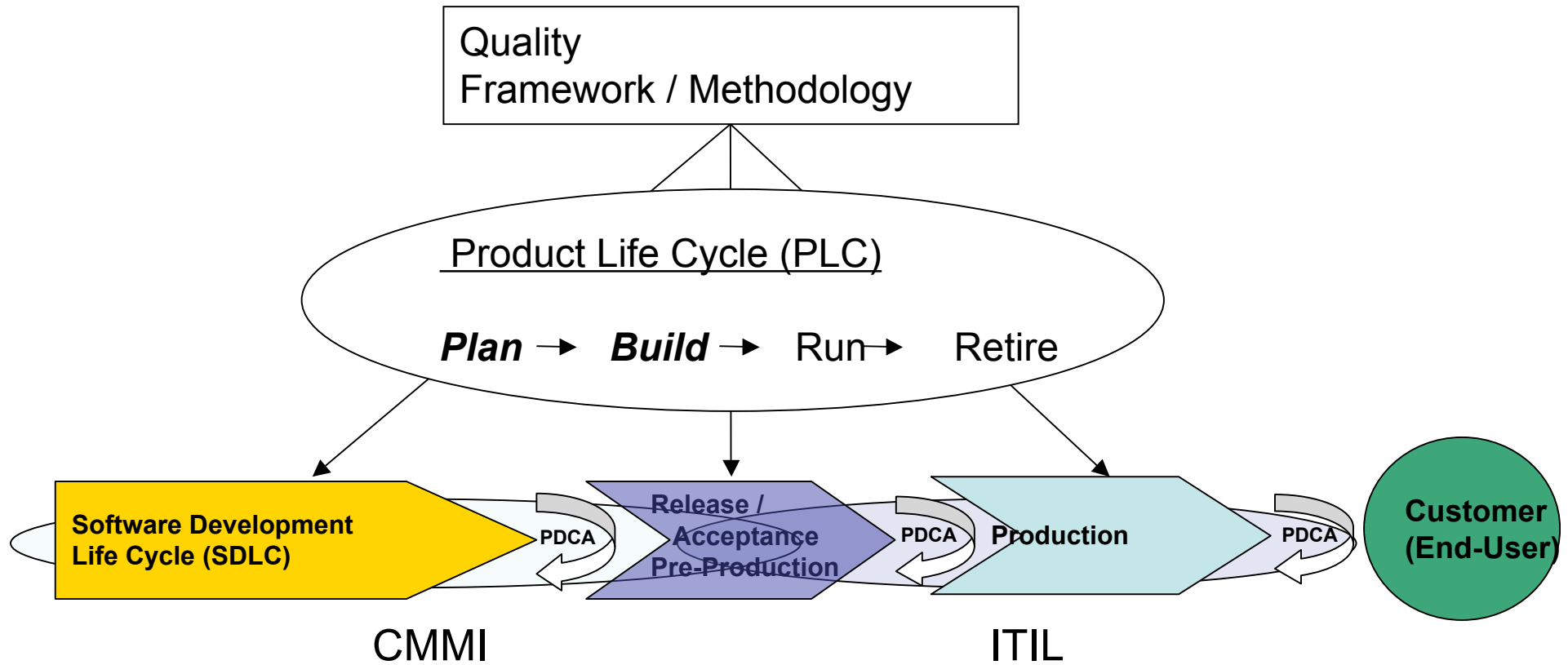
The Lean-Agile Approach to Change

- Define clear business objectives
- Set short-term and long-term goals
- 'Do the right things right'
  - measure the right things
  - leverage a standard for 'best practice' (eg CMMI)
- Identify key areas for improvement & plan phased improvements
  - work first on the key areas that will give greatest benefit to the customer
  - re-assess priorities at the start of each sprint
- Time-box the development of processes
- Involve staff in the creation of processes
- Underpin progress with measurement, celebrate success
- Software delivery improvement needs to be part of a management change programme. Successful change programmes need:
  - Long-term executive commitment
  - Regular hands-on engagement from senior sponsor
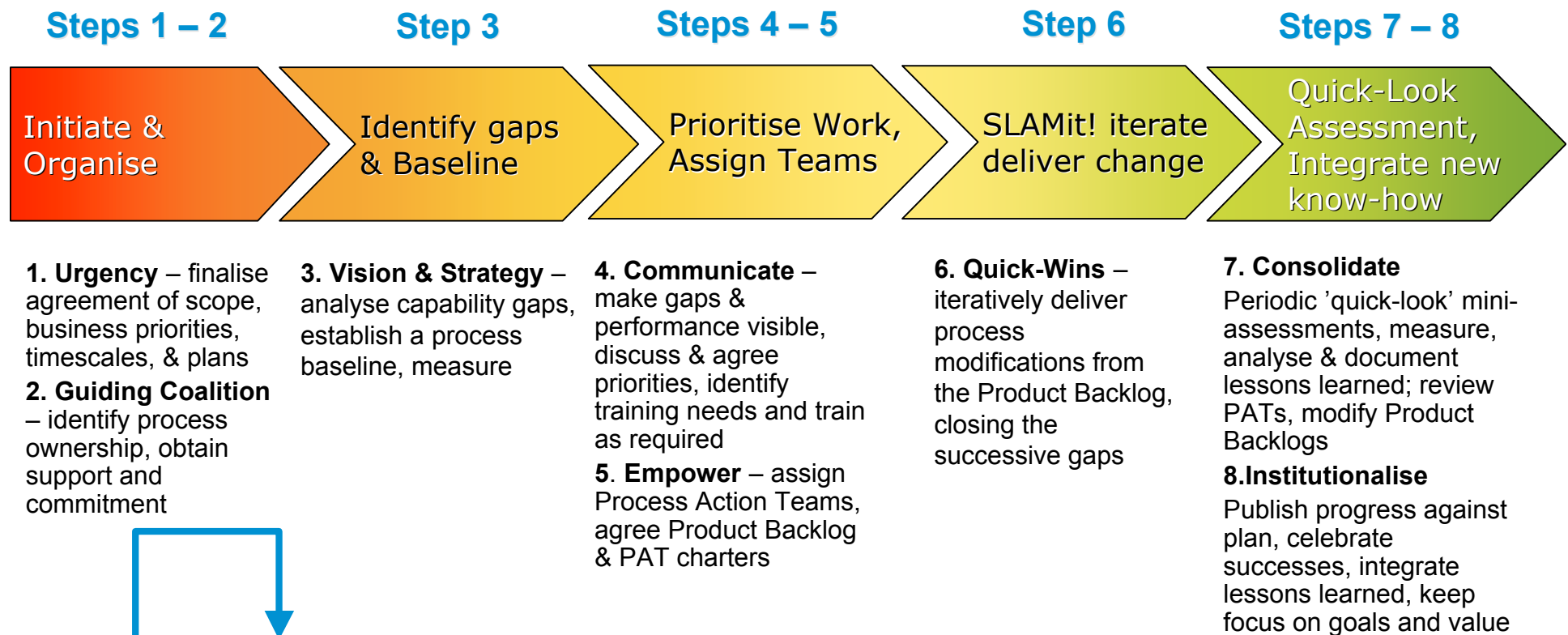 - Incentives aligned to direction of travel

Ride Your Thermal

- **A full improvement lifecycle typically takes 15-18 months to embed new thinking into the culture**

- **Requires sustained commitment from the organisation**

- **Improvements delivered incrementally - low risk, immediate results**

- **Effective use of metrics is critical to success**
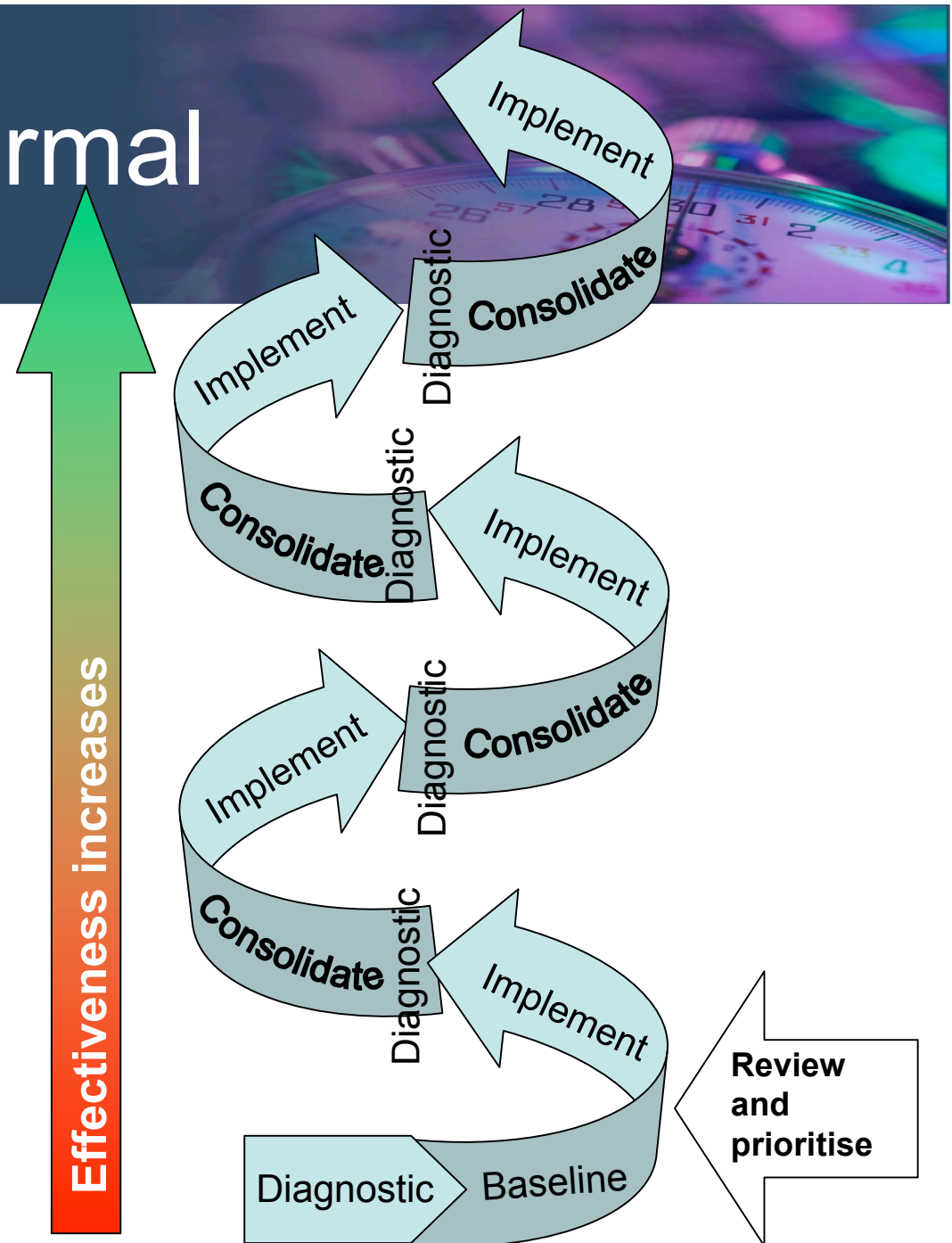
SLAMit! – a roadmap for starting & sustaining a programme to improve performance by 5x

Based on the experience of many business-focussed improvement programmes, SLAMit is customised specifically to fulfil the client's vision and mission. Lean and agile methods deliver rapid progress.

Steps 1 – 2

Step 3

Steps 4 – 5

Step 6

Steps 7 – 8

| Initiate & Organise | Identify gaps & Baseline | Prioritise Work, Assign Teams | SLAMit! iterate deliver change | Quick-Look Assessment, Integrate new know-how |

1. Urgency – finalise agreement of scope, business priorities, timescales, & plans

2. Guiding Coalition – identify process ownership, obtain support and commitment

3. Vision & Strategy – analyse capability gaps, establish a process baseline, measure

4. Communicate – make gaps & performance visible, discuss & agree priorities, identify training needs and train as required

5. Empower – assign Process Action Teams, agree Product Backlog & PAT charters

6. Quick-Wins – iteratively deliver process modifications from the Product Backlog, closing the successive gaps

7. Consolidate Periodic 'quick-look' mini-assessments, measure, analyse & document lessons learned; review PATs, modify Product Backlogs

8. Institutionalise Publish progress against plan, celebrate successes, integrate lessons learned, keep focus on goals and value

Continue the cycle of Plan, Do, Check, Act activities embodied in Steps 6 through 8

Questions

?

Sue Rule

Philip Standing

SMS Exemplar Ltd
Quantity Surveyors of Information Systems
www.smsexemplar.com

Thank You.

2006 Gartner Forecast

Gartner ITXPO – Quest for Quality : October 2006. "*The Quality Gap is Widening*"

- **By 2009, 90% of top-tier internal and external service providers will be** distinguished by **their substantial** process capabilities **as well as their** quality and service improvement capabilities **(0.8 probability)**

- **Through 2009,** 75% of IT **organisations** will focus their "quality" initiatives too narrowly **on implementing ITIL, CMMi, Prince or PMI's PMBOK (0.9 probability)**

- **Through 2009,** two-thirds of IT **organisations** will overemphasize process at the expense **of** developing staff **and the appropriate values and behaviours (0.8 probability)**

- **By 2011, IT organisations that have** not built holistic, integrated quality management programs and values **will be** substantially underperforming **against industry norms (0.8 probability)**

- **Through 2011,** quality problems in 75% of the IT **organisations will be predominantly** defects and waste **caused by silo based sub-optimization (0.8 probability)**

- **By 2016 many** organisations that have not deployed quality **techniques successfully** will fail**, be absorbed or be outsourced to those who have.**