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in the built & human environment
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Presentation to the
European Group for Lean Construction
Delft, Netherlands
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Agile Project Management in Construction

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Agenda

- ♦ **Very short recap of APM**
- ♦ **Outline of ongoing research**
- ♦ **Workshop exercise**
- ♦ **Feedback**

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Iterative & Incremental Development

- ♦ Initially espoused by Shewart (1930s) & Deming (1940s) ({Plan-Do-Check}-Act Cycle)
- ♦ Used on various projects 1950s, including X-15, Project Mercury & Space Shuttle – 1950s on
- ♦ Winston Royce introduced 'Waterfall development' - 1970
- ♦ Tom Gilb - EVOLutionary development 1976
- ♦ Barry Boehm - Spiral Development 1985
- ♦ Beck et al - Manifesto & Agile Principles 2001

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Agile Project Leadership Network

The APLN Declaration of Interdependence (Anderson et al, 2005) for agile and adaptive management stresses:

- ♦ continuous flow of value
- ♦ engaging customers in frequent interactions and shared ownership
- ♦ uncertainty (*should be expected*) and manage(*d*) through iterations, anticipation, and adaptation
- ♦ individuals are the ultimate source of value
- ♦ group accountability for results & shared responsibility for team effectiveness
- ♦ situationally specific strategies, processes and practices

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Lean & Agile

	Lean	Agile
Evolved from	Demming / TQM / Toyota Production Methods	Toyota Product Development / Perceived threat from Orient in USA / Reaction to Information Systems poor performance
Key Tenets	Waste Reduction & One-piece Flow	Emergent Value & Feedback
Signature Methods	Customer Pull / Just In Time	Embedded, Empowered, Multi-disciplinary Teams
Essential	Repeatability	Reliability
Continuous Type 2 Learning	Yes, but standardised work also vital	Yes
Decisions Delayed Until Last Responsible Moment	Yes, but only in Lean Product Development	Yes

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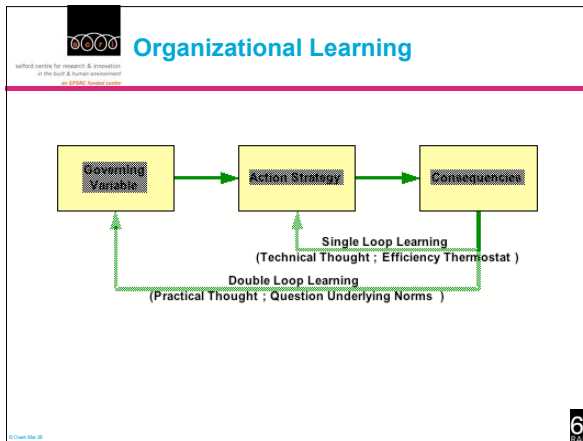
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The Cone of Uncertainty

Source: McConnell 98

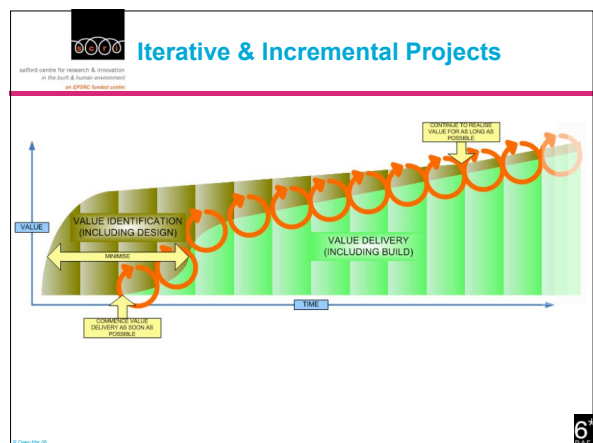
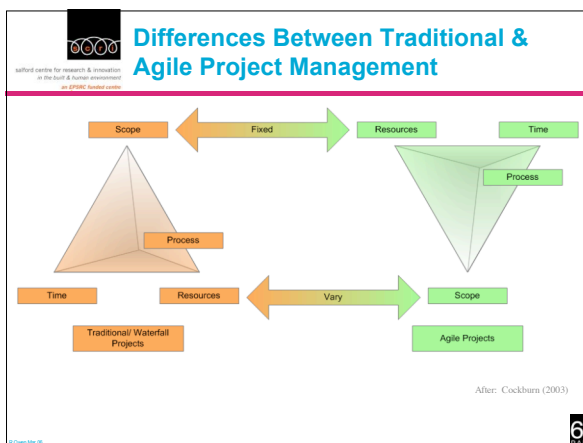
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Organisation Type

Theory X	Theory Y	Theory Z
Traditional: western authoritarian, repressive culture	Oriental: liberating and developmental	US Theoretical response to Japanese industrial threat
Produces limited, depressed culture	Enables, empowers & gives responsibility	Tries to adapt Japanese practices to USA business culture
Management & motivation from the manager's perspective	Management & motivation from the manager's perspective	Reliance on attitude and responsibilities of the worker
1960 Douglas McGregor	1960 Douglas McGregor	1981 William Ouchi



7 Agile Performance Studies in Information Systems Development

Study	Effort	Schedule	Defect Rate	Satisfaction	Baseline for Comparison
(Stapleton and Consortium, 1997), DSDM	-74%			High	Non-DSDM module, same project
(Maurer and Martel, 2002), XP	-40%			High	Non-XP projects
(Intellware, 2002)	-50 -80%			High	Industry averages
(Bowers et al., 2002), XP, FDD	-69%		-61%	High	Previous waterfall project
(Bowers et al., 2002), XP	-38%		-61%	High	Previous OO project
(Hodgetts and Phillips, 2003), XP, Scrum	-41%		-10%	High	Version 3 vs. Version 2
(Reifer, 2002), Various	-13 -19%	-25 -50%	0%	High	Corporate baselines

(Source: (Boehm and Turner, 2004), p. 229)

DSDM in Process Improvement – Pan-European Outcomes

Objective	Target Improvement	Actual Improvement
Improve on-time delivery and customer satisfaction	20%	23%
Increase process predictability; higher maturity level	10%	40%
Improve organisational skills of both management and development personnel	20%	79%

EC Funded Pan-European Initiative (Source: (Stapleton and Consortium, 2003), p.191)

Agile Survey Results (131 Companies)

Did Agile Processes Result In:

Did Agile Processes Result In:	Positive	Neutral	Negative
Reduction or significant reduction in cost	49%	46%	5%
Better or significantly better productivity	93%	5%	2%
Better or significantly better quality	88%	11%	1%
Better or significantly better business satisfaction	83%	16%	1%

Online Survey of 131 Companies (Source: (Shane, 2003))



The slide features a header with the text "Workshop Background" in a large, bold, blue font. To the left of the title is a small logo consisting of a black square with three white circles of varying sizes arranged in a triangular pattern. Below the logo, in a smaller black font, is the text: "salford centre for research & innovation in the built & human environment" and "an EPSRC funded centre". The main body of the slide contains three bullet points, each marked with a blue diamond symbol. The text of the bullet points is in a blue font. The background of the slide is white, and there is a thick pink horizontal bar at the bottom.

Workshop Background

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- ◆ APM offers real improvements in management and value realisation
- ◆ APM offers long-term benefits through reliable delivery and consequent trust networks
- ◆ Proposition: APM can be beneficially applied to the pre-design and design stages of construction but probably not to the construction phase itself due to established practice & cultural inertia

1. Please Describe Your Workshop Team

Approach/ Methodology/ Method

Traditional Construction

Lean Construction

Last Planner

Add more methods, if you think they may be appropriate

2. Review The Characteristics Considered

Organisational Attitudes & Practices				Planning				
Philosophy	Attitude to Change	Management Style	Organisation Type	Work Group Structure	Approach to Risk	Nature of Planning	Requirements Capture	Work Package Structure
Process adaptability	Openness to change	Participative	Type X (Visionary)	Empowered, small self-functional teams	Highly subjective	Highly subjective and informal until last responsible moment	Highly subjective and informal until last responsible moment	Formal
Strong interdependencies	Openness to evidence delivered value	Participative	Type Y (Conformal)	Empowered, small self-functional teams	Highly subjective	Highly subjective and informal until last responsible moment	Highly subjective and informal until last responsible moment	Formal
Modest interdependencies	Tendency to conform with the status quo	Top-down	Type Z (Control)	Modest approach	Modest approach	Modest approach	Modest approach	Modest approach
Team empowerment and facilitation	Team empowerment and facilitation	Modest approach	Type X (Visionary)	Empowered, small self-functional teams	Highly subjective	Highly subjective and informal until last responsible moment	Highly subjective and informal until last responsible moment	Formal
Command and control	Command and control	Top-down	Type Y (Conformal)	Modest approach	Modest approach	Modest approach	Modest approach	Modest approach
Team empowerment and facilitation	Team empowerment and facilitation	Modest approach	Type Z (Control)	Modest approach	Modest approach	Modest approach	Modest approach	Modest approach
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Most Agile Trait

Least Agile Trait

3. Review The Characteristics Considered (continued)

Execution				Control & Learning	
Development Approach	Quality Approach	Customer Involvement	Value Delivery	Project Metrics	Attitude to Learning
Iterative and incremental development					
Moderate approach					
Scalable development					
Extensive value as perceived by customer					
Moderate approach					
Direct induction conformant to original specification					
Essential throughout					
Moderate approach					
Usability early at point of project start and end					
Early and frequent delivery throughout project					
Moderate approach					
Handover of completed product/project					
Measurement is used					
Big visible shifts and daily feedback					
High performance metrics					
Types 2 (process improvement), learning balanced					
Types 3 (learning in process), learning balanced					
Types 1 (learning in process), learning balanced					
Change management from above					

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4. Assign Best Fit of Characteristic to Method – An Example

Approach/Methodology/Method	Philosophy	Organisational Attitudes & Practices					
		Attitude to Change/Change	Management Style	Organisation Type	Work Group Structure	Approach to Risk	
Traditional Construction	Process management	Threat to independence	Threat to independence	Threat to independence	Threat to independence	Threat to independence	
Lean Construction	Threat to independence	Threat to independence	Threat to independence	Threat to independence	Threat to independence	Threat to independence	
Limit Planner	Threat to independence	Threat to independence	Threat to independence	Threat to independence	Threat to independence	Threat to independence	

How you gain consensus is up to each team!

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Please Start

- ♦ You have 30 (?) minutes
- ♦ Results will be merged (possibly after further contact) and then published on the EGLC website
- ♦ The merged result will be used to increment the first iteration and then be presented at IGLC
- ♦ Please don't draw blood!

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The End!

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