

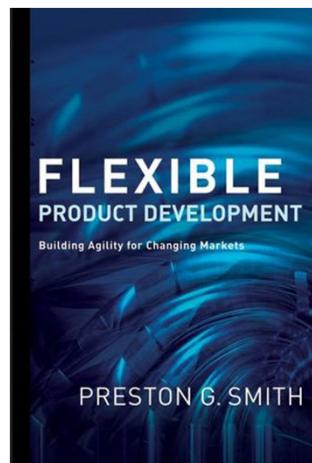
Flexible Project Management

Extending Agile Techniques
beyond Software Projects

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Thanks to Preston G. Smith



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:

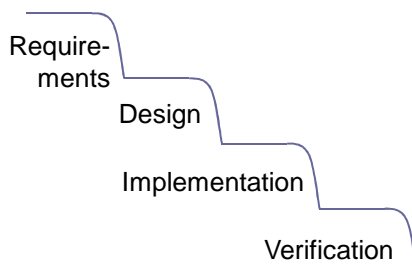
- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

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

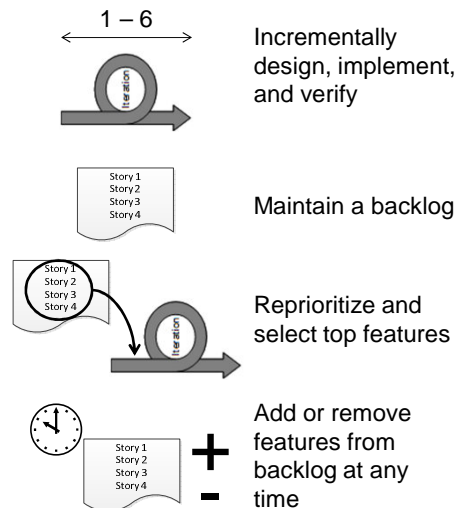
© 2001 by Kent Beck, Mike Beedle, Arie van Bennekum, Alistair Cockburn, Ward Cunningham, Martin Fowler, James Grenning, Jim Highsmith, Andrew Hunt, Ron Jeffries, Jon Kern, Brian Marick, Robert C. Martin, Steve Mellor, Ken Schwaber, Jeff Sutherland, and Dave Thomas
Source: www.agilemanifesto.org

Some Differences

Highly Predictive



Highly Adaptive



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Something is Going On Here

(with caveats...)

Standish, 2012-13

- Triple constraint success measure
- "All projects" data is shows huge impact, but is biased
- Ten year sample size

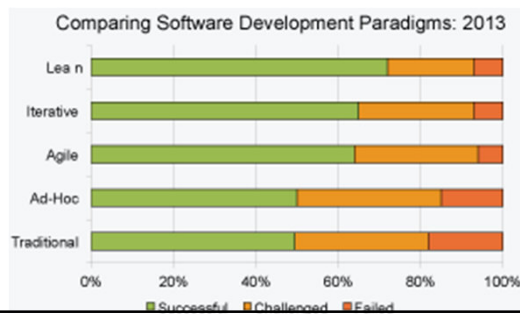
From The CHAOS Manifesto 2012 and 2013, ©,The Standish Group International

	Small (<\$1M labor) [2013]		All [2012]	
	Waterfall	Agile	Waterfall	Agile
Successful	46%	49%	14%	42%
Failed	6%	8%	29%	9%
Challenged	48%	43%	57%	49%

Ambler, 2013

- Reporter-defined success measure
- Small sample size, 2013
- Various project sizes

From 2013 IT Project Success Rates Survey, © 2014 Scott W. Ambler + Associates



Software Roots of Agile

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Modularization using object technologies

Low cost of automated build and test

Feasibility of automated error checking

Divisibility and incremental nature of many product features

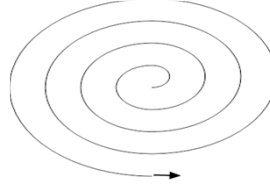
Relatively fast and easy to make and test changes



Transferability of Four Aspects



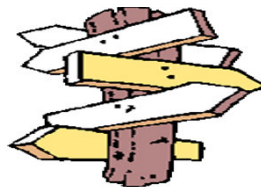
Individuals and Interactions



Incremental Results through Rapid Iteration



Flexible Environment



Embrace Change

Select Project for Exercises

1. With your neighbor, select a non-software project or sub-project that one of you will be starting soon.
2. Assume you will be the project managers of this project.
3. Brainstorm what aspects of it might benefit most from an agile emphasis.
 - a. Individuals and interactions
 - b. Incremental results
 - c. Flexible environment
 - d. Embracing change



Importance of People over Tools and Process
Impact of Co-location

INDIVIDUALS AND INTERACTIONS

Importance of “Individuals and Interactions”

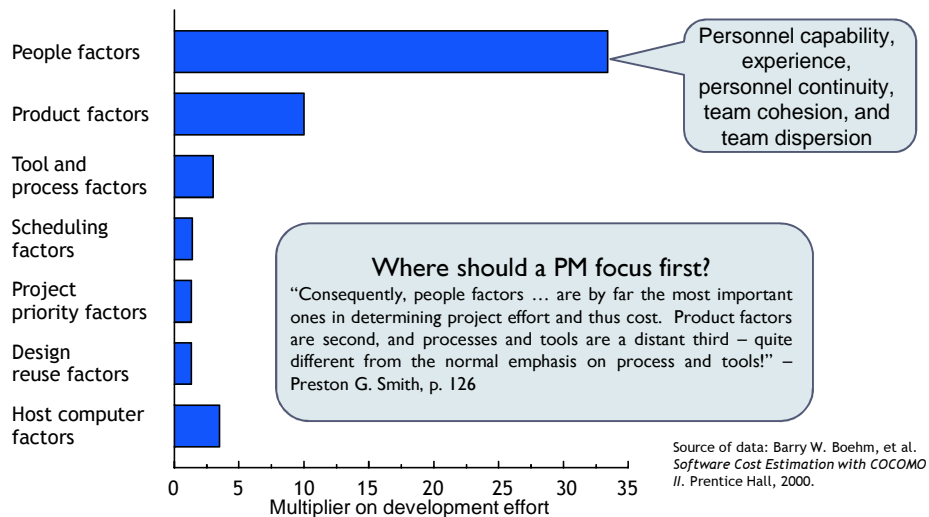
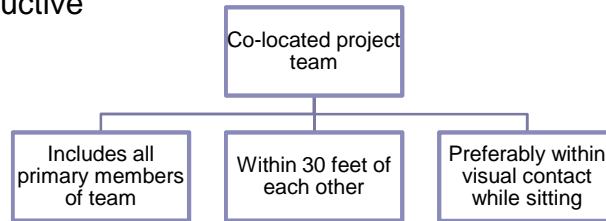


Figure 6.1 Factors Influencing Labor Cost for a Development Project, *Flexible Product Development*, Preston G. Smith



Co-location Matters!

- Recent research by Reinertsen, Smith, and Olson & Olson
- Co-located (within 30'-60') project teams twice as productive



“Our study of six teams that experienced radical collocation showed that in this setting they produced remarkable productivity improvements ... One of the main drivers of success was the fact that the team members were at hand, ready to have a spontaneous meeting, advise on a problem, teach/learn something new, etc. We know from earlier work that the gains from being at hand drop off significantly when people are first out of sight, and then most severely when they are more than 30 meters apart.” – Gary Olson and Judy Olson, University of Michigan

Sources: Preston G. Smith, *Flexible Product Development*, p. 141 -144; Gary Olson and Judith Olson, “Distance Matters”; Teasley, Covi, Krishnan, and Olson, “How Does Radical Collocation Help a Team Succeed?”

How to Co-locate a Distributed Team

1. Expect initial resistance
2. Co-locate key sub-teams and sub-projects
 - a. Who are in the same metro area
 - b. Who will have heaviest communication links (use directed graphs to detect links)
3. Adjust product architecture
 - a. Co-locate sub-teams and sub-projects working on the same architectural modules
 - b. Minimize long-distance communication interfaces
4. If you can co-locate for only part of the project, do it initially

“It [co-location] can be unpleasant. If your neighbor did not take a bath, you will be aware of it. ... [Researchers found] that participants are reluctant to try co-location at first, but after experiencing it, they readily see its advantages.” –

Preston G. Smith,
Flexible Product Development

“I am happy to spend 70 percent of a project’s travel budget up front to get people working face to face early in the project; it pays dividends later.” – Mike Griffiths, Quadrus Development (quoted by Smith)



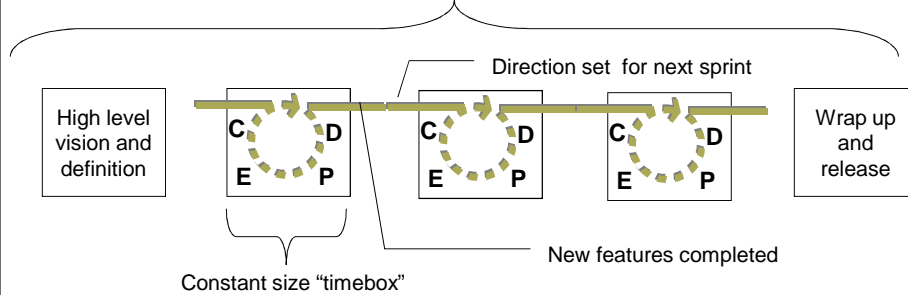


INCREMENTAL RESULTS

Timeboxed Iterations Build Incremental Results

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Single project with multiple iterations

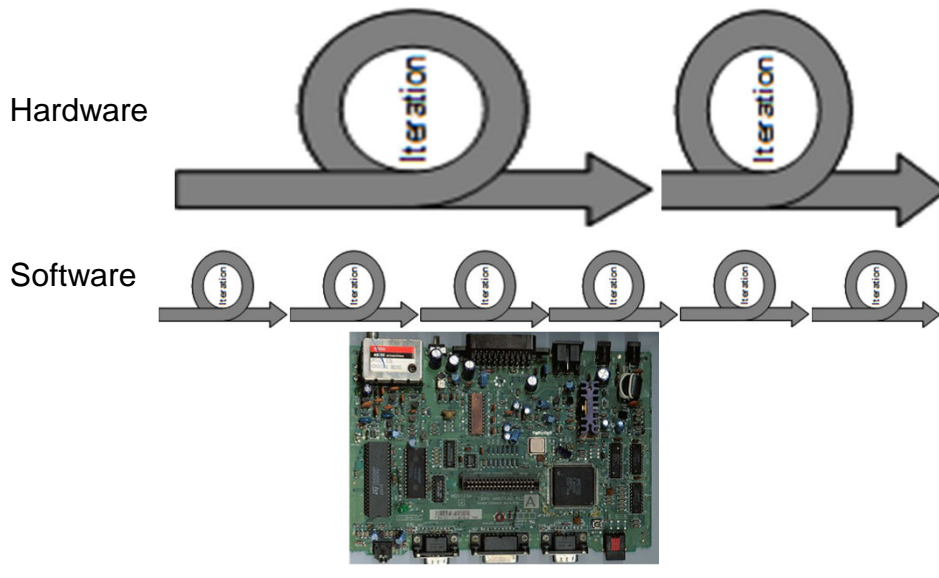


- Project**
- Project contains multiple sprints (iterations)
 - Each sprint fits in a timebox of fixed size
 - Can add or remove sprints

- Sprint**
- Produces incremental features or capabilities
 - Tested
 - Valuable to user or customer
 - Varies deliverables (features), not time
 - Feature list set at start of sprint, not before
 - Defines, plans, executes, and closes

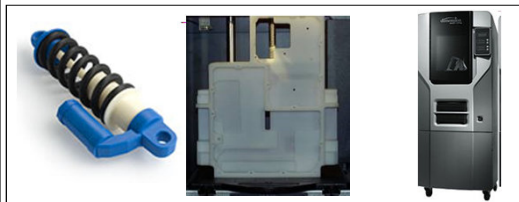


Longer or Variable Length Iterations

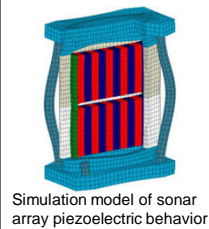


Mockups, Prototypes and Simulation

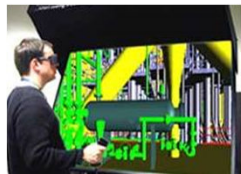
“Use rapid prototyping to get fast customer feedback.”
Bill, Program Manager



Plastic rapid prototypes (L & C) created by Dimension 3D printer (R)



Simulation model of sonar array piezoelectric behavior



Interacting with 3D CAD model at the Simulation Based Design Center.



A Siemens subway car is virtually modeled during the conceptual design phase.



People, Teams, and Iteration Exercise

- Group A – Identify the key people and skills for your project team. How will you get them onto your team and in the right roles?
- Group B – Identify two ways that you can build iteration into your project.
- Group C – How can you get your team members co-located, or if that is not possible, handle the dispersion as best as possible?

**CREATE A FLEXIBLE
PROJECT ENVIRONMENT**



Buy Options



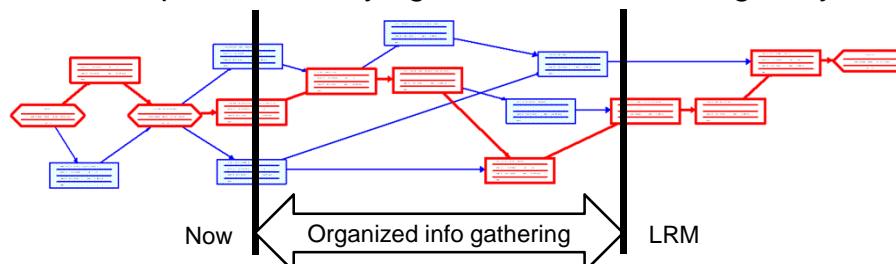
1. Slip schedule
2. Guess the winner
3. Design more expensive multi-camera interface

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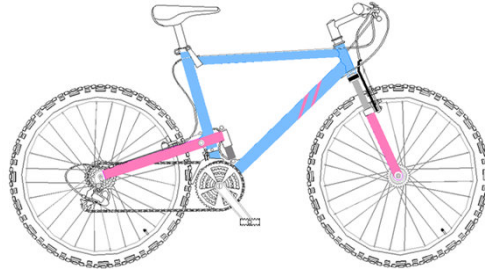
Delay Critical Decisions to LRM

Last *Responsible* Moment is the point at which:

1. An important decision option expires
2. Important sources of information or assistance become unavailable
3. Decision goes onto the critical path
4. Risk increases substantially if decision delayed
5. Expense of carrying decision increases greatly



Bicycle Development Dilemma

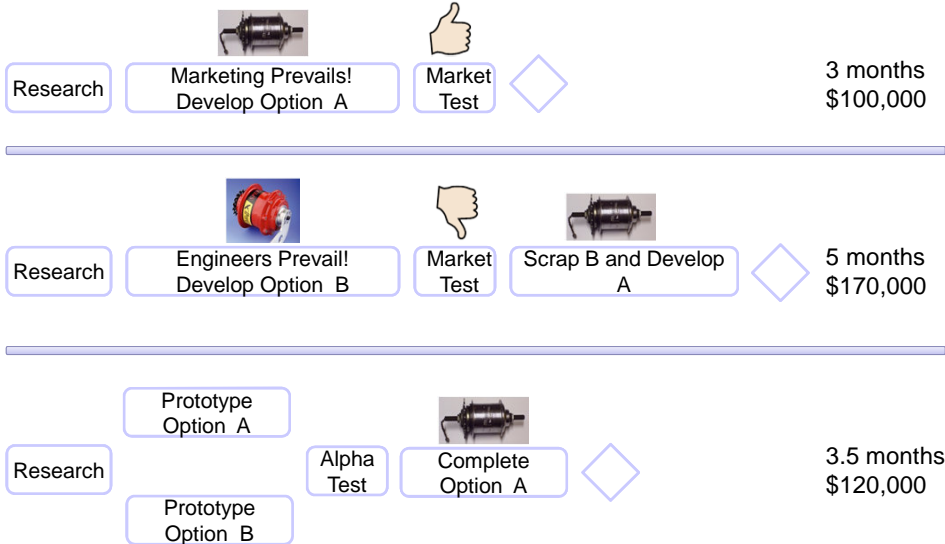


Option A: Update of tried and true bicycle hub



Option B: Hub with superior engineering and cost characteristics

Flexibility Isn't Free



Pick Suitable Approach



← Can see clearly

Crystal ball is cloudy →

Project Environment Exercise

- Group A – What options could you buy that would benefit your project?
- Group B – Identify an important and open future decision on your project. What are the key considerations for determining when the last responsible moment will occur?
- Group C - Identify an important and open future decision on your project. What information will you need to obtain to make this decision at the last responsible moment and how will you obtain it?



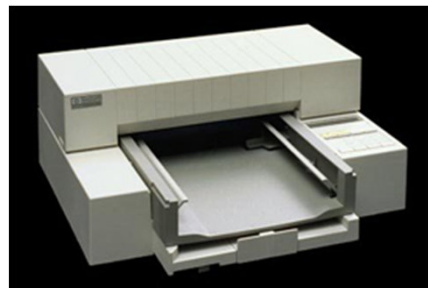
EMBRACE THE INEVITABILITY OF CHANGE

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Specify Differently

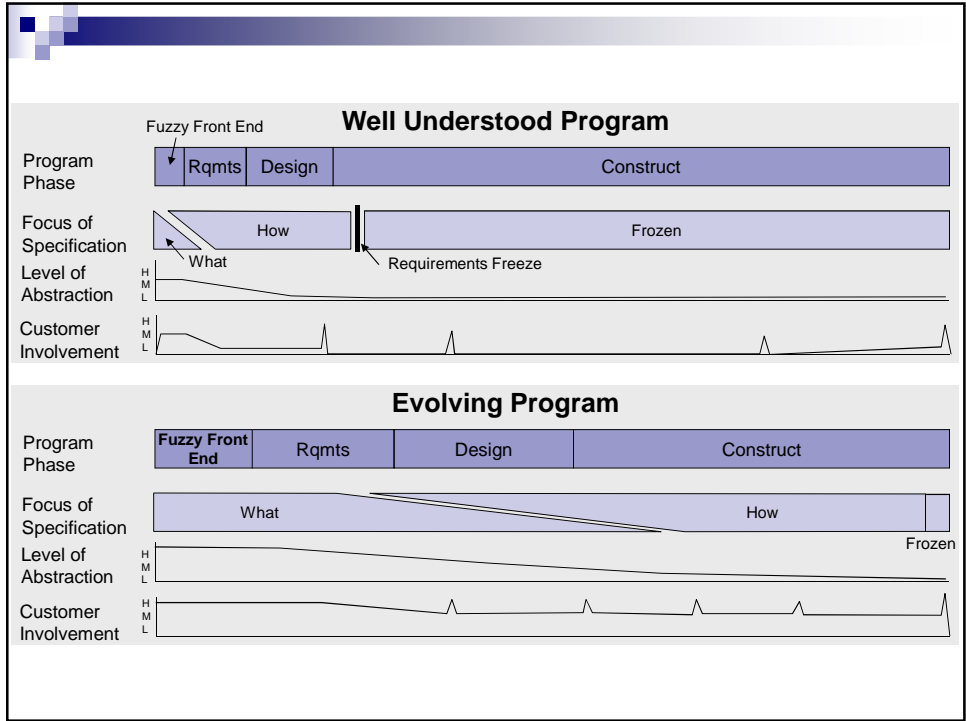
Agile techniques: product vision, personas, epics, user stories

1. *What* rather than *how*
2. Stay at higher level longer




Original 1988 HP DeskJet






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Exploit Modularity



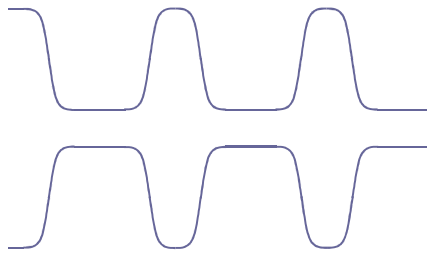
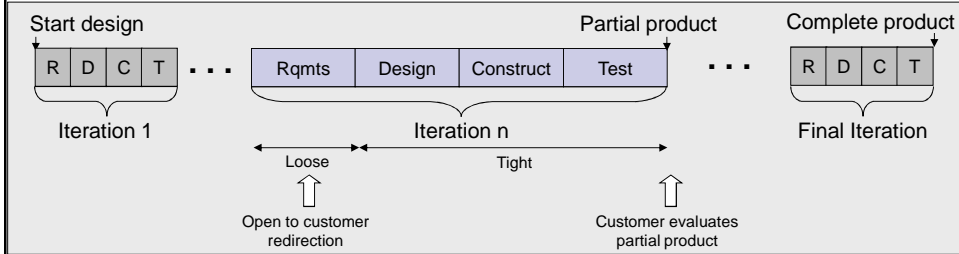
Partly completed mansion



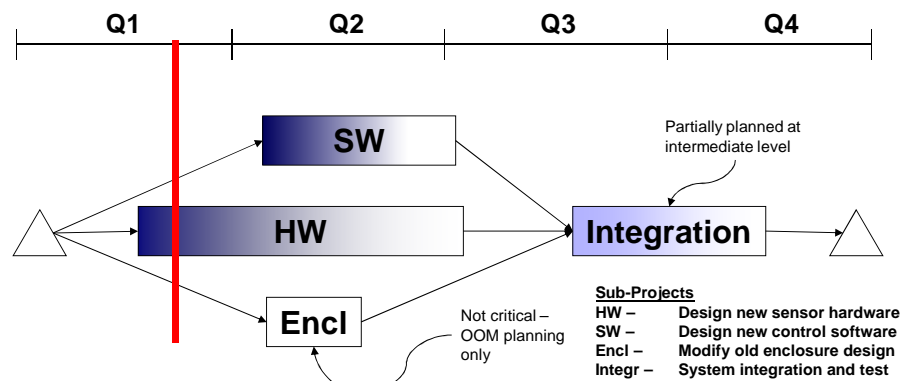
Small simple house designed for later additions



Use Loose-Tight Planning and Execution



Incremental (Rolling Wave) Planning

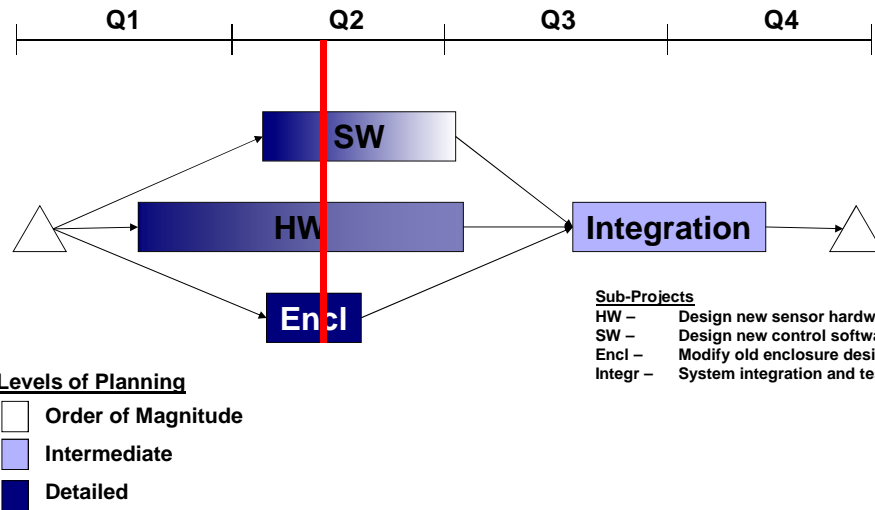


- Levels of Planning**
- Order of Magnitude
 - Intermediate
 - Detailed

Warning: Guard against the bias of being too optimistic when doing shallow long-term planning. The time is in the details.



Later in the Project



Flexible Techniques Exercise

- Group A – How do you plan to deal with the inevitable changing requirements on your project?
- Group B – How can you apply rolling wave planning to your project? What obstacles do you anticipate?
- Group C – Identify aspects of your project that would benefit from a loose-tight approach.



Seven Transferable Techniques

1. Put people and the team first
2. Apply flexibility selectively
3. Plan to iterate
4. Keep your options open
5. Expect product requirements to change
6. Plan the project expecting change
7. Manage project risk continually



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