An Introduction to Agile Software Development

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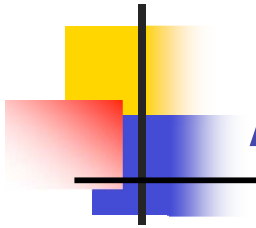
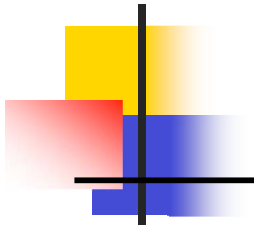


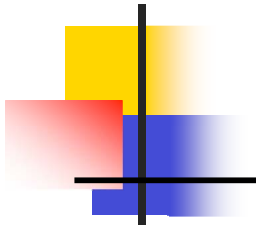
Agenda

- How we develop software
- BRUF, BDUF, and DWIM
- What's wrong with relay races, or Why Agile?
- What is Agile development? Prior art?
- When to use Agile
- Requirements: the requested system *versus* the needed system
- How to introduce Agile
- Answer your questions



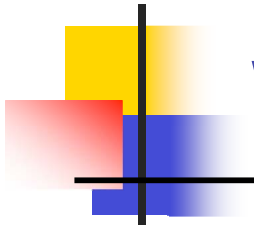
How We Develop Software

- Determine the need
- **Define/capture** business requirements
  - Note the vocabulary used…
- Design the system, assign the development team and…
  - Harlan Mills: buggy programs
  - Wright Brothers model



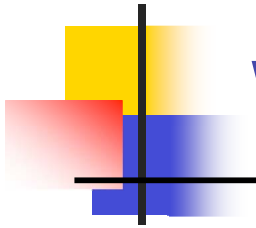
BRUF & BDUF

- Big Requirements Up Front
  - No design until all requirements known, defined and captured
- Big Design Up Front
  - No code until the design is done, complete and final
- Works IFF you're religious about sticking to it… but…
  - Request *versus* need!



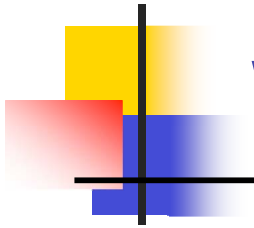
Waterfall/Relay Race Model

- Waterfall is strictly sequential
  - Strict sequence of stages
  - Mainframe-based; doesn't use modern tech
  - Doesn't accommodate or tolerate change without added cost and time
- A better conceptual model: relay race
  - Isn't a solution for the problem, it's merely a different way of expressing it



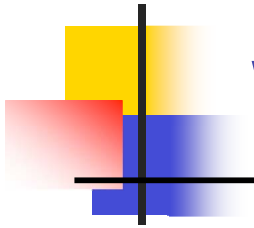
Waterfall/Relay Race Model

- Relay races: overlap before baton passed
- Waterfall and relay present a predetermined path and sequence.
  - Neither accommodate change
  - Can't go up the falls or backward in the race
- Multiple attempts to move away including Boehm's spiral model
  - Iterative: planning, risk analysis, development, and customer evaluation



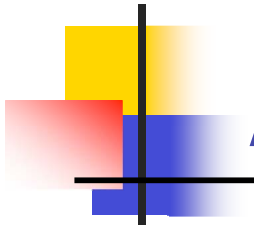
Why Agile

- Thomas Friedman in ***The World Is Flat*** : "…the flattening of the world has happened faster and changed rules, roles, and relationships more quickly than we could have imagined."
- How do we respond?
- How do we adapt?
- Is your current software development competitive in a flat world?



Why Agile?

- The height of insanity: repeat the same steps & expect different results.
- New approaches and ideas don't just occur out of the void.
- New approaches evolve from conditions in which old ideas no longer appear to work.

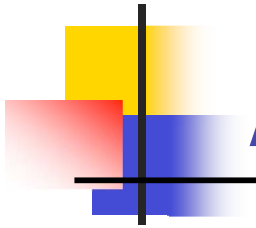


Agile Development Basics

Agile Manifesto (http://www.agilealliance.org/)

- **Individuals & interactions** Processes & tools
- **Working software** Comprehensive documentation
- **Customer collaboration** Contract negotiation
- **Responding to change** Following a plan

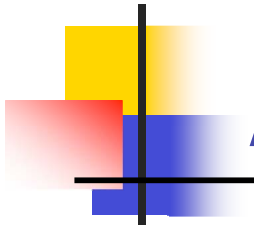
"Uncovering better ways to develop software. Through these efforts, while there is value to the things on the right, we value the left more."



Agile Principles from DSDM 1

1. Active user involvement is imperative
2. Agile teams make decisions
3. Focus on frequent, rapid delivery
4. Acceptance of deliverables: biz purpose
5. Iterative and incremental development

Source: http://www.dsdm.org/ and
DSDM: Business Focused Development, 2nd Ed,
Jennifer Stapleton (ed), A & W, © 2003



Agile Principles from DSDM 2

6. All changes are reversible
7. Requirements baselined at a high level
8. Testing integrated into process
9. Collaborative and cooperative approach between all stakeholders is essential

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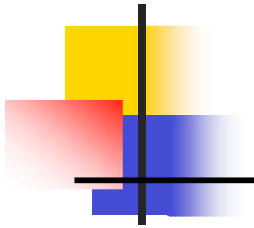


Essence of Agile

- **The essence part 1: Eliminate waste including**

  Partial Work — Unnecessary processes

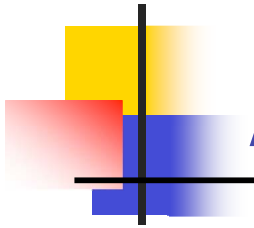
  Additional features — Wasted motion (paper shuffle, *etc.*)

  Context switching — Waiting for something/someone

  Bugs/defects… — Communication latency

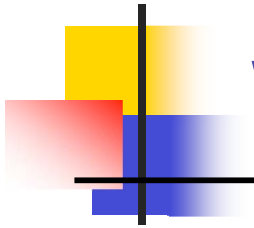
  Implementing out of date requirements.

- **The essence part 2: Delivering value**
  - What generates value?
  - Helps identify waste, too.



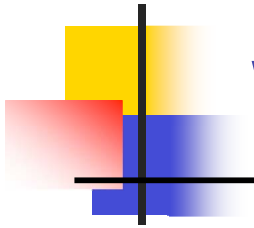
Agile as an Alternative

- The ultimate goal is working software, sooner that addresses need *vs*. request
  - This is an important driver
  - Old model: delivery long(?) after conception
- Along the way eliminate waste, reduce costs, reduce time to market, and increase quality.
  - Agile requires more testing sooner
- Different methodologies… different sized methodologies different size projects



What Is Agile Development?

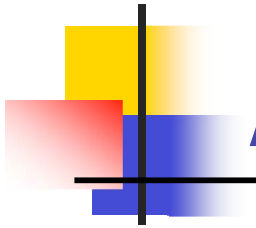
- Requirements driven
  - Customers, end-users, stakeholders, during – not before
  - Dynamic Feedback during development, – not after
- Deliver value
  - List the 10 to 20 most important organizational activities
  - Put yourself in the customer's shoes, rate the activity 1 (customers don't care – no value) to 5 (absolutely must have – high value)
- Basis in manufacturing (think JIT)
  - Prior art: automobile industry (Toyota)



What is Agile Development?

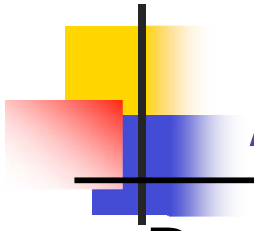
- **A**daptive
- **G**oal Driven
- **I**terative
- **L**ean
- **E**mergent approach

- Self-organizing
- Empowering
- Collaborative
- Active customer involvement
- Frequent delivery
- Incremental
- Time-boxed
- Disciplined
- Continuous integration
- Feature driven



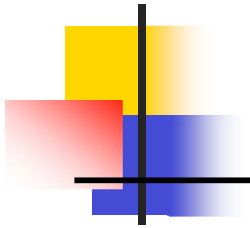
Agile Development Includes

- Continuous innovation and integration
  - Deliver **current** customer requirements
- Decreased communication latency
  - Stakeholders actively involved in development
- Testing integrated into the development process
  - Doesn't need or include a separate Q&A cycle
  - Continuous integration, multiple builds
- Product adaptability
  - Doesn't preclude future requirements
  - Adapts to changing requirements



Agile Development Includes

- People and process adaptability
  - Respond rapidly to change
- Short delivery cycles
  - Find smaller "sub-features" to deliver something
  - Meet market window
  - Improve ROI
  - Reduce TNWIM
- Reliable results
  - Support business growth and profitability
  - Does it contribute to business value?



What's Different?

Traditional

Fixed: Functionality / requirements

Variable (estimates): People & time (Cost & schedule)

Agile

Variable: Functionality / requirements

Fixed: People & time

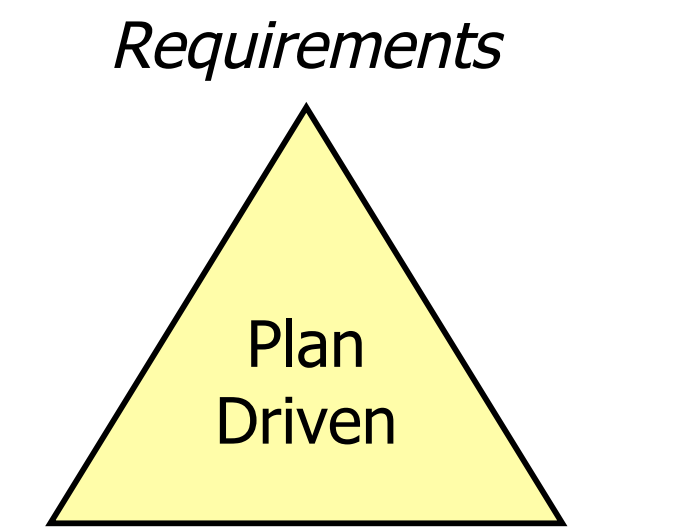
- The goal is to deliver something!
- Priority determines increment scope.
- A late requirement change in an agile project can be a competitive advantage.
- 60+% *required* features rarely or never used!

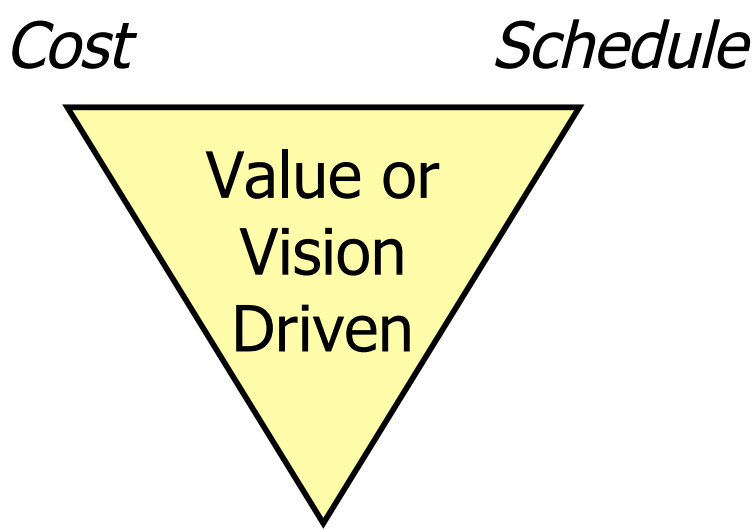
What Different (Visual)?

Predictive plan

Constraints

Adaptive process

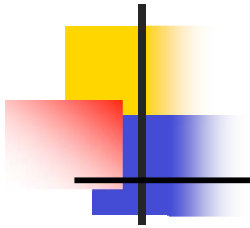




Phased-based

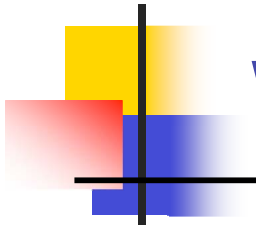
Estimates

Iterative



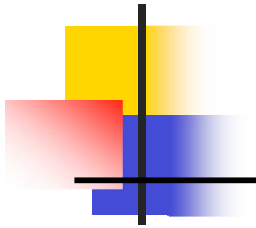
What If…?

- What is the difference between a need and a thneed?
  - Thneed => something you think you need
  - What is the difference between the *requested system* and the *needed system*?
- When are requirements defined?
  - Before coding starts or as part of the process?
  - If you're thinking about "capturing" requirements, it's the wrong mindset!!!



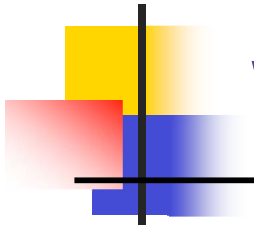
What If…?

- … requirements aren't baselined at a high level that allows detailed requirements to evolve during development, in concert with users (stakeholders)
- The antithesis is an…
  - …attempt to define a (nearly) complete set of requirements at the beginning.
  - It is the path over the waterfall



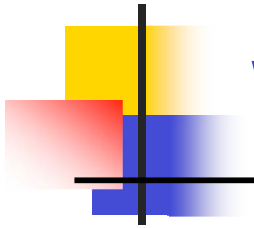
Prioritize Requirements

- Synthetic voting
- Must, Should, Might, NITI
  - Must: fundamental to system. Missing, application will be worthless
  - Should: important and may be promoted to must at a later time. Not absolutely critical to the system (at this time), can be used without.
  - Might: more easily left out of increment
  - NITI: not in this increment/iteration



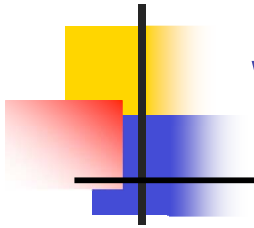
What Happens When?

- Feasibility determines whether or not Agile is appropriate in the organization for this project.
  - Determines if **all** principles fit the project
  - Produces initial outline/plan & optional prototype
- Business study sets baselined high level requirements (functional and non-functional) and their initial priority (set by business need)
  - System architecture definition (initial platforms, & architecture, *etc*). This is allowed to change.



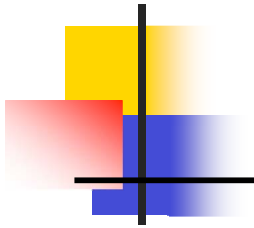
When to Use Agile

- Agile isn't a solution for everything
  - Will the culture support or torpedo it?
- Is functionality visible at the UI?
  - Reports and screens
  - Users verify that software meets needs
  - Agile dictates user involvement
- Can all classes of users be identified?
  - Need complete coverage by users



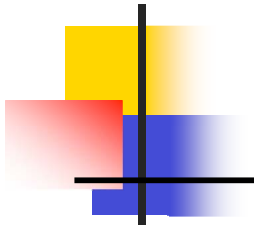
When to Use Agile

- Large application?
  - If so, can it be split into smaller deliverables?
- Is the project REALLY time constrained?
  - If it isn't, there is no need to compromise deliverables/features, everything must be delivered.
- Requirements flexible & defined only at high level?
  - "Complete" understanding of all deliverables?
    - If yes, you may have too much information.
- Only if customers are & can be available



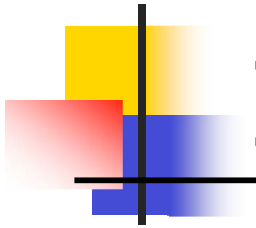
How to Do Agile???!?!

- Are you sure you want to?
- It's really difficult to do – in part, because
  - It requires testing and…
  - Most programmers don't like to do testing – as an integral part of development.
  - It requires customers…
- Agile development is much more disciplined…
  - Planning, test, code, with continuous integration (either once or multiple times per day)
  - Hard for many groups because of the discipline required.
  - Can be taught/learned



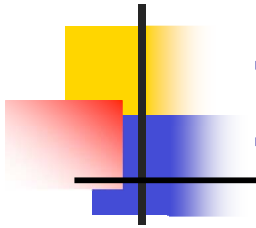
How to Introduce Agile

- Understand the organization
  - Bureaucratic: how quickly, how many steps
  - Hierarchical: tolerate empowerment
  - Innovative: today's cure changes
  - Technical focus: infrastructure suitable
  - Customer focus: with a service mindset
  - Willing to change: how does organization accommodate change



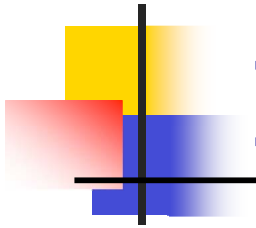
Introduce Agile

- Must be planned and managed just like any other project
  - Don't just "do" Agile
- Gradually (though fiat might be required)
  - Agile is a people-oriented process
  - Get the right people
    - People who want to be involved!
  - Empower them to make decisions
- Are you able to ask the right questions?



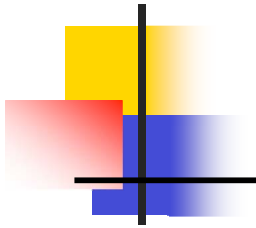
Introduce Agile

- Investigate options
  - Crystal, DSDM, RUP, Scrum, XP… ???
- Identify a suitable pilot project
  - Make sure resources are available
    - People and infrastructure
- Set the stage
  - Let people know what to expect
- Define/refine the business value



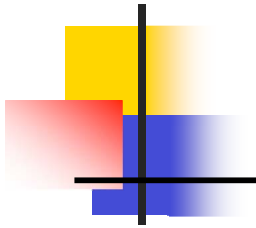
Introduce Agile

- Start the project
  - Constant prototyping with active user involvement (joined at the hip)
- Monitor progress and process
- What are we learning?
- What did we learn?
- How do you know?
- Are you sure?



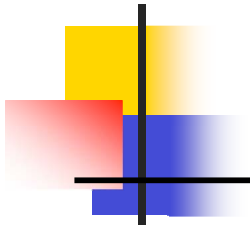
Have an Agile Coach

- Coach is not part of any programming team
- Coach should be technically knowledgeable
- Coach responsibility: process first, problem domain second
  - Coach's role is one of conversation, not coding
  - Coach's role is to keep the team on track, not be the CTO of the project
  - Coach's role is assure team can continue development without the coach
  - Game mediator



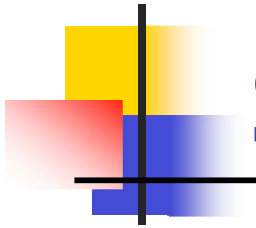
Process

- In most cases agile process doesn't matter
- Throw out ¾ of the (heavy weight) process and get a net improvement in the project and get better quality delivery
- Does infrastructure support strategy?
  - Continuous integration
  - More testing, sooner



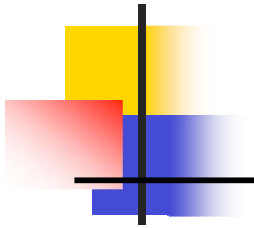
Process All Different

- Which is right?
- Common differences between success & failure
  - Success didn't have a lot of process,
  - Did have co-location (and a customer in the room),
  - Communication (including with the customer),
  - Early delivery
    - The failures (at agile) got so caught up in process that deliveries didn't happen (or didn't happen as often as they should)
- Use of a particular agile methodology doesn't distinctly correlate with success or failure
  - Pick one that is right for the organization



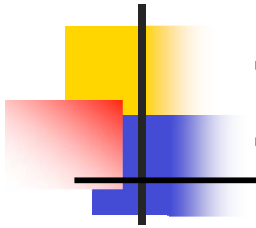
Success Factors

- Pressure / need for change
- Clear understandable shared vision
- Capacity for change
  - Ability to tolerate a degree of chaos that is part of the process
- Clear first steps / actions
- Customer in the room with developers
- Guidance or help for early projects
- Will asking the difficult questions cause…



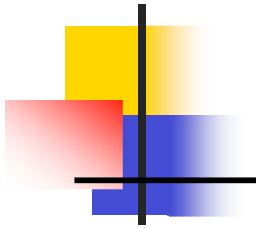
Success Factors

- Have the right people (& customers?)?
  - Assign highly skilled, flexible non-rigid people
  - Do they have the right thought process?
  - Are they dedicated & motivated to try something new and see it through?
    - Is there management support?
    - Is there some passion about the possibilities?
- Are the business drivers (value proposition) clearly understood?



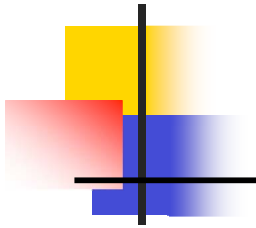
It's the Process…

- There isn't a Q&A cycle after development
  - Agile tests more often and sooner
  - Not waterfall!
- End users must be involved during, not after
- If you are PMing and an iteration is late
  - Agile isn't the problem!
  - You aren't the problem, either!
  - Good thing, not bad: address problem earlier
    - Problem might be (and remain) hidden until much later when it would be more expensive to address



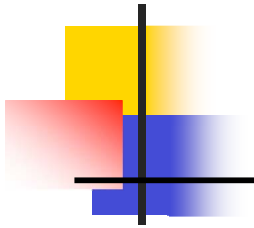
Rock the Boat

- In most organizations there really isn't a way to introduce agile without some objection.
- First projects should be important, but not bet the mortgage, mission critical.
  - Important so that there is impetus to complete
  - Not mission critical so that business continues
- Agile development is iterative development
  - Small functional pieces that do something



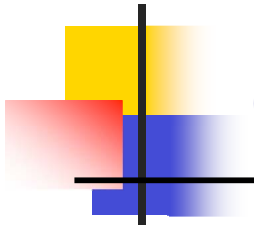
Really Rock the Boat

- How much documentation or analysis is enough and how much is too much?
- What is the purpose for documentation?
  - Allow new team members to catch up with us
  - Video white board sessions as documentation
  - Audio only, secondary
- Document process
- Defend time devoted to documentation



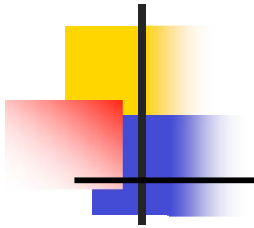
7 Deadly Sins

- More feedback, not less
- Run tests before/during development, not after
- More code, not more documentation
- Requirements evolve, not BRUF
- User involvement in code, not planning
  - From on-high (BR/DUF) is not agile
- Web front end & try new ideas, not big-bang
- Anticipate change as a competitive advantage, not a cost burden nor a reason for delay



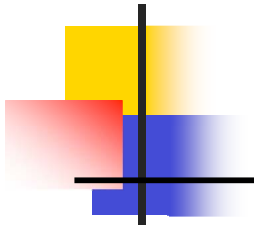
Concept: Agile == Game

- Cooperative game, lets people discuss what happens, "If we do X…
- Resource limited cooperative game
- Moves consist of communicating
  - All that there is is invention and communication
  - Finite, goal directed



Fallout from the Game

- People make sense of what they're doing
- Become playful about what they are doing.
  - Take that same vocabulary (the game vocabulary) into a live project and people make sense of what they are doing
  - Sense of past with projections into the future.
    - Almost to the point of getting playful and inventing: "That would be (is) a good move."



Summary

- Relay race development doesn't work
- Agile isn't **the** solution to every problem
- Agile development focuses on delivering the needed system that meets dynamic business requirements
- Agile eliminates waste
- Agile means people and process changes
  - Biggest source of resistance: folks who insist BRUF, BDUF & Gantt are the ONLY way

Questions ? ? ?

If you don't ask, who will?

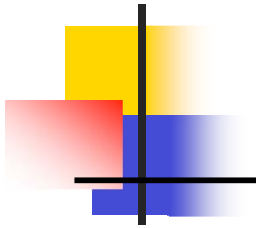
There aren't any dumb questions.

If not now, when?

The only dumb question is the one not asked!

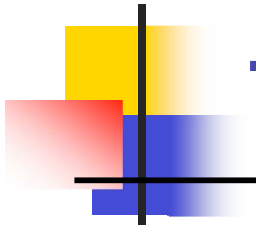
References (Partial list)

- *The Machine that Changed the World*, James Womack, Daniel Jones, & Daniel Roos; HarperCollins, ISBN: 0-06-097417-6
- *Lean Thinking: Banish Waste and Create Wealth in Your Corporation, Revised and Updated*, James P. Womack, Daniel T. Jones, James Womack, Daniel Jones; Free Press, ISBN: 0-74324-927-5
- *The World is Flat: A Brief History of the Twenty-first Century*, Thomas L Friedman; Farrar, Straus and Giroux, ISBN: 0-37429-288-4
- "The New Product Development Game", HirotakaTakeuchi and Ikujiro Nonaka, *Harvard Business Review Reprint 86116*, Jan-Feb 1986 © 1986
- *True Change: How Outsiders on the Inside Get Things Done in Organizations*, Janice Klein; Jossey-Bass (A Wiley Imprint), ISBN 0-7879-7473-0



Resources (Partial list)

- http://alistair.cockburn.us/crystal/wiki
- http://www.agilealliance.org/
- http://www.agilemodeling.com/
- http://www.controlchaos.com/
- http://www.dsdm.org/
- http://www.xprogramming.com/



Thank You

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