What is this Agile thing?
An Overview of Agile Software Delivery

Jason Tanner

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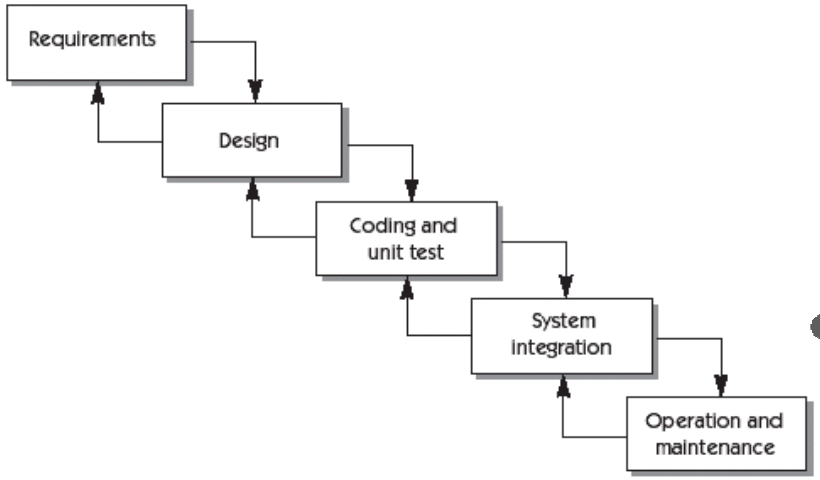
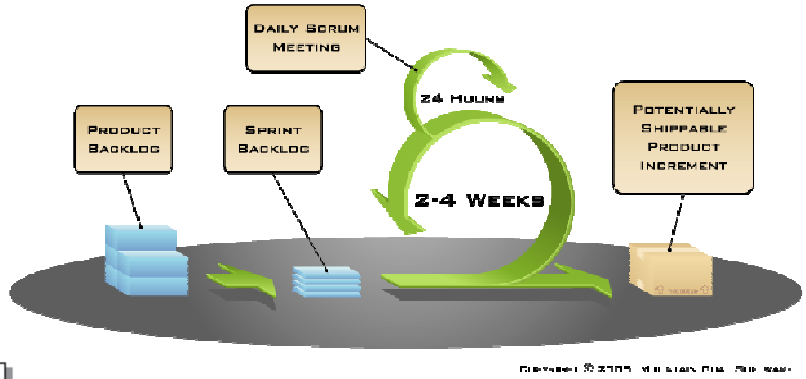
Dominant Approaches

Waterfall-Centric



- *Information known up front*
- *Manage and reduce risk*
- *Change is expensive (avoid)*
- *Contractual ("sign off")*
- *Document centric*
- *Resources variable*

Agile-Centric (Scrum)



- *Emergent knowledge/behavior*
- *Deliver highest value*
- *Change is inevitable (embrace)*
- *Negotiated*
- *Communication centric*
- *Resources fixed*

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The Agile Manifesto (2001)

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.

www.agilemanifesto.org

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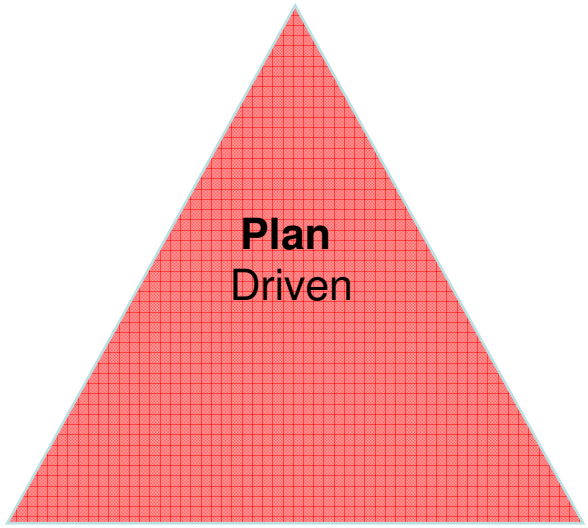
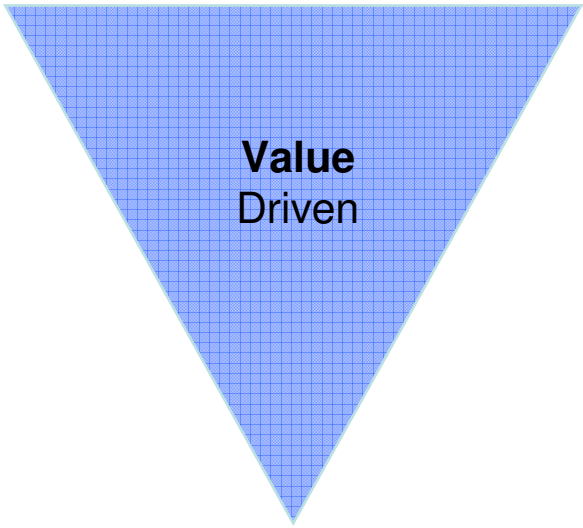
Principles of the Manifesto

- Customer satisfaction by rapid delivery of products
- Working product is the measure of progress
- Late changing requirements are welcome
- Cooperation between business and engineering
- Face-to-face is the best form of communication
- Self-organizing, motivated, trusted teams
- Attention to technical excellence and design
- Regular adaptation to changing circumstances

Fixed Vs. Variable

	Waterfall	Agile
Fixed	**Requirements**	Resources / Time
Estimated	Resources / Time	**Features**





The Plan creates cost/schedule estimates

Release themes & feature intent drive estimates

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Agile is an Umbrella

- Scrum
- Agile Project Management Framework (APM)
- Extreme Programming (XP)
- Crystal Methods
- Dynamic Systems Development Model (DSDM)
- Agile or Rational Unified Process (AUP/RUP)
- Feature Driven Development (FDD)
- Lean Development
- Rapid Application Development (RAD)

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What's Unique About Agile

	Less Agile…	*More Agile…*
Values	Mechanistic Production	Agile Manifesto!
	Forced Roles	Whole Teams
Culture	Predictive	Collaborative
	Command & Control	Self-Organization
	Discrete	Continuous
	Opaque	Transparent
	Six Sigma	Social Sigma
Practices *(Some)*	Build - Test	Test - Build
	Code Review	Pair Programming
	Big Up Front Design	Reference Architecture
	Integrate & Test	Continuous Shippability

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Benefits of Agile

- Creates options
- Reduces risk
- Improves quality
- Improves profitability
- Binds customers
- Improves morale
- Competitive advantage

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Agile is Maturing

Agile was…		***Agile is…***
Small teams	→	Global scale
IT projects	→	All product categories
Engineering focus	→	Whole company focus
Backlogs	→	Roadmaps & portfolios
Business value	→	Sustainable profits
Something you do	→	Something you are

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Some Agilists

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VeriSign MSS
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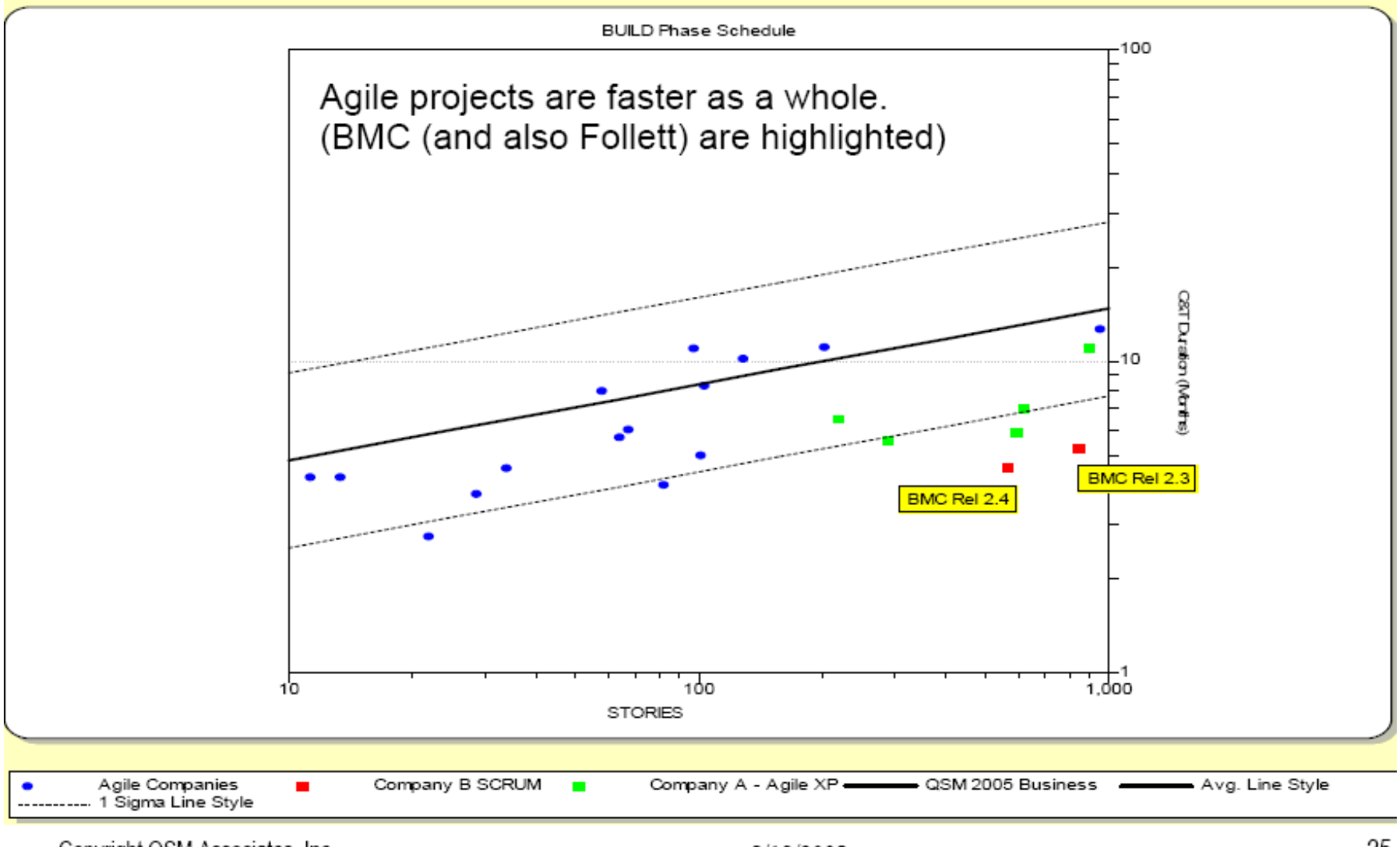
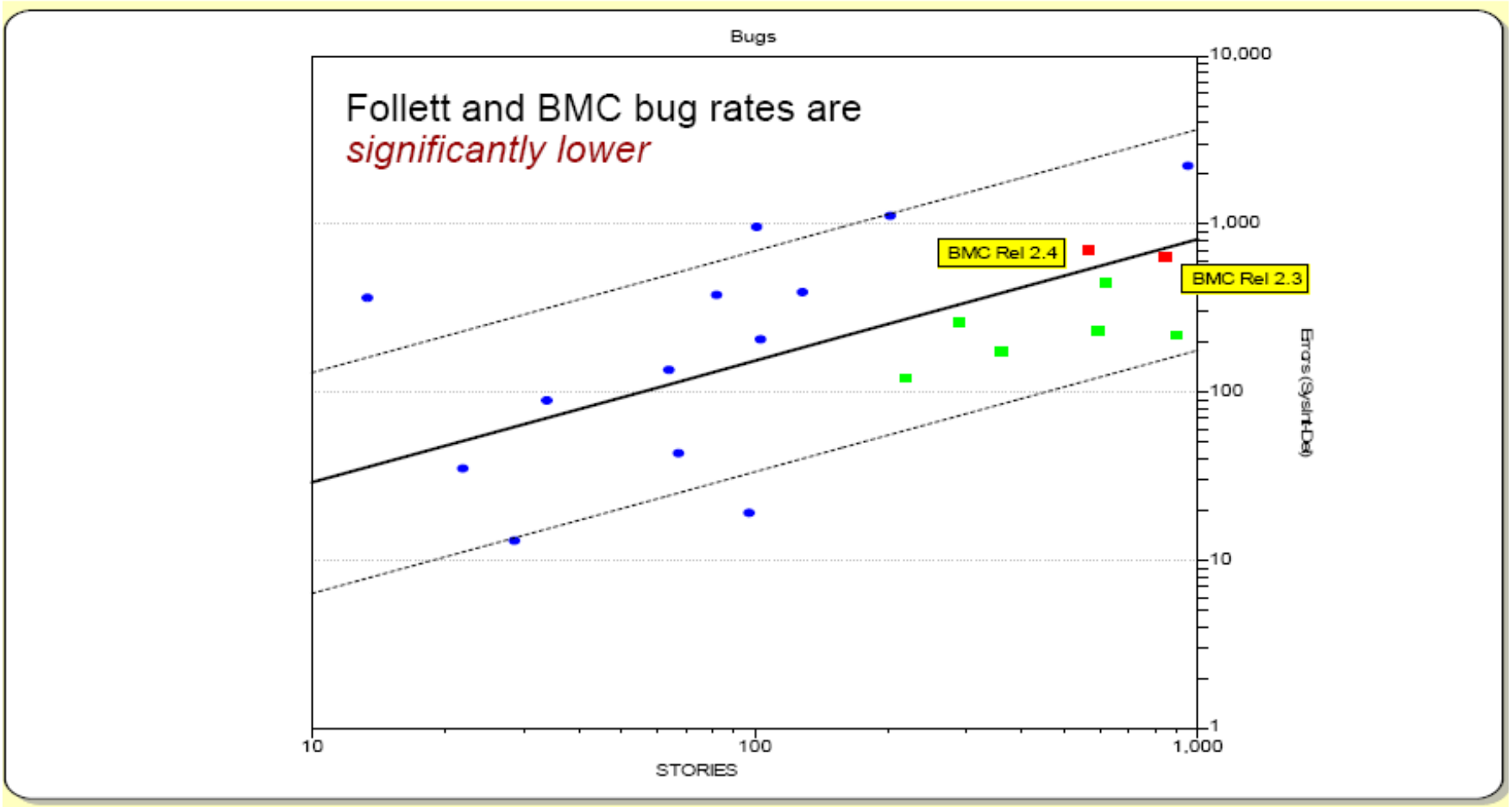
But Does It Work? Alan MacCormack (HBS)

- 130+ software projects studied in several industries and domains
- Results?
  - Agile works.
  - Architecture matters.
  - Final results don't often match "spec". This makes Agile antagonistic to traditional mngt metrics and practices.
- Myths:
  - Myth 1: It's a new "Best" practice…
  - Myth 2: It's all about making late changes…
  - Myth 3: You trade-off quality, productivity…
  - Myth 4: US is way ahead of the world…

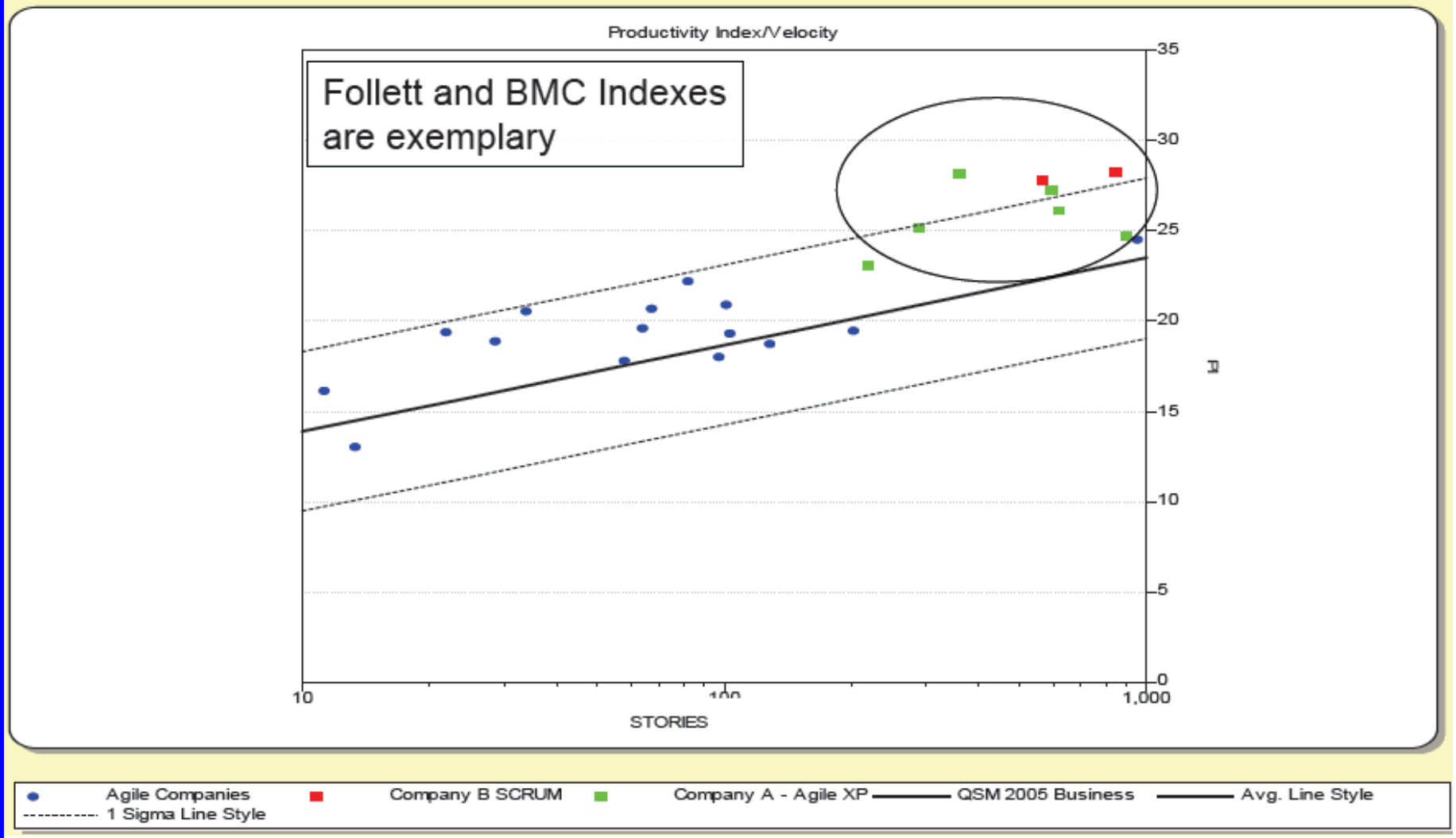
Proven Results – Speed



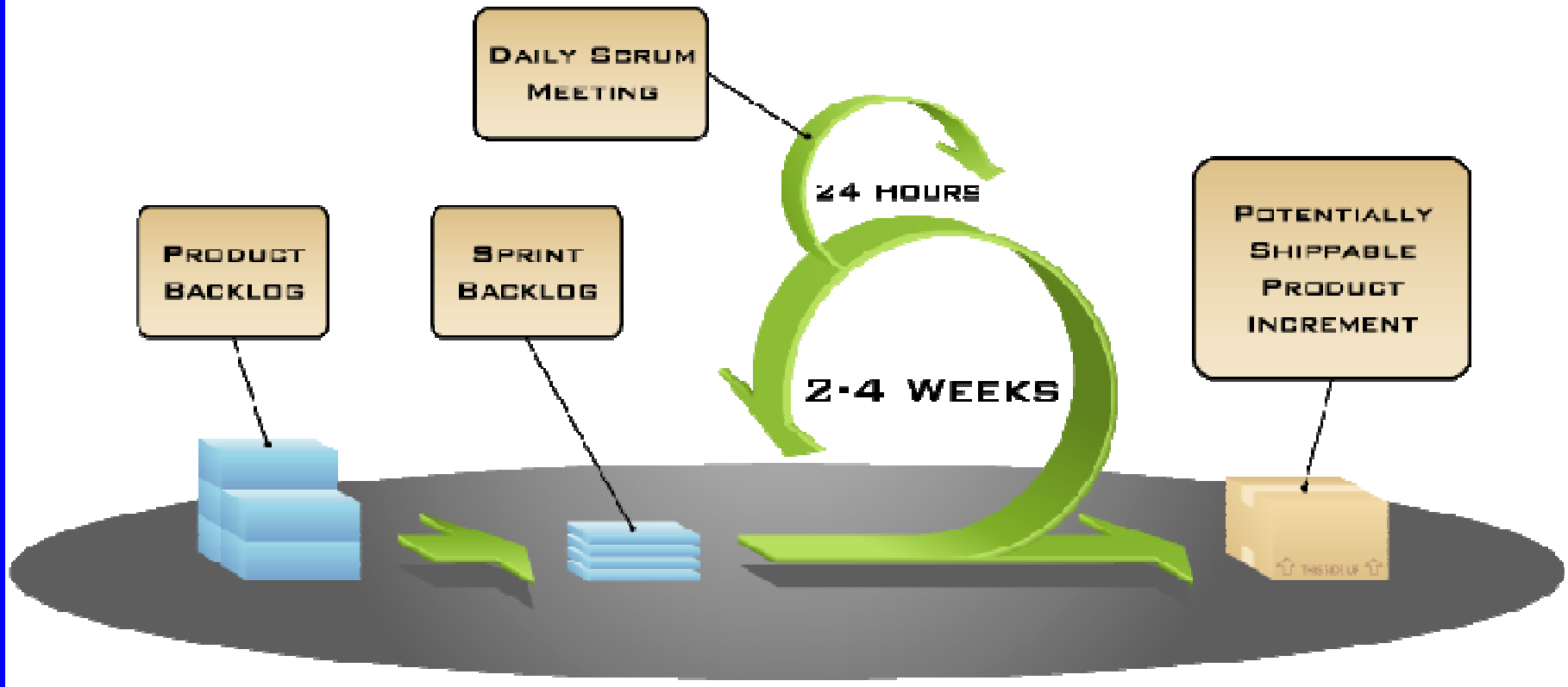
Proven Results – Quality



Proven Results – Productivity



The Scrum Framework



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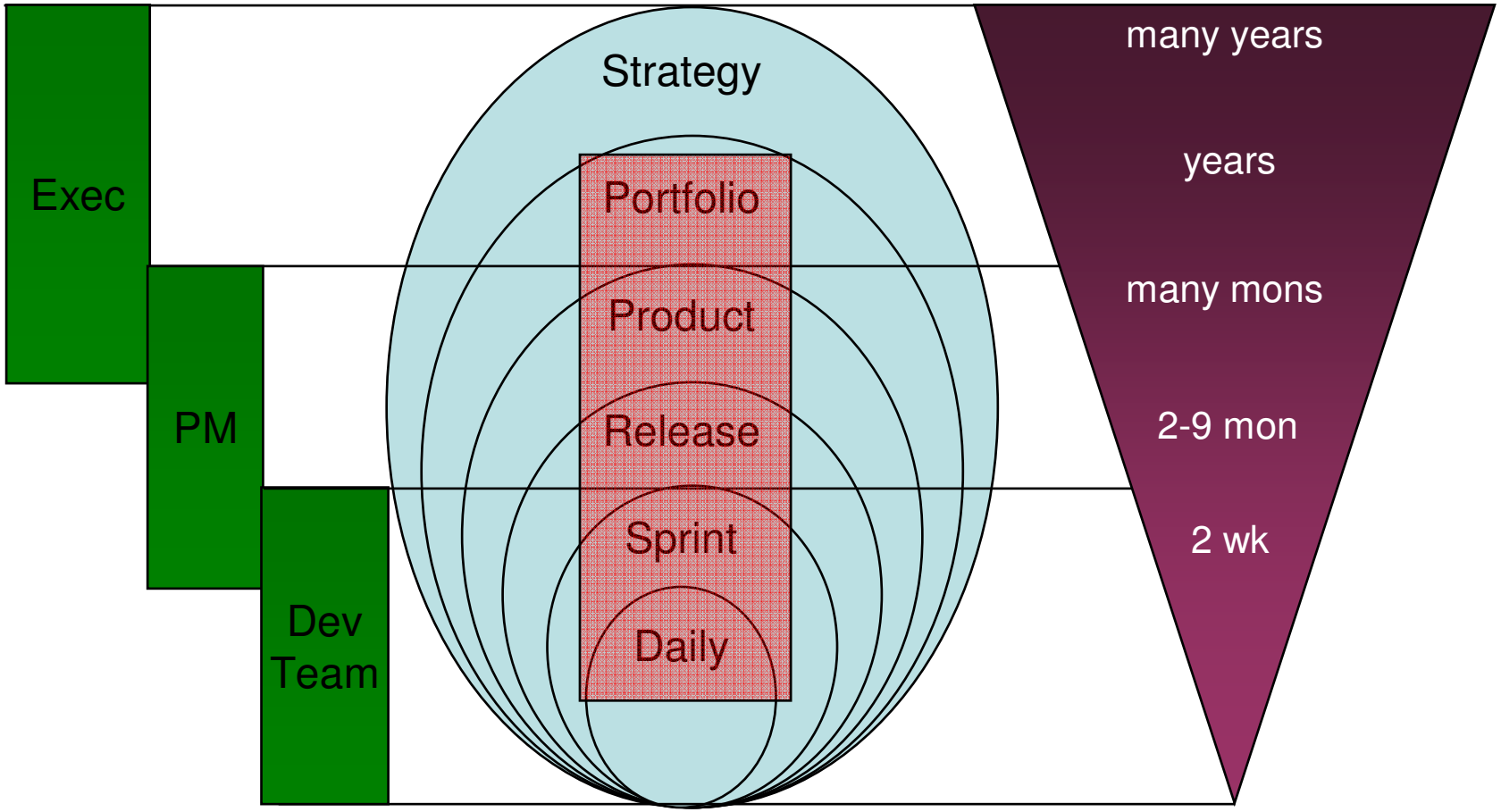
Typical 2-Week Sprint

Mon	Tue	Wed	Thu	Fri
Sprint Planning Meeting	Daily Scrum	Daily Scrum	Daily Scrum	Daily Scrum
Mon	Tue	Wed	Thu	Fri
Daily Scrum	Daily Scrum	Daily Scrum	Daily Scrum (Review)	Review Retrospective

Srpint planning:	Product manager and team meet to review next set of items from the backlog. Team updates task board.
Daily Scrum:	What have you done since last meeting? What will you do before next meeting? What is in your way?
Review:	Meet with product manager to accept/reject work.
Retrospective:	Review and reflect on process and how it can be improved.

Planning Time Horizons



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Agile Roadmap Management

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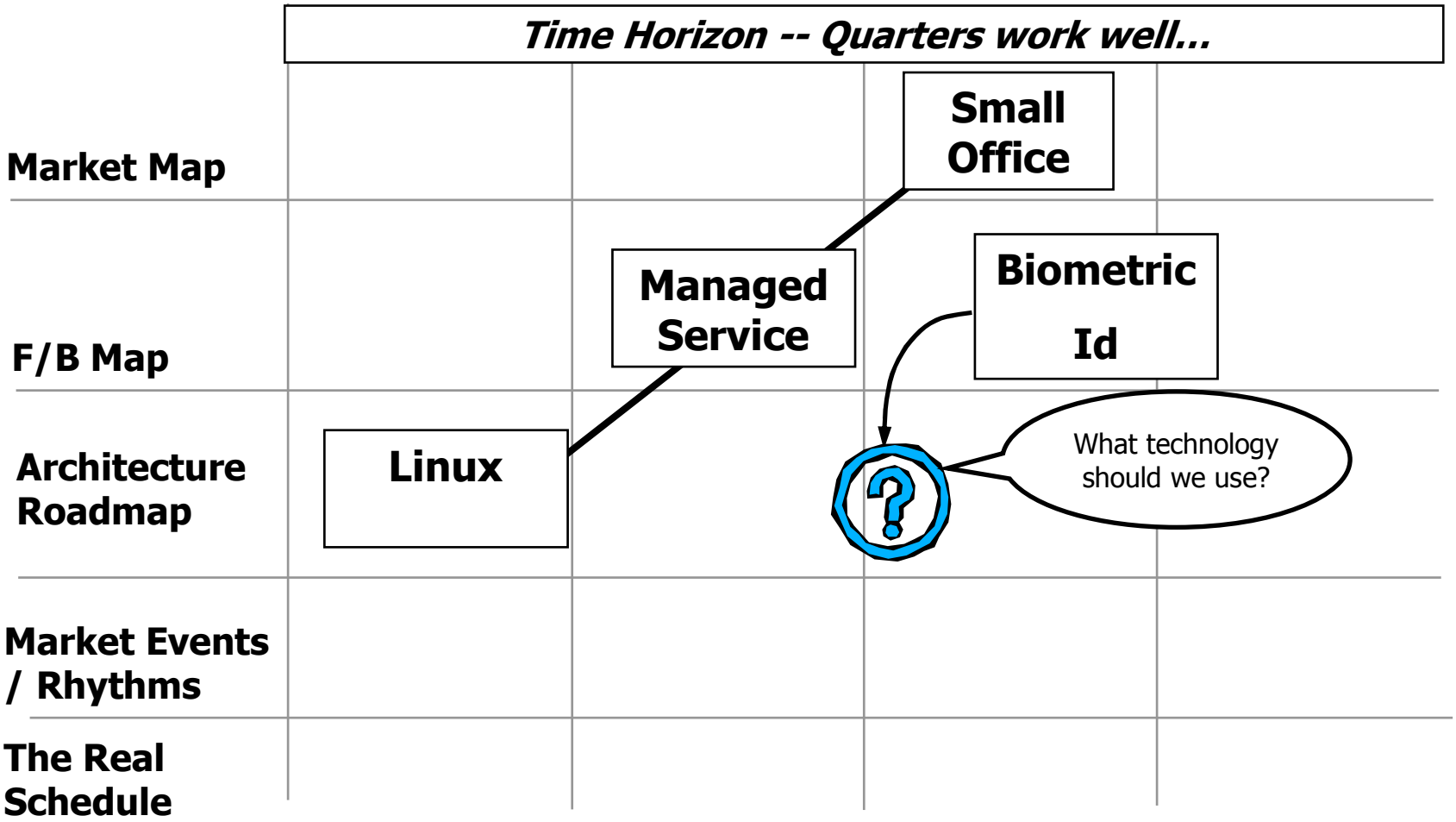
Roadmap Example



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Release Planning

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Example of a Release Plan

Backlog Item	Team Points
1. bug fix	2
2.1. user story “do this A”	8
2.2. user story “do this B”	5
2.3. user story “do this C”	13
3. architectural enhancement	21
4.1. user story “do that 1”	2
4.2. user story “do that 2”	8
4.3. user story “do that 3”	5
total?	60 pts

Assuming 12pts/sprint, this team needs at least 5 iterations, plus any additional sprints for buffer and “end game”.

Sprint Zero
Infrastructure

description of typically technical work that is required for the team to complete the rest of the release.

Sprint One (theme)

bug fix 2
do this “A” 8

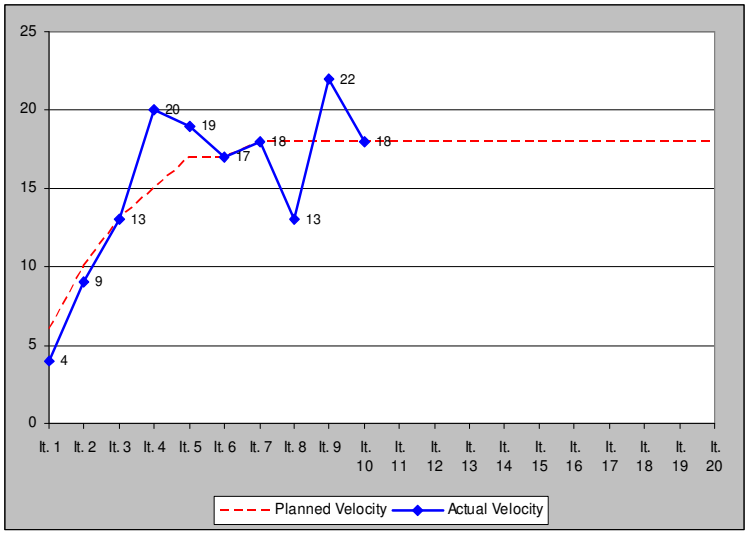
Sprint Two (theme)

do this “B” 5
do this “C” ??

Sprint Three (theme)

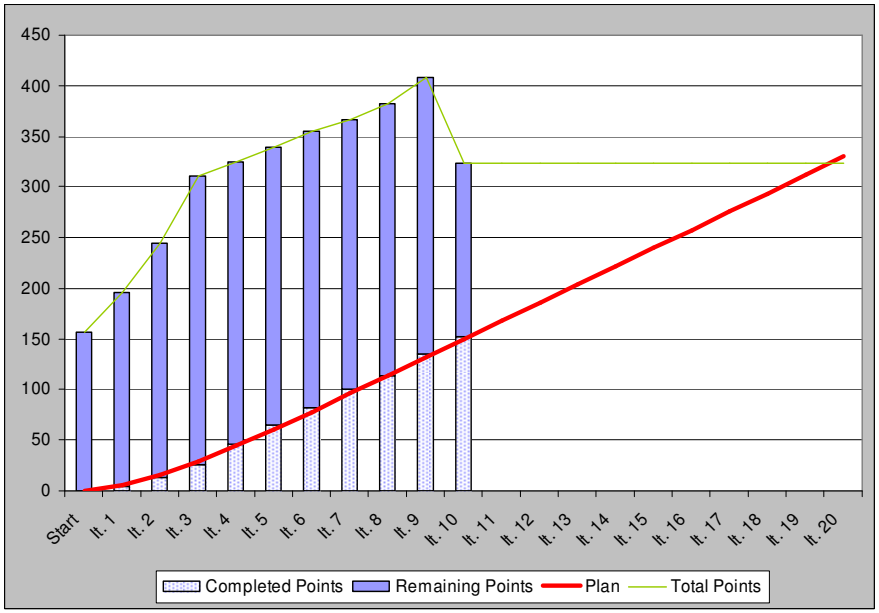
do this “C” 5

Reporting Progress: Velocity / Burn Up Charts



Velocity

Burn Up



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Sprint Planning & Sprinting

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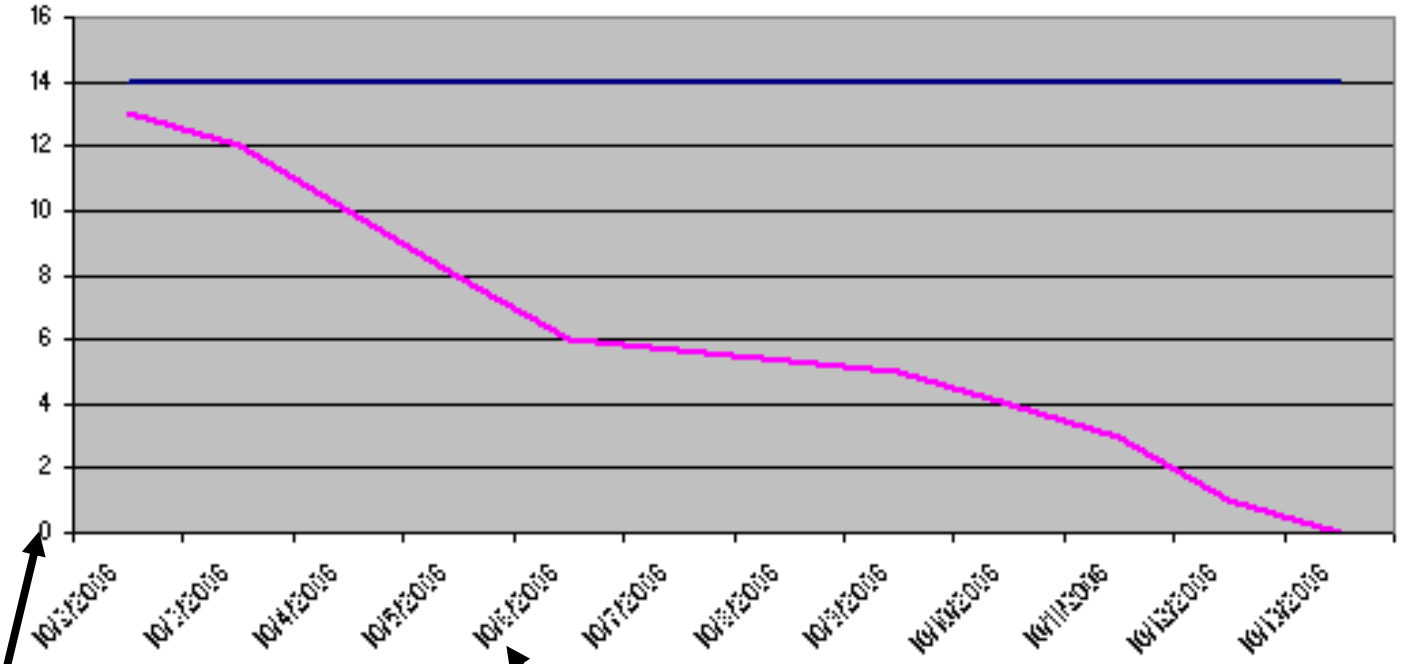
Sprint Plan

- The specific set of tasks required to implement a backlog item within the sprint time box.
  - Whole team present – usually ½ day
  - As much detail as needed to engage wor
- Teams will break down larger backlog items into smaller items
- Teams can associate hours estimates to create an sprint burn down.

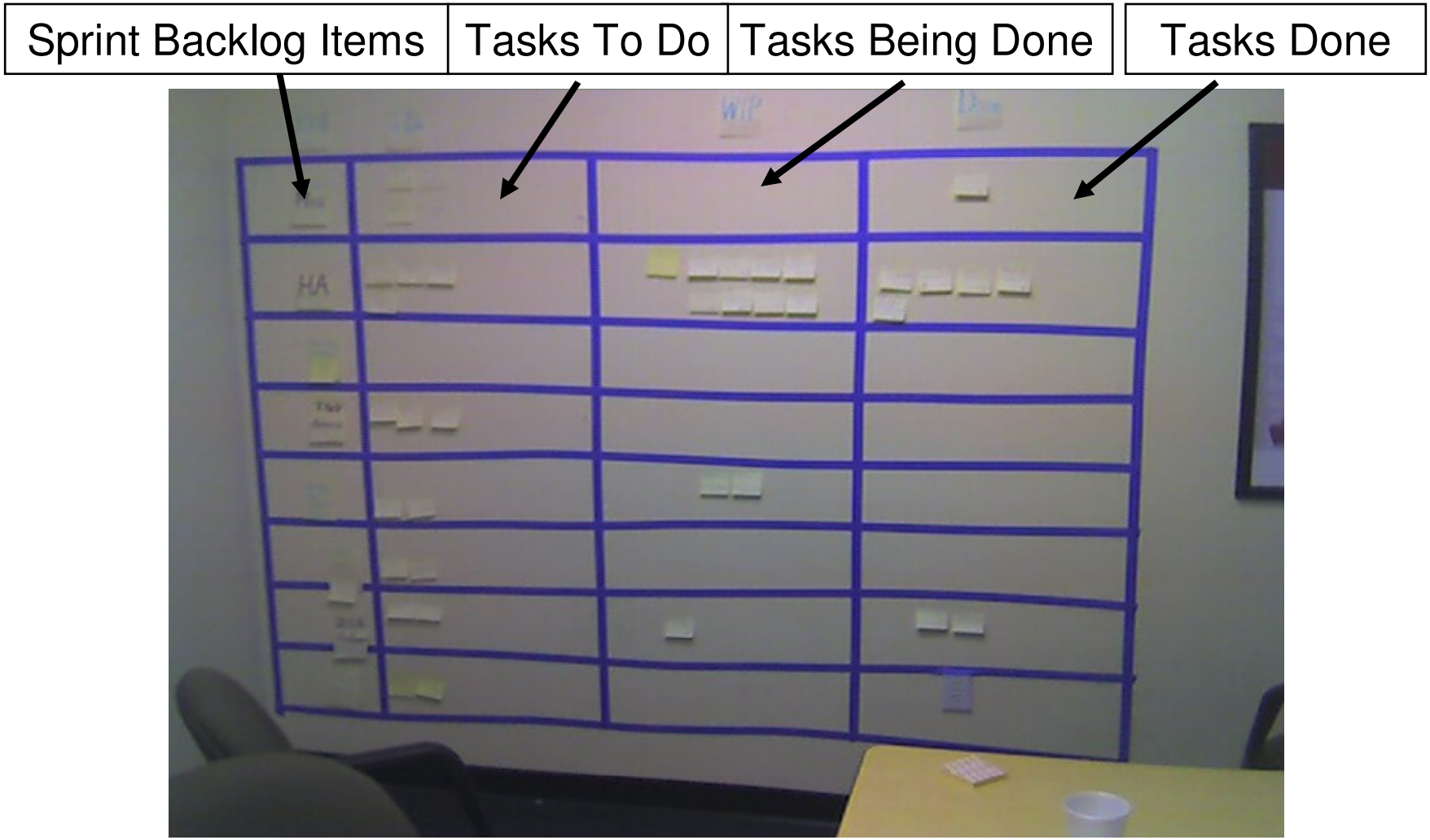
Sprint Burn Down



Hours Remaining

Each Day

Getting to Done, Done



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Sprint Review – Demonstration

- At the end of every iteration, you and the team demonstrate the accepted stories
- You and the team review the sprint metrics:
  - The Burndown Chart
  - The Taskboard
  - The number of dropped stories
  - The number of split stories
  - The number of tests
- You work with the team to evaluate the process
- You ask for stakeholder reactions and recommendations
- You re-evaluate the Product Backlog priorities and adjust for next sprint planning meeting

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Retrospectives

Continuous Improvement – A Critical Part of the Process

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Retrospective Overview

What?

- Meeting for team to look back on a period of work to learn from their experience and *immediately* apply this learning to future projects
- What went well?
- What went poorly?
- What to do differently?

When?

- Every iteration for a few hours to handle mid-course adjustments, ensure metrics (flossing)
- Every release for a whole day to gather substantive issues and plan bigger changes

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Agile Teams

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Scrum Roles

- Scrum Team
  - Cross-functional, self-organizing, self-managing group
  - Engineers, Developers, Testers, Analysts, Technical Writers
  - Fully responsible and accountable for meeting commitments
- Product Owner
  - Similar to Product Manager (subset of work)
  - Ultimately determines what is and is not in the backlog
  - Fully responsible and accountable for product success
- Scrum Master
  - Coordinates and tracks team activities
  - Removes obstacles and shields team from interference
  - Similar to Project Manager – Facilitator vs. Manager
- Customer
  - Whoever receives the benefit of the product or project
  - Required to attend reviews and provide feedback
- Stakeholders
  - Anyone directly or indirectly involved or related to the project or product
  - May add backlog items
  - Required to attend reviews and provide feedback

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Characteristics of Scrum

- Scrum is an Agile Project Management “wrapper”
  - No specific engineering practices are prescribed
- Iterative and incremental
  - The product progresses in a series of short iterations
  - Working software is delivered at the end of each iterations
- No (or minimal) requirements “sign-off”
  - Requirements are captured as items in an ever-evolving ‘backlog’
- Scrum teams are self-organizing and cross-functional
  - Product Management (Product Owner) direction comes primarily at the beginning and end of each sprint
  - During the sprint, the team works collectively to plan and organize their work
  - Team improves by holding regular retrospectives
  - Scrum Master is responsible for the Scrum process (implementation and maximization of its benefits).

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Benefits of Scrum

- Frequent delivery of working software
- Released products more accurately meet customer and market needs
- Increased productivity
  - Typically 2-3x, greater in some cases
  - Development teams produce better quality software, more frequently, working less hours
- Team members report increased sense of empowerment and job satisfaction
- Greater clarity, better visibility, clear accountability

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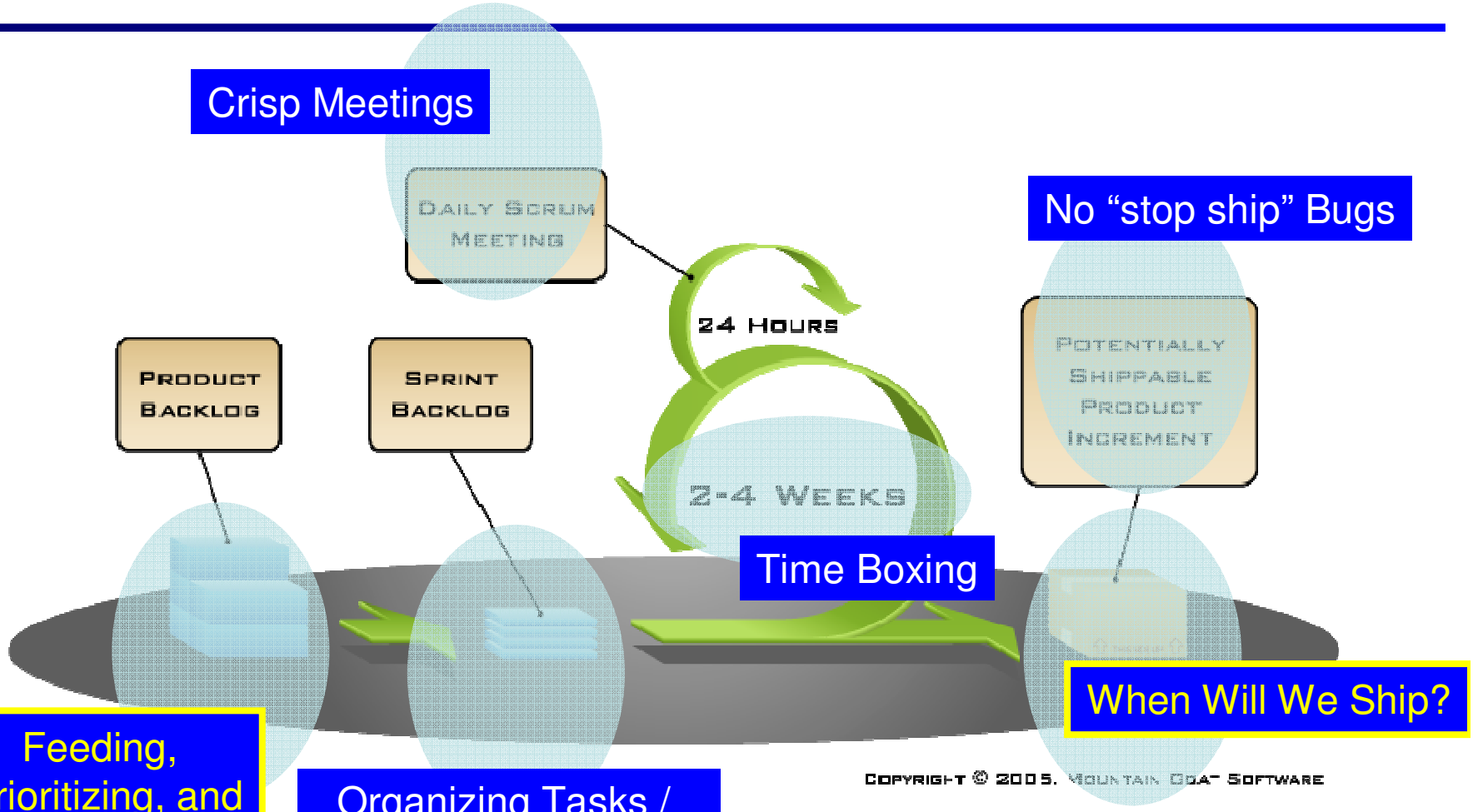
Organizational Impact of Scrum

- Problems become visible – very quickly
  (Ultimately a good thing, but disorienting at first)
- Organizational hierarchies tend to get leveled; traditional boundaries erode
- Traditional management roles change to emphasize mentoring/support/service
- All personnel have to rethink the way they work. This is challenging.

Common Challenges With Scrum



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How to Get Started (in 8 days or less)

- Select a pilot project
- Select a coach
- Engagement Planning (2-3 days)
  - Project Goals and Success Criteria
  - Team and Stakeholder Identification
  - Engagement Overview and High Level Plan
  - Scheduling and Logistics Coordination
  - Team Communication Plan
- Training (2 days)
- Project Chartering (2 days)
  - Vision and Scope and Boundary Definition
  - Roadmapping
  - Story Definition and Backlog Management
- Release Planning (2 days)
  - Release Schedule and Milestone Planning
  - Risk Identification
  - Story Estimation and Iteration Planning
- Begin Sprints
  - Sprint Planning
  - Customer Collaboration
  - Daily Scrums, Task Tracking and Burn Down Charting
  - Sprint Retrospectives

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Selecting a Pilot Project

- A willing and able team of 7 +/- 2 people.
  - The team should be whole and complete (developers, QA, documentation, business analysts, etc.)
  - A Product Owner and Scrum Master should be identifiable and committed to the project.
  - Preferably the team should be 100% dedicated to the project. If that is not possible, team members should be limited to involvement in no more than one other project.
- The team must have the active, engaged support of an executive sponsor.
  - The sponsor should embrace Agile and must grant the team the authority to manage itself to its commitment and give the Scrum Master the authority to remove obstacles.
  - The executive sponsor must agree to validate the outcome of the pilot and, if a stakeholder in the project, agree to participate in Sprint reviews.
- A customer, or suitable customer proxy, must be available for collaboration.

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Selecting a Pilot Project (cont.)

- The project should have sufficient size, scope, complexity and risk (technical and/or market).
  - The project would likely or possibly fail if done in the status quo manner.
  - It should be 'meaty' and non-trivial. A maintenance release is a bad candidate as is something a team can do 'in its sleep.' Ideally we want the Agile project to shine brightly. Therefore, the project should have some meaningful importance to the firm.
  - The project should have an element of uncertainty for exploration to occur.
  - The best duration is 3-4 months (We want to see substantial value in a reasonable amount of time).
  - Also, it's OK to start in the middle of an existing project.
- The team will need a suitable workspace for displaying information and meeting. After the initial engagement planning, chartering, roadmapping, backlog creation and prioritization, release planning and iteration planning, the workspace does not need to be completely dedicated to the team except for daily standups, iteration planning, Sprint reviews and retrospectives. For a distributed team, collaboration and communication tools will be required.
- Collocation of the team is really good to have but not a must have.

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Comparison of Agile Methods

Method	Strengths	Weaknesses
Scrum	Complements existing practices. Self organizing teams and feedback. Customer participation and steering. Priorities based on business value. Only approach here that has a certification process.	Only provides project management support, other disciplines are out of scope. Does not specify technical practices. Can take some time to get the business to provide unique priorities for each requirement.
XP	Strong technical practices. Customer ownership of feature priority, developer ownership of estimates. Frequent feedback opportunities. Widely known and adopted approach, at least in the U.S.	Requires onsite customer. Documentation primarily through verbal communication and code. For some teams these are the only artifacts created, others create minimal design and user docs. Difficult for new adopters to determine how to accommodate arch and design concerns.
Lean	Complements existing practices. Focuses on project ROI. Eliminates all project waste. Cross-functional teams.	Does not specify technical practices. Requires constant gathering of metrics which may be difficult for some environments to accommodate. Theory of Constraints can be a complex and difficult aspect to adopt.

Comparison of Agile Methods (cont.)

Method	Strengths	Weaknesses
FDD	Supports multiple teams working in parallel. All aspects of a project tracked by feature. Design by feature and build by feature aspects are easy to understand and adopt. Scales to large teams or projects well.	Promotes individual code ownership as opposed to shared/team ownership. Iterations are not as well defined by the process as other Agile methodologies. The model-centric aspects can have huge impacts when working on existing systems that have no models.
AUP/RUP	Robust methodology with many artifacts and disciplines to choose from. Scales up very well. Documentation helps communicate in distributed environments. Priorities set based on highest risk. Risk can be a business or technical risk.	Higher levels of ceremony may be a hindrance in smaller projects. Minimal attention to team dynamics. Documentation is much more formal than most approaches mentioned here.

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Comparison of Agile Methods (cont.)

Method	Strengths	Weaknesses
Crystal	Family of methodologies designed to scale by project size and criticality. Only methodology that specifically accounts for life critical projects. As project size grows, cross-functional teams are utilized to ensure consistency. The "human" component has been considered for every aspect of the project support structure. An emphasis on testing is so strong that at least one tester is expected to be on each project team.	Expects all team members to be co-located. May not work well for distributed teams. Adjustments are required from one project size/structure to another in order to follow the prescribed flavor of Crystal for that project size/criticality. Moving from one flavor of Crystal to another in mid project doesn't work, as Crystal was not designed to be upward or downward compatible.
DSDM	An emphasis on testing is so strong that at least one tester is expected to be on each project team. Designed from the ground up by business people, so business value is identified and expected to be the highest priority deliverable. Has specific approach to determining how important each requirement is to an iteration. Sets stakeholder expectations from the start of the project that not all requirements will make it into the final deliverable.	Probably the most heavyweight project compared in this survey. Expects continuous user involvement. Defines several artifacts and work products for each phase of the project; heavier documentation. Access to material is controlled by a Consortium, and fees may be charged just to access the reference material.

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On-Line Resources

Agile Alliance: http://www.agilealliance.org/

Scrum Alliance: http://www.scrumalliance.org/

Agile Journal: http://www.agilejournal.com

Borland Software: http://www.borland.com/agile-transformation-forum/

Wikipedia: http://en.wikipedia.org/wiki/Agile_software_development

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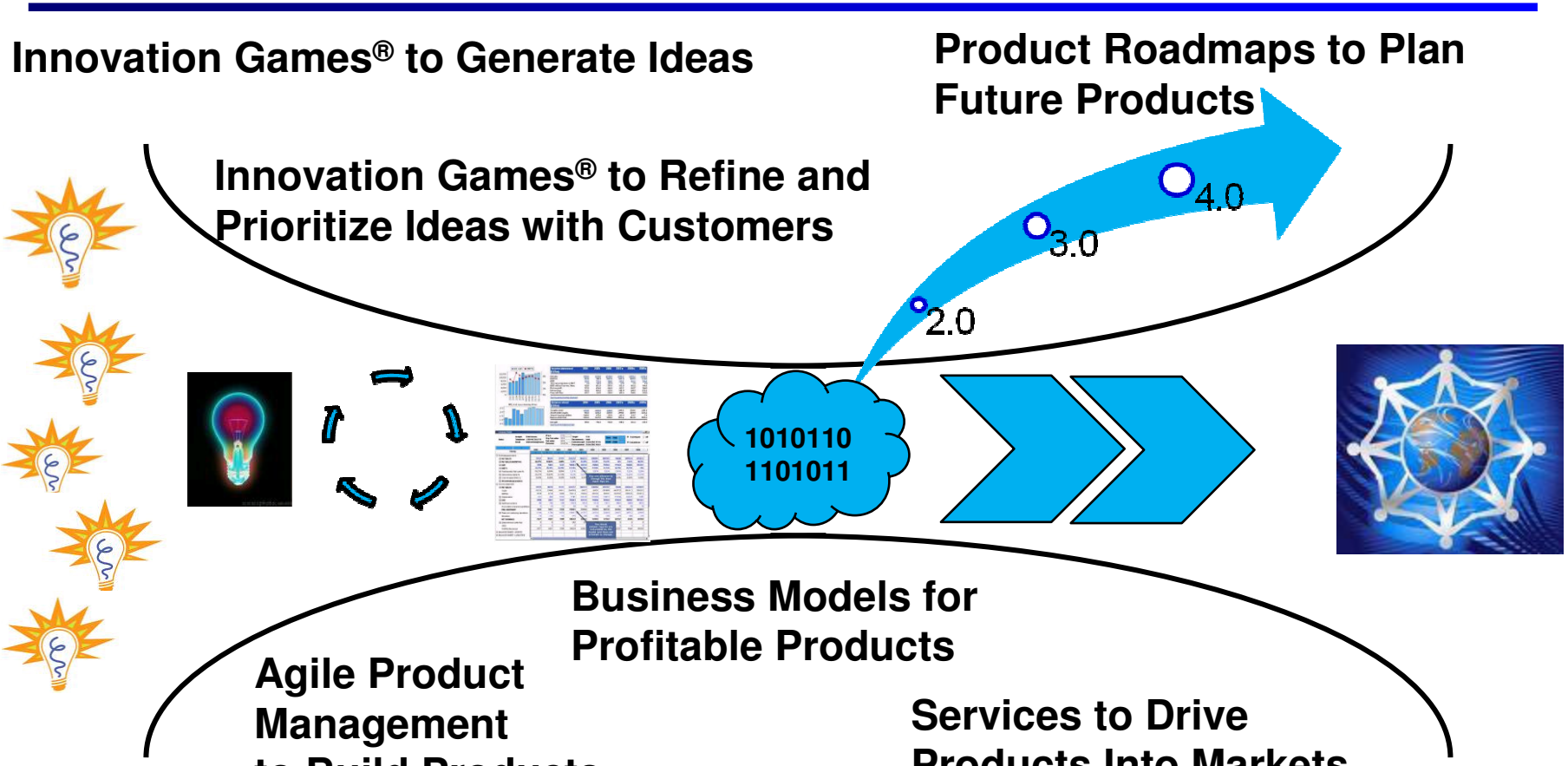

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