소프트웨어 공학 원리

(SEP521)

Agile Mehods

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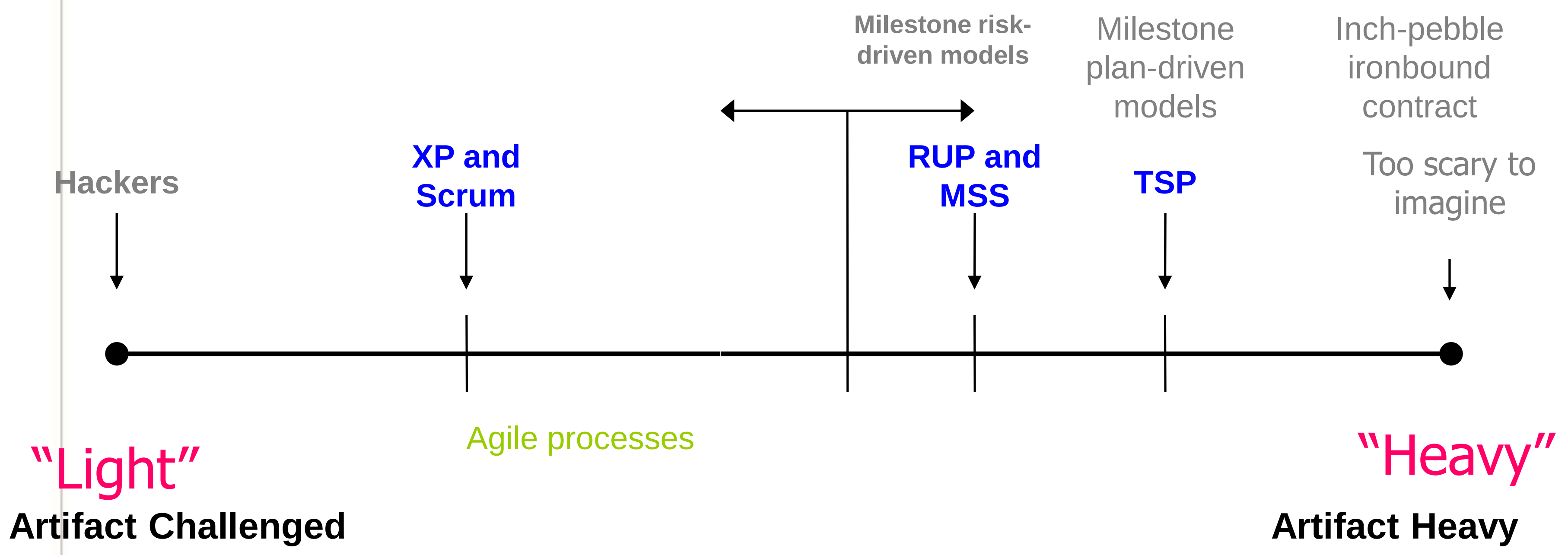
SINCE 1971

Problems in Current S/W Developments

- Systems are regularly delivered late or over budget if at all
- Customers do not trust nor work with developers because they have been burned so many times
- Software developers are getting burnt out because of long hours

Process Spectrum

Weight = amount of project overhead/code



Adapted from Justin Rockwood, "Choose your Weapon Wisely," 2003

What is Agile Methods?

- Webster Dictionary:
  - **“Marked by ready ability to move with quick easy grace”**

- As applied to Software Development:
  - **“Ability to change development in response to changing requirements” Cockburn**

- The Agile Manifesto [http://agilemanifesto.org/]
  - “A method of software development that aims for customer satisfaction through early and continuous delivery of useful software components”

Why Agile Processes ?

What agile proponents say:

- Flexibility
  - Market Changes
  - Technology Changes (Moore's Law)
  - Unclear Requirements
- More coding, less paper-work
- Higher quality, quicker

But, opponents say....

- No plan, no structure
  - Architecture?
  - Easily derailed
- Inefficient use of developers
  - pair programming
- No documentation
- Unrealistic customer involvement

Today Trend in Agile

“ More than 2/3’s of all corporate IT organizations will use some form of agile software development process in the next 18 months.”

Giga Information Group Inc., 2002

- Cutter Report “Agile vs. Heavy”
- Use is increasing

Agile vs. Non-Agile Methods

AGILE

- Extreme Programming
- Crystal
- SCRUM
- Development Method (DSDM)
- Adaptive Software Development (ASD)
- Feature-Driven Development (FDD)
- Pragmatic Programming

NON-AGILE

- Waterfall
- Spiral
- RUP
- Cleanroom
- Prototyping
- CMM/CMMi
- PSP/TSP

Agile - History

- Started at a meeting on February 11-13 2001 at the Snowbird Ski resort in the Wasatch mountains of Utah, USA

- At the end of this meeting:
  - “Agile ‘Software Development’ Manifesto”
    - Kent Beck, Alistar Cockburn, etc

Principles of the Agile Manifesto - I

- Our highest priority is to satisfy the customer through early and continuous delivery of valuable software
- Welcome changing requirements, even late in development. Agile processes harness change for customer's competitive advantage
- Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter time scale
- Business people and developers must work together daily throughout the project
- Build projects around motivated individuals. Give them the environment and support that they need, and trust them to get the job done
- The most efficient and effective method of conveying information to and within a development team is face-to-face conversation

Principles of the Agile Manifesto - II

- Working software is the primary measure of progress
- Agile processes promote sustainable development.
- The sponsors, developers, and users should be able to maintain a constant pace indefinitely
- Continuous attention to technical excellence and good design enhances agility
- Simplicity—the art of maximizing the amount of work not done—is essential
- The best architectures, requirements, and designs emerge from self-organizing teams
- At regular intervals, the team reflects on how to become more effective, then tunes and adjusts it’s behavior accordingly

Agile Value Statements - I

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
  - Team dynamics
    - experience mix, team size
  - Physical workspace, communality, meetings

- Working software over comprehensive documentation
  - Code primary artifact
  - Iterative (subscription)
  - Value to the customer
  - QA inherent

Agile Value Statements - II

- Customer collaboration over contract negotiation
  - Customer Onsite (Involved/Knowledgeable)
  - Requirements Centric
  - Rapid Return of Perceived Value
  - Customer Expectation Management

- Responding to change over following a plan Developer / Customer Team
  - Emergent Requirements
  - Short Iterations
    - Smaller changes
  - Adaptation

Source: http://agilemanifesto.org/

Weaknesses of Agile Methods

- Communication is critical
- Projects with Non- Decomposability / Coupled Functionality
- Scalability
- Reliance on Corporate Knowledge
  - Document at End
- Maintenance
- Long Life Cycle
- Centralized management control
- “Big” Specifications
- Required Documentation
  - Safety Critical
- Non-flexible work environment
- Fixed Price and Scope

Agile Center Piece - Coding

- Emphasizing what we do best
  - What we prefer to do
- Lack of formal design, architecture
- Lack of documentation
  - But makes you think about what is important

Pros vs. Cons of Agile Methods

PROS

- Help organizations deal situations with uncertain requirements, resources, time, and risks
- Build working software quickly

CONS

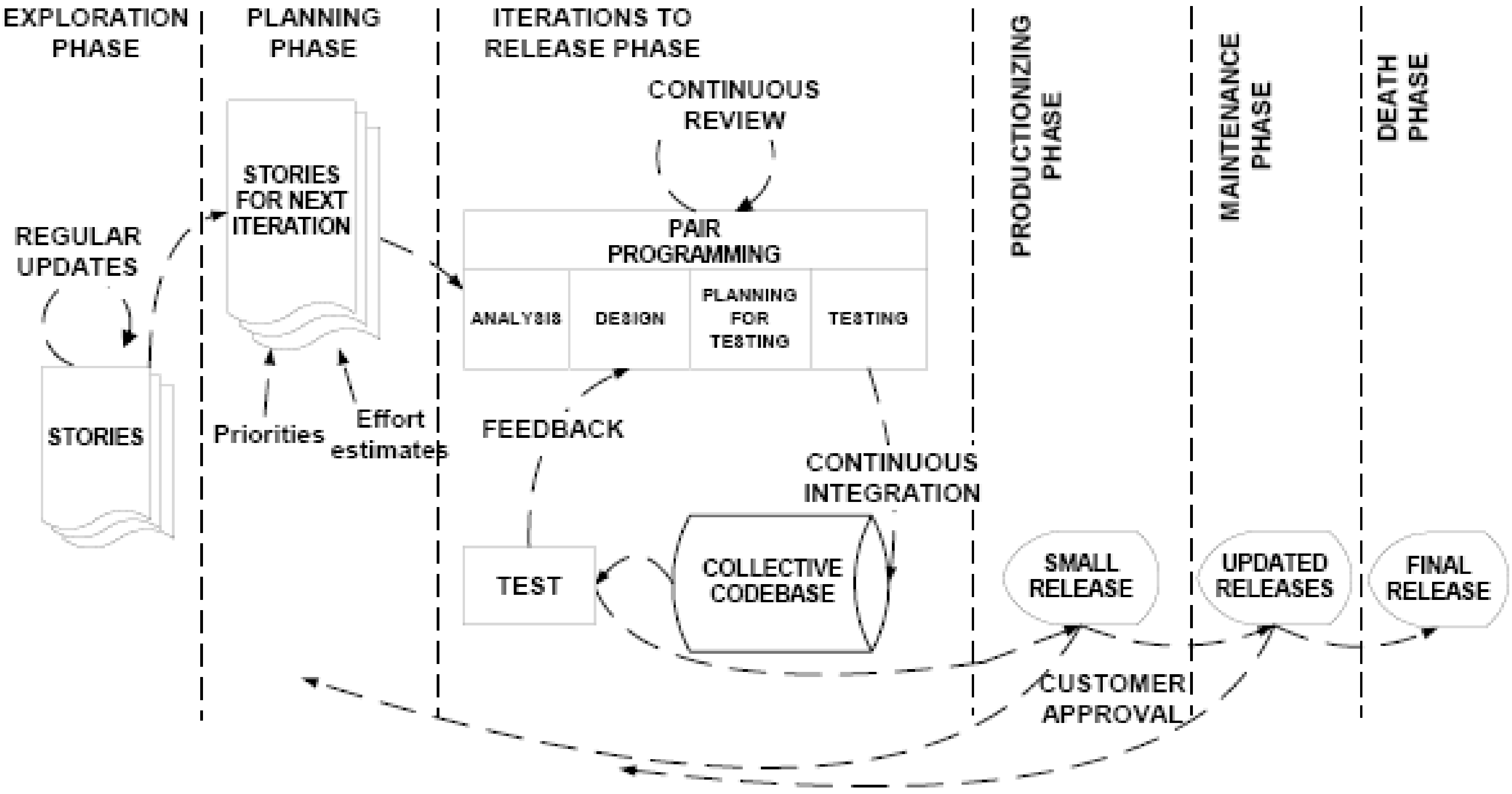
- Must consider the skills of the people involved
- Consider the process and how well they account for your unique needs
- Consider the management and reporting techniques used to control the project

Agile - Application Areas

- Applications that can be built quickly and don't require extensive quality assurance, analysis, design, code, and testing

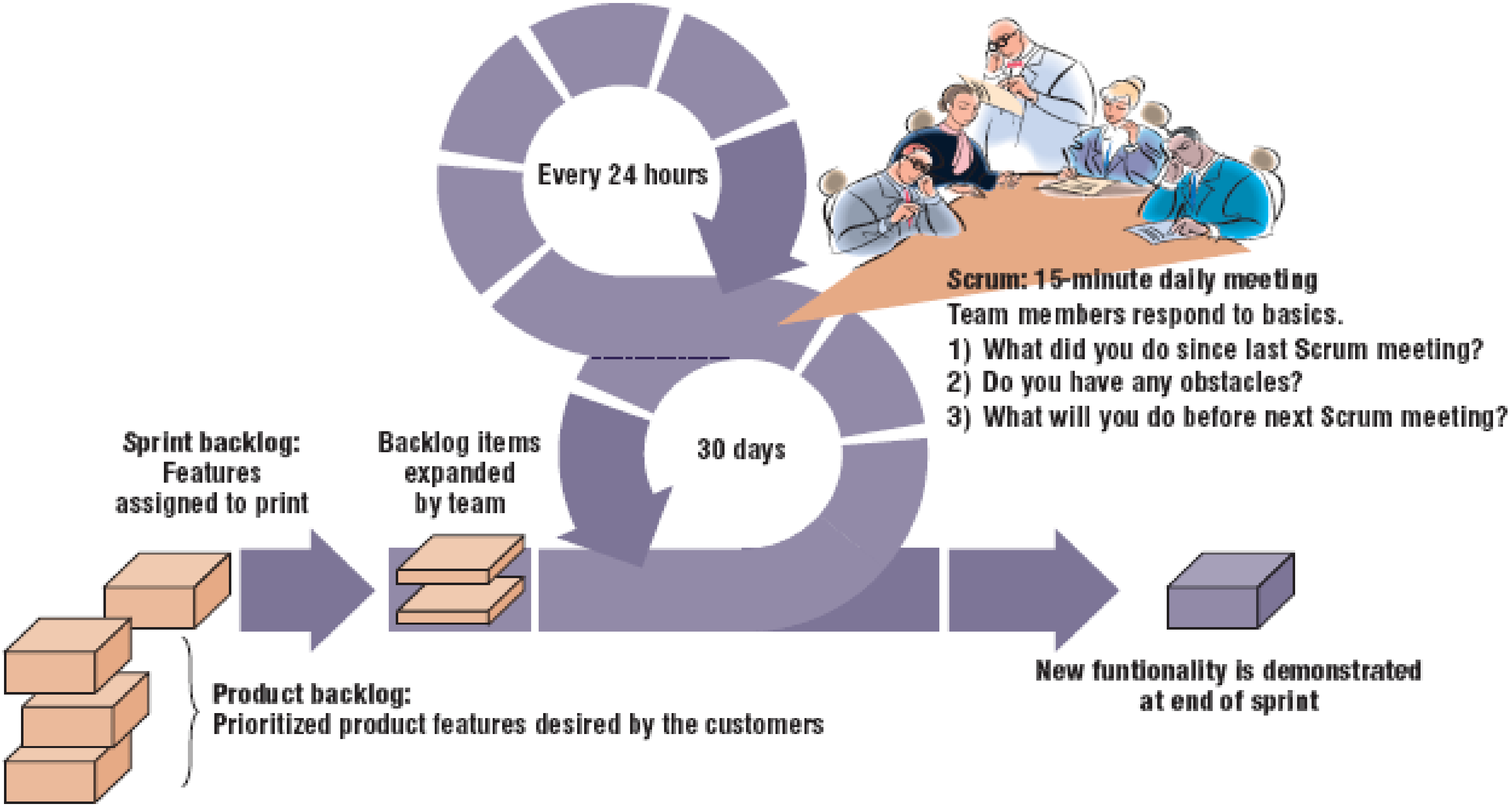
- Small in-house teams developing software for quick to market applications

eXtreme Programming



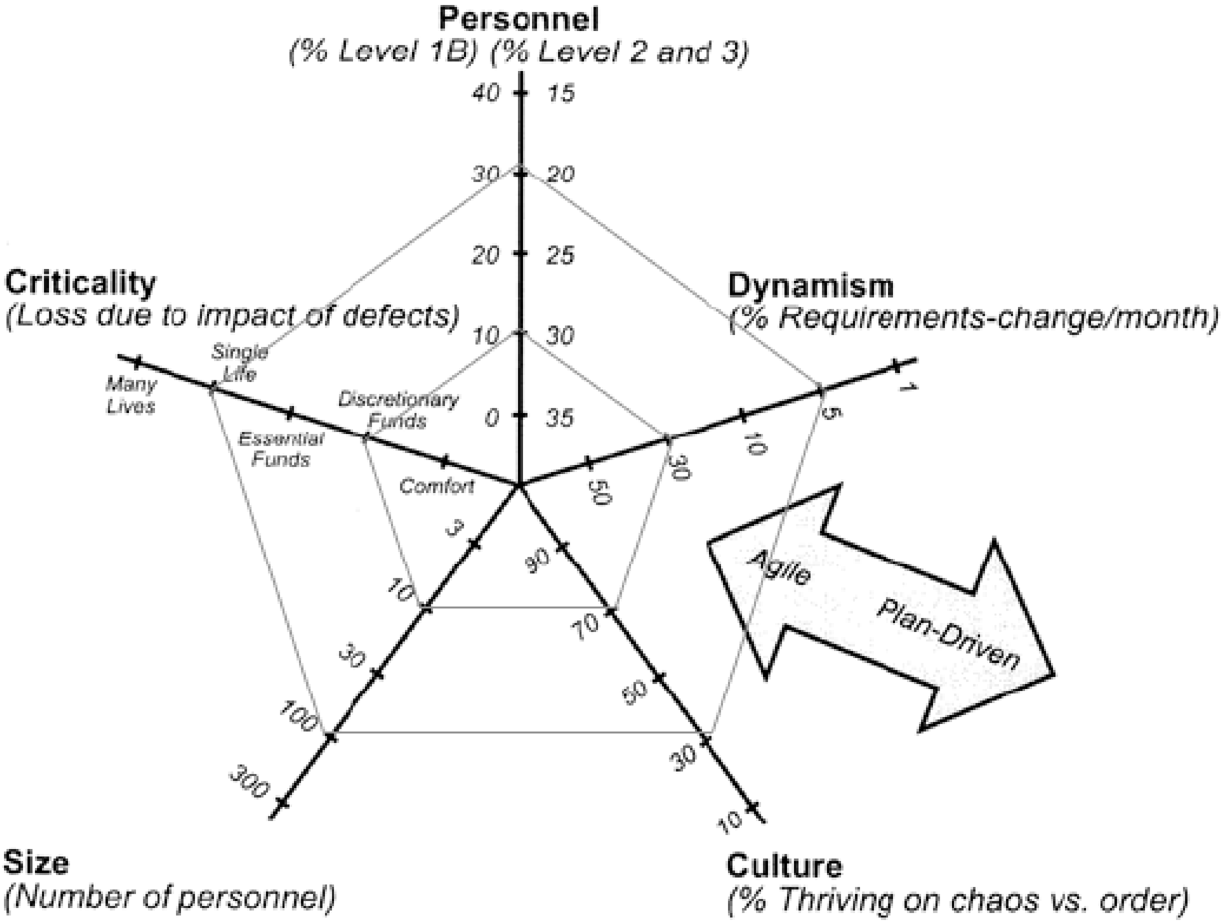
Source: Agile Software Development Methods: Review & Analysis

Scrum Process


Every 24 hours
30 days
Scrum: 15-minute daily meeting
Team members respond to basics.
1) What did you do since last Scrum meeting?
2) Do you have any obstacles?
3) What will you do before next Scrum meeting?
Sprint backlog:
Features
assigned to print
Backlog items
expanded
by team
Product backlog:
Prioritized product features desired by the customers
New funtionality is demonstrated
at end of sprint

Source: IEEE Software, Volume 22, Issue 5, Sept.-Oct. 2005

How to Balance???



Boehm and Turner: "Balancing Agility with Discipline," 2004

Q & A