



Scrum

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Scrum – A Snapshot.

- A process for incrementally building software in complex environments.
 - Basic premise: if you are committed to the team and the project, and if your boss really trusts you, then you can spend your time being productive instead of justifying your work.
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Scrum

■ Overview

- Invented by Jeff Sutherland, Ken Schwaber and Mike Beedle.
 - Term “scrum” originally derived from strategy in game of rugby; “getting an out-of-play ball back into the game” with teamwork (Schwaber and Beedle 2002)
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Scrum

- Asset
 - Known for management & control process; identifying shortcomings and/or obstacles
 - Phases
 - Pre-game
 - Development
 - Post-game
-



Scrum

- Pre-game phase
 - Planning. Create Product Backlog. A prioritized list of current requirements, each with an estimated implementation effort
 - Architecture. Use Backlog to create high level design of system, including architecture
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Scrum

- Development/Game phase
 - This phase designed to handle the changeable aspects of the project
 - Project divided into iterative cycles or “sprints” length of one week to one month; multiple sprints and possibly, multiple teams
 - Backlog, architecture and design evolves at each iteration
 - Daily “scrum” meeting to discuss what is complete, next day tasks, and barriers
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Scrum

- Post-game phase
 - Release Closure. Commences once agreed that all requirements have been met; no more issues can be found, no new ones can be invented. System is complete.
 - Preparation. Complete all necessary testing and documentation
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Scrum

- Team Size
 - Geared for smaller teams of no more than 10
 - If more people are available or required, additional teams should be formed
 - Collaboration with XP
 - Unsupported claims that the project management framework of SCRUM will increase XP's ability to handle larger projects; XP has already adopted some of its practices
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Scrum

- Collaboration with XP
 - Schwaber's firm calls the new hybrid approach **XP@Scrum** (Computerworld)
 - Another firm promoting the combined use of Scrum and XP is Brighton (Computerworld)
 - Mike Beedle is documenting a Scrum/XP approach that he calls Xbreed (Computerworld)
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Scrum

- Key points
 - ‘Independent, small, self-organizing development teams’
 - Special features
 - ‘Enforce a paradigm shift from the “defined and repeatable” to the “new product development view of SCRUM”’
(Abrahamsson, P., et. al., p. 90)
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Scrum

- Identified shortcomings
 - “While SCRUM details in specific how to manage 30-day release cycle, the integration and acceptance tests are not detailed.”
(Abrahamsson, P., et. al., p. 90)
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Scrum

- Benefits of Collaborating SCRUM & XP
 - Scrum provides the agile management mechanisms; Extreme Programming provides the integrated engineering practices (**XP@Scrum**)
 - “Together they provide engineering solidity to Scrum and business orientation and scalability to Extreme Programming.”
(Schwaber)
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Current Development Situation

As the complexity of the project increases, the greater the need for controls, the ongoing assessment and response to risk.

Attempts to model this development process have encountered the following problems:

- Many of the development processes are uncontrolled.
 - The inputs and outputs are either unknown or loosely defined.
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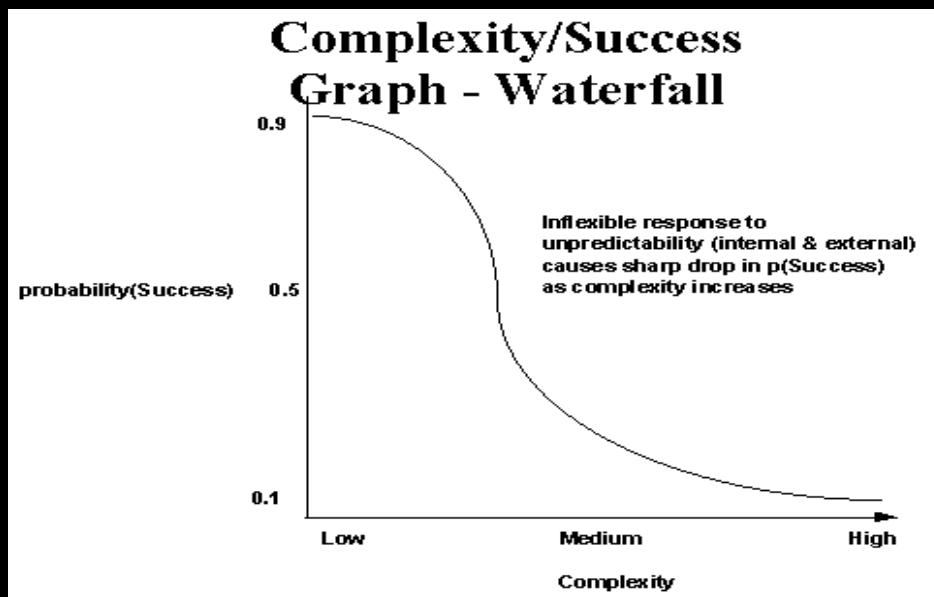


Current Development Situation

- The transformation process lacks necessary precision
 - Quality control is not defined.
 - An unknown number of development processes that bridge known but uncontrolled processes are unidentified.
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Complexity/Success Graph



- The following graph demonstrates the current development environment, using any of the Waterfall, Spiral or Iterative processes.



Rigorous Process

- Rigorous processes...
 - Disciplined processes
 - Bureaucratic processes
 - Heavyweight processes
 - Heavy processes
 - Industrial-strength processes
 - Plan-driven processes
-



Agile Process

- Agile processes...
 - Lightweight processes
 - Light processes
 - Lean processes
 - Internet-speed processes
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The Agile Alliance

Agile Manifesto:

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
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The Agile Alliance

- Working software over comprehensive documentation
 - Customer collaboration over contract negotiation
 - Responding to change over following a plan
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Scrum - Concepts

- Premise: no organization can definitively predict and plan what software it will deliver, when, or what the quality and cost will be
 - Backlog: all outstanding work for a product area.
 - Sprints: 30-day increments of work that produce a deliverable.
 - Scrums: daily status check meetings.
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Scrum - Meetings

Three questions

- What did you do since the last Scrum?
 - What got in your way?
 - What are you going to do before the next Scrum?
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Scrum - Meetings

Scrum meeting protocol

- Daily, same place and time
 - Only three questions
 - All committed must respond
 - All involved can attend, but must be silent
 - No new backlog can be introduced externally
 - Backlog can be added internally
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Scrum - Sprint Rules

- Use small interdisciplinary teams.
 - Build clean interface software.
 - Intelligent management required.
 - Solid systems architecture and framework.
 - Prototype all new tools and technology.
 - Develop infrastructure first.
 - Each Sprint results in an executable.
 - Develop, document, and test in parallel.
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Why Scrum is Powerful

- Focus is on team's work and team's work only.
 - Daily communication of status occurs.
 - Enables low-overhead empirical management.
 - Makes impediments visible.
 - Someone is willing to make decisions and remove impediments real-time.
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Scrum Philosophy

- The system development process is complicated and complex.
 - Therefore maximum flexibility and appropriate control is required.
 - Evolution favors those that operate with maximum exposure to environmental change and have maximized flexibility.
 - An approach is needed that enables development teams to operate adaptively within a complex environment using imprecise processes.
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Scrum Philosophy

- Complex system development occurs under chaotic circumstances.
 - The closer the development team operates to the edge of chaos, the more competitive and useful the resulting system will be.
 - Methodologies that encourage and support flexibility have a high degree of tolerance for changes in other variables.
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SCRUM – An Introduction

- Scrum is an agile process to manage and control development work.
 - Scrum is a team-based approach to iteratively, incrementally develop systems and products when requirements are rapidly changing
 - Scrum is a process that controls the chaos of conflicting interests and needs.
 - Scrum is a way to improve communications and maximize co-operation.
 - Scrum is a way to maximize productivity.
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SCRUM – An Introduction

- Scrum is a way to detect and cause the removal of anything that gets in the way of developing and delivering products.
 - Scrum is scalable from single projects to entire organizations.
 - Scrum has controlled and organized development and implementation for multiple interrelated products and projects with over a thousand developers and implementers.
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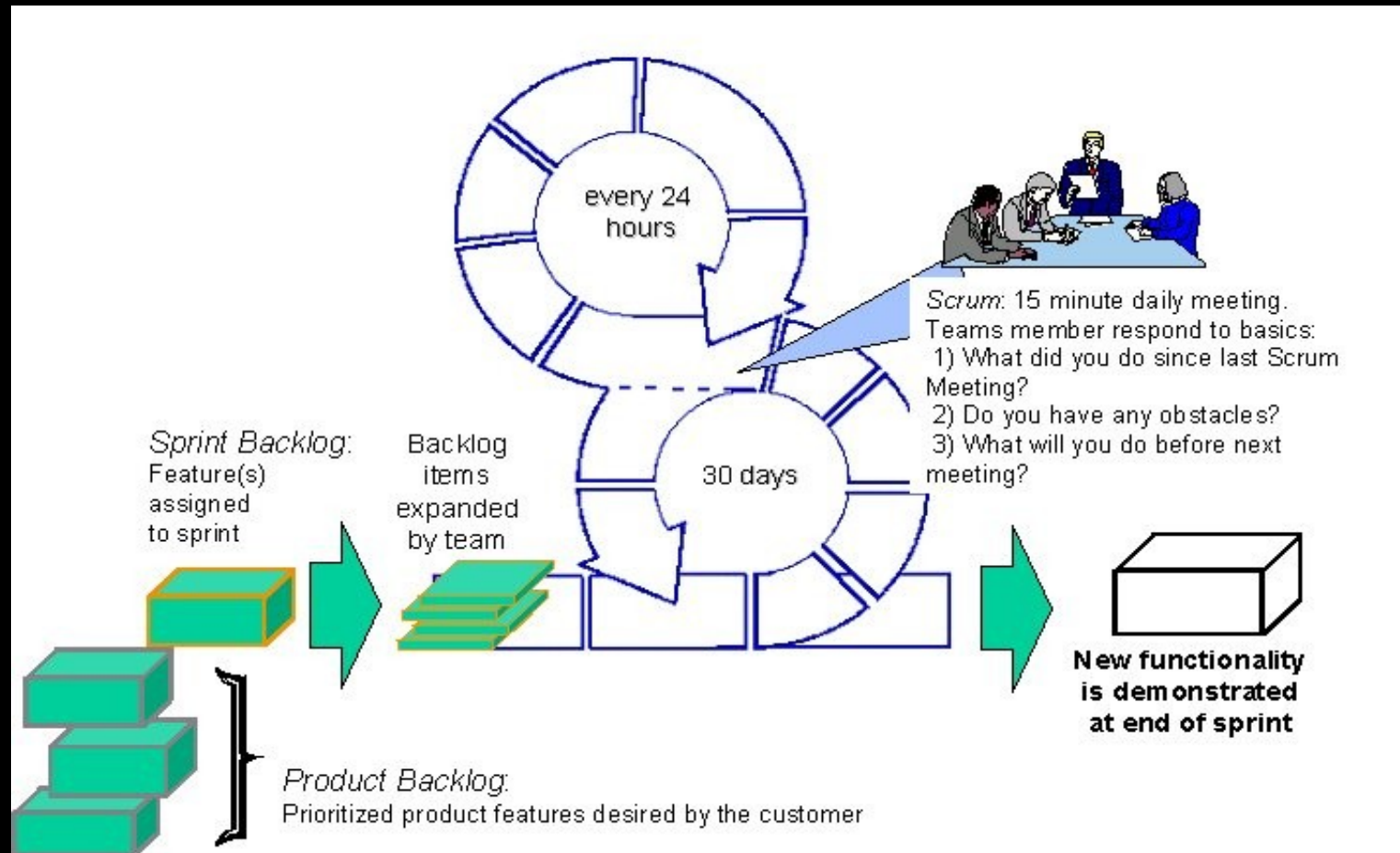


SCRUM – An Introduction

- Scrum is a set of
 - Interrelated practices and rules that optimize the development environment.
 - Reduce organizational overhead.
 - Closely synchronize market requirements with iterative prototypes.
 - Scrum causes the best possible software to be constructed given the available resources, acceptable quality, and required release dates.
-



SCRUM – An Introduction





Scrum - Vocabulary

Scrum provides a language for this common sense way of organizing, performing and managing work:

- Backlog : All work to be performed in the foreseeable future, both well defined and requiring further definition.
 - Sprint : A period of 30 days or less where a set of work will be performed to create a deliverable.
 - Scrum : A daily meeting at which progress and impediments to progress are reviewed.
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Scrum - Vocabulary

- Sprint Backlog : That work that is well-enough defined that it can be worked on with relatively little change over a period of 30 days or less and will result in a tangible, incremental deliverable.
 - Scrum Meeting Rules : Protocol for effective Scrum daily meetings.
 - Scrum Team : The cross-functional team working on the sprint's backlog.
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Scrum Methodology

Scrum Methodology

■ Pregame

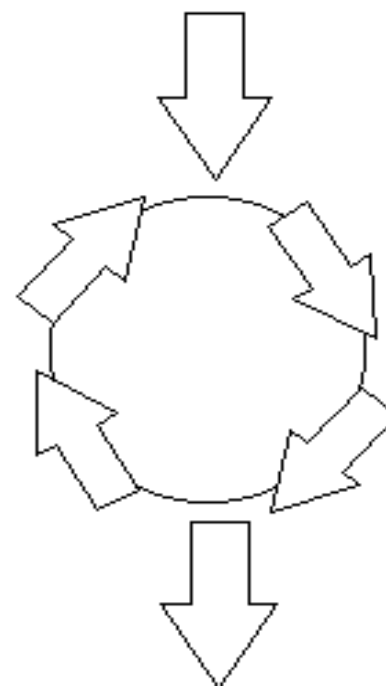
- ♦ Planning
- ♦ System Architecture/High Level Design

■ Game

- ♦ Sprints (Concurrent Engineering)
- ♦ Develop (Analysis, Design, Develop)
- ♦ Wrap
- ♦ Review
- ♦ Adjust

■ Postgame

- ♦ Closure





Scrum Phases - Pregame

Each of the pregame phases has the following steps:

Planning

- Development of a comprehensive backlog list.
 - Definition of the delivery date and functionality of one or more releases.
 - Selection of the release most appropriate for immediate development.
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Scrum Phases - Pregame

Planning

- Mapping of product packets (objects) for backlog items in the selected release.
 - Definition of project team(s) for the building of the new release.
 - Assessment of risk and appropriate risk controls.
 - Review and possible adjustment of backlog items and packets.
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Scrum Phases - Pregame

Planning

- Validation or reselection of development tools and infrastructure.
 - Estimation of release cost, including development, collateral material, marketing, training, and rollout.
 - Verification of management approval and funding.
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Scrum Phases – Pregame.

Architecture/High Level Design

- Review assigned backlog items.
 - Identify changes necessary to implement backlog items.
 - Perform domain analysis to the extent required to build, enhance, or update the domain models to reflect the new system context and requirements.
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Scrum Phases – Pregame.

Architecture/High Level Design

- Refine the system architecture to support the new context and requirements.
 - Identify any problems or issues in developing or implementing the changes
 - Design review meeting, each team presenting approach and changes to implement each backlog item. Reassign changes as required.
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Scrum Phases - Game

Development (Sprint)

- The Development phase is an iterative cycle of development work.
 - The management determines that time, competition, quality, or functionality are met, iterations are completed and the closure phase occurs.
 - This approach is also known as Concurrent Engineering.
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Scrum Phases - Game

Development (Sprint)

- Development consists of the following macro processes :
 - Meeting with teams to review release plans.
 - Distribution, review and adjustment of the standards with which the product will conform.
 - Iterative Sprints, until the product is deemed ready for distribution.
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Scrum Phases - Game

- Each Sprint consists of one or more teams performing the following:
 - Develop: Defining changes needed for
 - The implementation of backlog requirements into packets & opening the packets.
 - Performing domain analysis, designing, and developing.
 - Implementing, testing, and documenting the changes.
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Scrum Phases - Game

- Development consists of the micro process of discovery, invention, and implementation.
 - Wrap: Closing the packets, creating a executable version of changes and how they implement backlog requirements.
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Scrum Phases - Game

- Review: All teams meeting to present work and review progress
 - Raising and resolving issues and problems,
 - Adding new backlog items.
 - Risk is reviewed and appropriate responses defined.
 - Adjust: Consolidating the information gathered from the review meeting into affected packets, including different look and feel and new properties.
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Scrum Phases - Game

Each Sprint is followed by a **Review**, whose characteristics are :

- The whole team and product management are present and participate.
 - The review can include customers, sales, marketing and others.
 - Review covers functional, executable systems that encompass the objects assigned to that team and include the changes made to implement the backlog items.
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Scrum Phases - Game

Review

- The way backlog items are implemented by changes may be changed based on the review.
 - New backlog items may be introduced and assigned to teams as part of the review, changing the content and direction of deliverables.
 - The time of the next review is determined based on progress and complexity. The Sprints usually have a duration of 1 to 4 weeks.
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Scrum Phases - Postgame

Closure

When the management team feels that the variables

- Time,
- Competition,
- Requirements,
- Cost,
- Quality

concur for a new release to occur, they declare the release "closed" and enter this phase.



Scrum Phases - Postgame

Closure

- This phase prepares the developed product for general release.
 - Closure tasks include
 - Integration and system test
 - User documentation
 - Training material preparation and marketing material preparation.
-



Scrum - Rules

Backlog

- Only one person maintains and prioritizes the backlog list.
 - Any interested party can request that backlog be put on the list.
 - Between sprints, all involved parties and the engineering team meet to determine which work can be completed in the next sprint, and what the executable will be.
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Scrum - Rules

Sprint

- An executable demonstrating the goal will be completed by the team during the sprint.
 - The sprint team has final say in estimating and determining what they can accomplish during the forces determine that the sprint is sprint.
 - If external working on the wrong thing, a sprint can be halted and restarted with new backlog and purpose.
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Scrum - Rules

Sprint

- Once the sprint is underway, new backlog cannot be added to the sprint
 - Exception: *The scrum master determines that a new backlog item can only be added if it*
 - *will enhance the viability of the product*
 - *is in alignment with the sprint*
 - *builds on the sprint's executable*
 - *can be completed within the sprint's time frame*
-



Scrum - Characteristics

- The first and last phases (Planning and Closure) consist of defined processes, where all processes, inputs and outputs are well defined.
 - The knowledge of how to do these processes is explicit.
 - The flow is linear, with some iterations in the planning phase.
 - The Sprint phase is an empirical process.
 - Many of the processes in the sprint phase are unidentified or uncontrolled.
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Scrum - Characteristics

- Accordingly, controls, including risk management, are put on each iteration of the Sprint phase to avoid chaos while maximizing flexibility.
 - The project is open to the environment until the Closure phase.
 - The deliverable can be changed at any time during the Planning and Sprint phases of the project.
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Scrum - Characteristics

- The project remains open to environmental complexity, including competitive, time, quality, and financial pressures, throughout these phases.
 - The deliverable is determined during the project based on the environment.
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Methodology Comparison

Process Comparison

	Waterfall	Spiral	Iterative	SCRUM
Defined processes	Required	Required	Required	Planning & Closure only
Final product	Determined during planning	Determined during planning	Set during project	Set during project
Project cost	Determined during planning	Partially variable	Set during project	Set during project
Completion date	Determined during planning	Partially variable	Set during project	Set during project
Responsiveness to environment	Planning only	Planning primarily	At end of each iteration	Throughout
Team flexibility, creativity	Limited - cookbook approach	Limited - cookbook approach	Limited - cookbook approach	Unlimited during iterations
Knowledge transfer	Training prior to project	Training prior to project	Training prior to project	Teamwork during project
Probability of success	Low	Medium Low	Medium	High



Scrum - Controls

Controls in the SCRUM methodology are

- Backlog: Product functionality requirements that are not adequately addressed by the current product release.
 - Backlog items include
 - Bugs and defects
 - Customer requested enhancements and technology upgrades
 - Competitive edge functionality, and competitive product functionality,
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Scrum - Controls

Controls

- Release/Enhancement: backlog items that at a point in time represent a viable release based on the variables of requirements, time, quality, and competition.
 - Packets: Product components or objects that must be changed to implement a backlog item into a new release.
 - Changes: Changes that must occur to a packet to implement a backlog item.
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Scrum - Controls

Controls

- Problems: Technical problems that occur and must be solved to implement a change.
 - Risks: risks that effect the success of the project are continuously assessed and responses planned.
 - Solutions: solutions to the problems and risks.
 - Issues: Overall project and project issues that are not defined in terms of packets, changes and problems.
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Scrum - Deliverables

- The delivered product is flexible.
 - Its content is determined by environment variables, including time, competition, cost, or functionality.
 - The deliverable determinants are market intelligence, customer contact, and the skill of developers.
 - Frequent adjustments to deliverable content occur during the project in response to environment.
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Scrum - Implementation

Start the Scrum Process

- Define the team consisting of pigs (people who are assigned work) and chickens (people who are interested, but are not working).
 - Identify pigs that will compose the Scrum team.
 - No more than 6-9 members per team
 - If more members than manageable, break into multiple Scrums
 - Each Scrum focuses on one, self-contained work area
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Scrum - Implementation

Appoint Scrum Master

The Scrum Master is the person who conducts the Scrum meetings, empirically measures progress, makes decisions, and gets impediments out of the way of slowing or stopping work.

- Must be able to make immediate decisions
 - Better to ask forgiveness than ask permission
 - Must resolve work impediments ASAP
 - Identifies initial backlog
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Scrum - Implementation

Identify Backlog

Backlog is all of the work that is outstanding for a product area, both immediate and well-defined, and long terms and visionary.

- List the known work to be done
 - List all outstanding work to be done
 - In areas where work is volatile or cannot be fully defined for up to 30 days, establish an increment for known horizon
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Scrum - Implementation

Identify Backlog

- Only one person in charge of backlog prioritization.
 - Team chooses backlog for Sprint.
 - Backlog is signed up for by team members.
 - Only this backlog is worked on during this Sprint.
-



Scrum - Implementation

Establish & Conduct Daily Scrum Meeting

The daily Scrum meeting is a status check and provides a daily focus on the work being done.

Daily Scrum Meeting :

- Same time and place
 - Avoids overhead of finding a place daily
 - Avoids overhead of team trying to figure out where and when is today's meeting
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Scrum - Implementation

Establish & Conduct Daily Scrum Meeting

- No more than 30 minutes
 - Scrum master asks pigs the 3 questions
 - All discussion other than replies to 3 questions deferred to later meetings
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Scrum – Project Team

The **team** that works on the new release includes

- Full time developers
 - External parties
 - Marketing
 - Sales
 - Customers.
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Scrum – Project Team

Management: Led by the Product Manager,

- It defines initial content and timing of the release
- Manages their evolution as the project progresses and variables change.
- Management deals with backlog, risk, and release content.

Development teams:

- Development teams are small, with each containing developers, documenters and quality control staff.
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Scrum – Project Team

Development teams:

- One or more teams of between three and six people each are used.
 - Each is assigned a set of packets including all backlog items related to each packet.
 - Teams can be either functionally derived or system derived.
 - The members of each team are selected based on their knowledge and expertise regarding sets of packets, or domain expertise.
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Scrum – Advantages

- Additional development methodologies are designed only to respond to the unpredictability of the external and development environments at the start of an enhancement cycle.
 - Such newer approaches as the Boehm spiral methodology and its variants are still limited in their ability to respond to changing requirements once the project has started.
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Scrum – Advantages

- The SCRUM methodology, on the other hand, is designed to be quite flexible throughout.
 - It provides control mechanisms for planning a product release
 - Manages variables as the project progresses.
 - Enables organizations to change the project and deliverables at any point in time, delivering the most appropriate release.
 - Frees developers to devise the most ingenious solutions
-



Scrum – Advantages

- Scrum Methodology
 - Small, collaborative teams of developers are able to share tacit knowledge about development processes.
 - An excellent training environment for all parties is provided.
 - Objects, or product features, offer a discrete and manageable environment.
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xP@Scrum

- Scrum has been employed successfully as a management wrapper for Extreme Programming engineering practices.
 - Scrum provides the agile management mechanisms.
 - Extreme Programming provides the integrated engineering practices.
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xP@Scrum

Benefits of xP@Scrum include:

- The agile management and control mechanisms of Scrum are applicable for any type of project, including business initiatives that consist of multiple, simultaneous software development, business development, re-engineering, marketing, support, and implementation projects.
 - xP@Scrum projects realize the full benefits of self organization; teams are iteration goal directed.
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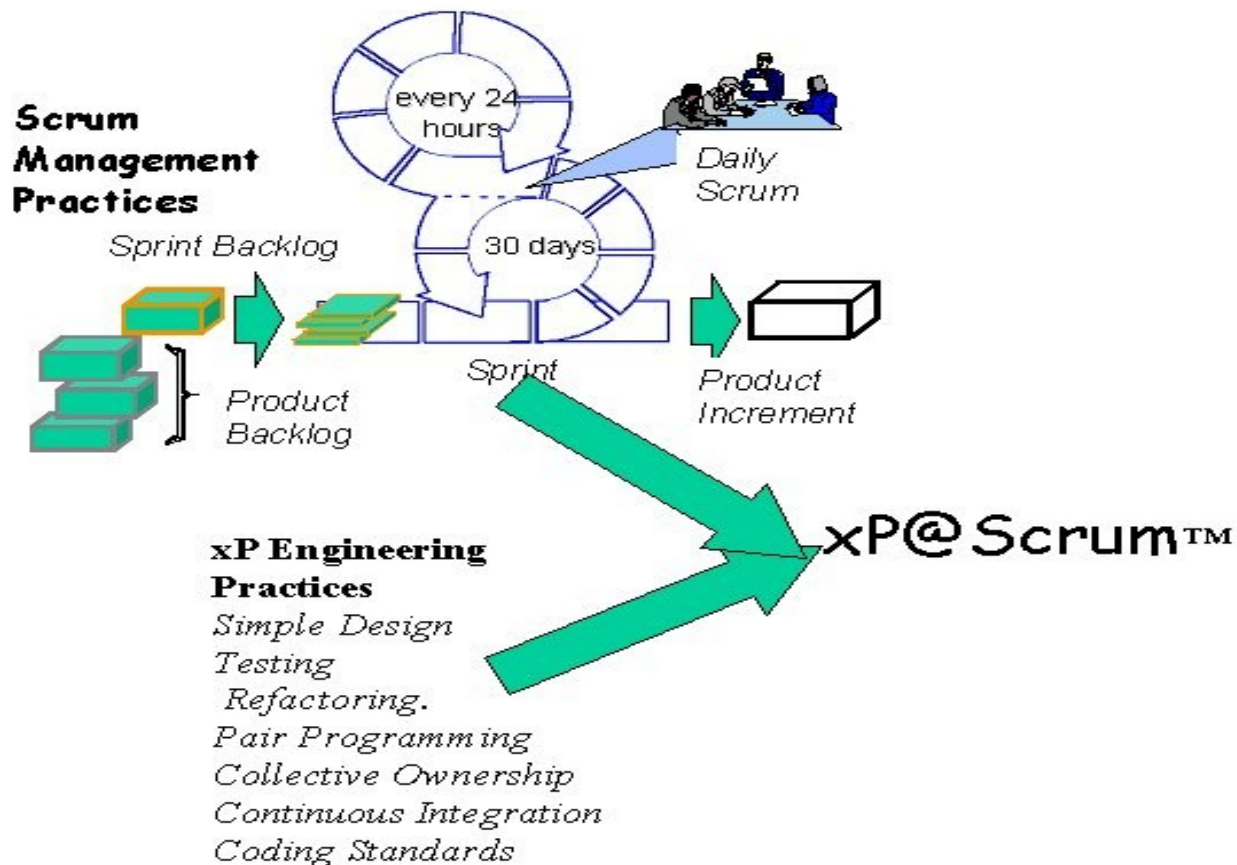


xP@Scrum

- When Extreme Programming projects are wrapped by Scrum, they becomes scalable and can be run simultaneously by non collocated teams.
 - xP@Scrum projects benefit from ADM's business value metrics process for measuring and managing initiative ROI.
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xP@Scrum





XBreed

- XBreed is the product of mixing SCRUM, XP and Alexandrian ideas (<http://c2.com/cgi/wiki?AlexandrianForm>).
 - XBreed is the result of developing multiple applications and shared components as fast as humanly possible.
 - In addition, Scrum practiced at the application team level, and provided a Shared Resources Team is involved, can lead to reusability.
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