Developing Software in a Research Environment

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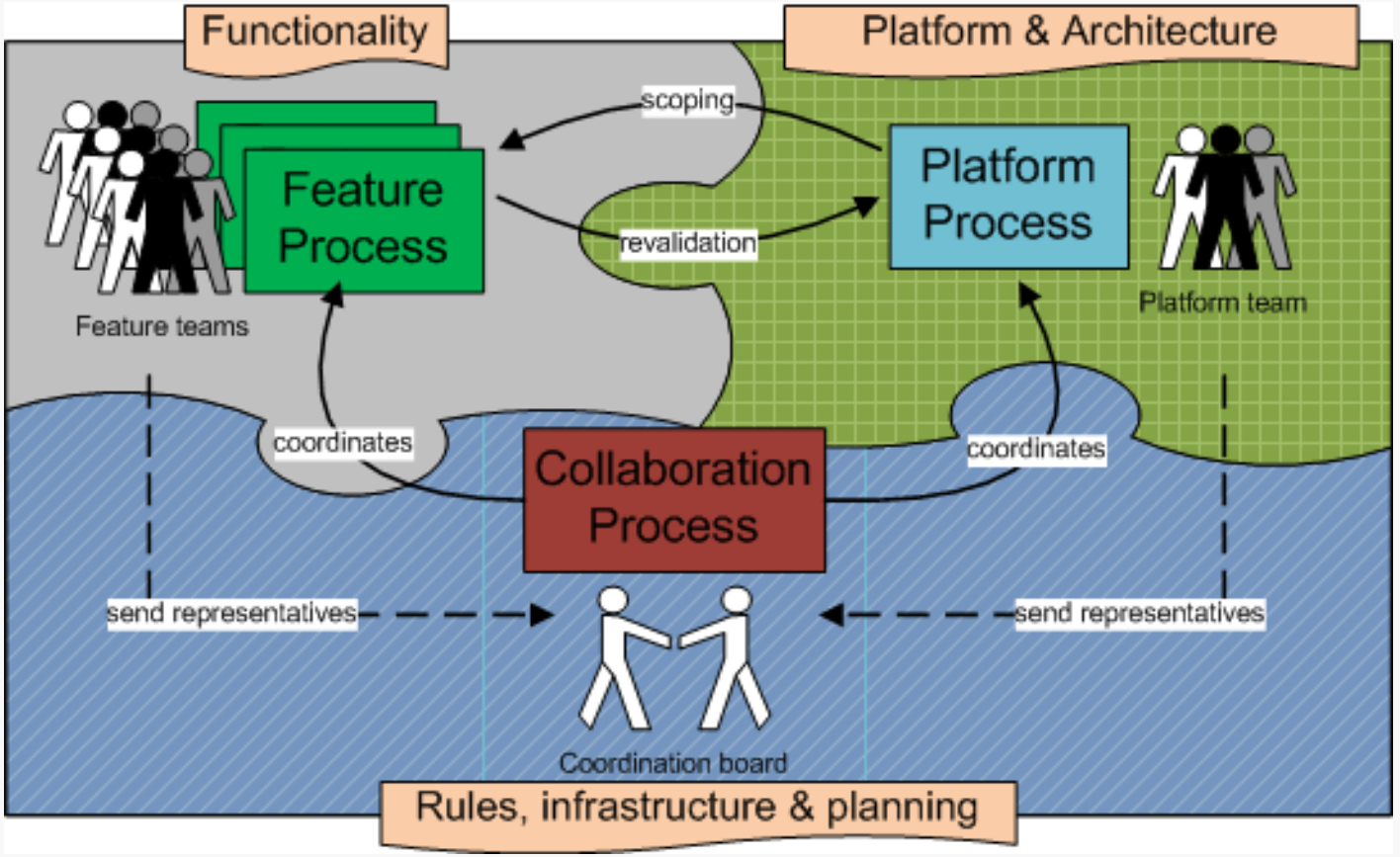
SWC SOFTWARE CONSTRUCTION

Scientific Software Projects

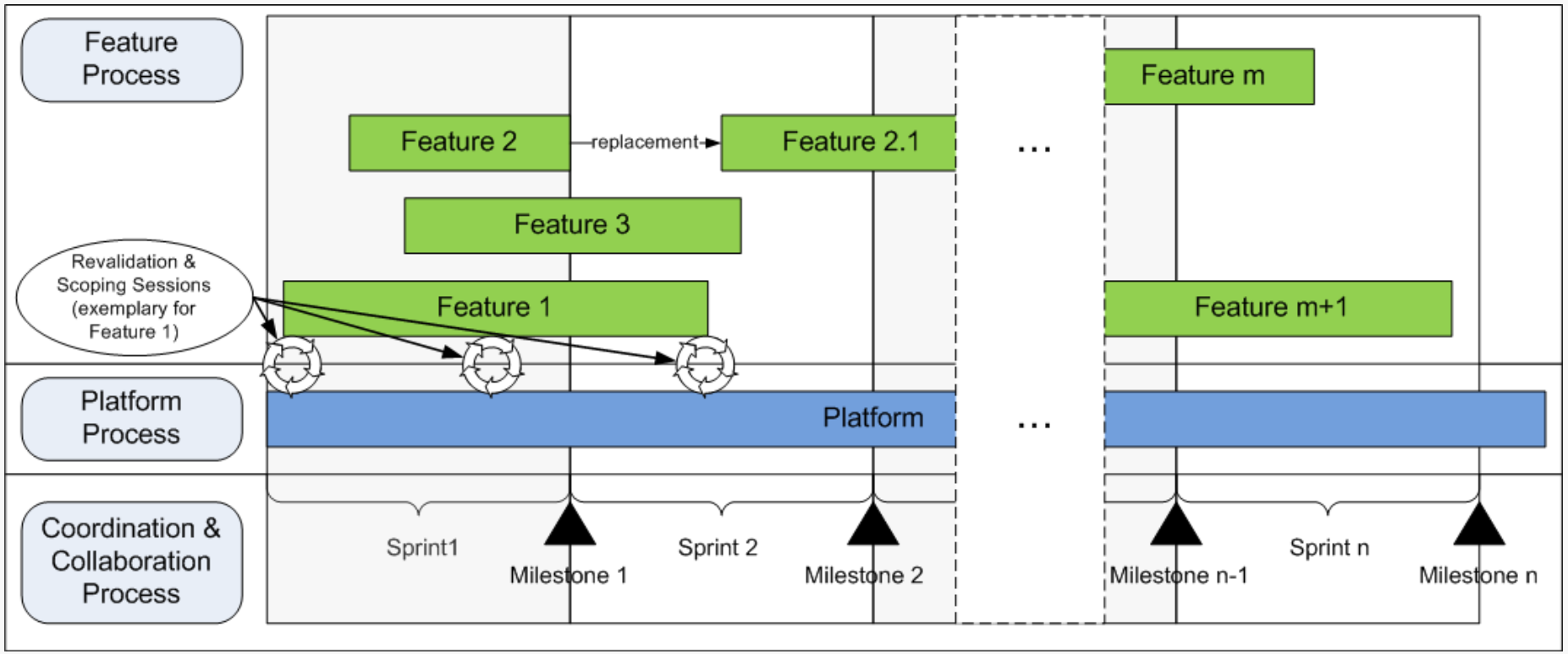
- Scientific software projects
  - vary in size, domain, applied technology etc.
- Scientific software projects are embedded in one or more research projects
  - research direction may change
  - dead-ends may occur
  - changes in requirements and architecture are typical
- Scientific software projects are performed with student involvement
  - not experienced with processes, technologies etc.
  - member of the team for a short period
  - hand-over of results must be done systematically
- Scientific software is developed iteratively and incrementally

Our Process Frame

- Consists of
  - Platform Process
  - Feature Processes
  - Collaboration and Coordination process



A Project Snapshot



Proposed Best Practices - 1

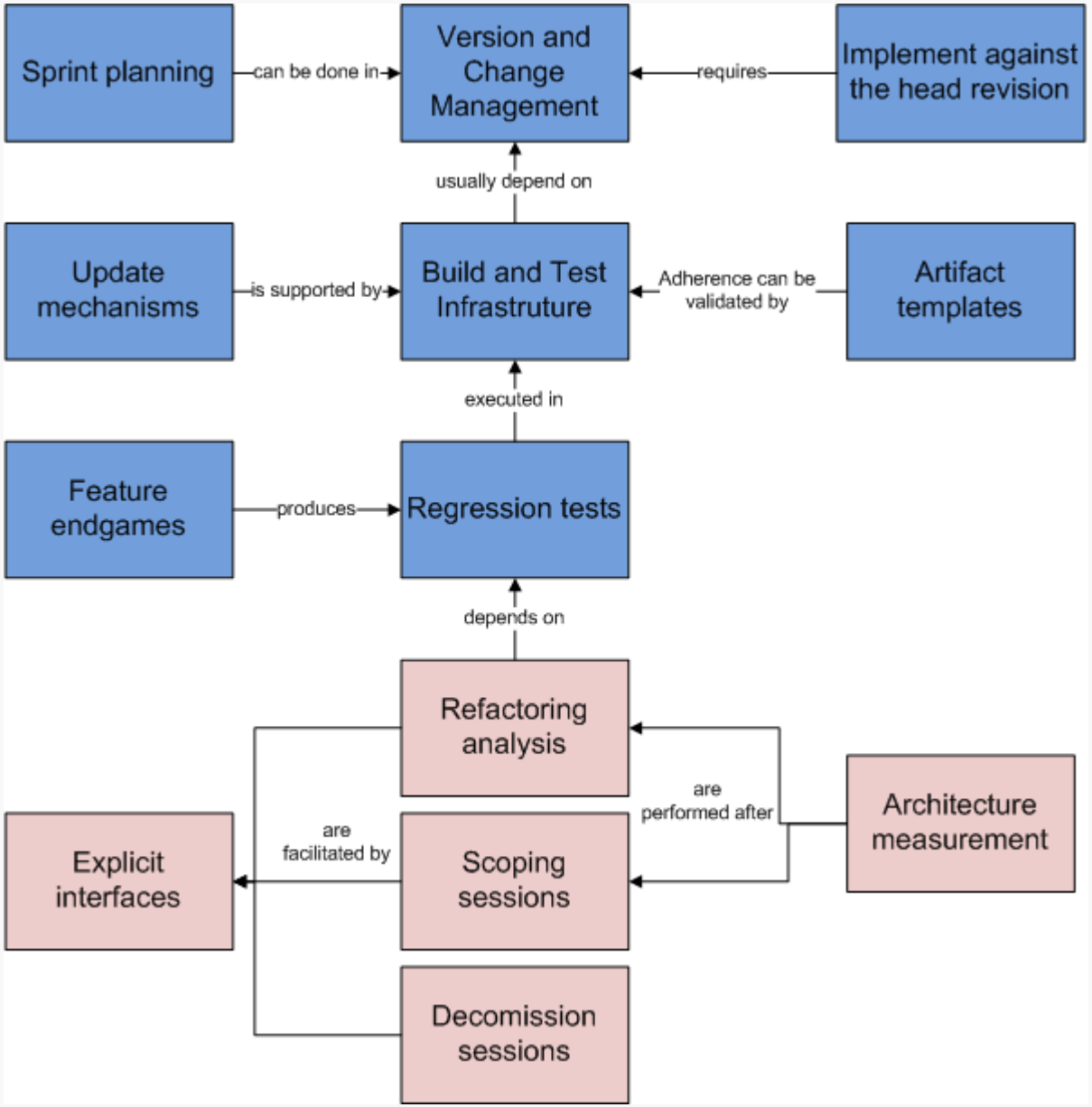
SOFTWARE CONSTRUCTION

- Release and Version Management
  - Apply a sprint based release management
  - Use an integrated change and configuration management system
  - Use an automated build and test system
  - Provide an update infrastructure
  - Implement new features against the head revision
- Platform Management
  - Perform platform scoping sessions on a regular basis
  - Perform refactoring analysis before developing a new feature
  - Check for obsolete features on a regular basis

Proposed Best Practices - 2

- Quality Assurance
  - Perform a quality assurance phase for each feature-project
  - Explicitly define the interfaces of each feature
  - Measure the architectural quality on a regular basis
  - Create and run regression tests
  - Define templates and rules for project artifacts
- People Management
  - Perform pair programming sessions with new developers
  - Provide an infrastructure for knowledge documentation
  - Perform regular team sessions

Best Practices in Context



Pair programming

Team sessions

Knowledge documentation