

An Introduction to Scrum

Presented by

Wayne Allen

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Mountain Goat Software, LLC



The Agile Manifesto—a statement of values

Individuals and
interactions

over

Process and tools

Working software

over

Comprehensive
documentation

Customer
collaboration

over

Contract negotiation

Responding to
change

over

Following a plan

Source: www.agilemanifesto.org

Scrum in 100 words

- Scrum is an agile process that allows us to focus on delivering the highest business value in the shortest time.
- It allows us to rapidly and repeatedly inspect actual working software (every two weeks to one month).
- The business sets the priorities. Teams self-organize to determine the best way to deliver the highest priority features.
- Every two weeks to a month anyone can see real working software and decide to release it as is or continue to enhance it for another sprint.

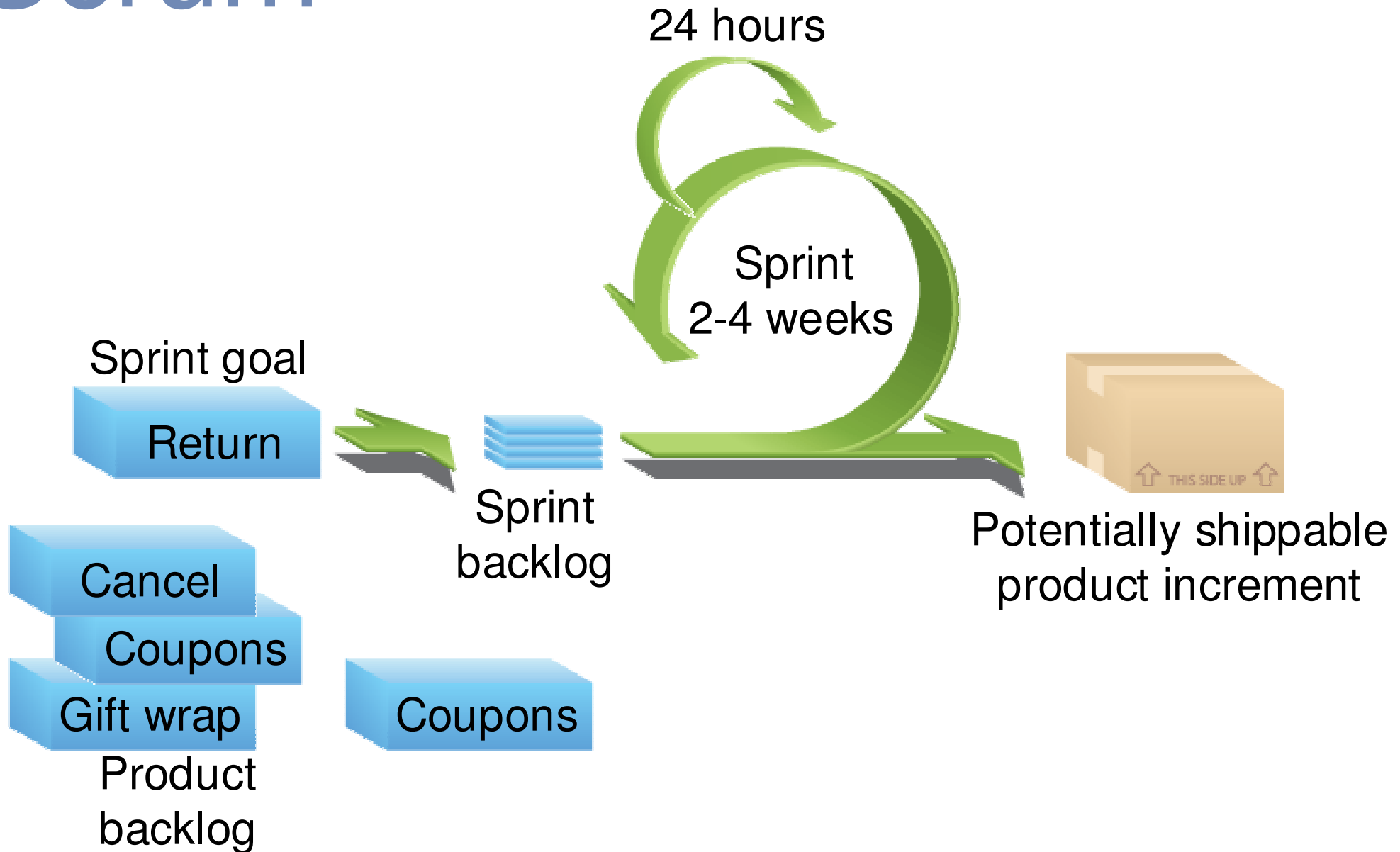
Scrum has been used for:

- Commercial software
- In-house development
- Contract development
- Fixed-price projects
- Financial applications
- ISO 9001-certified applications
- Embedded systems
- 24x7 systems with 99.999% uptime requirements
- the Joint Strike Fighter
- Video game development
- FDA-approved, life-critical systems
- Satellite-control software
- Websites
- Handheld software
- Mobile phones
- Network switching applications
- ISV applications
- Some of the largest applications in use

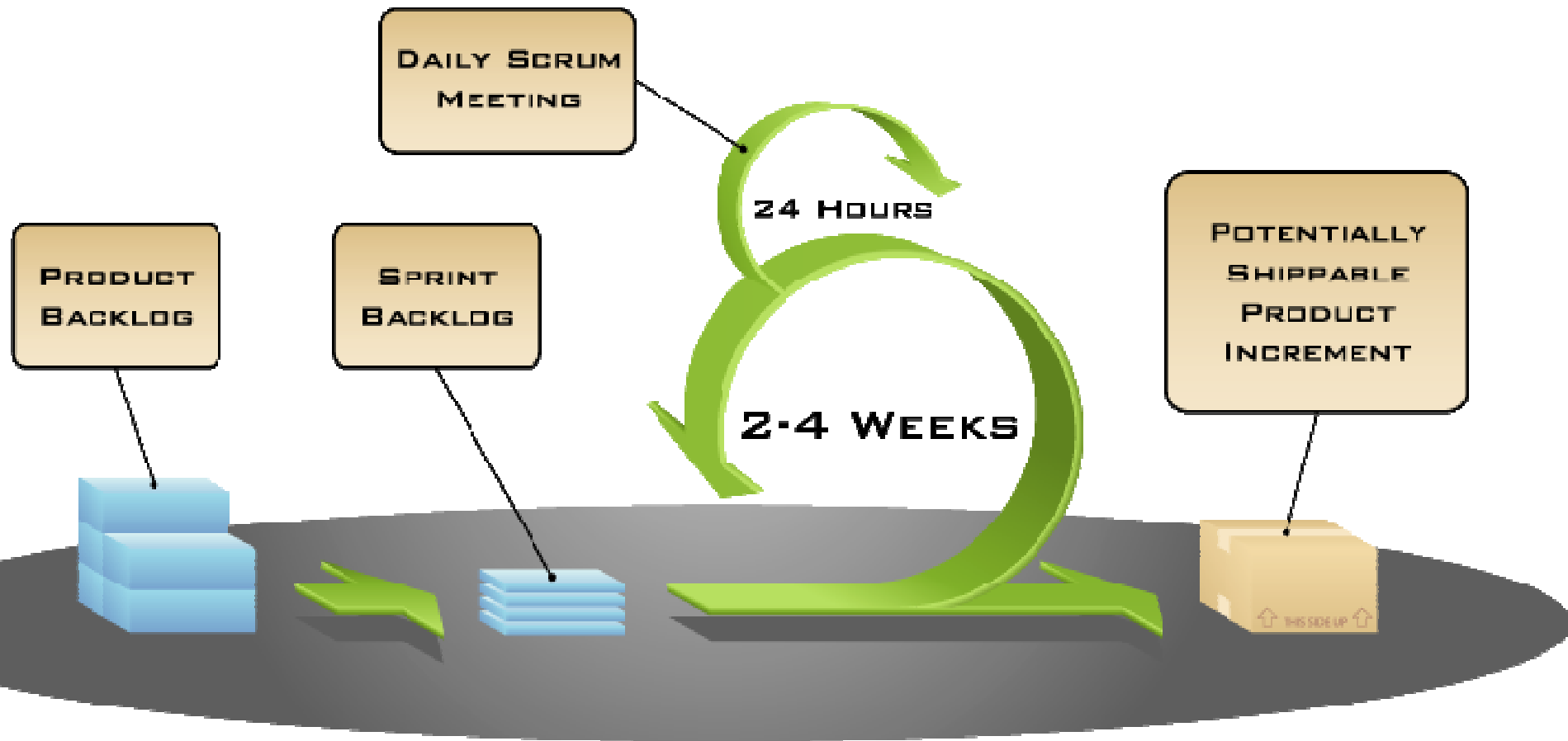
Characteristics

- Self-organizing teams
- Product progresses in a series of month-long “sprints”
- Requirements are captured as items in a list of “product backlog”
- No specific engineering practices prescribed
- Uses generative rules to create an agile environment for delivering projects
- One of the “agile processes”

Scrum



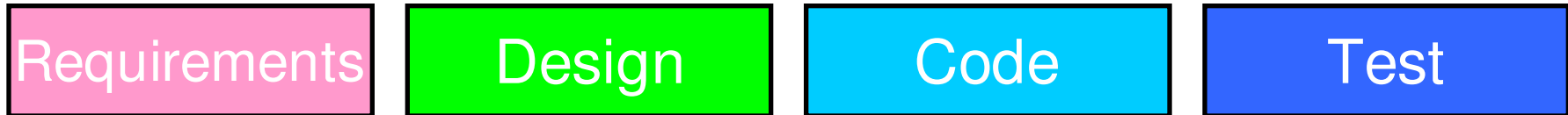
Putting it all together



Sprints

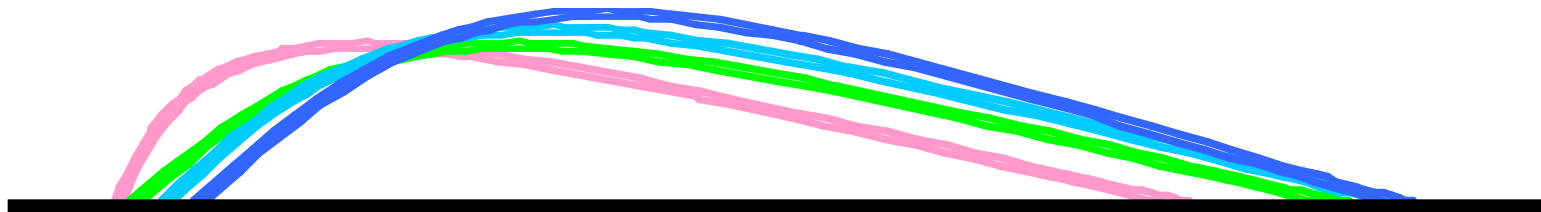
- Scrum projects make progress in a series of “sprints”
 - Analogous to Extreme Programming iterations
- Typical duration is 2–4 weeks or a calendar month at most
- A constant duration leads to a better rhythm
- Product is designed, coded, and tested during the sprint

Sequential vs. overlapping development



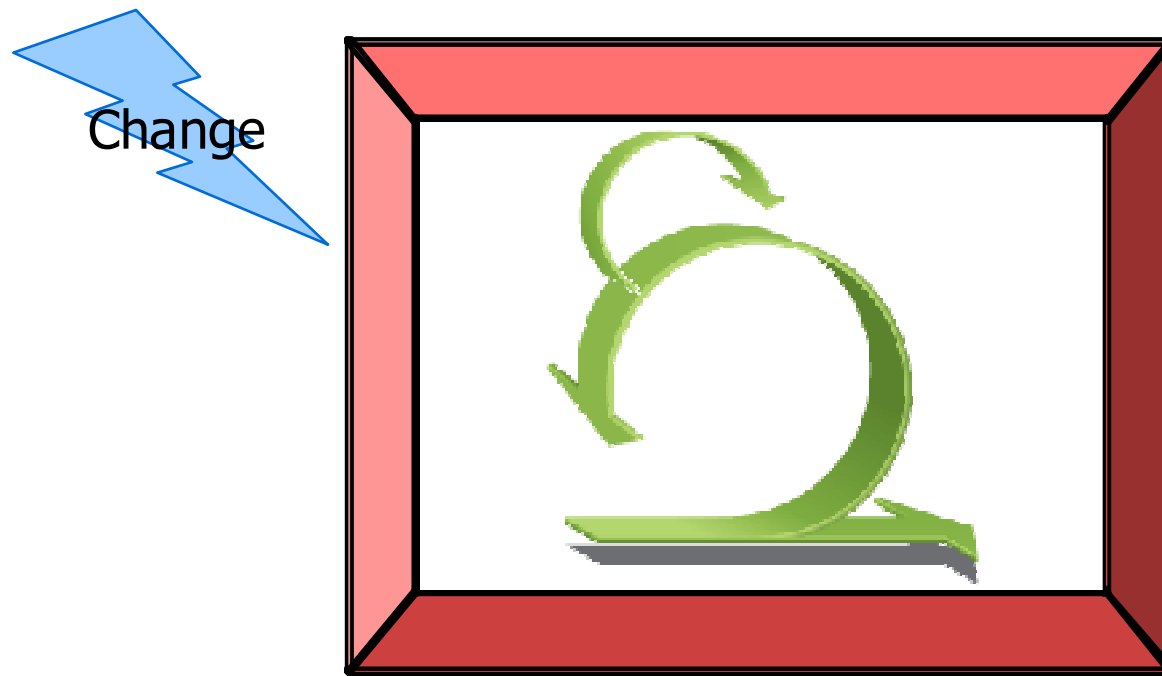
Rather than doing all of one thing at a time...

...Scrum teams do a little of everything all the time



Source: "The New New Product Development Game" by Takeuchi and Nonaka. *Harvard Business Review*, January 1986.

No changes during a sprint



- Plan sprint durations around how long you can commit to keeping change out of the sprint

Scrum framework

Roles

- Product owner
- ScrumMaster
- Team

Ceremonies

- Sprint planning
- Sprint review
- Sprint retrospective
- Daily scrum meeting

Artifacts

- Product backlog
- Sprint backlog
- Burndown charts

Scrum framework

Roles

- Product owner
- ScrumMaster
- Team

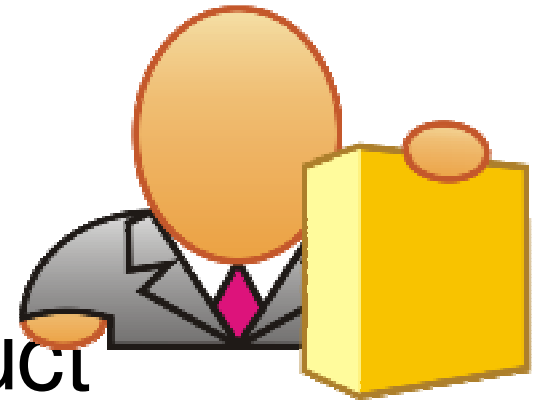
Events

- Sprint planning
- Sprint review
- Sprint retrospective
- Daily scrum meeting

Artifacts

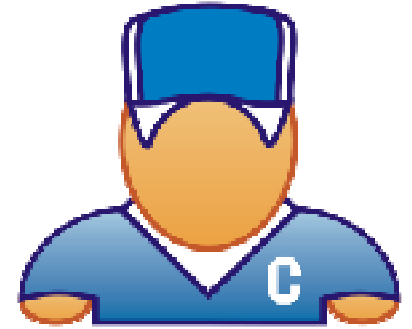
- Product backlog
- Sprint backlog
- Burndown charts

Product owner



- Define the features of the product
- Decide on release date and content
- Be responsible for the profitability of the product (ROI)
- Prioritize features according to market value
- Adjust features and priority every iteration, as needed
- Accept or reject work results

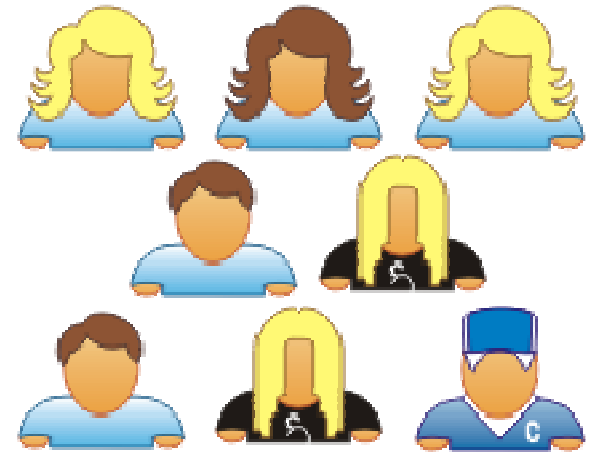
The ScrumMaster



- Represents management to the project
- Responsible for enacting Scrum values and practices
- Removes impediments
- Ensure that the team is fully functional and productive
- Enable close cooperation across all roles and functions
- Shield the team from external interferences

The team

- Typically 5-9 people
- Cross-functional:
 - Programmers, testers, user experience designers, etc.
- Members should be full-time
 - May be exceptions (e.g., database administrator)
- Teams are self-organizing
 - Ideally, no titles but rarely a possibility
- Membership should change only between sprints



Scrum framework

Roles

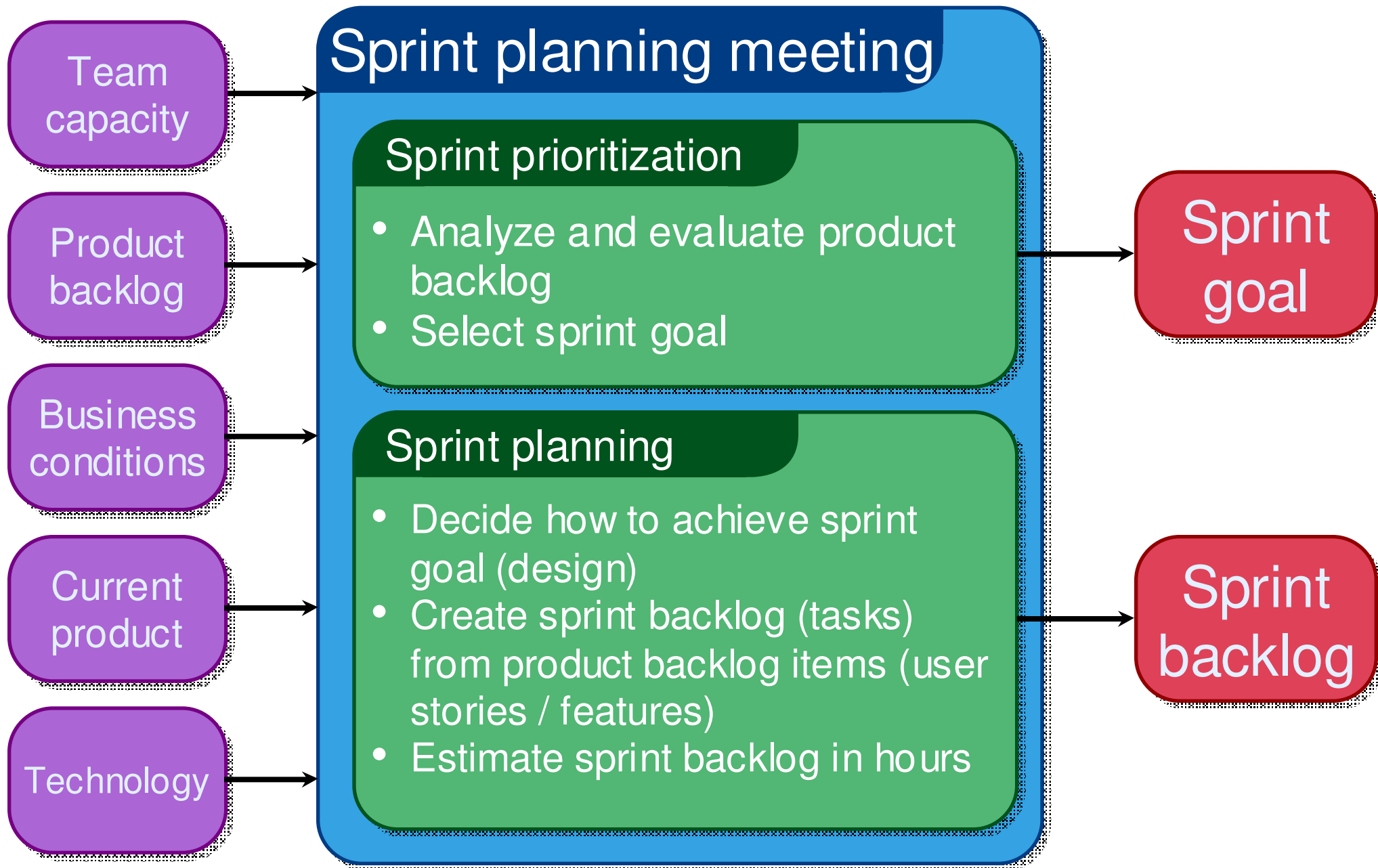
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Sprint planning

- Team selects items from the product backlog they can commit to completing
- Sprint backlog is created
 - Tasks are identified and each is estimated (1-16 hours)
 - Collaboratively, not done alone by the ScrumMaster
- High-level design is considered

As a vacation planner, I want to see photos of the hotels.

Code the middle tier (8 hours)
Code the user interface (4)
Write test fixtures (4)
Code the foo class (6)
Update performance tests (4)

The daily scrum

- Parameters
 - Daily
 - 15-minutes
 - Stand-up
- Not for problem solving
 - Whole world is invited
 - Only team members, ScrumMaster, product owner, can talk
- Helps avoid other unnecessary meetings



Everyone answers 3 questions

1

What did you do yesterday?

2

What will you do today?

3

Is anything in your way?

- These are *not* status for the ScrumMaster
 - They are commitments in front of peers

The sprint review

- Team presents what it accomplished during the sprint
- Typically takes the form of a demo of new features or underlying architecture
- Informal
 - 2-hour prep time rule
 - No slides
- Whole team participates
- Invite the world



Sprint retrospective

- Periodically take a look at what is and is not working
- Typically 15–30 minutes
- Done after every sprint
- Whole team participates
 - ScrumMaster
 - Product owner
 - Team
 - Possibly customers and others

Start / Stop / Continue

- Whole team gathers and discusses what they'd like to:

Start doing

Stop doing

Continue doing

This is just one of many ways to do a sprint retrospective.

Scrum framework

Roles

- Product owner
- ScrumMaster
- Team

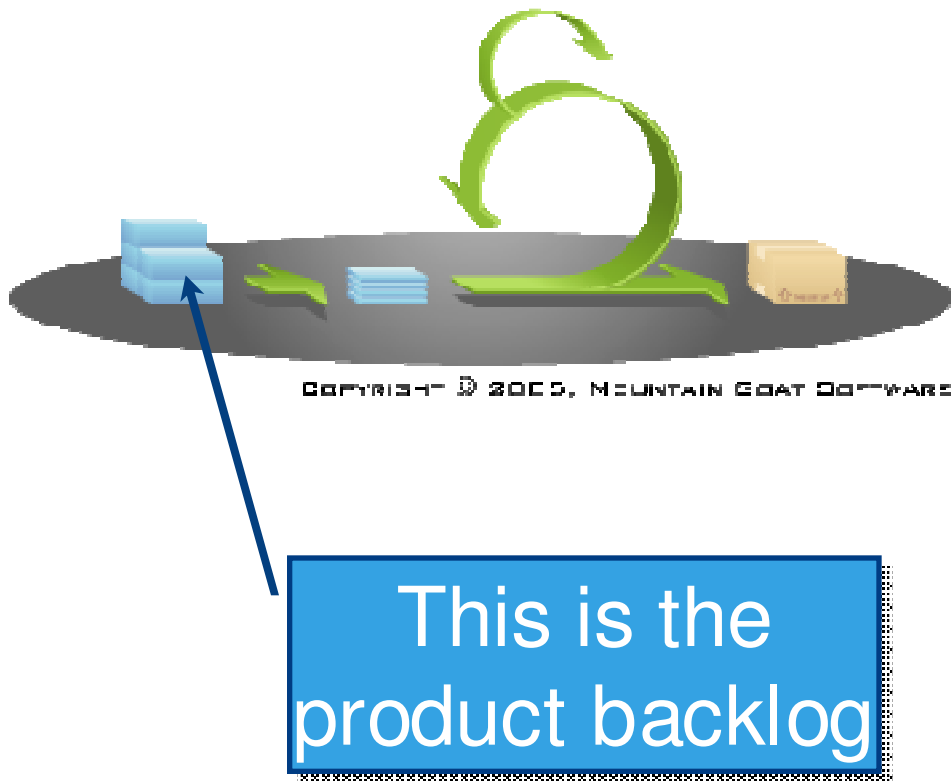
Ceremonies

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Product backlog



- The requirements
- A list of all desired work on the project
- Ideally expressed such that each item has value to the users or customers of the product
- Prioritized by the product owner
- Reprioritized at the start of each sprint

A sample product backlog

Backlog item	Estimate
Allow a guest to make a reservation	3
As a guest, I want to cancel a reservation.	5
As a guest, I want to change the dates of a reservation.	3
As a hotel employee, I can run RevPAR reports (revenue-per-available-room)	8
Improve exception handling	8
...	30
...	50

The sprint goal

- A short statement of what the work will be focused on during the sprint

Life Sciences

Support features necessary for population genetics studies.

Database Application

Make the application run on SQL Server in addition to Oracle.

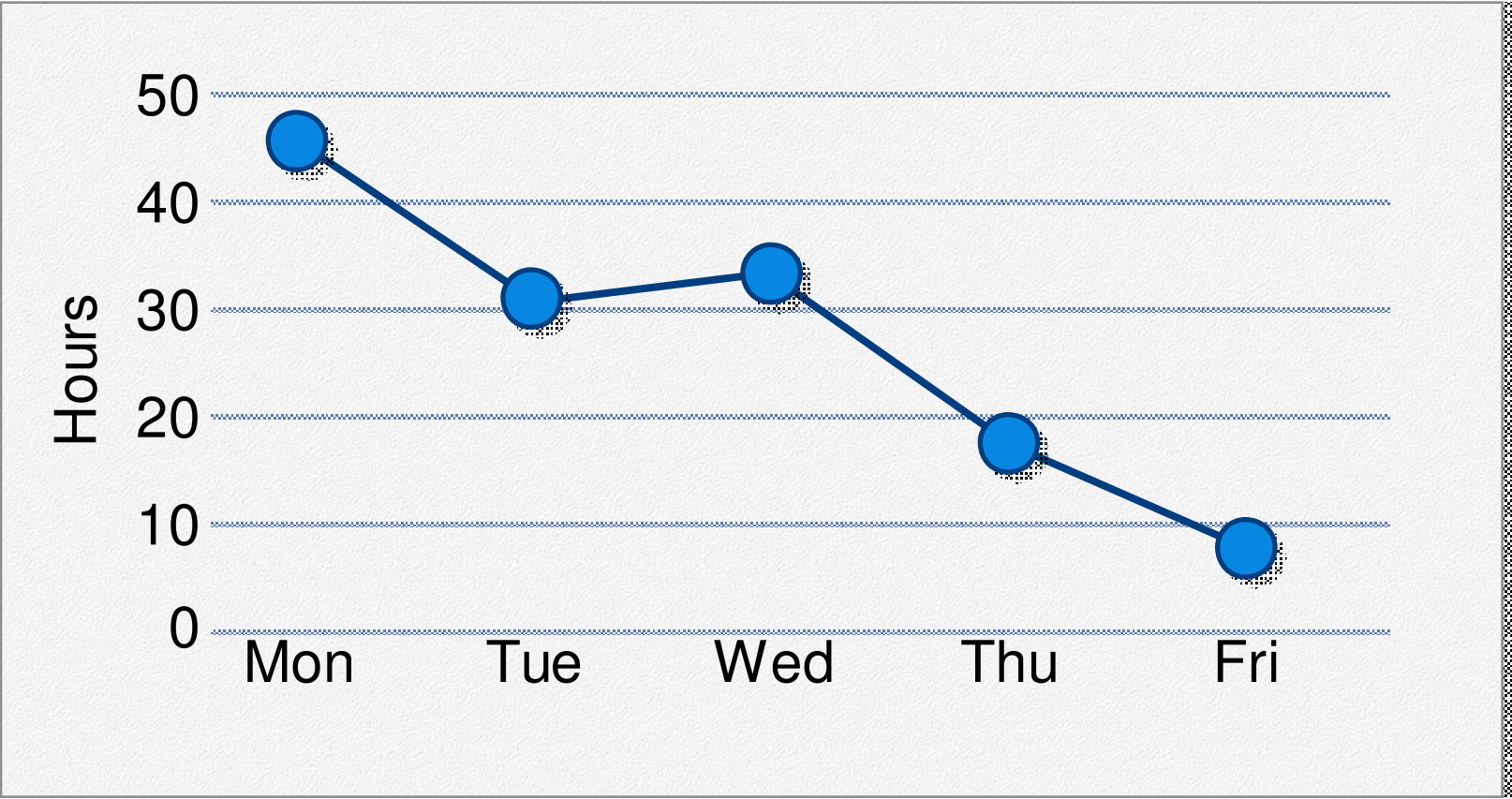
Financial services

Support more technical indicators than company ABC with real-time, streaming data.

Managing the sprint backlog

- Individuals sign up for work of their own choosing
 - Work is never assigned
- Estimated work remaining is updated daily
- Any team member can add, delete or change the sprint backlog
- Work for the sprint emerges
- If work is unclear, define a sprint backlog item with a larger amount of time and break it down later
- Update work remaining as more becomes known

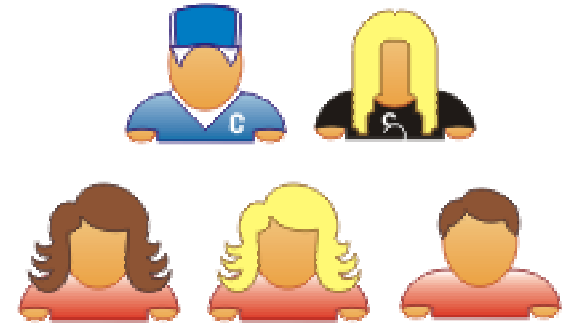
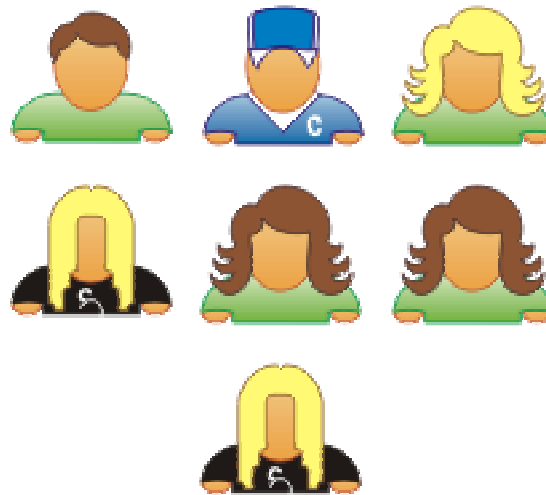
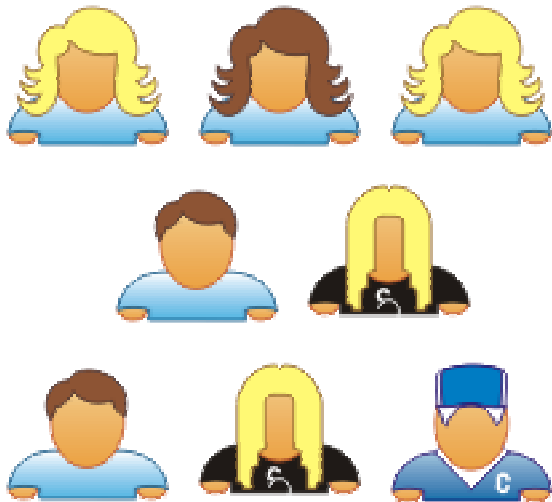
Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4	8		
Code the middle tier	16	12	10	7	
Test the middle tier	8	16	16	11	8
Write online help	12				



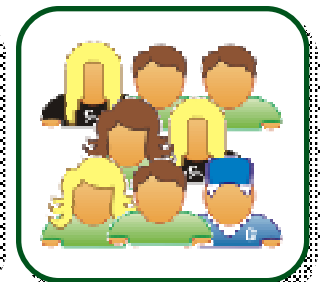
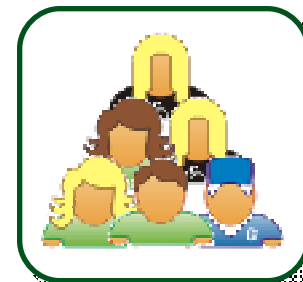
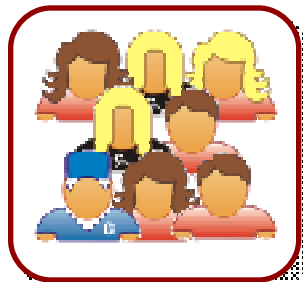
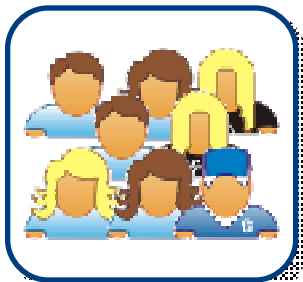
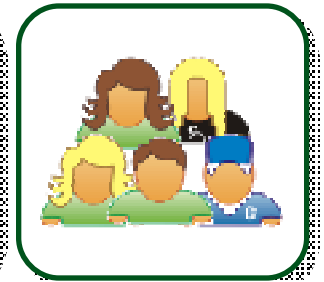
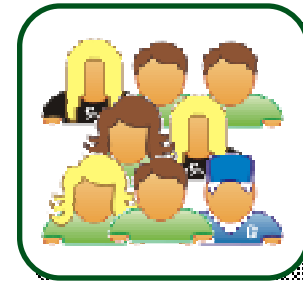
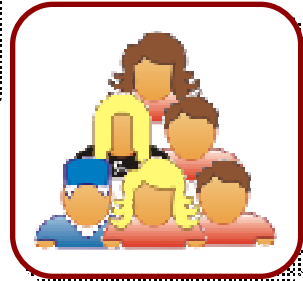
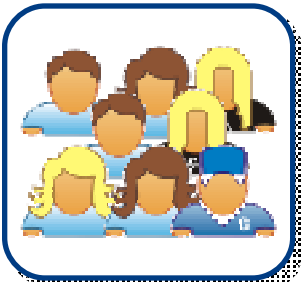
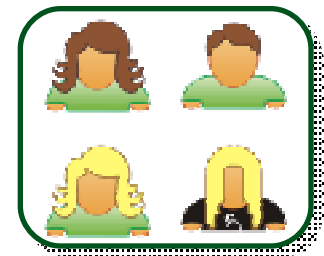
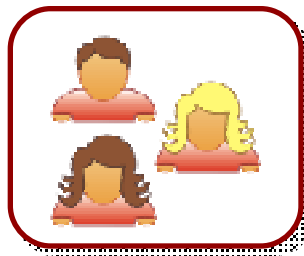
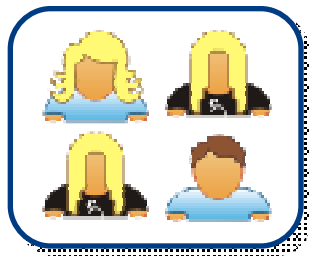
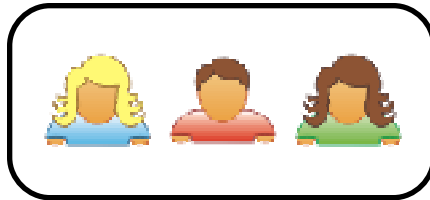
Scalability

- Typical individual team are 7 ± 2 people
 - Scalability comes from teams of teams
- Factors in scaling
 - Type of application
 - Team size
 - Team dispersion
 - Project duration
- Scrum has been used on multiple 500+ person projects

Scaling through the Scrum of scrums



Scrum of scrums of scrums



Where to go next

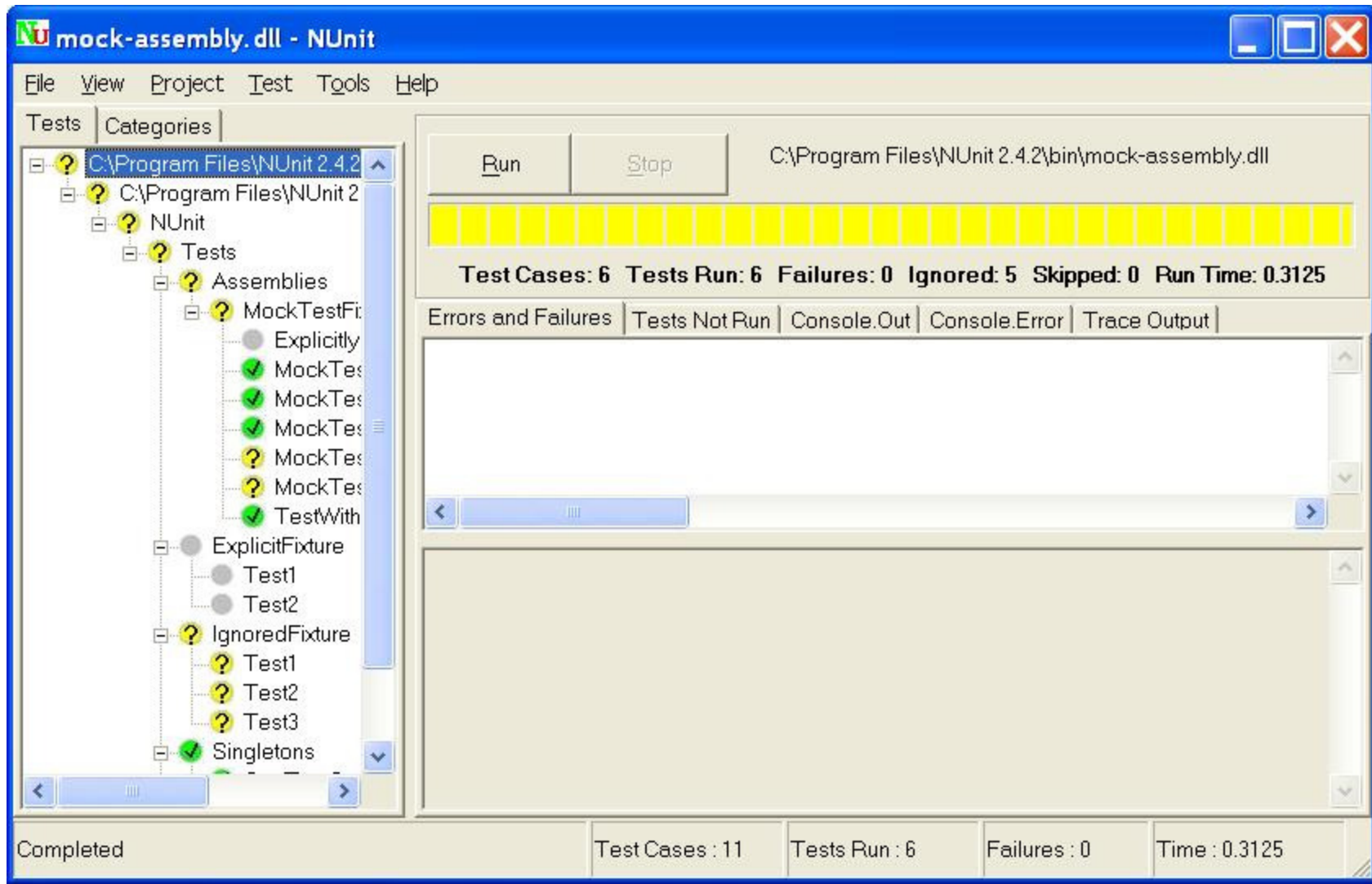
- www.mountangoatsoftware.com/scrum
- www.scrumalliance.org
- www.controlchaos.com
- scrumdevelopment@yahoogroups.com

A Scrum reading list

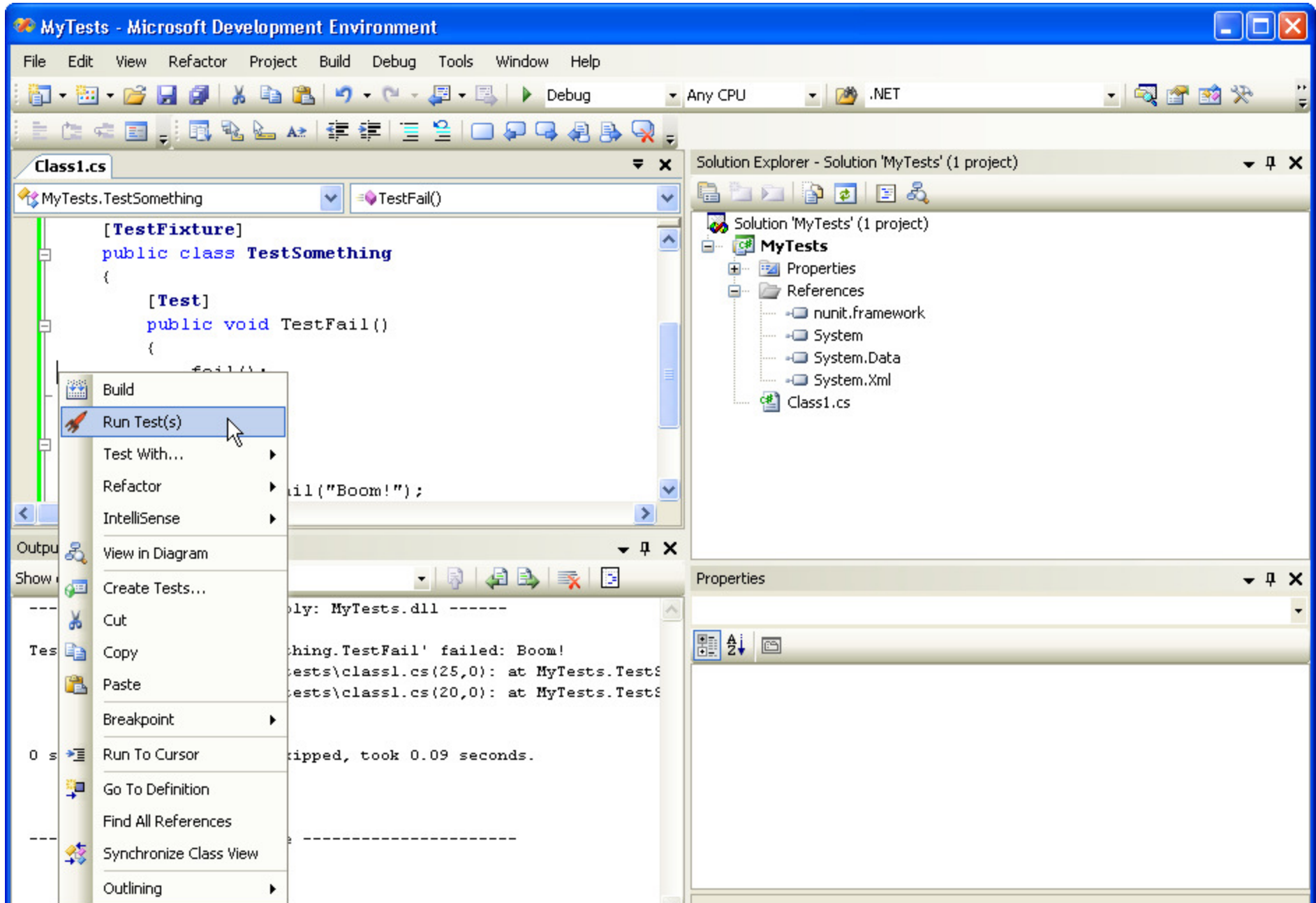
- *Agile and Iterative Development: A Manager's Guide* by Craig Larman
- *Agile Estimating and Planning* by Mike Cohn
- *Agile Project Management with Scrum* by Ken Schwaber
- *Agile Retrospectives* by Esther Derby and Diana Larsen
- *Agile Software Development Ecosystems* by Jim Highsmith
- *Agile Software Development with Scrum* by Ken Schwaber and Mike Beedle
- *Scrum and The Enterprise* by Ken Schwaber
- *User Stories Applied for Agile Software Development* by Mike Cohn
- Lots of weekly articles at www.scrumalliance.org

Agile Tools

Unit Testing (xUnit)



xUnit IDE Integration



Refactoring IDE Integration

```
if (form.ShowDialog() == DialogResult.OK)
{
    for (int n = form.CountValue; n-- > 0;)
        demoControl1.AddRectangle();
}
```

Refactor This

Rename...	F2
Safe Delete...	Alt+Del
Extract Method...	Ctrl+Alt+M
Introduce Variable...	Ctrl+Alt+V
Introduce Field...	Ctrl+Alt+D
Introduce Parameter...	Ctrl+Alt+P
Encapsulate Field...	
Use Base Type where Possible...	

```
public TreeNode GetChild(String name)
{
    return myNameToChildNodeMap(name);
}
```

	Cast to 'TreeNode'
	Safely cast to 'TreeNode'
	Change type of 'GetChild' to 'object'

```
Console.WriteLine("Name: " + name + "Address: " + address);
```

	Use format string
--	--------------------------

Builds (Ant, NAnt, Rake)

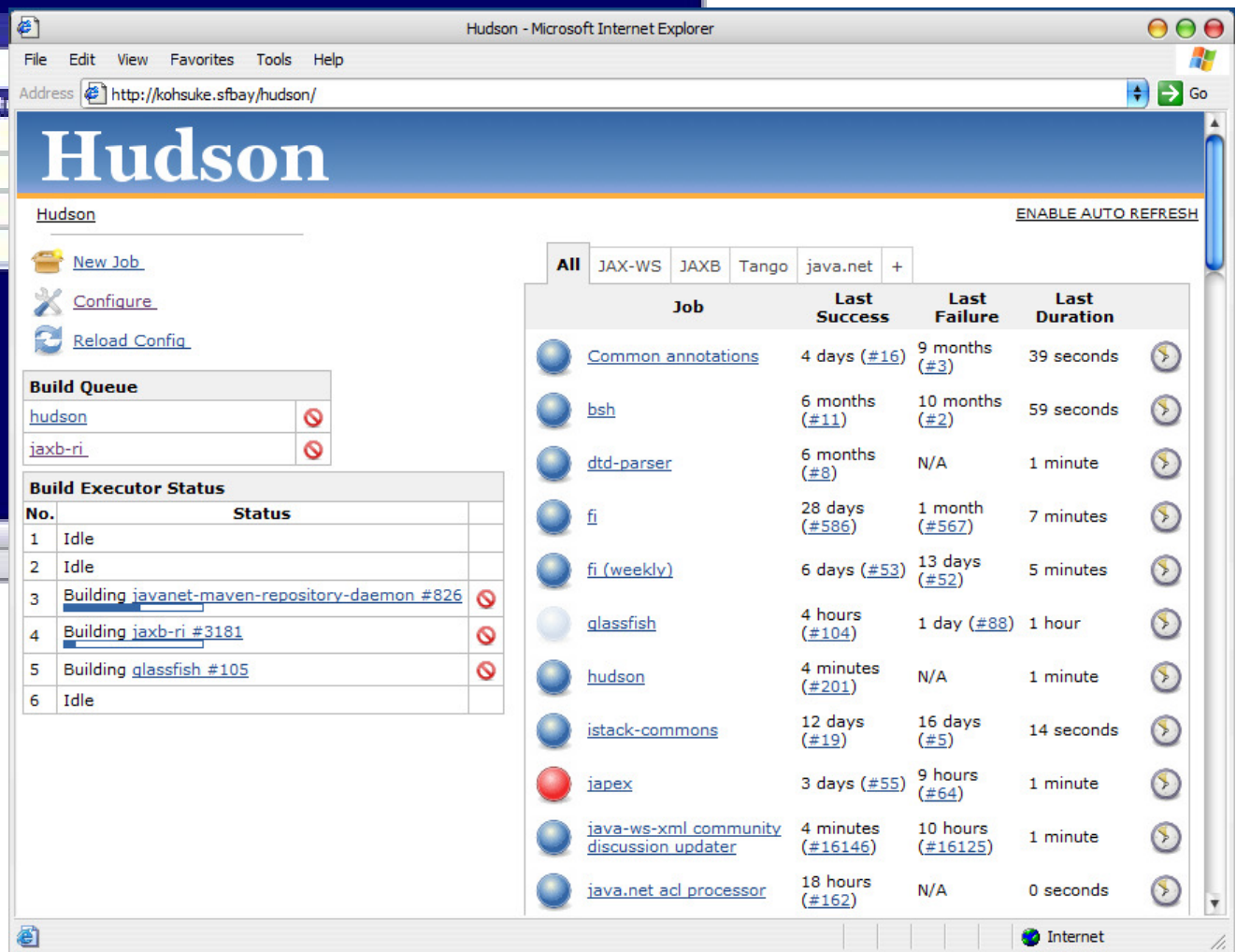
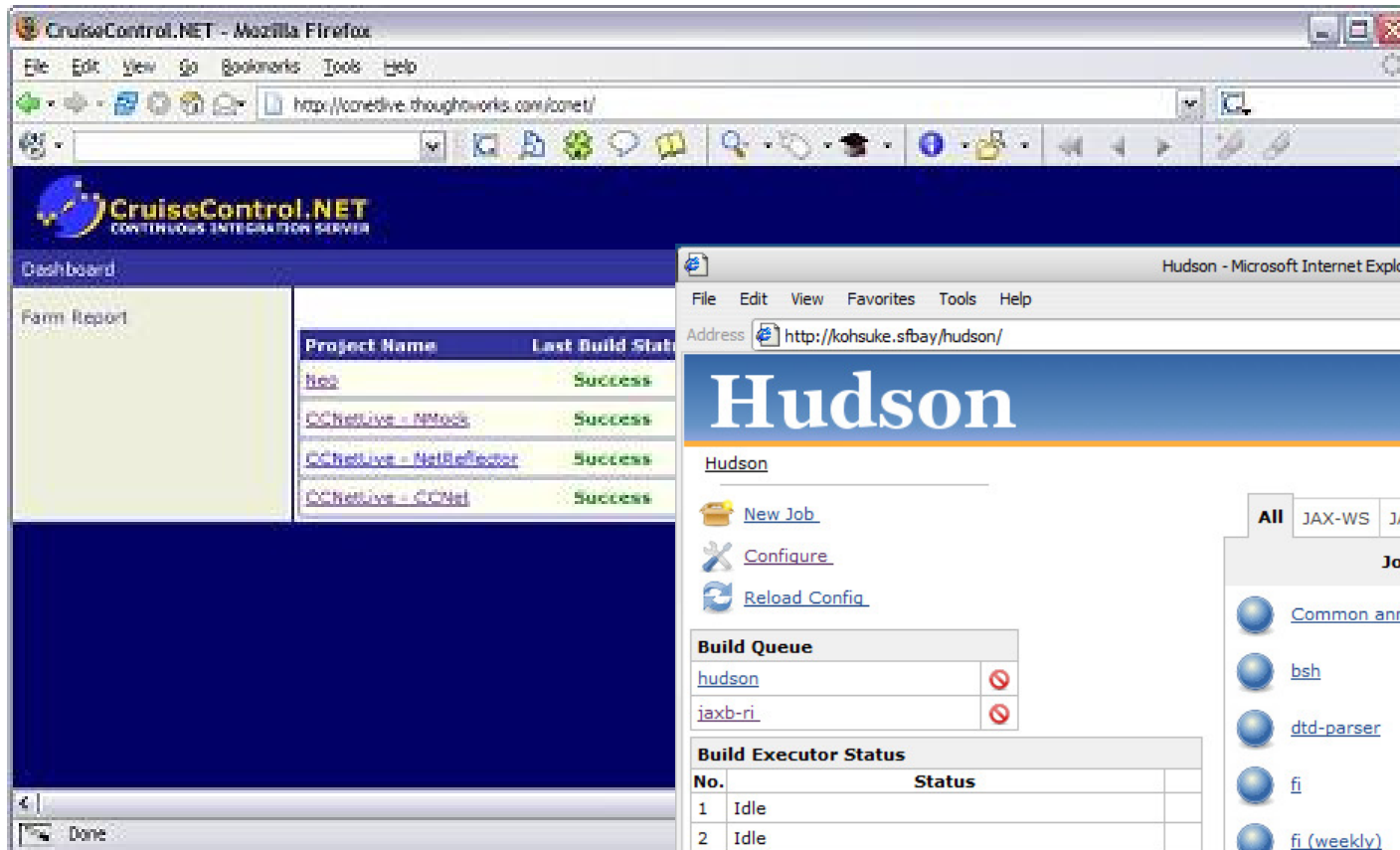
```
<?xml version="1.0"?>
  <project name="Hello World" default="build" basedir=".">

    <description>The Hello World of build files.</description>
    <property name="debug" value="true" overwrite="false" />

    <target name="clean" description="remove all generated files">
      <delete file="HelloWorld.exe" failonerror="false" />
      <delete file="HelloWorld.pdb" failonerror="false" />
    </target>

    <target name="build" description="compiles the source code">
      <csc target="exe" output="HelloWorld.exe" debug="${debug}">
        <sources>
          <includes name="HelloWorld.cs" />
        </sources>
      </csc>
    </target>
  </project>
```

Continuous Integration



CruiseControl
Draco.Net
Hudson

Test Coverage

Clover
NCover
EMMA

NCover Explorer - C:\Dev\NCover\Coverage200.Xml

File Edit View Project Help

Coverage200.Xml (87%)
ClassTests (87%)
ClassTests (87%)
AllStatic (100%)
StaticMethod (100%)
BaseClass (100%)
InheritedMethod (100%)
ClassLoaded (77%)
Empty (100%)
ExternalThrownException (100%)
HasDeadCode (100%)
HasDeadCode (80%)
InternalThrownException (100%)
LaunchSubProcess (100%)
NeverCalled (0%)
StaticFunctionCalled (100%)
StaticFunctionNotCalled (0%)
ThrowsAndCatchesException (100%)
ThrowsAndCatchesException (100%)
ClassNeverLoaded (0%)
OuterClass (100%)

Method	Visit Count	Line	Column	End Line	End Column	FileName
ExternalThrownException	1	40	17	40	43	Program.cs
ExternalThrownException	0	41	17	41	59	Program.cs
ExternalThrownException	1	42	15	42	34	Program.cs
ExternalThrownException	1	43	17	43	46	Program.cs
ExternalThrownException	1	45	9	45	10	Program.cs

Program.cs

```
39         try {  
40             InternalThrownException();  
41             Console.WriteLine("ERROR! Never called.");  
42         } catch (Exception e) {  
43             Console.WriteLine(e.Message);  
44         }  
45     }  
46     private void InternalThrownException() {  
47         throw new Exception("Cross-Method Exception");  
48     }  
49     public void NeverCalled() {  
50         Console.WriteLine("ERROR! Never called.");  
51     }  
52     public void HasDeadCode() {  
53         HasDeadCode(true);  
54     }  
55     private void HasDeadCode(bool stop) {  
56         Console.WriteLine("Function with Dead Code");  
57         if (stop)  
58             return;  
59         Console.WriteLine("ERROR! Never called.");  
60     }  
61     public static void StaticFunctionCalled() {  
62         Console.WriteLine("Static Function");  
63     }
```

Static Analysis (xDepend)

The screenshot shows the SharpDevelop 2.0 IDE with the VisualNDepend extension. The 'Metrics' tab is active, displaying a treemap visualization of code metrics. A context menu is open over the treemap, showing options to select the top N items (10, 20, 50, 100, 200, 500, 1000, 2000, 5000). The 'CQL Query Result 50 items' window is open on the left, showing a list of methods and their line counts. The 'CQL Queries' window at the bottom shows the active query: `SELECT TOP 50 METHODS ORDER BY NbLinesOfCode DESC`.

SharpDevelop 2.0 (Wed 11 Apr 15:30 most recent) - VisualNDepend

Home Dependencies Metrics Compare Builds CQL Queries

Level: Method

Metric: # lines of code (LOC): 1 line = 2.7 pixels

Metrics

CQL Query Result 50 items

Export to HTML

methods	# line of code (LOC)
SynErr(Int32,Int32,Int32)	535
StructureMemberDecl(Modifier...	396
SynErr(Int32,Int32,Int32)	383
EmbeddedStatement(ref.State...	322
StructMemberDecl(Modifiers, Li...	309
PrimaryExpr(ref.Expression)	287
LoadFromXml(DockPanel,Stre...	235
InitializeComponent()	184
Step(IDocumentAccessor,Inde...	183

Items: 50
Items tested: 26446
% matched items: 0.18...
Sum: 7189
Average: 143.78
Min: 76
Max: 535
Standard deviation: 95.339
Variance: 9089.6

Metrics

ICSharpCode...
SharpCode...
Parser
Debugger...
BooBi...
Sharp...
XmlEd...
Debugger...
Sharp...
VBNetOut...
ICSharpCode...
TextEditor
ICSharpCode...
SharpRe...
portCor...

CQL Queries

Save changes Cancel changes

Active

When warning, display statistics in report
When warning, display list of items selected in report
When warning, display selection view pic in report

Comment selection

Parent group: Source Code Quality constraints

SELECT TOP 50 METHODS ORDER BY NbLinesOfCode DESC

Query compilation succeeded, no warning

Assemblies:37 Namespaces:129 Types:2 881 Methods:22 664 Fields:9 662 Lines of code:99 054

Simian

Similarity Analyser 2.1.2 -

<http://www.redhillconsulting.com.au/products/simian/index.html>

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Simian is not free unless used solely for non-commercial or evaluation purposes.

{ignoreCurlyBraces=true, ignoreModifiers=true, ignoreStringCase=true, threshold=9}

Loading (recursively) *.java from /var/tmp/jdksrc

Found 9 duplicate lines in the following files:

Between lines 65 and 76 in /var/tmp/jdksrc/javax/swing/plaf/basic/BasicSliderUI.java

Between lines 71 and 82 in

/var/tmp/jdksrc/com/sun/java/swing/plaf/gtk/SynthSliderUI.java

Found 9 duplicate lines in the following files:

Between lines 37 and 49 in

/var/tmp/jdksrc/com/sun/java/swing/plaf/motif/MotifCheckBoxMenuItemUI.java

Between lines 43 and 55 in

/var/tmp/jdksrc/com/sun/java/swing/plaf/motif/MotifRadioButtonMenuItemUI.java

Between lines 36 and 48 in

/var/tmp/jdksrc/com/sun/java/swing/plaf/motif/MotifMenuItemUI.java

Found 9 duplicate lines in the following files:

Between lines 391 and 435 in

/var/tmp/jdksrc/org/apache/xml/dtm/ref/DTMDocumentImpl.java

Between lines 1533 and 1577 in

/var/tmp/jdksrc/org/apache/xml/dtm/ref/dom2dtm/DOM2DTM.java

Found 9 duplicate lines in the following files:

Between lines 1744 and 1758 in

/var/tmp/jdksrc/javax/swing/plaf/metal/MetalFileChooserUI.java

Between lines 1995 and 2009 in

/var/tmp/jdksrc/com/sun/java/swing/plaf/windows/WindowsFileChooserUI.java

Between lines 849 and 863 in

/var/tmp/jdksrc/com/sun/java/swing/plaf/gtk/GTKFileChooserUI.java

Found 9 duplicate lines in the following files:

Between lines 47 and 59 in /var/tmp/jdksrc/javax/swing/plaf/basic/BasicMenuBarUI.java

Between lines 55 and 67 in

/var/tmp/jdksrc/com/sun/java/swing/plaf/gtk/SynthMenuBarUI.java

Mocking Frameworks

```
[TestFixture]
[ClearMocks]
public class TestClass
{
```

```
    [Test]
    [VerifyMocks]
    public void TestWithNatural()
    {
        using (RecordExpectations recorder =
RecorderManager.StartRecording())
        {
            ClassToIsolate.StaticMethod();
            recorder.Throw(new NullReferenceException());
        }
    }
}
```

```
    [Test]
    [VerifyMocks]
    public void TestWithReflective()
    {
        Mock mock = MockManager.Mock<ClassToIsolate>();
        mock.ExpectAndThrow("StaticMethod", new
NullReferenceException());
    }
}
```

TypeMock

Rhino Mocks

NMock

jMock

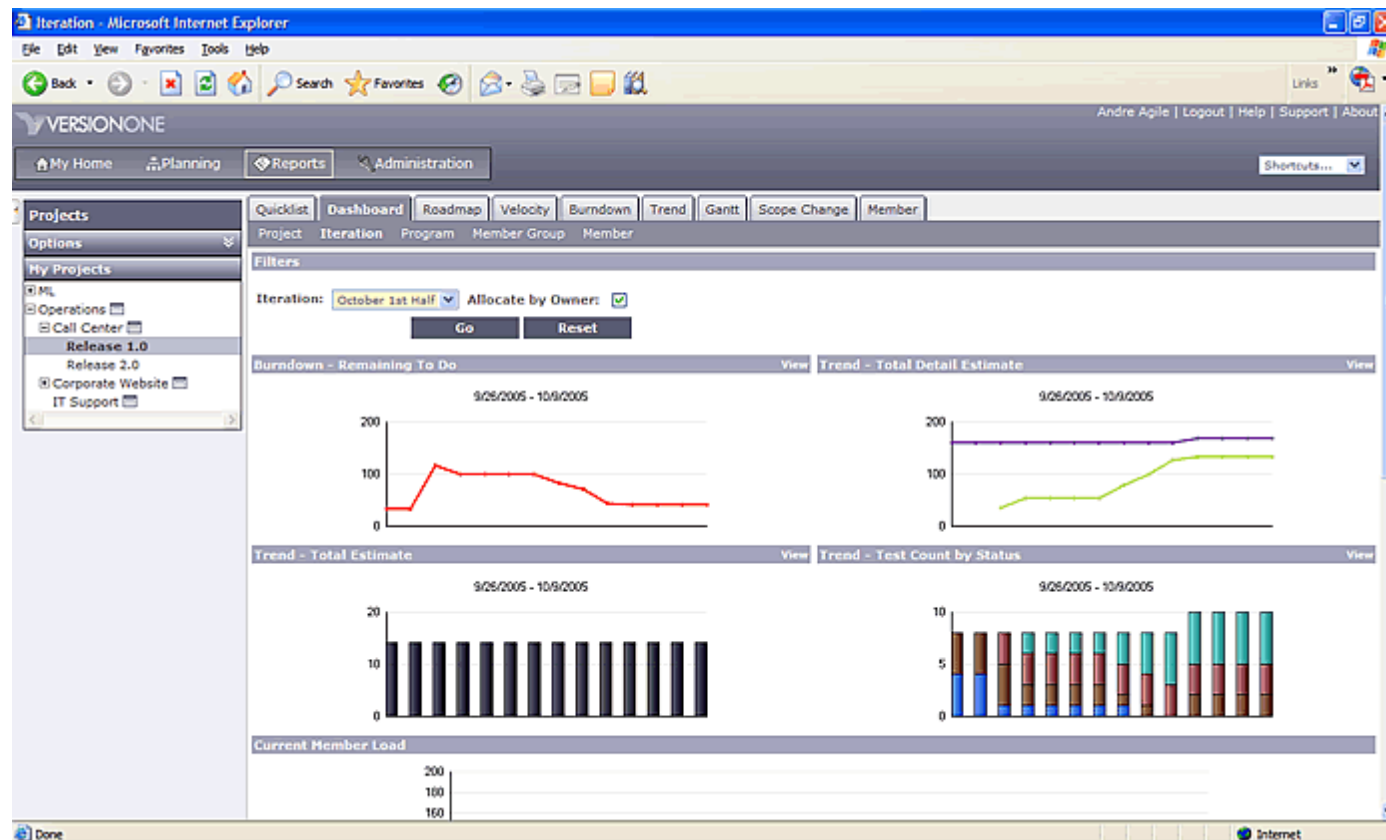
EasyMock

Mocha

RSpec

Project Tracking

- VersionOne
- Rally
- ScrumWorks
- XPlanner



Other Tools

- FxCop, CheckStyle, PMD, FindBugs, ...
- VS 2005/2008, Eclipse
- Selenium
- WatiN
- Subversion

Contact information

Presentation by: Wayne Allen
Wayne.Allen@ints.com
blogs.consultantsguild.com

Thanks to Mike Cohn for making
some of this presentation material
available for use by the agile
community.