



Quality & Testing in Agile

PV260 Software Quality

About me...



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What can you expect



- What is quality?
- Agile development in nutshell
- Project deviations
- Barriers of quality improvement
- Automation
- Dashboards
- Reviews
- ISO and CMMI

What is quality?



A problem has been detected and windows has been shut down to prevent damage to your computer.

DRIVER_IRQL_NOT_LESS_OR_EQUAL

If this is the first time you've seen this Stop error screen, restart your computer. If this screen appears again, follow these steps:

Check to make sure any new hardware or software is properly installed. If this is a new installation, ask your hardware or software manufacturer for any windows updates you might need.

If problems continue, disable or remove any newly installed hardware or software. Disable BIOS memory options such as caching or shadowing. If you need to use Safe Mode to remove or disable components, restart your computer, press F8 to select Advanced Startup Options, and then select Safe Mode.

Technical information:

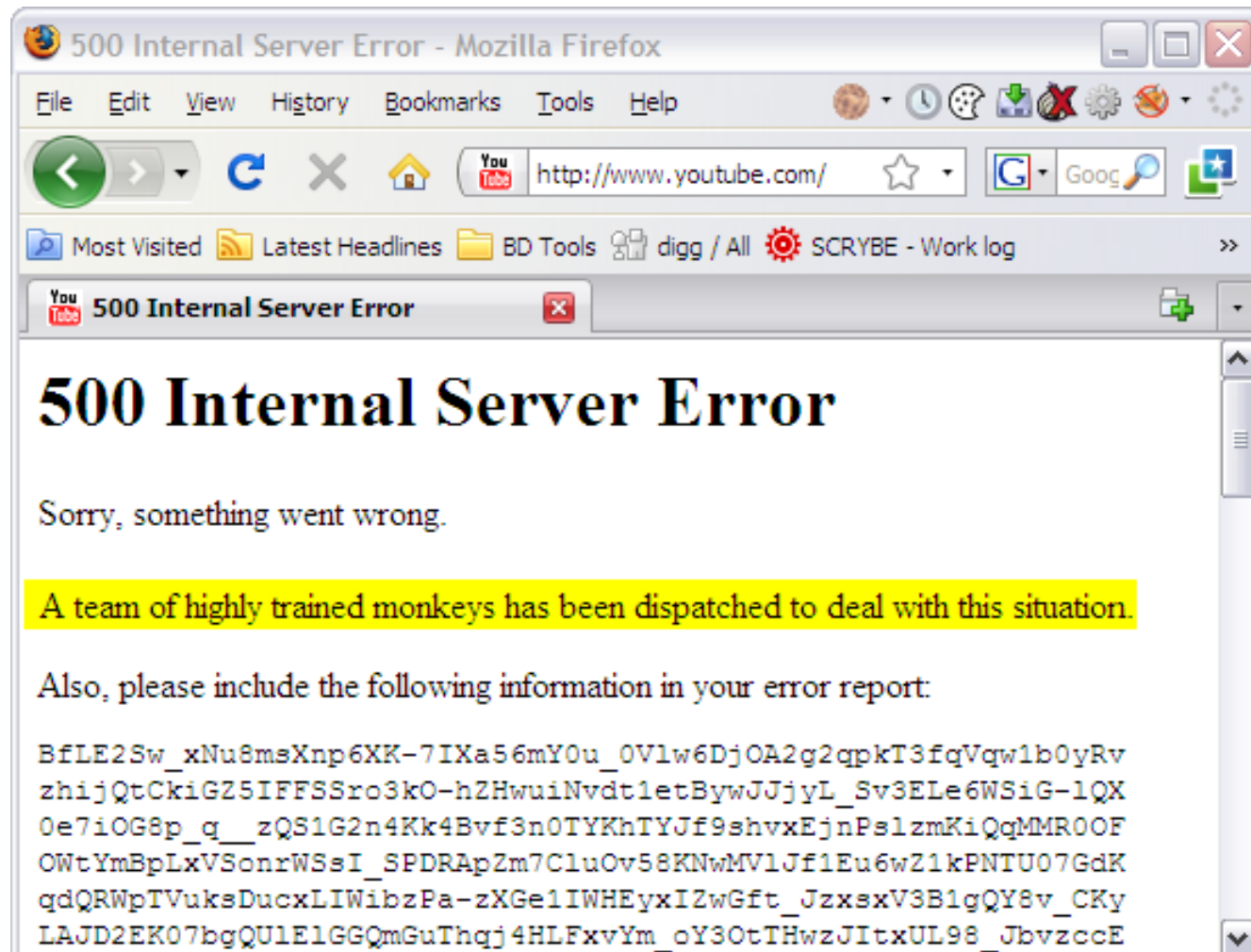
*** STOP: 0x000000d1 (0x0000000000000010,0x0000000000000002,0x0000000000000000,0x0000000000000000) (fffffadfc80b5578)

*** NDIS.sys - Address fffffadfc80b5578 base at fffffadfc80ad000, DateStamp 45d699f1

Beginning dump of physical memory

Physical memory dump complete.

Contact your system administrator or technical support group for further assistance.



What is quality?

- No bugs
- Fast and responsive software
- Satisfied user or customer
- Compliance with legislatives
- Compliance with internal rules
- ...



What is quality?

Software functional quality reflects how well it complies with or conforms to a given design, based on **functional requirements** or specifications.

Software structural quality refers to how it meets **non-functional requirements** that support the delivery of the functional requirements.

What is agile development?

Individuals and interactions **over** processes and tools

Working software **over** comprehensive documentation

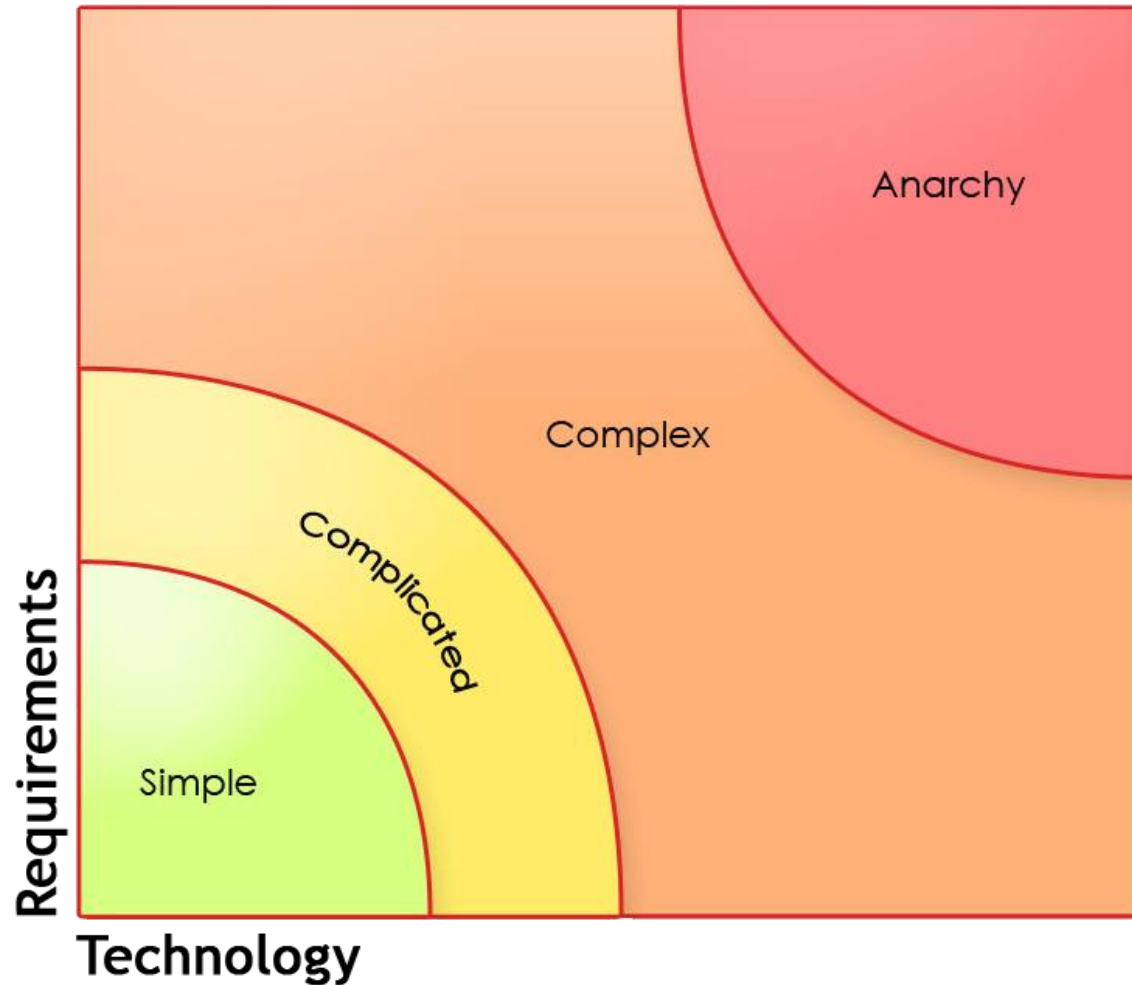
Customer collaboration **over** contract negotiation

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.

<http://agilemanifesto.org/>

When should we use agile?



Agile process in detail

The Agile: Scrum Framework at a glance

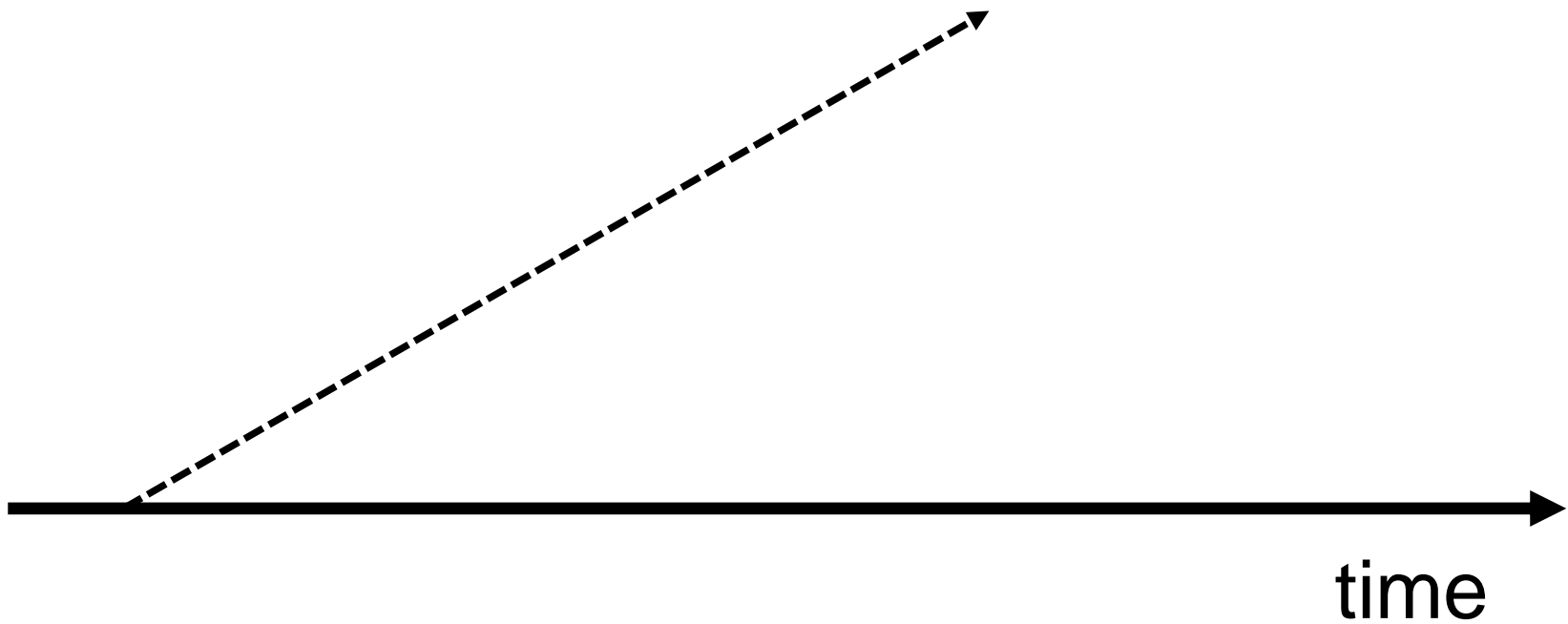
Inputs from Executives,
Team, Stakeholders,
Customers, Users



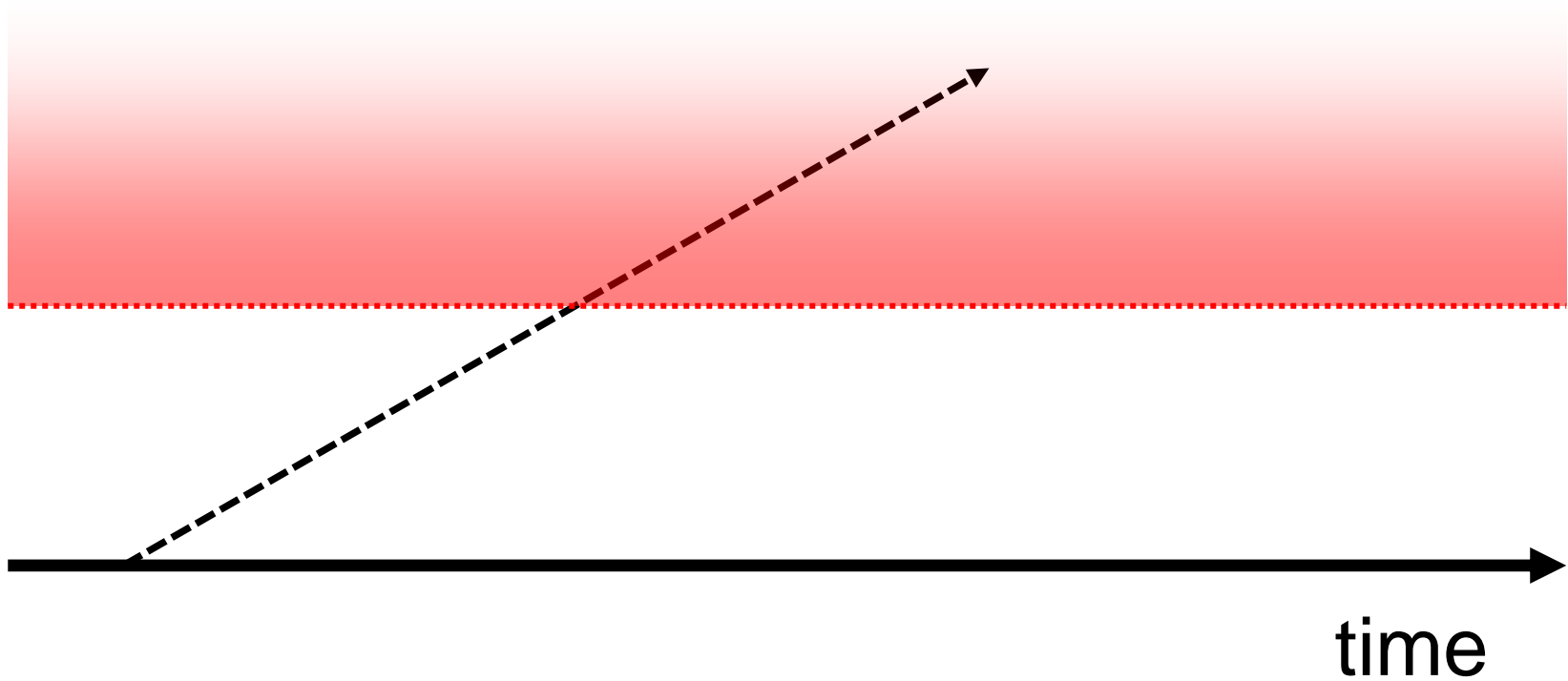
agileforall.com



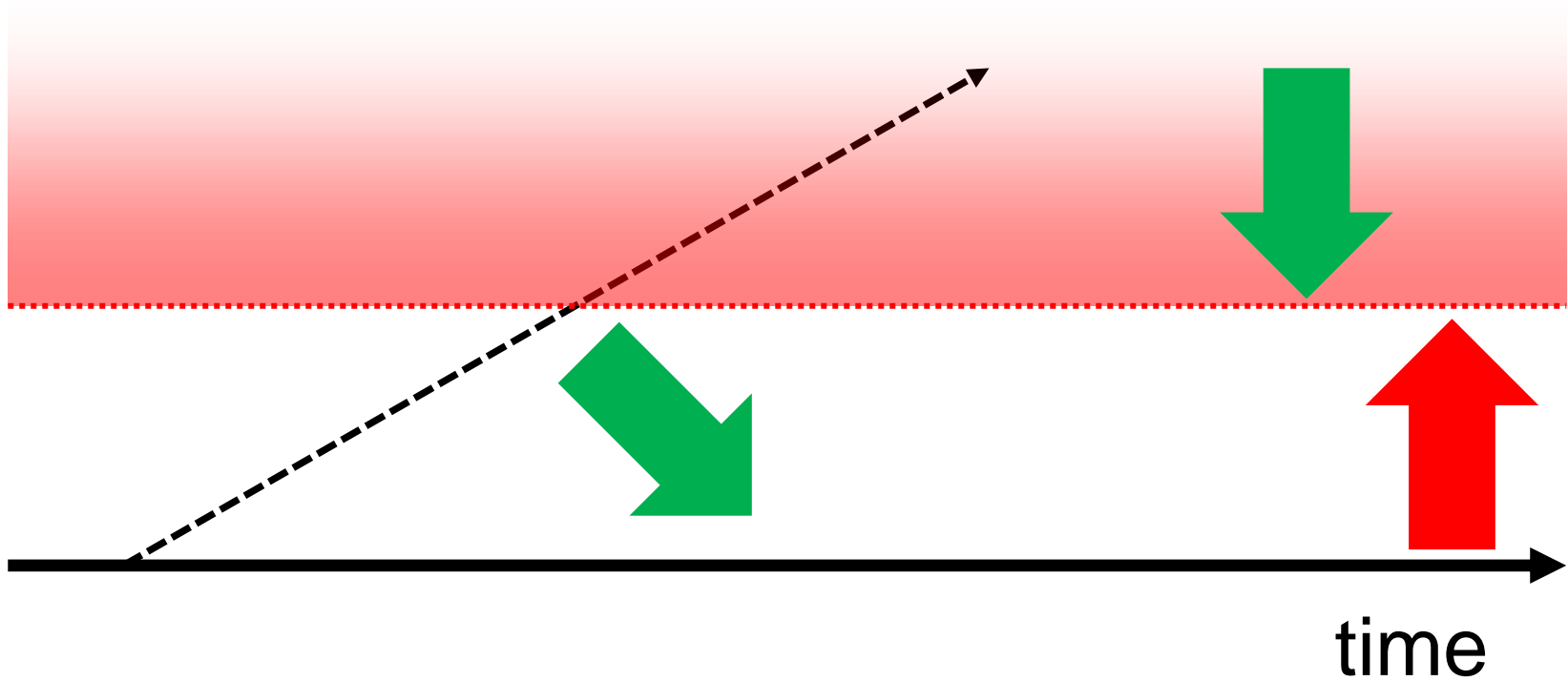
Project deviation



Project deviation



Project deviation



Project deviation

THE RELATIVE COST OF FIXING DEFECTS

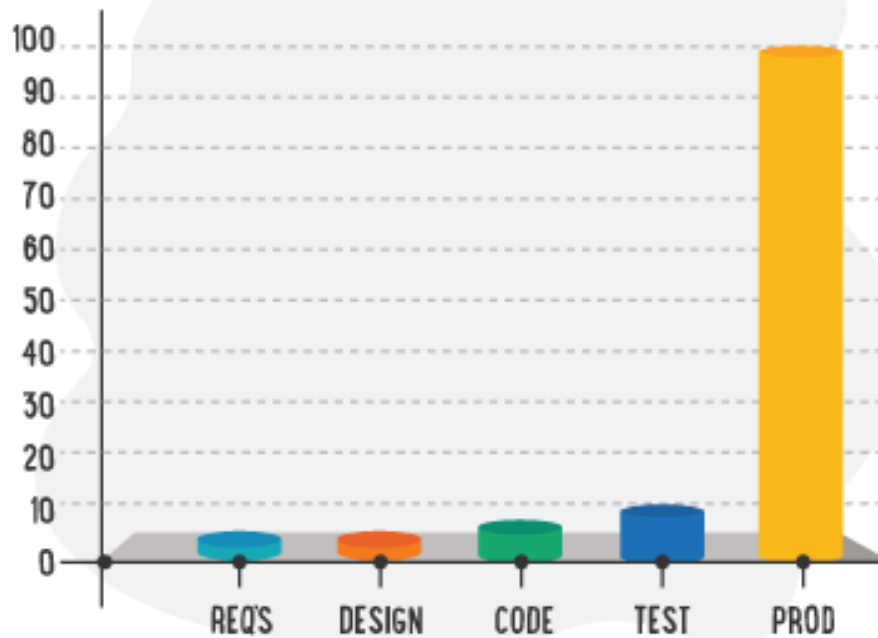
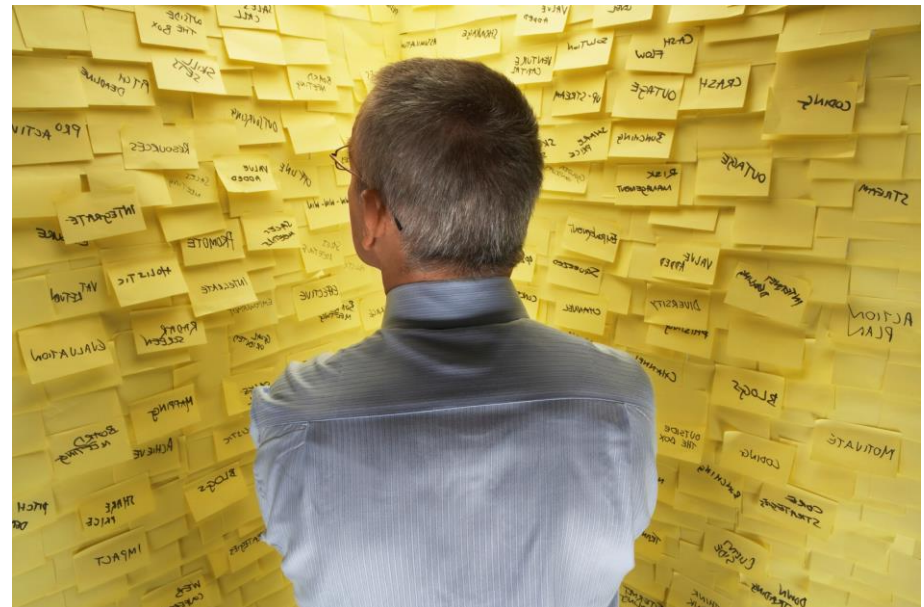


ILLUSTRATION BY SEGUE TECHNOLOGIES

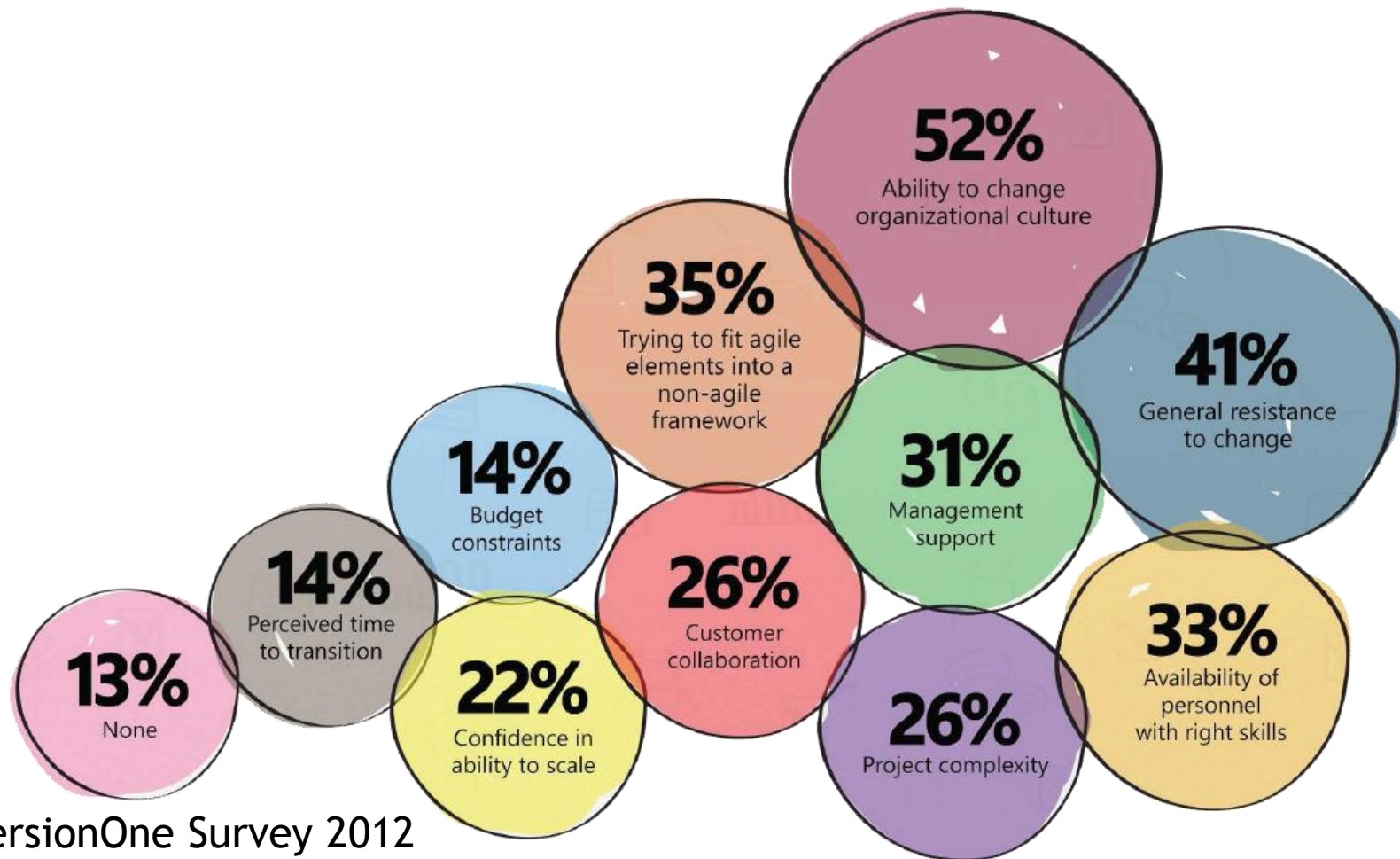
Fail fast
Learn fast

Three key messages for agile

- Communication within team is basis
[email, communicator, face to face meeting, minutes of meeting]
- Product owner is key role
[training, will to change mindset, non-waterfall approach]
- Retrospective quality is essential
[focus on improvements, focus on positives]



Barriers of agile adaptation



Quality-focused thinking

It is about mindset of the people

It is about cultural change

Positive results generate positive results

Start doing the quality already during **interviews**

[early detection, ability to solve difficult situations, creativity test]

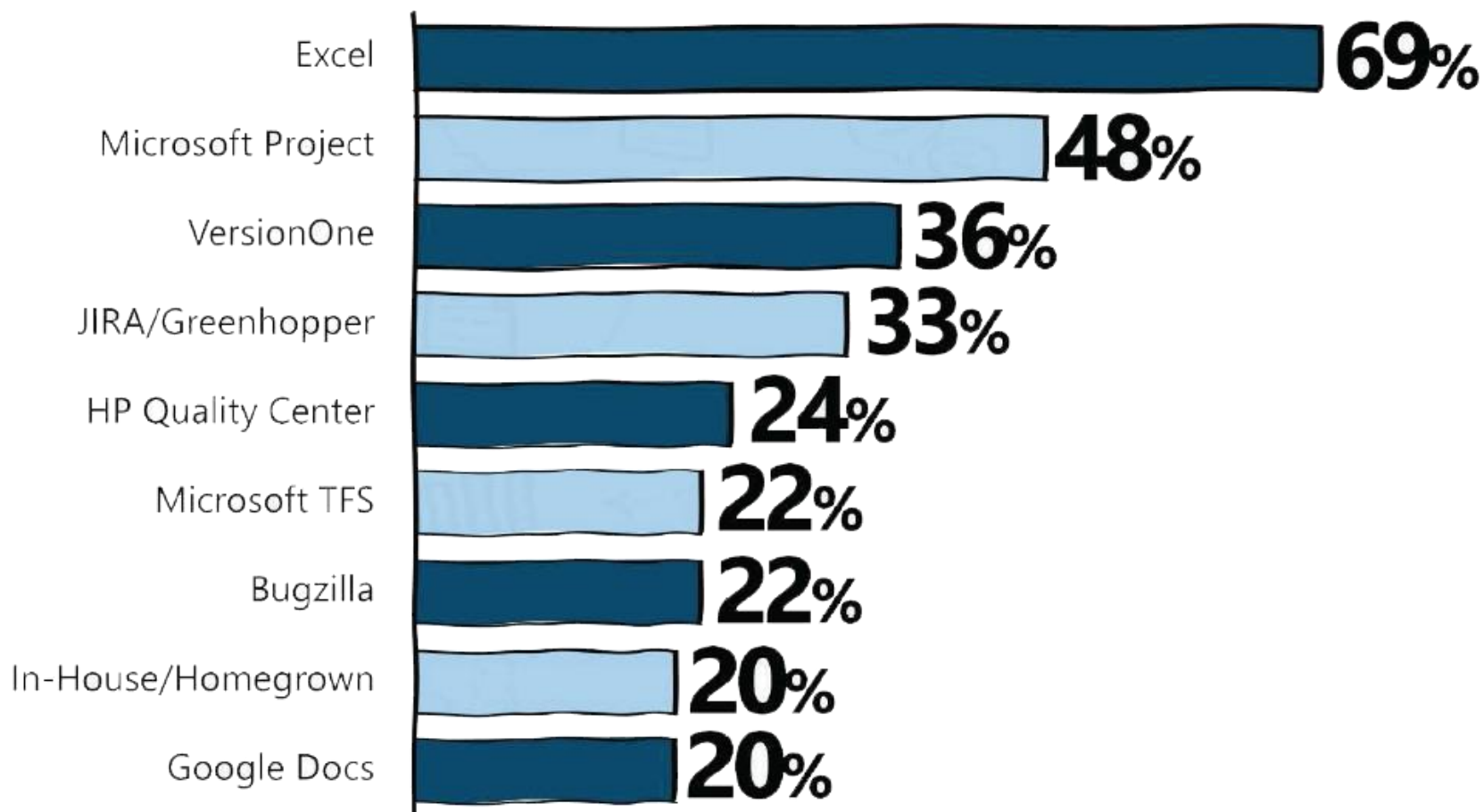
You have to **invest** into development of the people

*[one to one, coaching,
feedbacks]*





Barriers of agile adaptation



VersionOne Survey 2012



The truth is

We are lazy.

We will not repeat processes.

We want to improve.

We make errors, it is natural.

We fall ill time to time.

We may leave the project.





Realize human weaknesses



Do you have a new idea?
Does your idea work?
Automate it!

Automatic tests

- Can **not** tell you that you have not done a bug.
- Save time for developers.
- Save time for testers.
- Specially suitable for unit tests.
- Can be used to calculate test coverage.
- Advances motivation of testers.
- Maintenance of tests is needed.



Dashboards – SonarQube

Dashboards
Projects ▾
Measures
Issues
Quality Profiles
Log in
Search

Helicopter View

Activity

Java Projects

Javascript Projects

Languages Panel

TOOLS

Dependencies

Compare

Sonar as a Service
for your project with

All Projects

SQALE Rating

Technical Debt

29,020.1 days ↗

Lines of Code

11,320K ↗

All Projects

Issues

691,577 ↗

Technical Debt

29,020.1 days ↗

Issues Breakdown

- ❗ Blocker 4,639 ↗
- ⚠ Critical 36,665 ↗
- ⚠ Major 511,093 ↗
- ✔ Minor 126,617 ↗
- ℹ Info 12,563 ↗

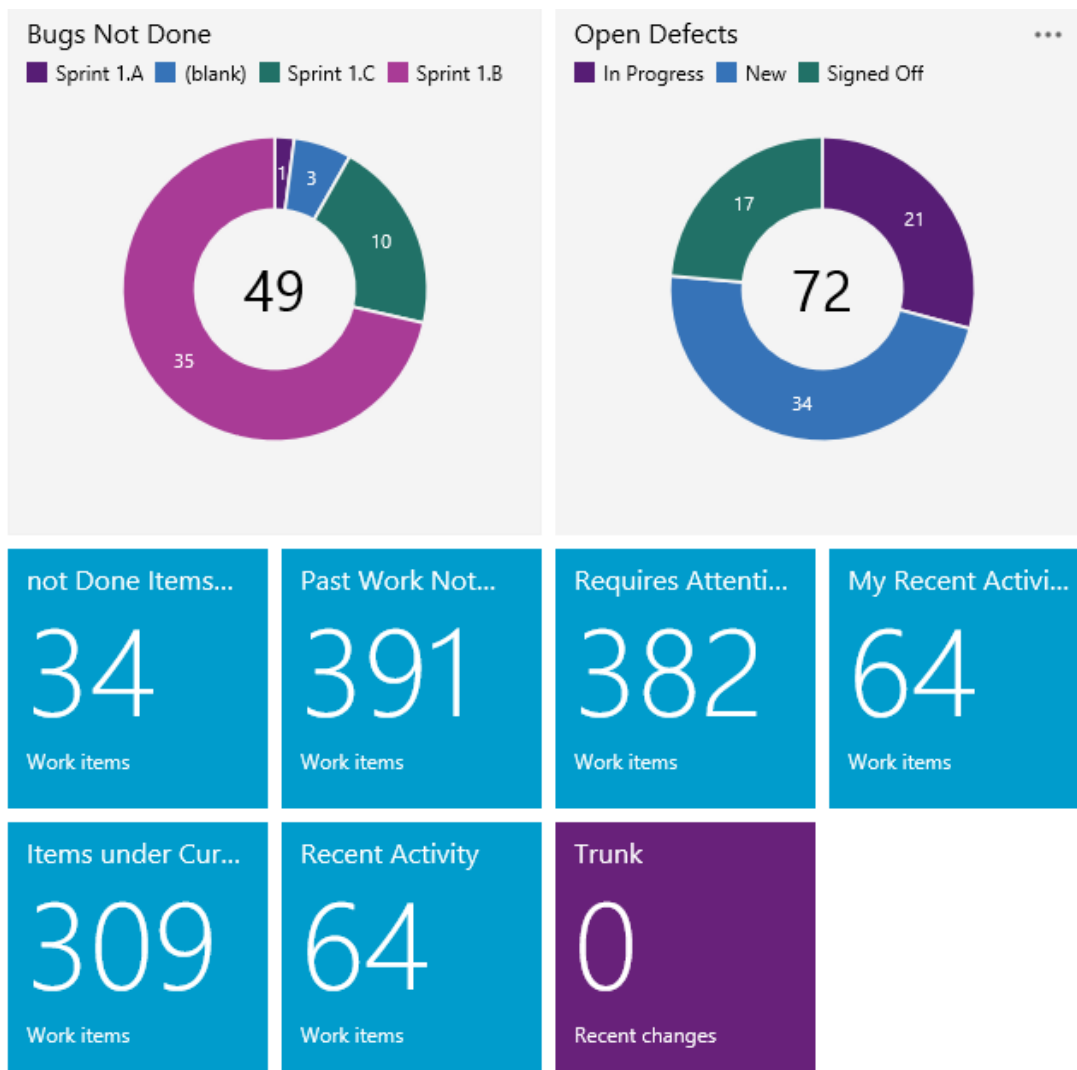
Forges

Name	LOCs ↗	SQALE Rating
Forges	7,669,626 ↗	
Apache	4,274,793 ↗	
Others	1,958,254 ↗	
JBoss	560,876	
Sourceforge	338,997 ↗	

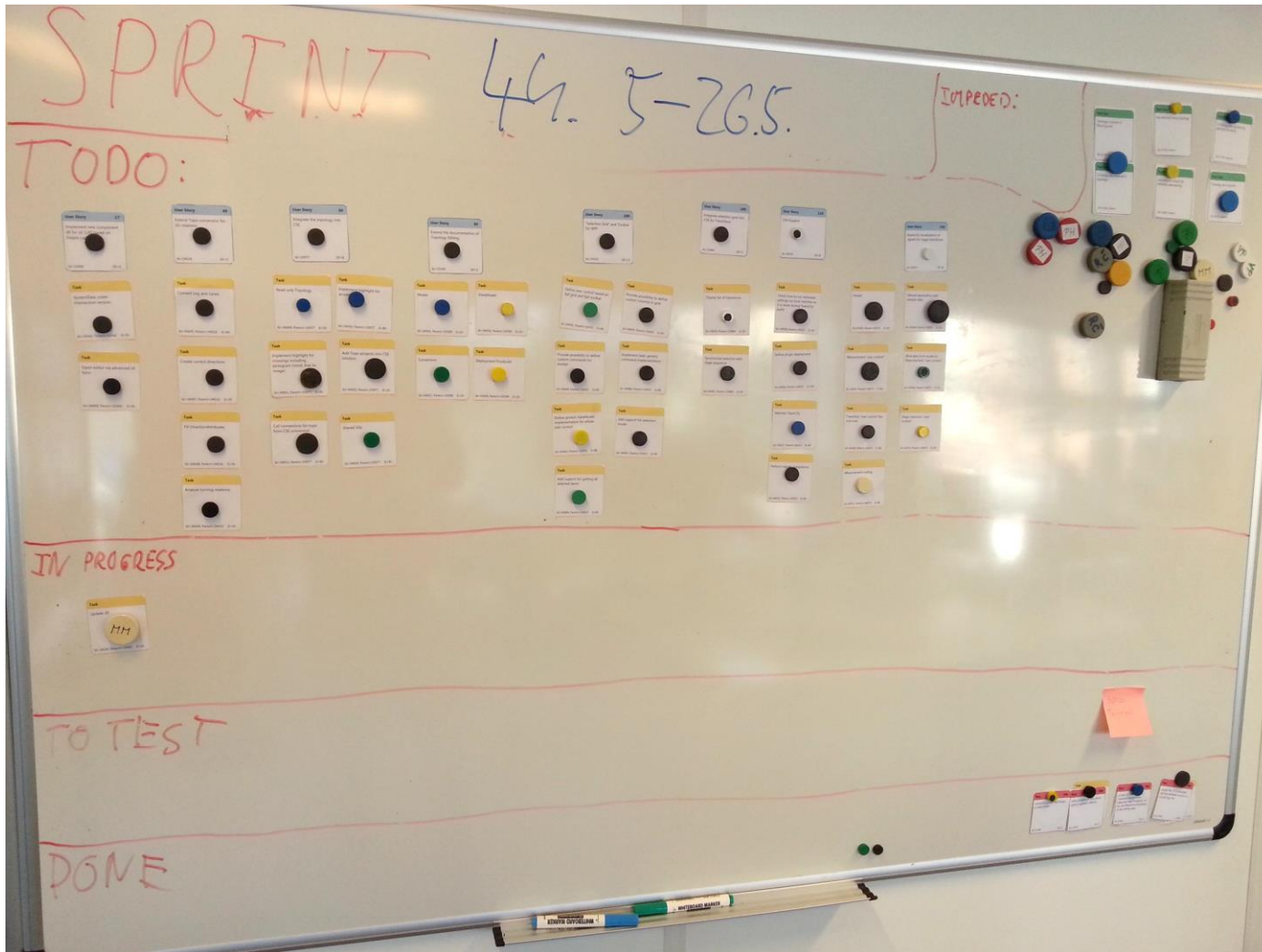
All Projects

Size: Lines of code Color: Rules compliance 0.0% 100.0%

Dashboards – Team Foundation Server



Dashboards - physical





Pair programming

It is expensive!



Is it expensive?



Code reviews

Search for errors

Share know how

Train in new members faster

Review architecture

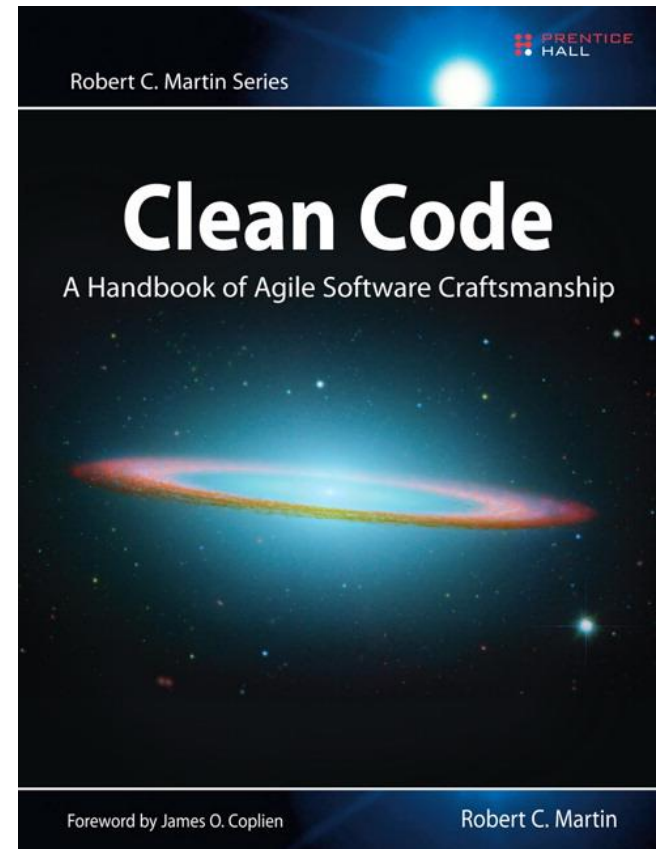
Make user interface review

Define common coding guidelines

Use dashboards statistics as input



[SitraffCommonCodingGuidelines_61.html](#)





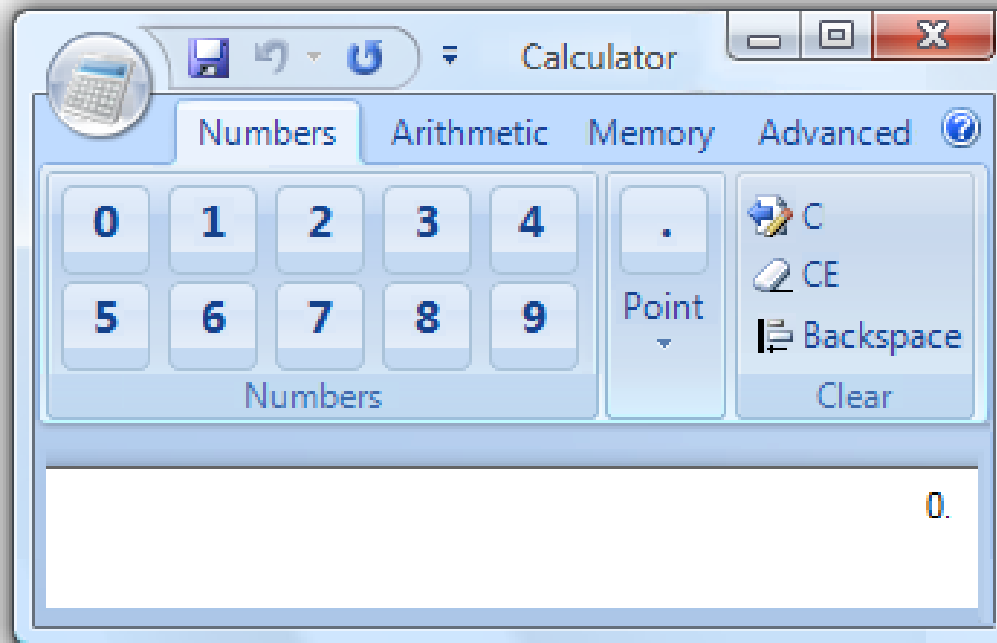
Code reviews

- ... software testing alone has limited effectiveness -- 25 – 45%
- ... effectiveness of design and code inspections are 55 and 60 percent.
- In a group of 11 programs developed by the same group of people, the first 5 were developed without reviews. The remaining 6 were developed with reviews. After all the programs were released to production, the first 5 had an average of **4.5 errors per 100 lines of code**. The 6 that had been inspected had an average of only **0.82 errors per 100**. Reviews cut the errors by over 80 percent.
- The Aetna Insurance Company **found 82 percent of the errors** in a program by using inspections and was able to decrease its development resources by 20 percent.
- A study of an organization at AT&T with more than 200 people reported a **14 percent increase** in productivity and a **90 percent decrease** in defects after the organization introduced reviews.

[link](#)

UI reviews

- It is the very same process as code review.
- Can be used to improve visual side of the product.
- It is good way to check that nothing is forgotten



UX testing

- Talk about emotions
- Measure time to complete a task



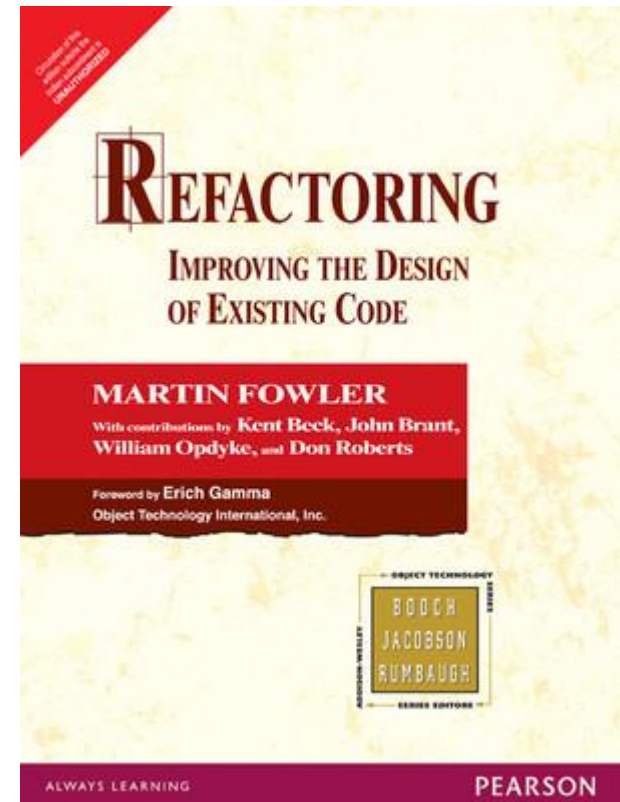
Code refactoring

Improve existing code

Set of techniques

You should have automated tests

You can use tools (e.g. ReSharper)





Code refactoring

```

1  /// <summary>
2  ///
3  /// </summary>
4  /// <param name="file">number of parts</param>
5  /// <param name="line">line number</param>
6  /// <returns></returns>
7  private string ExtractMethodBody(List<string> inputFile, int lineNumber)
8  {
9      List<string> methodBody = new List<string>();
10     int numberOfParenthesis = 0;
11     bool process = true;
12     int index = lineNumber + 1;
13     int state = 1;
14
15     while (process)
16     {
17         switch (state)
18         {
19             case 1:
20
21                 if (inputFile[index].Contains("{"))
22                 {
23                     methodBody.Add(inputFile[index - 1]);
24
25                     numberOfParenthesis++;
26                     state = 2;
27                 }
28                 else
29                 {
30                     process = false;
31                     break;
32                 }
33
34             case 2:
35                 if (inputFile[index].Contains("{"))
36                     numberOfParenthesis++;
37
38                 if (inputFile[index].Contains("}"))
39                     numberOfParenthesis--;
40
41                 if (numberOfParenthesis == 0)
42                     methodBody.Add(inputFile[index]);
43                 process = false;
44                 break;

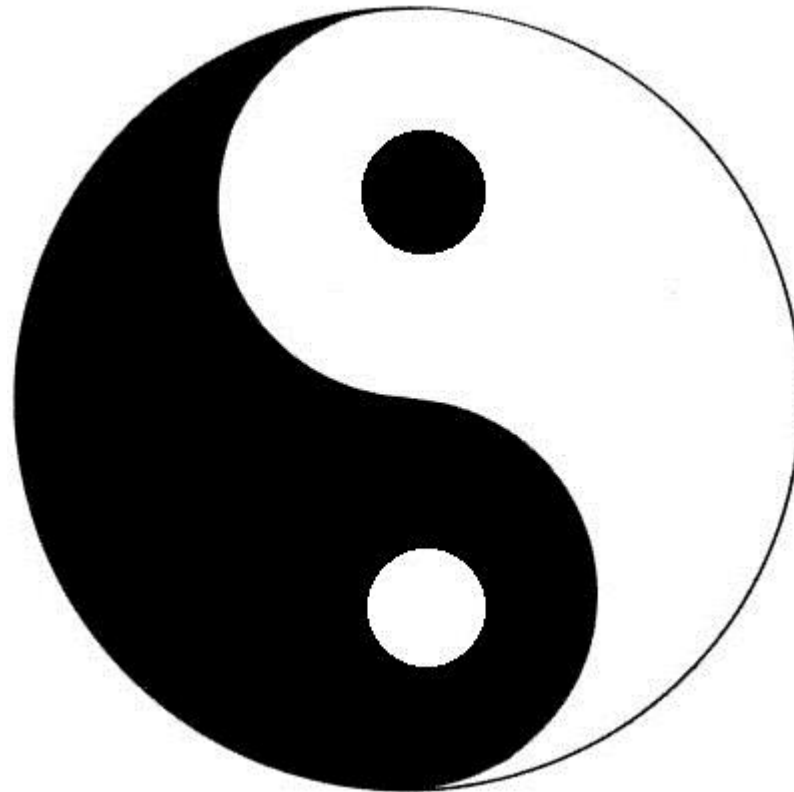
```

```

1  /// <summary>
2  /// Extracts method body from given list of lines from input file
3  /// </summary>
4  /// <param name="parsedLines">list of lines with potential method body</param>
5  /// <param name="lineIndex">method position in the given lines</param>
6  /// <returns>Methods body separated by new line characters</returns>
7  private string ExtractMethodBody(IList<string> parsedLines, int lineIndex)
8  {
9      _numberOfParenthesis = 0;
10     bool operationDone = false;
11     _state = States.EmptyInput;
12     var methodBody = new List<string>();
13
14     while (!operationDone)
15     {
16         switch (_state)
17         {
18             case States.EmptyInput:
19                 ProcessEmptyLines(parsedLines, lineIndex, methodBody);
20                 break;
21
22             case States.MethodBody:
23                 AdjustParenthesisCount(parsedLines, lineIndex);
24                 AddLineToBody(parsedLines, lineIndex, methodBody);
25                 operationDone = true;
26                 break;
27         }
28     }

```


ISO and CMMI



Feedback form



surveyMonkey.com/r/J3BTG6V

Contact



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