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Quality Audit in SCRUM-project
or
Continuous Improvement of Continuous Integration

Nadezhda Evstifeeva, Alexander Babkin



ARRIS Group Inc.

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ARRIS Group Inc.

- Motorola Home, former division of Google, is part of the ARRIS since 2013.
- The world leader in the development of solutions for digital TV.
- Produces set-top boxes for digital TV, equipment for cable system operators and IP TV, and broadband access devices.

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Quality Engineer



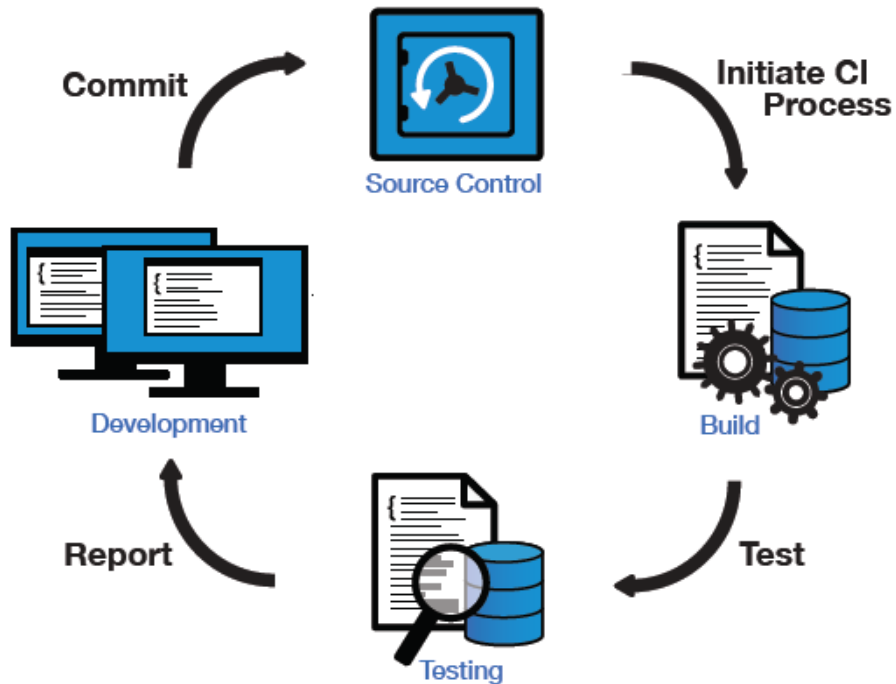
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Alexander Babkin
Quality Manager



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Project context



- Distributed development teams following Agile.
- Everybody commits changes to one Trunk.
- Multiple commits daily.
- Control of build states of Jenkins on a board (red, yellow, green).

Keep Jenkins Green!

Даешь

Зеленый

Дженкинс!



Keep Jenkins Green!

Даешь

Зеленый

Дженкинс!



- If Jenkins is **yellow** or **red** do not commit your code.

Keep Jenkins Green!

Даешь

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- If Jenkins is **yellow** or **red** do not commit your code.
- Commit a fixed solution or revert **failed builds** within 15 minutes.

Keep Jenkins Green!

Даешь

Зеленый

Дженкинс!



- If Jenkins is **yellow** or **red** do not commit your code.
- Commit a fixed solution or revert **failed builds** within 15 minutes.
- Contact CI support if you suspect something is **wrong**.

What's the problem?

What's the problem?

New team
New process
New product



What's the problem?

New team
New process
New product

Red Jenkins
blocking the
work of other
teams



What's the problem?



What's the problem?

New team
New process
New product

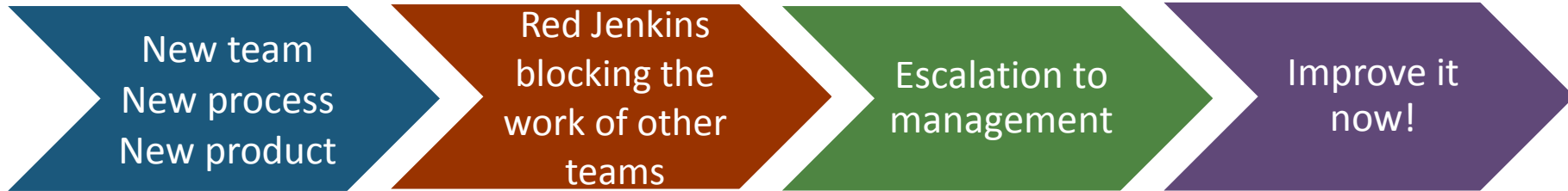
Red Jenkins
blocking the
work of other
teams

Escalation to
management

Improve it
now!



What's the problem?



- How to avoid the problems blocking the work of other teams?

What's the problem?



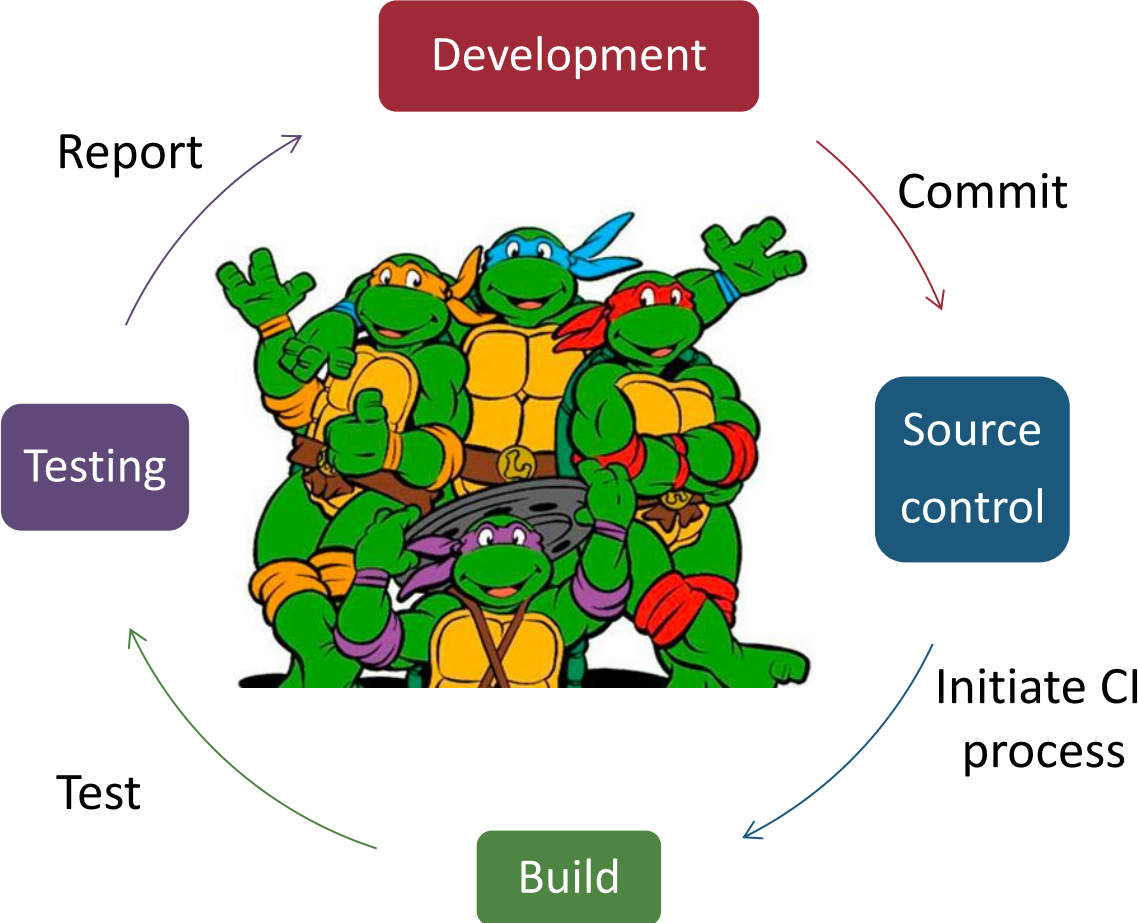
- How to avoid the problems blocking the work of other teams?
- How to sustain the green monitor?

What's the problem?

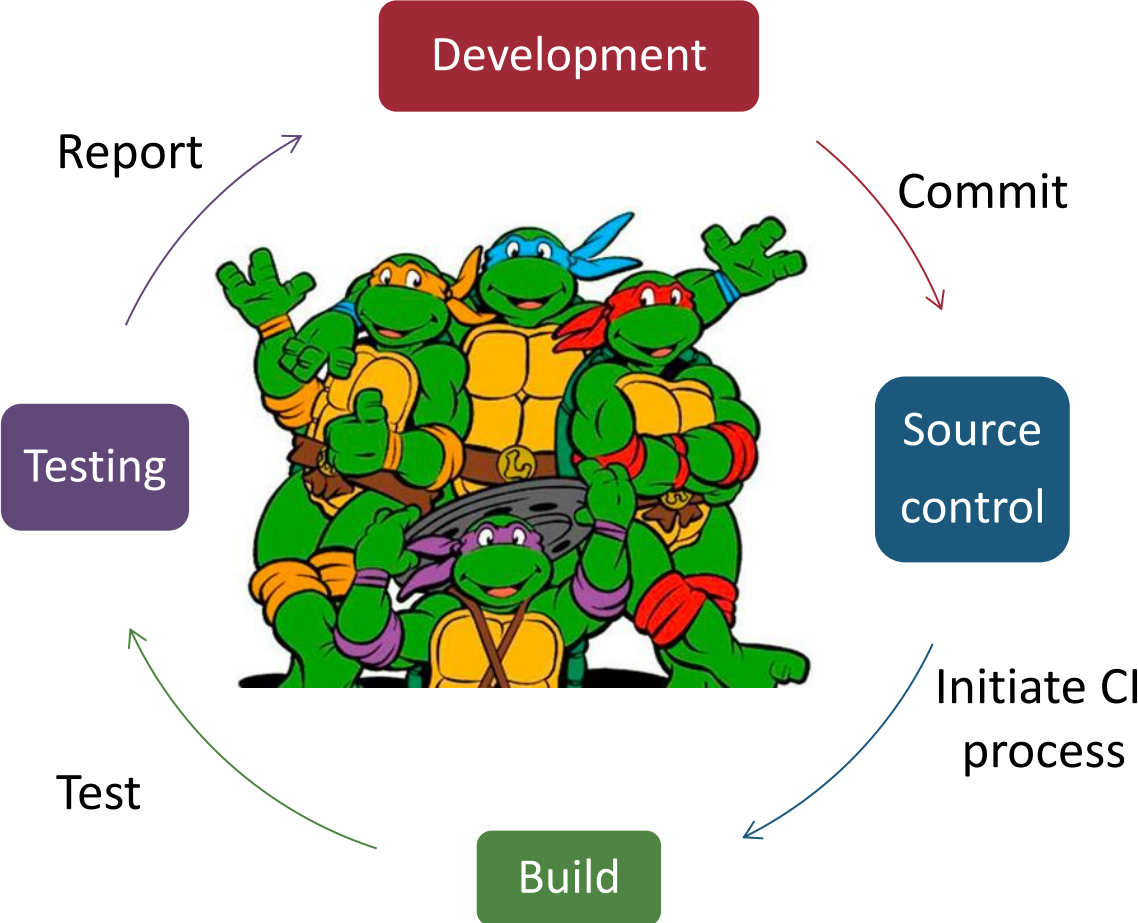


- How to avoid the problems blocking the work of other teams?
- How to sustain the green monitor?
- ... and finally how to «calm down» the senior management?

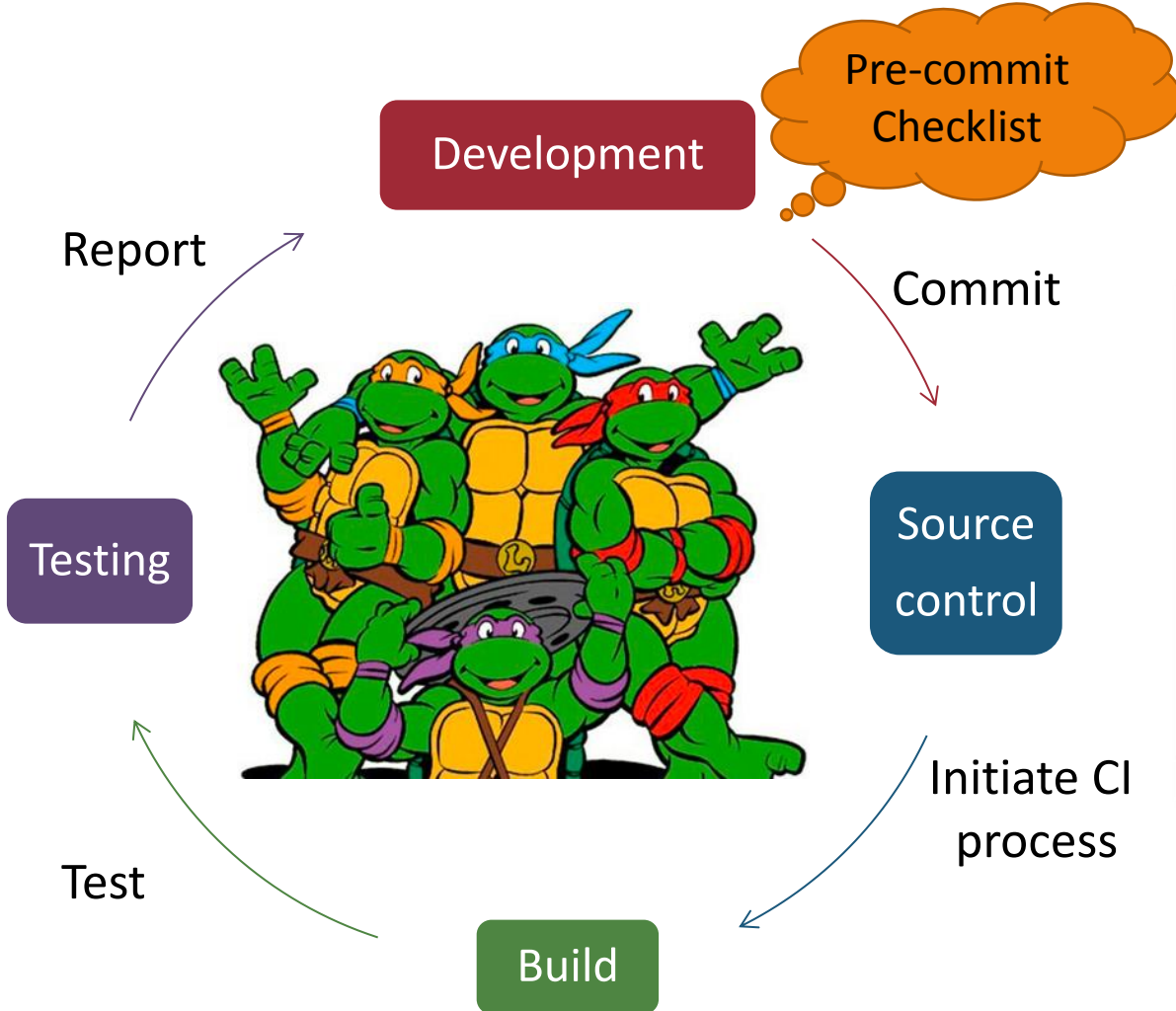
Improvements of the process



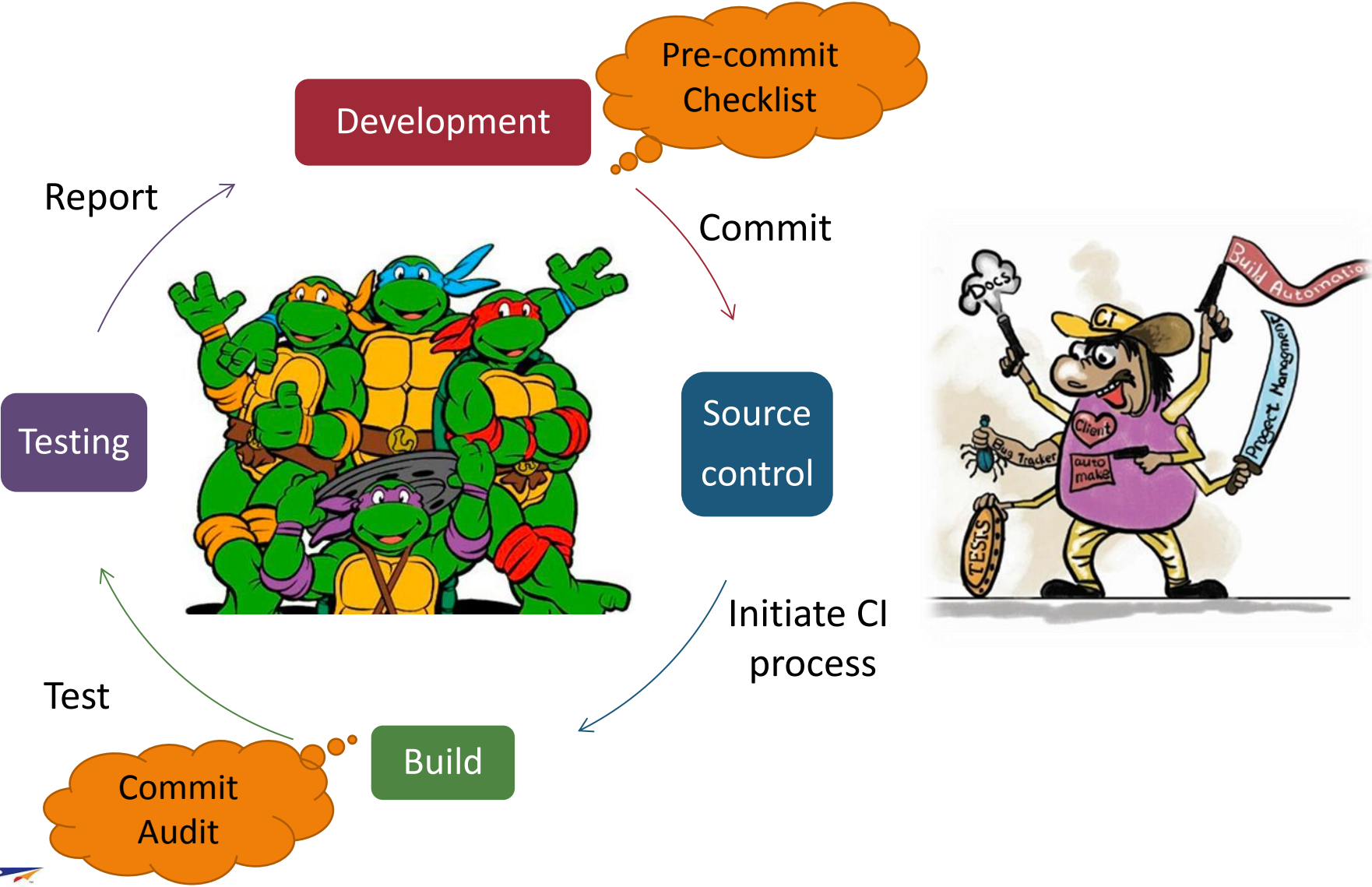
Improvements of the process



Improvements of the process

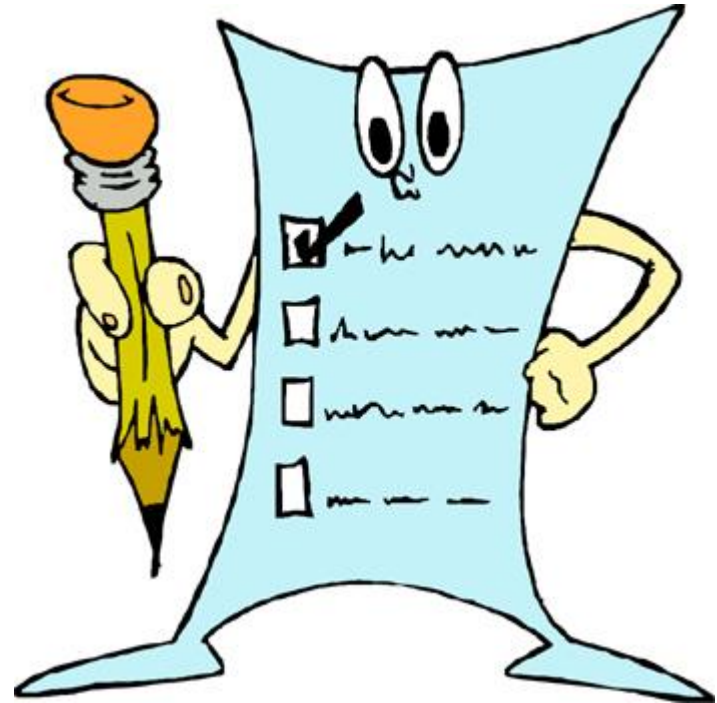


Improvements of the process



Pre-Commit Checklist

- List of items to be checked before commit is done.
- Pre-commit checklist was partly automated.
- Printed checklists were hanged at each work place.



Example of Pre-commit Checklist

Pre-commit checklist

- 1) Code should have unit tests?
- 2) All texts should be translatable and available in English and Swedish?
- 3) Long/high texts?
- ...



Example of Pre-commit Checklist

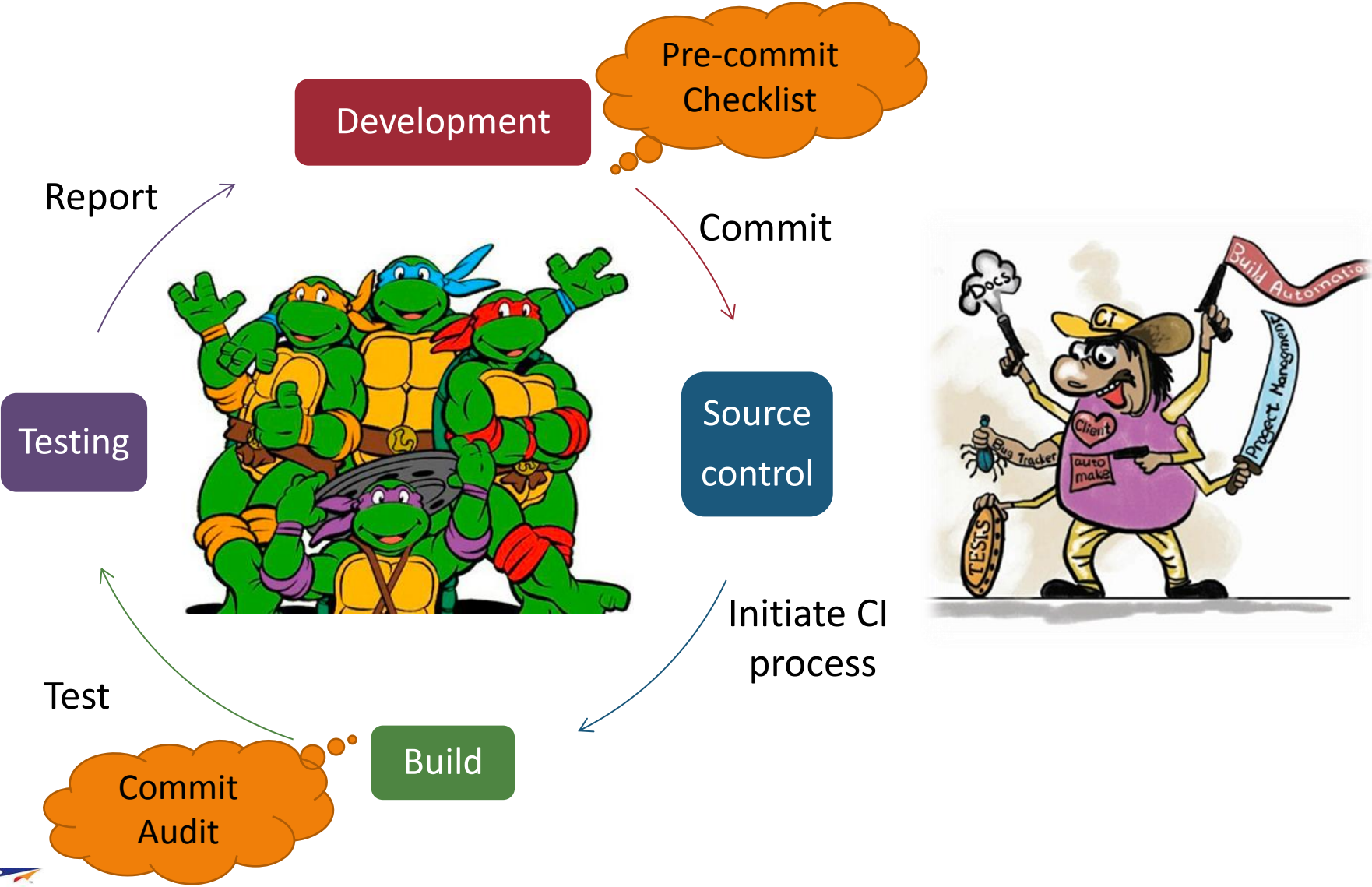
Pre-commit checklist

- 1) Code should have unit tests?
- 2) All texts should be translatable and available in English and Swedish?
- 3) Long/high texts?
- ...

- Running unit tests
- Checking style
- Static analysis



Improvements of the process



Commits Audit

Commits Audit

Select failed commit(s)

Preliminary analysis

Define «our fault» commits

Root Cause Analysis (RCA) of «red builds»

Improvements

Metrics

SCRUM master



Test Leader



Quality Engineer



Reasons of “Red” builds appearance

Reasons of “Red” builds appearance



Reasons of “Red” builds appearance



The specific implementation of target
DBMSs and platforms

Reasons of “Red” builds appearance



The specific implementation of target
DBMSs and platforms



Reasons of “Red” builds appearance



The specific implementation of target DBMSs and platforms



The differences between environment settings

Reasons of “Red” builds appearance



The specific implementation of target DBMSs and platforms



The differences between environment settings



Jenkins

≠ **debugger**

Reasons of “Red” builds appearance



The specific implementation of target DBMSs and platforms



The differences between environment settings



Jenkins

≠ **debugger**

Incorrect use of Jenkins

Reasons of “Red” builds appearance



The specific implementation of target DBMSs and platforms



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The differences between environment settings



Jenkins

≠ debugger

Incorrect use of Jenkins



The human factor

Continuous Improvements: Corrective & Preventive actions

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Continuous Improvements: Corrective & Preventive actions

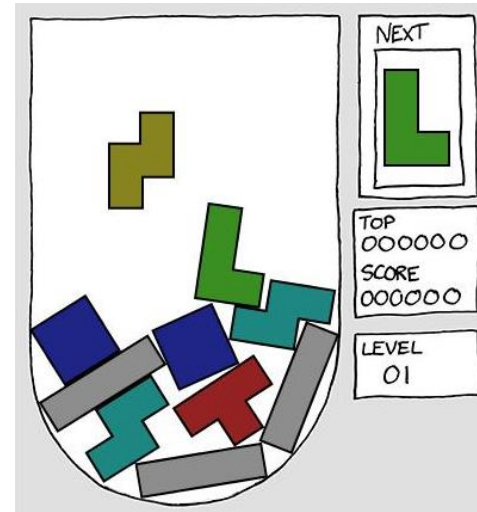


Additional training for team members

Continuous Improvements: Corrective & Preventive actions



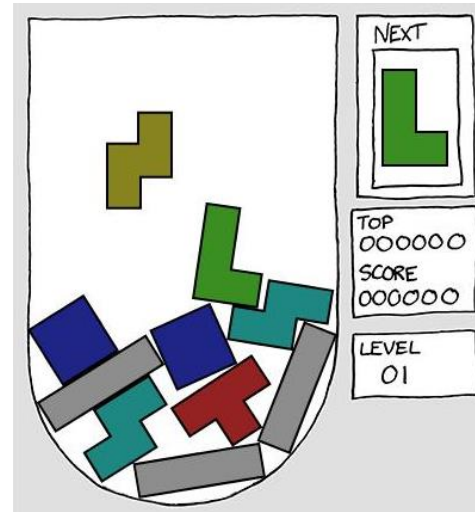
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Continuous Improvements: Corrective & Preventive actions



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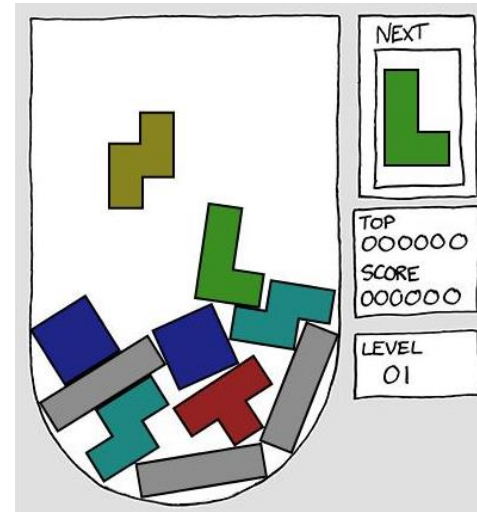


Addition of new items to
Pre-Commit Checklist

Continuous Improvements: Corrective & Preventive actions



Additional training for team members



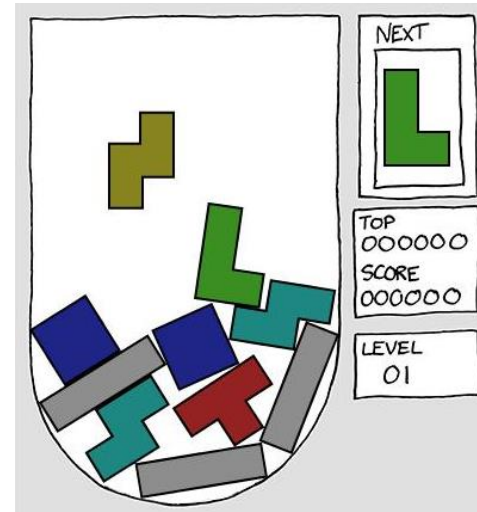
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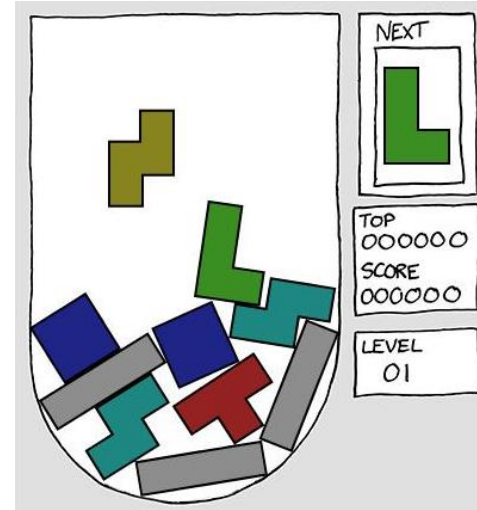


Involvement of the architect in Code
Review at the stage of Pre-Commit

Continuous Improvements: Corrective & Preventive actions



Additional training for team members



Addition of new items to
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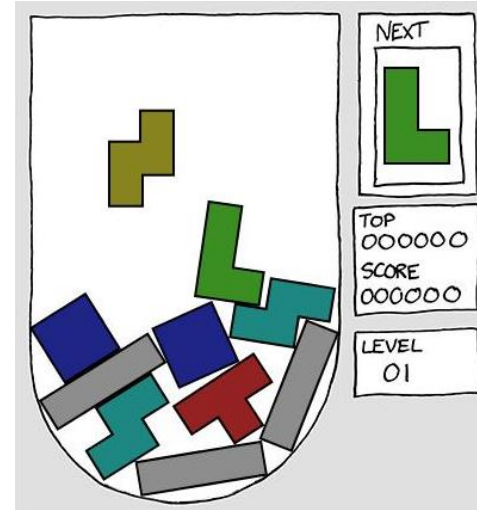
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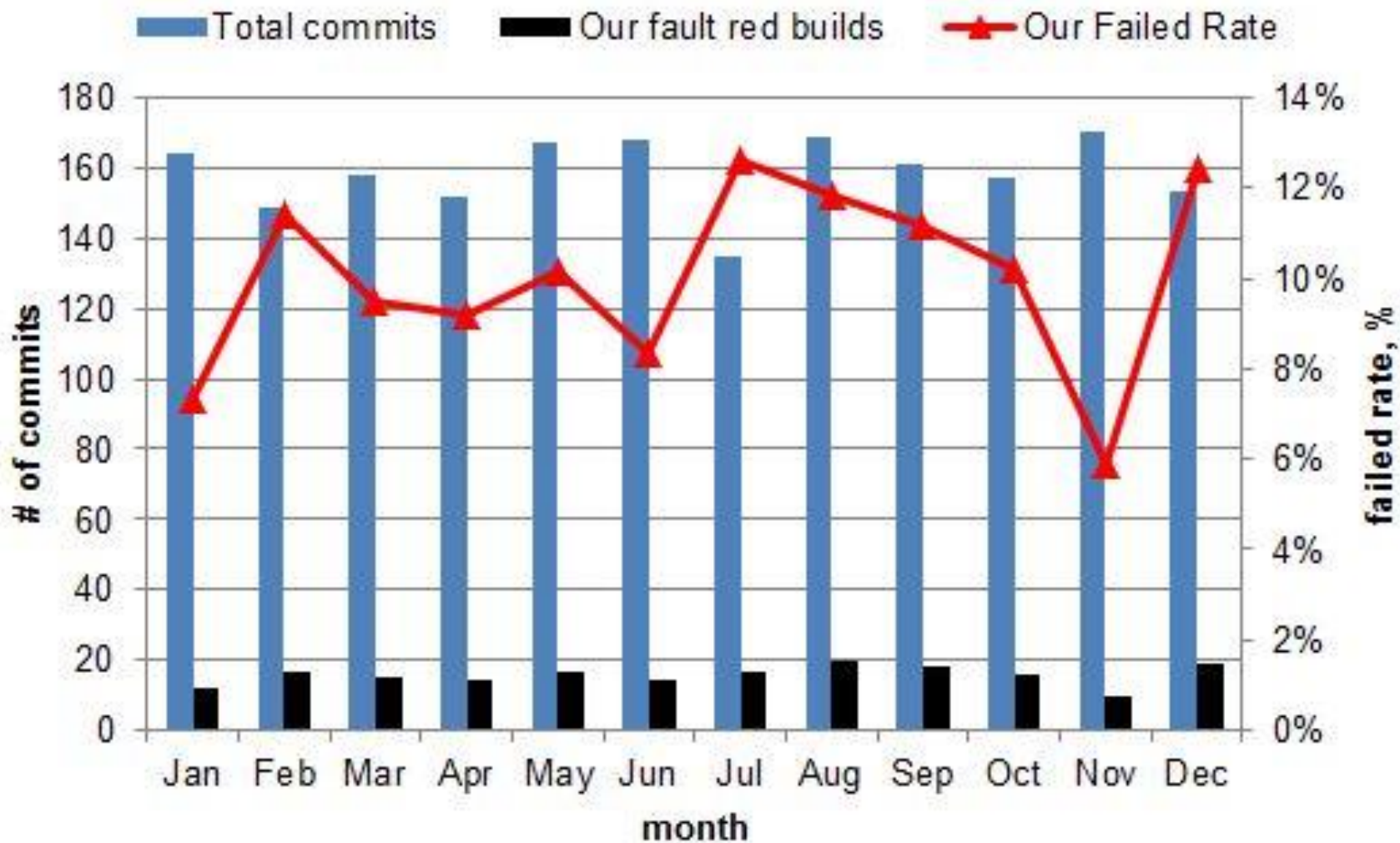
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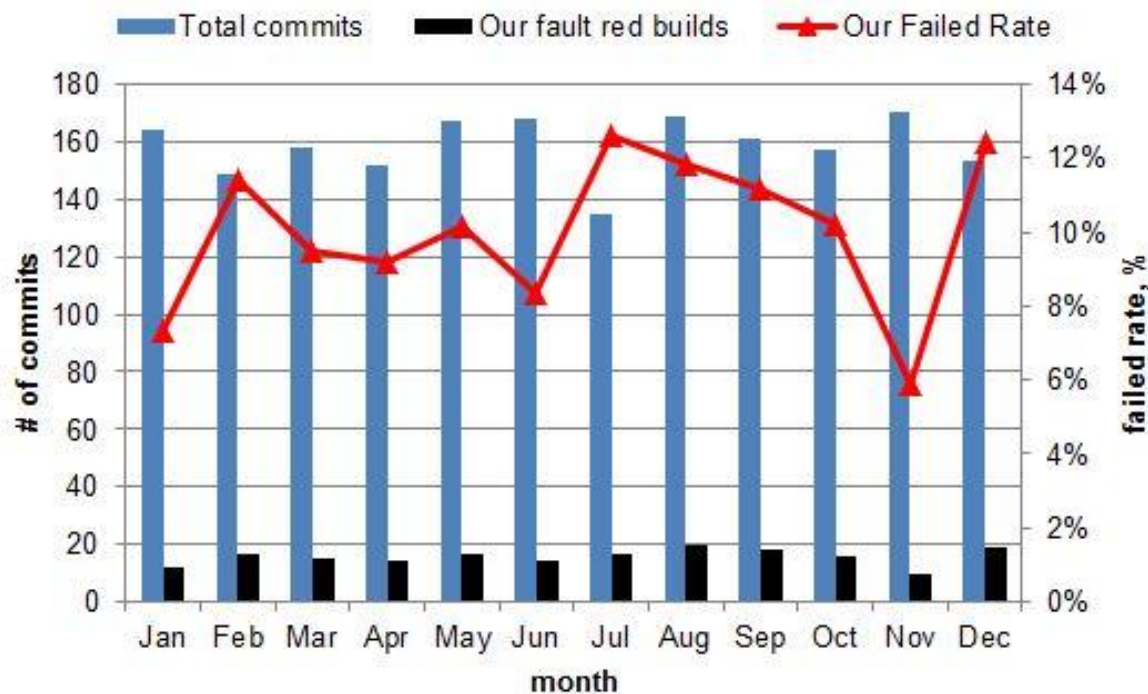
«Violator» coaching

Exapmle of Commmits Metrics

Example of Commits Metrics



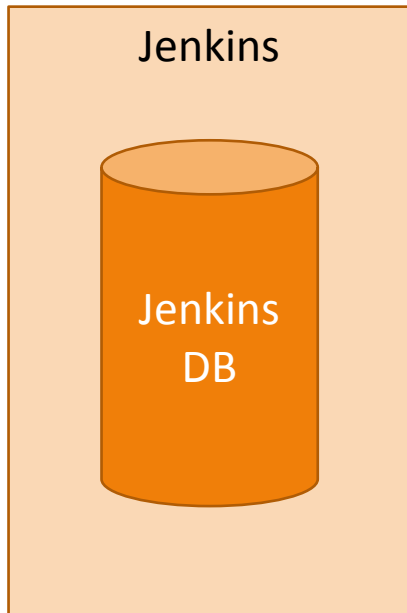
Example of Commits Metrics



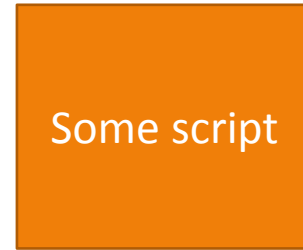
Limits, min	
Green	< 15
Yellow	> 15 to 30
Red	> 30

Automated Tool

1-2
days



- Team name
- Start date
- End date



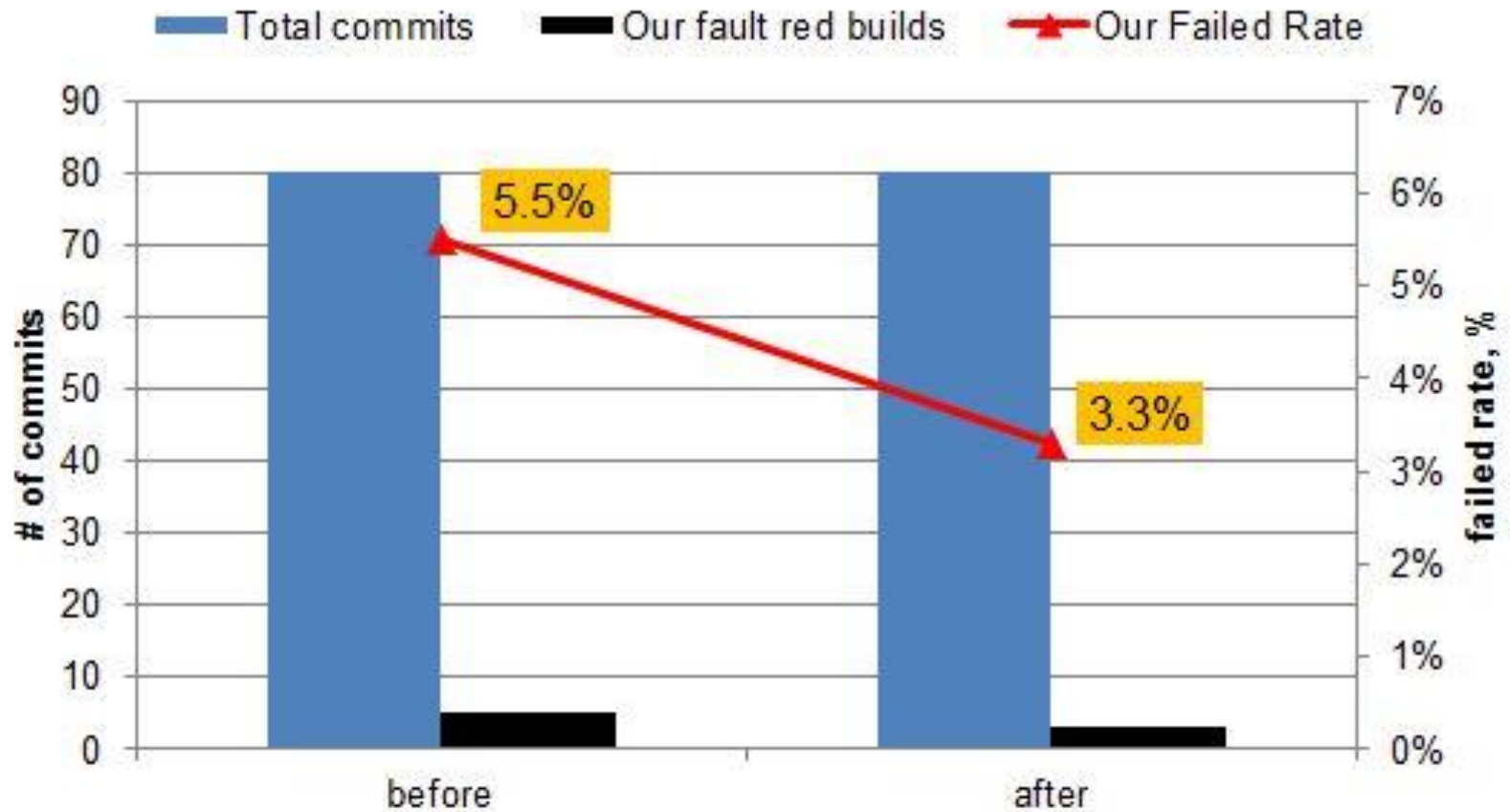
- Number of commit
- Author
- Date
- List of builds with statuses

Exapmle of Commit Audit Report

Revision Number	Author	Date	Builds	
			Job Name	Job ID
176939	Ivan Ivanov	9/9/2013	job name xxxxxx01	2719
			job name xxxxxx07	3323
			job name xxxxxx358	2194
			job name xxxxxxxx3	740
			job name xxxxxxxx8	150
181120	Petr Petrov	9/12/2013	job name xxxxxx155	76
			job name xxxxxx39	113
			job name xxxxxxxx4	64
			job name xxxxxx120	41
			job name xxxxxxxx9	2811

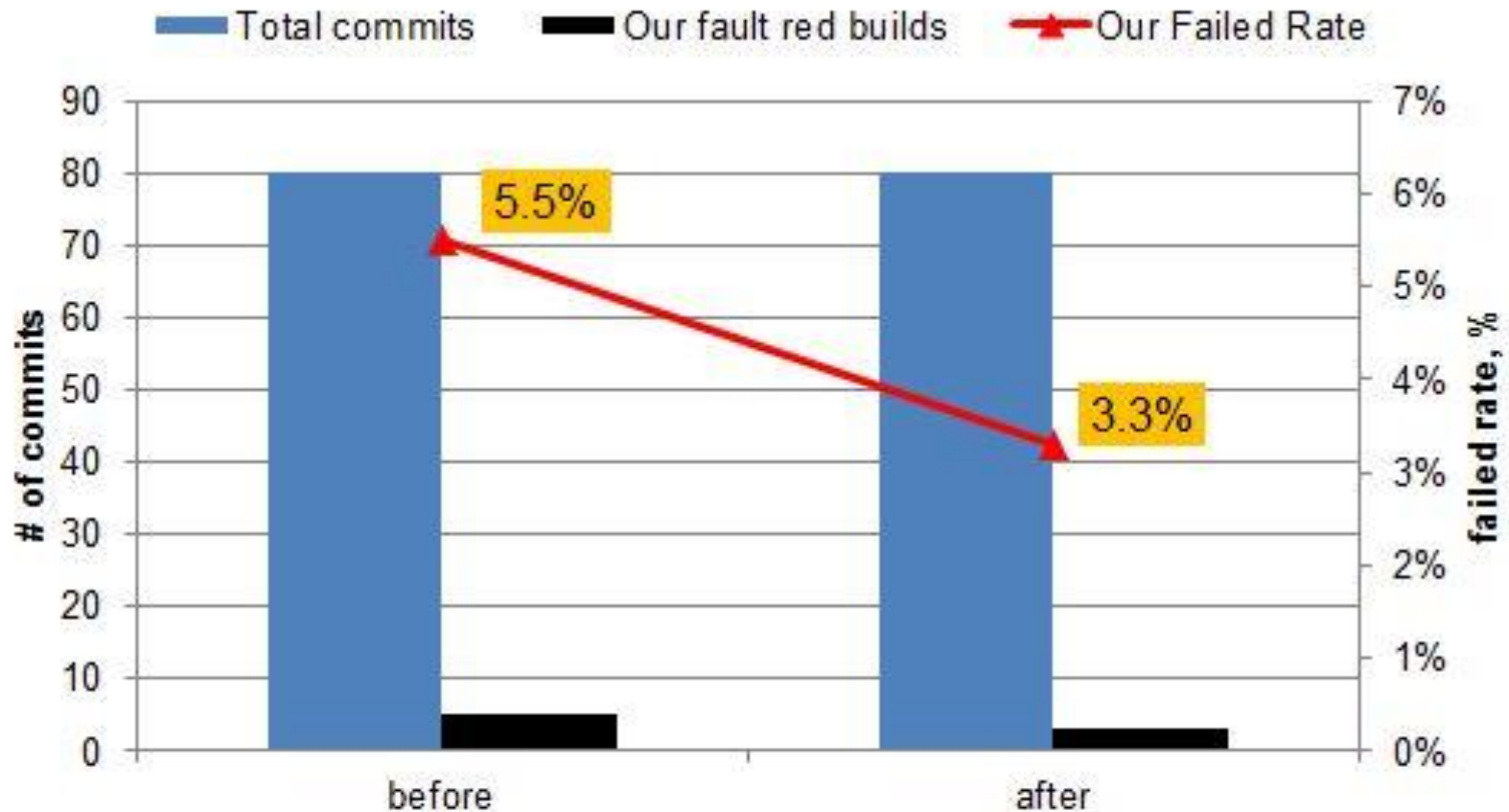
Summary

Commits metric



Summary

Commits metric



- ~ 3-x reduction of “blocked time” over 3 month.
- Now only single cases of “red commits”.

Summary



Summary



Summary



Summary



Thank you!
Questions?