



**Cloud Corridor**  
GUIDING BUSINESSES TO THE CLOUD

## Continuous Integration

What you (probably) don't know and why you should care?



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# Who am I?

## Lukasz Rybka



UNIVERSITY OF GDANSK

Co-lecturer  
(2014)



POLISH-JAPANESE  
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Co-lecturer  
(2015)



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Software Architect  
(2017)

+ Physicist by education

+ With IT industry for 10+ years



# Agenda

// Continuous Integration – what it is and what it's not?

// What kind of problems does it solve?

// How to apply the rules of CI to your day-to-day development life?

// Continuous Integration servers – what are these for?

// Patterns and anti-patterns of working with teams

// I know CI – what's next for me?



# Disclaimer

// Have a question? Please ask! 😊

// Slides are for me to navigate through the presentation, not much of a value to the audience in them.

// Everything I say is opinionated

// Truly sorry for my English, I'm not a native speaker



# Question



**Who has non-academic experience?**

# Question



**Who has commercial experience?**

# Question



Who knows Agile and Scrum methodologies?



# Agile Manifesto

Manifesto for Agile Software Dev.

- INDIVIDUALS AND INTERACTIONS OVER PROCESSES AND TOOLS
- WORKING SOFTWARE OVER COMPREHENSIVE DOCUMENTATION
- CUSTOMER COLLABORATION OVER CONTRACT NEGOTIATION
- RESPONDING TO CHANGE OVER FOLLOWING A PLAN



# Motivation

*„A man who dares to waste one hour of time has not discovered the value of life”*

Charles Darwin



# Motivation

*„I choose a lazy person to do a hard job. Because a lazy person will find an easy way to do it.”*

Bill Gates



# A bit of history...

„The New New Product Development Game” (Scrum)

„Extreme Programming explained: Embrace Change”

Agile Manifesto

1986

March 1996

1999

February 2000

February 2001

February 2011

Chrysler Comprehensive Compensation System (Kent Beck)

End of C3 System

Jenkins CI



# Common Misconception

## Continuous Integration: Its History and Benefits

This post provides an overview of the origins and basic methodologies of continuous integration for those who might not be familiar.



by Soumyajit Basu · MVB · May. 23, 17 · DevOps Zone · Opinion

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“Continuous Integration,” or “CI” for short, is a concept which has been taken as a standard nowadays within our IT services and development. The concept of continuous integration means automating the overall deployment process for an application after a code has been committed. It helps in reducing bugs in the deployment process. Besides this, it also helps in reducing complexity within the code and increases clarity in each module.



# Other incorrect definitions

// „Tool for running unit tests”

// „Tool for deploying newest changes to development and production environments”

// „Tool for static code analysis”

// „Tool for preparing binary distribution of our product”



# What it actually is?

// Originated in Extreme Programming (XP)

// Practice in software engineering

// Assumes frequent integrations next, smaller changes in code with main development branch

// Commonly teams assumes multiple integrations per day, about 1 integration per programmer each day



# What are the benefits

- // Avoiding „merging hell”
- // Helps to quickly catch architectural errors
- // Makes conversation between development team and product owner a lot easier
- // Introduces new, more efficient and standarized process for working with tasks



# Example task/issue





# Example task/issue

A screenshot of an Amazon product page for the Echo Spot - White. The page shows the device on a white surface next to some greenery. The main title is "Echo Spot - White" by Amazon, with a 4.5-star rating and 5,541 reviews. The price is \$129.99, with a note about a \$40 discount for buying two. The item is in stock but not shipped from Amazon's warehouse. A callout at the bottom left says, "Alexa, show me the front door." To the right, there's a sidebar with sharing options, a quantity selector (set to 1), an "Add to Cart" button, and a "Turn on 1-Click ordering for this browser" link. A gift-wrapping option is available. A list of related items is shown, along with a "Deliver to Lukasz - Gdynia 81-261" link and an "Add to List" button. At the bottom, there's a "Sell yours for a Gift Card" section and a "Trade in now" button.

*"Alexa, show me the front door."*

amazon.com

Shop school supplies

Echo & Alexa

Designed around your voice

See Echo and Alexa Family ▾

Echo Dot \$49.99

Echo \$99.99

Echo Plus \$164.98 \$99.99

Echo Dot Kids Edition \$79.99

Echo Spot \$129.99

Echo Show \$229.99 \$129.99

Echo Look \$199.99 \$119.99

Share Email Facebook Twitter 26K+ Shares

Qty: 1

Add to Cart

Turn on 1-Click ordering for this browser

This item does not ship to Gdynia, Poland. Please check other sellers who may ship internationally. Learn more

Ships from and sold by Amazon Digital Services LLC. Gift-wrap available.

Color: White

Configuration: Echo Spot

Echo Spot Echo Spot + Amazon Cloud Cam Echo Spot + LIFX Smart Bulb

Echo Spot is designed to fit anywhere in your home. Use 2nd generation far-field voice recognition to watch video flash briefings, see music lyrics, weather forecasts, to-do and shopping lists, browse and listen to Audible audiobooks, and more. All hands-free—just ask.

Echo Spot connects to Alexa, a cloud-based voice service to play music, read the news, answer questions, set music alarms, control smart home, and more.

Just ask to play a song, artist, or genre, and see lyrics with Amazon Music. Also, stream music and books from Pandora, Spotify, Tidal, iHeartRadio, and Audible.

Use the built-in speaker or connect to speakers through Bluetooth or 3.5 mm stereo cable. With multi-room music, you can play music on your Echo devices in different rooms. Adjust the treble, mid, and bass levels with your voice.

Ask Alexa to turn on your lights, show baby monitors and front door cameras, and lock your doors. Plus, control your thermostats, garage doors, sprinklers, and more.

Call almost anyone hands-free, or make video calls to family and friends with an Echo Spot, Echo Show, or the Alexa App. Instantly connect to other Echo devices around your home.

With tens of thousands of skills, Alexa is always getting smarter and adding new features. Just ask Alexa to control your TV, request an Uber, order a pizza, and more.

Jump to: Camera devices | Technical details

Sell yours for a Gift Card  
We'll buy it for up to \$30.00  
Learn More

Trade in now



# Example task/issue

**Shopping Cart**

		Price	Quantity
 <b>Fire TV Cube   Hands-Free with Alexa and 4K Ultra HD   Streaming Media Player</b> <small>In Stock</small> Eligible for FREE Shipping <input type="checkbox"/> This is a gift <a href="#">Learn more</a> <a href="#">Delete</a>   <a href="#">Save for later</a>	\$119.99	<input type="button" value="1"/>	
 <b>AmazonBasics High-Speed HDMI Cable, 3 Feet, 1-Pack</b> <small>In Stock</small> Eligible for FREE Shipping <input type="checkbox"/> This is a gift <a href="#">Learn more</a> <a href="#">Delete</a>   <a href="#">Save for later</a>	\$5.99	<input type="button" value="1"/>	
 <b>Echo Spot - White</b> <small>In Stock</small> Eligible for FREE Shipping <input type="checkbox"/> This is a gift <a href="#">Learn more</a> <a href="#">Delete</a>   <a href="#">Save for later</a>	\$129.99	<input type="button" value="1"/>	
<b>Subtotal (3 items): \$255.97</b>			



# Typical questions from management



„How long will it take?”

„When can I see it?”

„We only asked for one checkbox, why do you  
need 3 weeks for it?”



# „Continuous” Approach





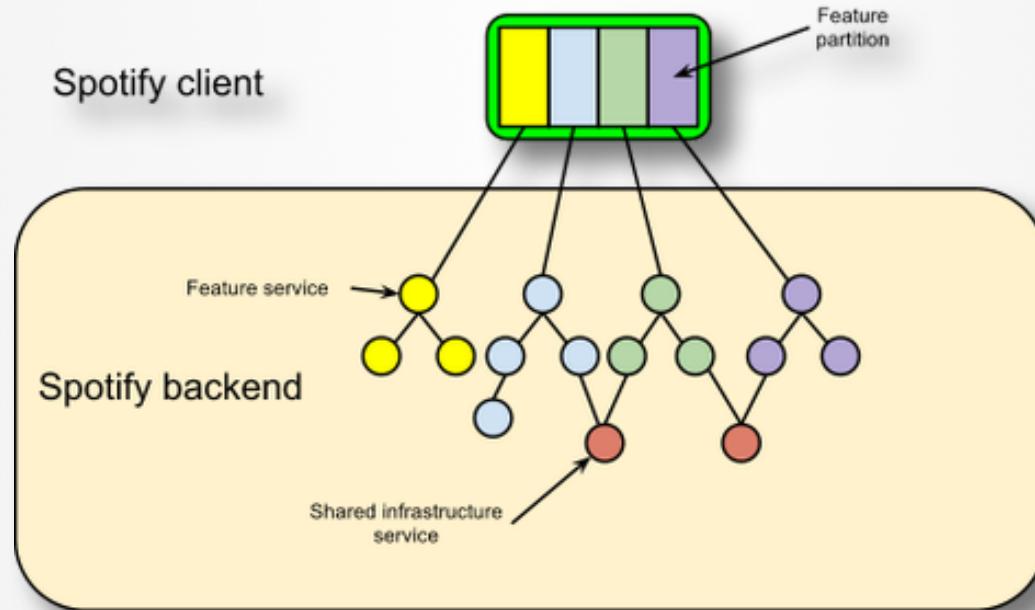
# Typical concerns



„What if I don't want to ship unfinished feature to clients and deployment is very close?”

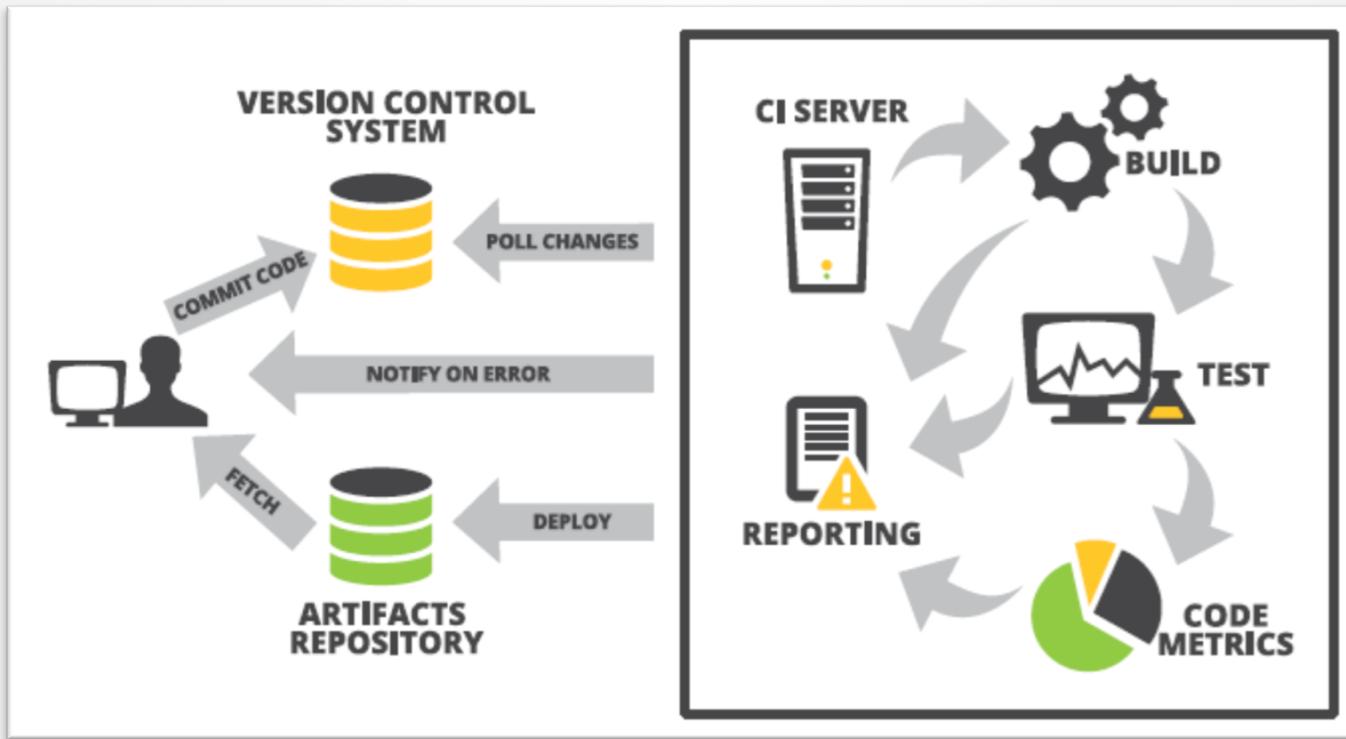


# Feature toggle – Spotify architecture





# Automation





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# Continuous Integration servers



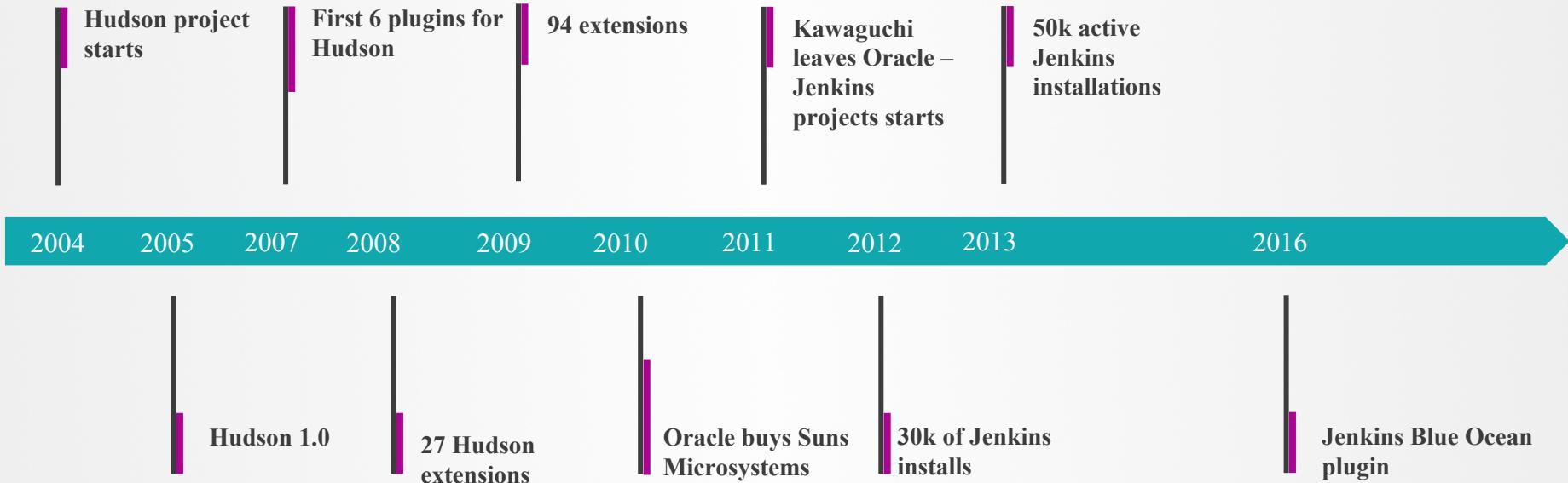
# Jenkins

*„I had this great idea of a web framework, and I wanted an excuse to actually implement it. This was around the time when everyone had his own framework, so I suppose I couldn't help myself.”*

Kohsuke Kawaguchi



# Jenkins history





# Jenkins features

- // Easy to install – Docker image
- // Weekly updates
- // Build as a group of core plugins
- // Huge database of plugins
- // Easy to learn and use
- // Platform and programming language agnostic
- // Elastic
- // Built-in scripting mechanism
- // Very scalable (master/slave model)





# Jenkins interface

**Jenkins**

Pipelines Search pipelines... [New Pipeline](#)

NAME	HEALTH	BRANCHES	PR	
othot-admin-db		18 passing	14 passing	
othot-admin-db-release		-	-	
othot-core-release		-	-	
othot-customer-db		19 passing	16 passing	
othot-customer-db-release		-	-	
othot-data-science-engine-publish		-	-	
othot-external-api		13 passing	10 passing	
othot-external-api-release		-	-	
othot-model-build-queue-release		-	-	
othot-platform-api-release		-	-	
othot-platform-app		23 failing	22 passing	



# Jenkins interface

Jenkins

Pipelines Administration Logout

ot hot-admin-db ⭐ 🚙

Activity Branches Pull Requests

STATUS	RUN	COMMIT	BRANCH	MESSAGE	DURATION	COMPLETED	↻
✓	15	Saafdab	develop	OP-3088 Extended models with columns storing...	5m 36s	6 days ago	↻
✓	1	bf3c141	OP-3088-replacement-f...	Branch indexing	6m 21s	6 days ago	↻
✓	1	bf3c141	PR-27	Branch indexing	56s	7 days ago	↻
✓	3	b95447c	release2.0-patch4	Branch indexing	26s	11 days ago	↻
✓	2	2cce9f5	master	add logging flag	49s	11 days ago	↻
✓	1	b95447c	PR-26	Branch indexing	1m 58s	11 days ago	↻
✓	1	019caed	release2.0-patch4-dev-...	Branch indexing	1m 35s	11 days ago	↻
✓	14	1507e98	develop	add logging flag	49s	11 days ago	↻
✓	3	d500a46	feature/OP-3008	Branch indexing	46s	14 days ago	↻
✓	13	dab022b	develop	OP-3008 - added support for workqueue extern...	1m 34s	14 days ago	↻
✓	2	b95447c	release2.0-patch4	add logging flag	9m 25s	15 days ago	↻



# Jenkins interface

✓ ohot-admin-db < 15

Pipeline Changes Tests Artifacts ⚡ 🖊⚙️🔗Logout

Branch: develop 5m 36s Changes by Łukasz Rybka  
Commit: Saafdab 6 days ago Branch indexing

Start Start Build Analyze Test End

Test - 19s

Restart Test ⚡ 🔍

Step	Description	Duration
✓ > npm run test	— Shell Script	18s
✓ > reports/**/*xml	— Archive JUnit-formatted test results	<1s
✓ > #00FF00	— Send Slack Message	<1s



# Jenkins interface

Jenkins

othot-admin-db / develop

Pipelines Administration Logout

Cancel Save

```
graph LR; Start((Start)) --> Build((Build)); Build --> Analyze((Analyze)); Analyze --> Test((Test)); Test --> Plus(( )); Start -.-> Start; Build -.-> Build; Analyze -.-> Analyze; Test -.-> Test;
```

Test

Steps

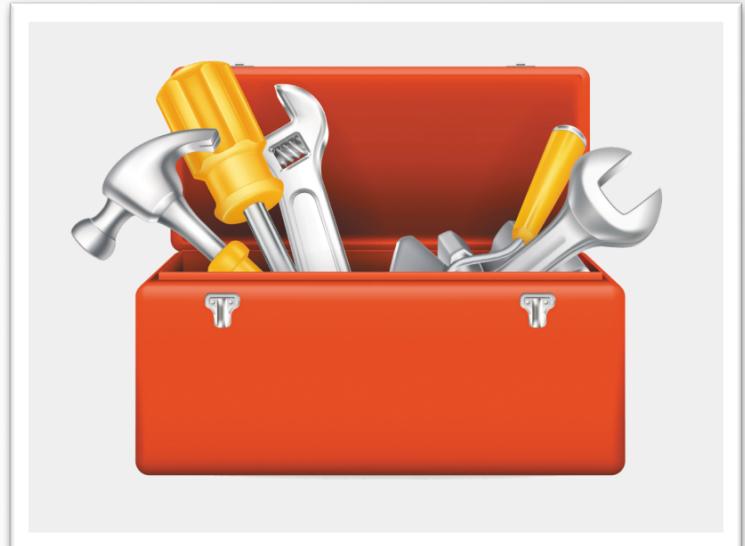
Shell Script  
npm run test

+ Add step



# What do I need?

- // Version control system (Git)
- // Application build tool (Maven)
- // Versioning tool (Maven)
- // Code review tool (GitHub)
- // Scripting language (Maven/bash)
- // Artifacts repository (Nexus)
- // Testing environment (Google App Engine)





# Joel Spolsky

Avram Joel Spolsky (born 1965) is a software engineer and writer. He is the author of *Joel on Software*, a blog on software development, and the creator of the project management software Trello.<sup>[2]</sup> He was a Program Manager on the Microsoft Excel team between 1991 and 1994. He later founded Fog Creek Software in 2000 and launched the *Joel on Software* blog. In 2008, he launched the Stack Overflow programmer Q&A site in collaboration with Jeff Atwood. Using the Stack Exchange software product which powers Stack Overflow, the Stack Exchange Network now hosts over 170 Q&A sites.





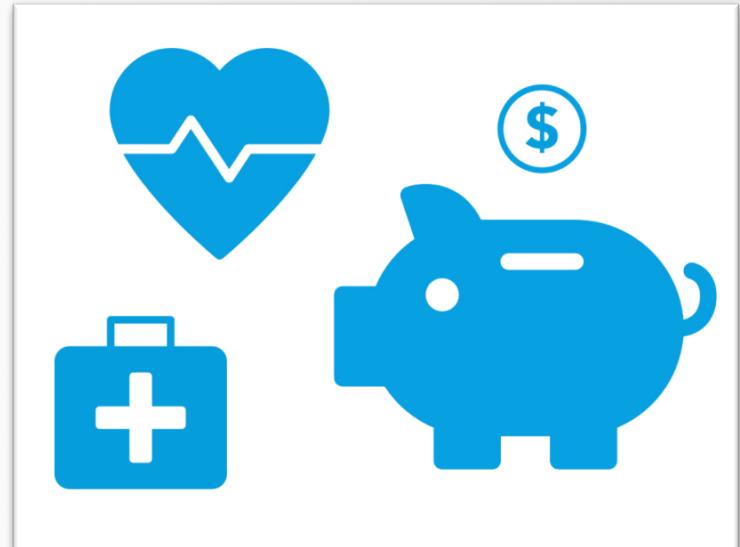
# Joel Spolsky Test

- 01. Do you use source control?**
- 02. Can you make a build in one step?**
- 03. Do you have daily builds?**
- 04. Do you have a bug database?**
- 05. Do you fix bugs before writing new code?**
- 06. Do you have an up-to-date schedule?**
- 07. Do you have a spec?**
- 08. Do programmers have quiet working conditions?**
- 09. Do you use the best tools money can buy?\***
- 10. Do you have testers?**
- 11. Do new candidates write code during their interview?**
- 12. Do you do hallway usability tests?**



# Overall benefits

- // Speed of delivering new features
- // Higher quality
- // Better application architecture
- // Product more aligned with the vision
- // Flexibility in working on single feature by more than one developer
- // Easy QA process
- // Easy production bugs investigation





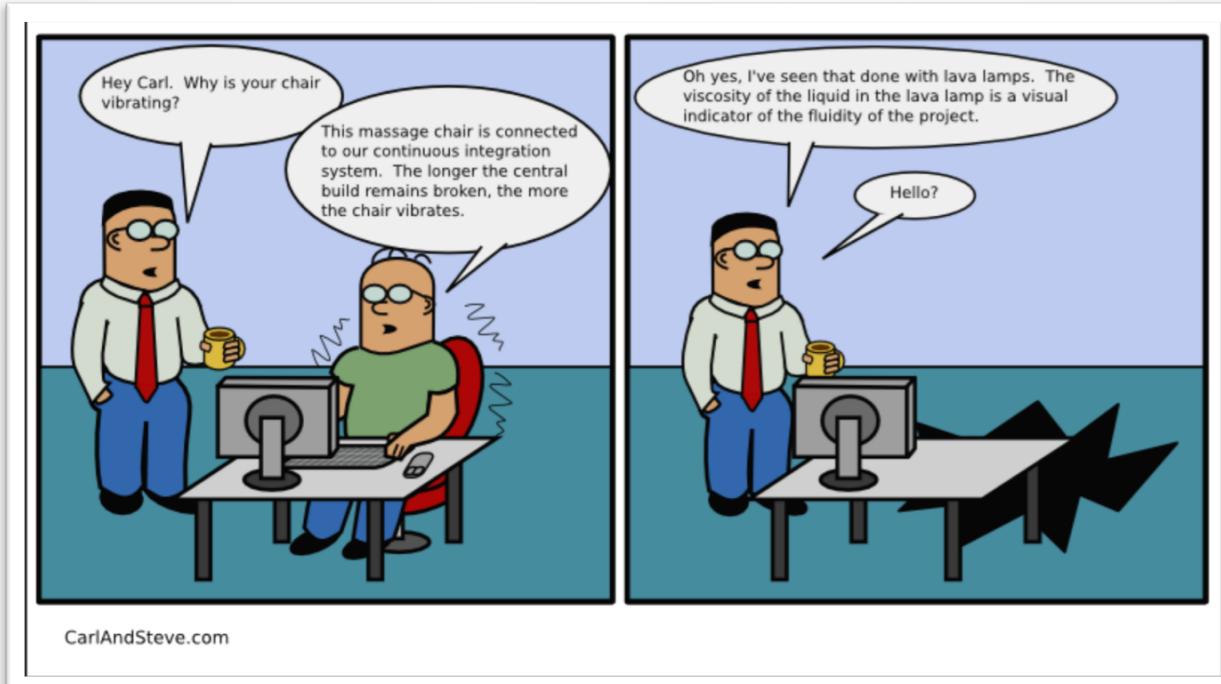
# What's next?

- // Continuous Deployment / Delivery (CD)
- // Microservices pattern
- // Nightly Builds
- // Automated Integration/Functional/... tests
- // A/B testing
- // ...





# Digression





EXIT



STORM



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# Contact

<http://www.dragonia.org.pl>