

# Tallying and Taming Technical Debt

Eoin Woods  
Endava  
@eoinwoodz

Andy Longshaw  
Co-op  
@andylongshaw

Nick Rozanski  
Vitruvius  
@nickrozanski

*SPA2019 – June 2019*

# Content

09:15 – 09:45 – Introducing Technical Debt (30m)

09:45 – 10:10 – Exercise 1: Classes of Technical Debt (25m)

10:10 – 10:25 – Group: Collate Ex1 Output (15m)

10:25 – 10:30 – Exercise 2: Finding and Mitigating (5m)

10:30 – 10:45 – Break

10:45 – 11:25 – Exercise 2 continued (40m)

11:25 – 11:45 – Presentations (20m)

11:45 – 12:00 – Recap and Conclusions (15m)

# INTRODUCING TECHNICAL DEBT

# Defining Technical Debt

*Technical Debt consists of **design or implementation constructs** that are **expedient** in the short term but that set up a technical context that can make a **future change more costly or impossible**.*

*Technical debt is a contingent liability whose impact is limited to internal system qualities – primarily, but not only, maintainability and evolvability.*

Kruchten, Nord and Ozkaya  
“Managing Technical Debt” - 2019

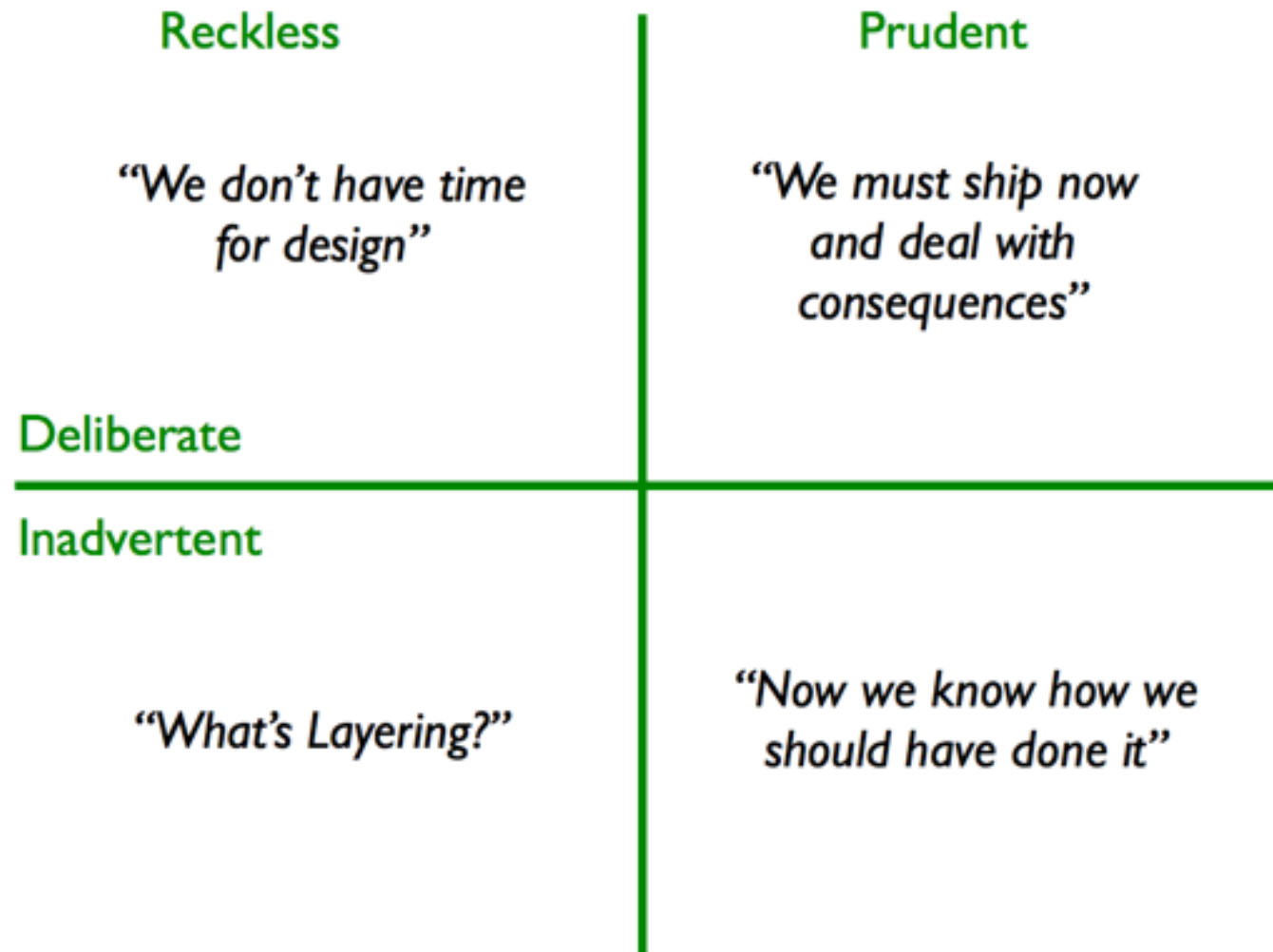
# Why Do We Care?

- Reduces speed of delivery
- Reduces options for change
- Reduces morale in the team
- Reduces reliability
- Increases cost of change
- Increases cost of operation
- Increases operational risk

**REDUCES OUR RETURN ON INVESTMENT**

TECHNICAL DEBT IS OFTEN WHAT PREVENTS US  
MEETING A FUTURE NEED IN A  
TIMELY AND COST EFFECTIVE MANNER

# Incurring Technical Debt (Fowler)



# (Some) Areas Where Technical Debt is Found

Intra-Module

Inter-Module

Operation

Testing

Platform

Data

User  
Experience

+ Functional



# Categories of Technical Debt and Examples

## Architecture

- Style or pattern violations & inconsistency
- Structural complexity
- High inter-component communication
- Data duplication and multi-mastering

## Code

- Complexity
- Missing tests
- Large classes, methods or functions
- Misleading names
- Poor cohesion
- Unnecessary coupling (many types)

## Production

- Missing monitoring
- Manual deployment steps
- Manual “housekeeping”
- Manual data patching
- Lack of deployment meta-data

(Categories from “*Managing Technical Debt*”, Kruchten, Nord and Ozkaya, 2019)

# Causes and Symptoms

Internal  
Communication

Poor Domain  
Knowledge

External  
Pressures

Poor Tooling

Low Skill Level

Fear of Change

Organisational  
Structure

**WE WILL FOCUS ON THE SYMPTOMS  
AND WORK BACKWARDS TO THE CAUSES**

# What are we calling technical debt?



- Bad architecture
- Bad code structure
- Poor code implementation
- Bad use of tools or frameworks
- Systemic operational issues



- Bad process
- Poor application of techniques
- Bad team dynamics
- Bad organisational structure  
*(sorry Mr. Conway)*

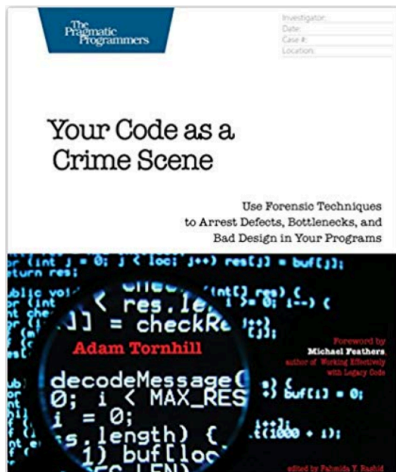
# Measuring Technical Debt

Measure metrics relating to a category of technical debt

- Cyclomatic complexity
- Hotspots in the codebase
- Production error rates

Measure the impact of technical debt

- Cycle time
- Defects
- Production outages
- Cost of change or ownership
- Build and deploy times



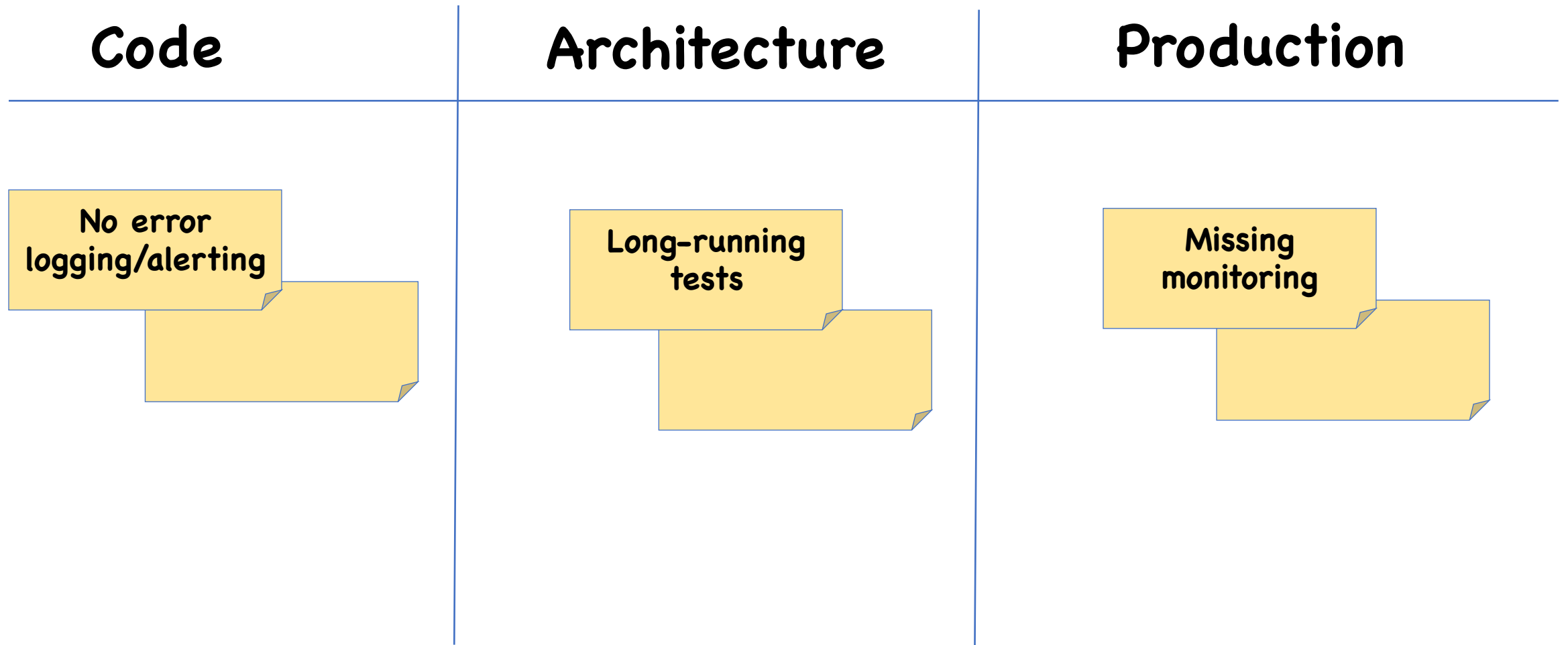
And many more...

# EXERCISE 1: CLASSES OF TECHNICAL DEBT

# Ex1: Classes of Technical Debt [25 mins]

<b>Objective</b>	Brainstorm important classes of technical debt and organize them
<b>Inputs</b>	Your collective experience
<b>Outputs</b>	<ul style="list-style-type: none"><li>• List of potential classes of technical debt (Post-its)</li><li>• Organised into code/architecture/production categories <u>or</u> your own taxonomy</li></ul>
<b>Process</b>	<ul style="list-style-type: none"><li>• Brainstorm <u>examples</u> of technical debt</li><li>• As a group, list potential <u>classes</u> of tech debt on Post-its</li><li>• Organise into <u>categories</u> (ours or yours)</li></ul>

# Categorising Classes of Technical Debt



# EXERCISE 1: COLLATE OUTPUT



# Ex1: Collate Outputs [15 mins]

## Objective

Organise our outputs into one shared taxonomy of technical debt

## Process

- Each group will ...
  - Describe your tech debt **categories**
    - Code / Architecture / Production or your own
    - We'll put each on the wall
  - Describe your **classes** of tech debt and put the Post-its into the appropriate categories on the wall
- We will rationalize the categories and classes as we go!

# EXERCISE 2: FINDING, MEASURING, AVOIDING, MITIGATING

# Ex2: Finding, Measuring, Avoiding, Mitigating [45m]

<b>Objective</b>	Each group creates useful advice for one of our classes of technical debt
<b>Inputs</b>	<ul style="list-style-type: none"><li>• Tech debt categories and classes from Ex1</li><li>• Your experience</li></ul>
<b>Outputs</b>	<ul style="list-style-type: none"><li>• A tech debt description table for your chosen class of technical debt [next slide]</li></ul>
<b>Process</b>	<ul style="list-style-type: none"><li>• Each group choose a tech debt class to work on</li><li>• Develop answers to the questions posed by the technical debt description table [next slide]</li></ul>

# Describing Classes of Technical Debt

<b>Name</b>	What is the <b>name</b> of this class of tech debt?
<b>Summary</b>	Where do you <b>observe</b> it, what are its <b>characteristics</b> , how do you <b>recognize</b> it?
<b>Measurement Approach</b>	Can you <b>measure</b> this class of technical debt? How do you know its <b>severity</b> ? Can you measure <b>quantity</b> ?
<b>Consequences</b>	<b>Why</b> is it important to <b>avoid</b> or <b>remediate</b> this debt? What are the <b>consequences</b> of leaving it?
<b>Avoidance Approach</b>	How do you <b>avoid</b> this class of technical debt occurring?
<b>Remediation Approach</b>	How can the debt be <b>remediated</b> ? <b>When</b> should this occur? <b>Who</b> needs to do it?

# EXERCISE 2: GROUP PRESENTATIONS

# Presenting Our Results

*Each Group Present Your Technical Debt Description Table*

***5 Minutes Please!***

# RECAP AND CONCLUSIONS

# Recap

- **Technical debt** is those aspects of **implementation** that cause **problems later** due to risk, cost or other limiting factor
- Can be **deliberate** or **inadvertent** (and reckless or prudent too)
- There are potentially **many classes**, each with their own implications and tactics to avoid or mitigate
- No significant **catalogue** exists today to provide guidance
- We have tried to start building the **taxonomy** and explored if we can create **tangible advice** for some classes of technical debt



# Conclusions

## Your thoughts on the taxonomy?

## ... and the description tables?

# THANK YOU

/ Eoin Woods    / Andy Longshaw    / Nick Rozanski  
/ @eoinwoods    / @andylongshaw    / @nickrozanski