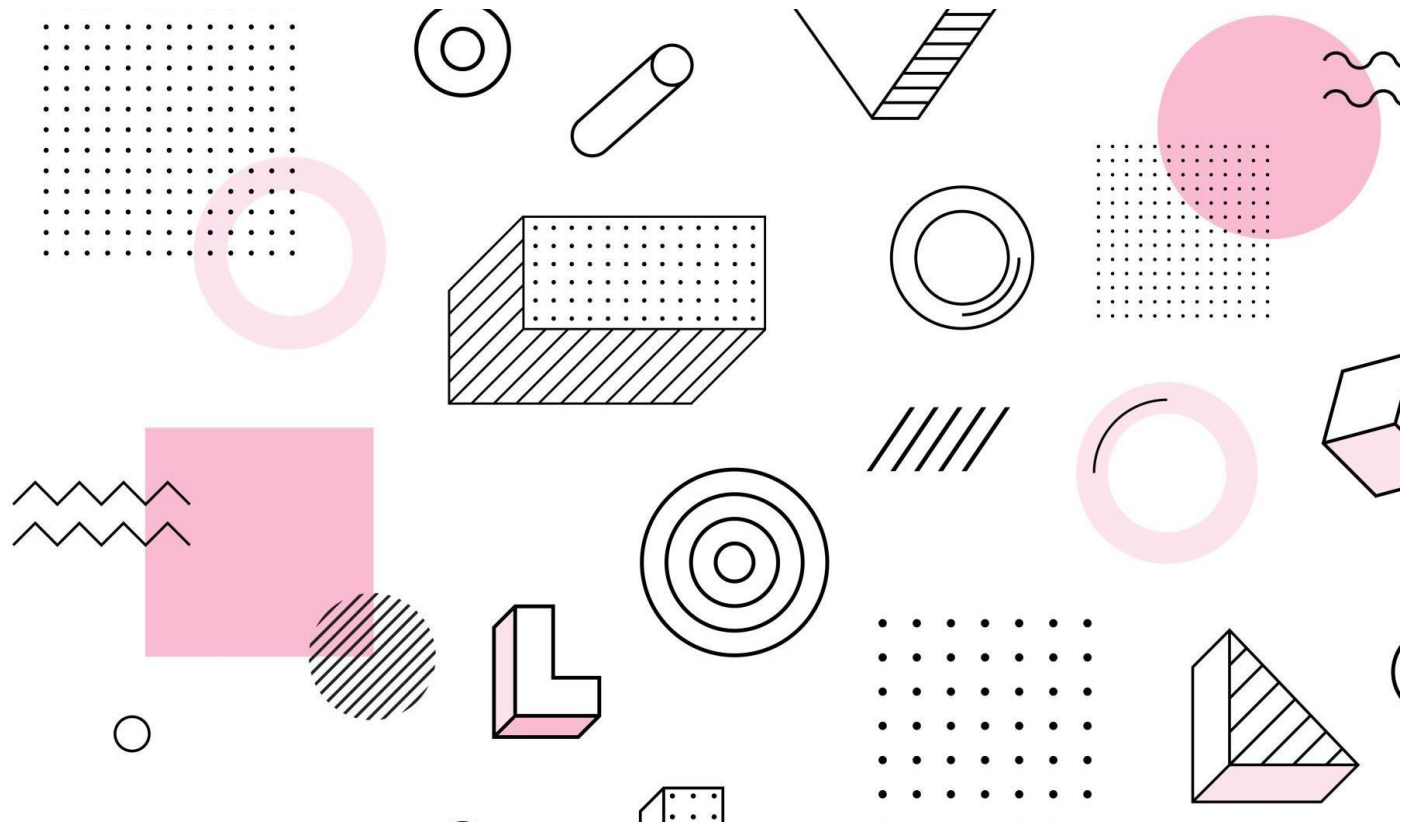# BEHAVIORAL CODE ANALYSIS

- Carlos Pelazas
- Jaime Loredo Teijeiro
- Ahmet Erdem Yabacı
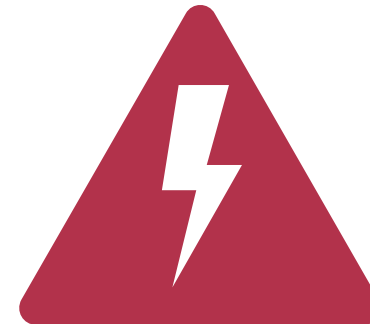- Christian Fernández Noriega

# WHAT IS TECHNICAL DEBT?

**Cost of using a suboptimal solution now, instead of a better approach that would be more mantainable**
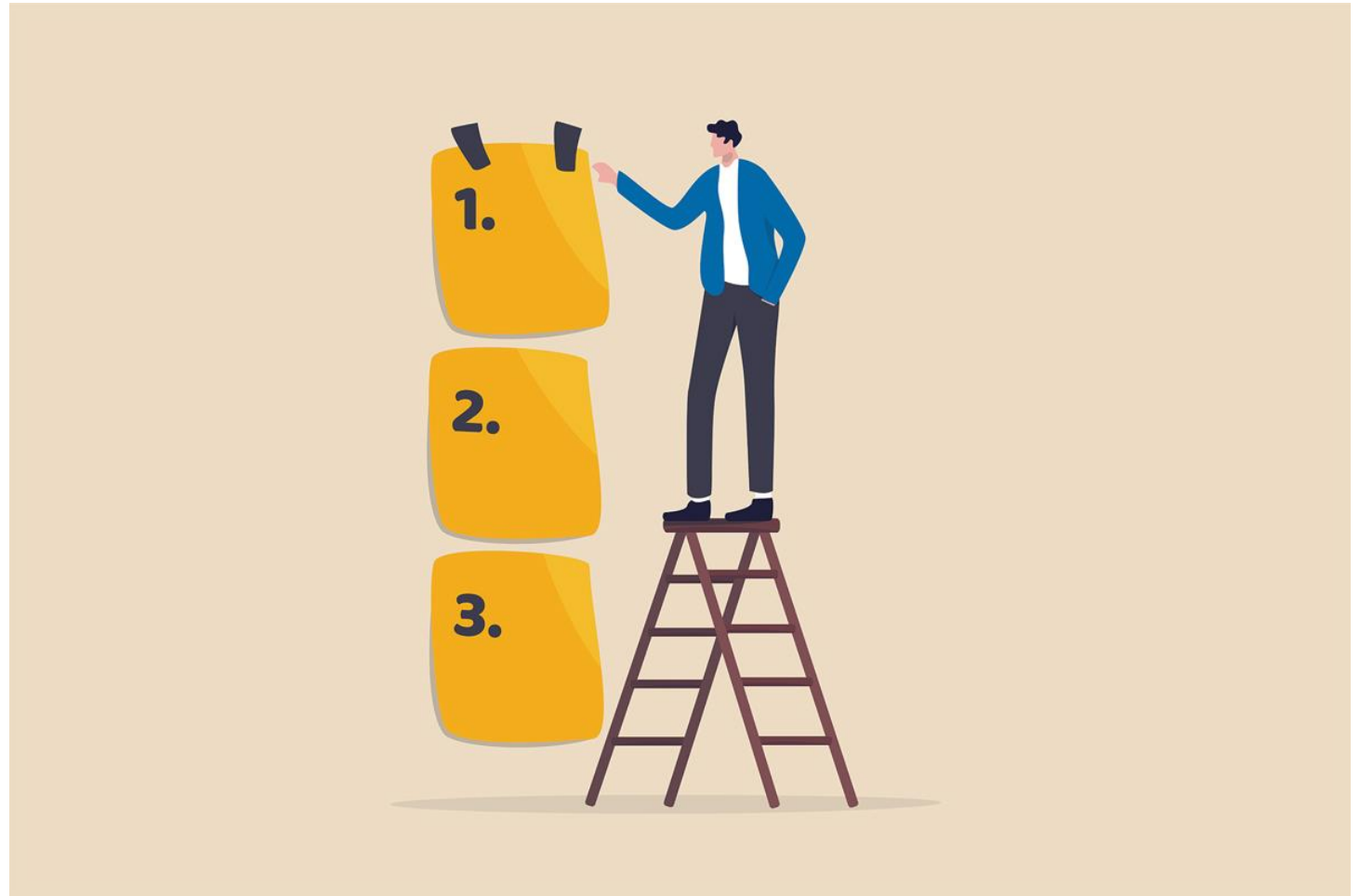
# WHAT IS A HOTSPOT?

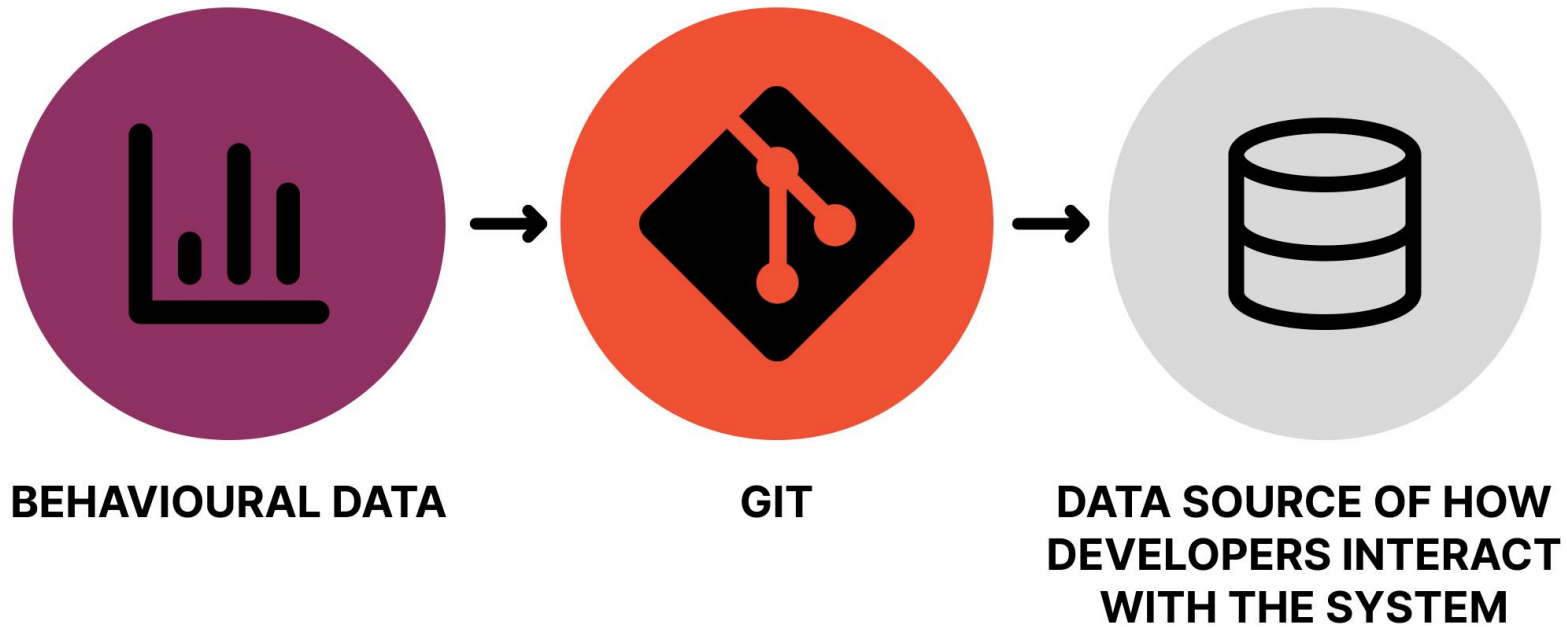Technical debt in stable parts of the codebase -> Low risk

Technical debt in volatile parts of the codebase -> High risk (Hotspot)

# WHAT IS BEHAVIOURAL CODE ANALYSIS?

- Tool that identifies and prioritizes technical debt

- Code quality matters in context

# HOW DOES IT WORK?



**BEHAVIOURAL DATA** → **GIT** → **DATA SOURCE OF HOW DEVELOPERS INTERACT WITH THE SYSTEM**

# IMPORTANCE OF BCA:IS IT IMPORTANT?

IT'S REALLY IMPORTANT

SHORT ANSWER: **YES**

- Average waste of time by technical debt is between 23% and 42% of **total** development.

- Difficult to notice

- Difficult to prioritize and estimate, so you cant know beforehand if it will be worth it

- Can be difficult to explain to non technical profiles
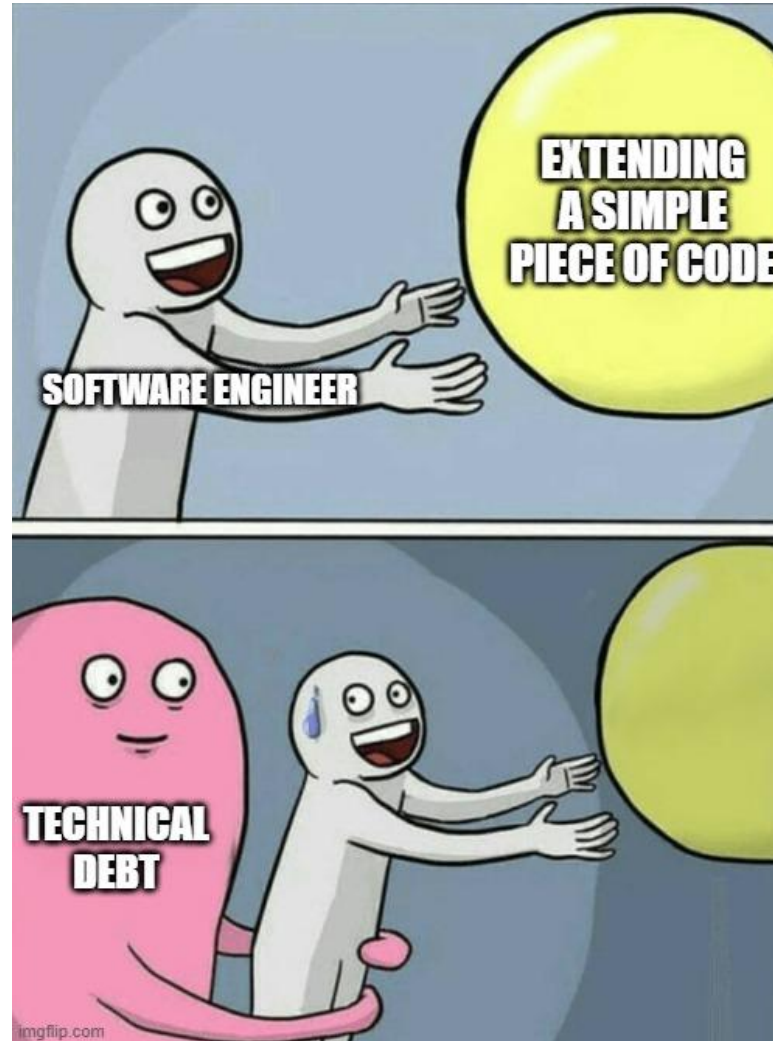
- Average waste of time by technical debt is between 23% and 42% of **total** development.
- Difficult to notice
- Difficult to prioritize and estimate, so you

All those things are difficult to **US**, but are easily solved (or at least mitigated) with BCA. That is the reason why it is important

BEHAVIOURAL ANALYSIS

summit club

# DIFFERENCES WITH STATIC CODE ANALYSIS

Static source code analysis refers to the operation performed by a source code analysis tool, which is the analysis of a set of code against a set (or multiple sets) of coding rules.

sonarcloud

- Quality
- Coverage
- Vulnerabilities
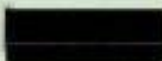- Etc...

# DIFFERENCES WITH STATIC CODE ANALYSIS

| | BCA | Static Code Analysis |
|---|---|---|
| **Measures Impact on development time** | 😄 | 😞 |

**Important**

**BCA still does all of the other things that traditional Static Code Analysis can**

Daniel ███████          The cooler Daniel

# OUTPUTS OF BCA

It allows you to see:

- How the different teams are organized
- How the team work with the code
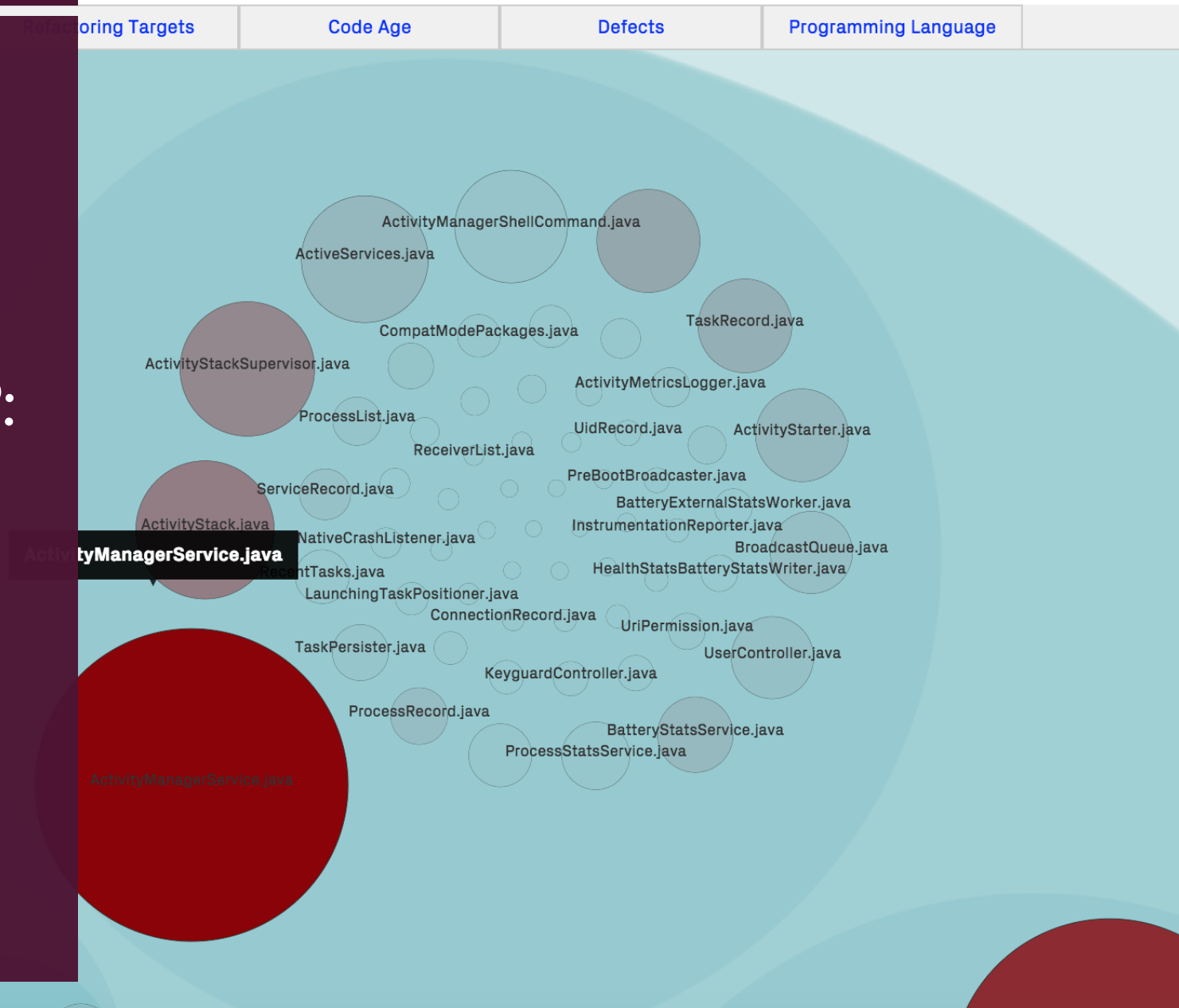- How familiar the team are with the code

Understandable to even not software people.

Hotspots identify the modules with most development activity -- often technical debt. ➕

ANALYSIS RESULTS

ANDROID

Dashboard

Scope

Augmented Analysis

Technical

Hotspots

Code Biomarkers

Temporal Coupling

Architecture

Social Analysis

Project Management

Hotspots

Refactoring Targets

Code Age

Defects

Programming Language

System / platform_fram
/ com / android / se
/ ActivityManagerServic

**Size** 2015

**Change Frequency** 2067

**Main Author** The A
(29 %

**Knowledge Loss** 0 % A

**Defects** 1584

**Last Modified** 0 mo

**Actions**

View Code

Trends

**Complexity Tr**

ActivityManagerShellCommand.java
ActiveServices.java
TaskRecord.java
CompatModePackages.java
ActivityStackSupervisor.java
ActivityMetricsLogger.java
ProcessList.java
UidRecord.java    ActivityStarter.java
ReceiverList.java
PreBootBroadcaster.java
ServiceRecord.java
BatteryExternalStatsWorker.java
InstrumentationReporter.java
ActivityStack.java
ActivityManagerService.java
NativeCrashListener.java
BroadcastQueue.java
HealthStatsBatteryStatsWriter.java
RecentTasks.java
LaunchingTaskPositioner.java
ConnectionRecord.java
UriPermission.java
TaskPersister.java
UserController.java
KeyguardController.java
ProcessRecord.java
BatteryStatsService.java
ProcessStatsService.java

ActivityManagerService.java

# OUTPUTS OF BCA

- HOTSPOT MAP: helps with prioritizing technical debt

- CHANGE COUPLING

## WHEN AND WHERE SHOULD WE USE IT

- Preferably brownfield projects since there are existing data

- Can be started using in greenfield projects for early detection

# INTEGRATION OF BCA - TOOLS



CodeScene

## Standard

For small teams where code health and knowledge insights are enough.

**€18** Per active author / month ⓘ
Billed annually

⊙ Host options: **On-premise & Cloud**

**Standard** plan includes:

✔ Unlimited private repositories
✔ Code Health insights
✔ Knowledge Distribution Insights
✔ Quality gates on pull requests

## Pro

For companies that want the full feature set and a 360° view of their software development.

**€27** Per active author / month ⓘ
Billed annually

⊙ Host options: **On-premise & Cloud**

Everything in **Standard**, plus:

✔ Software Portfolio Overview
✔ Team insights
✔ Delivery insights
✔ REST API, PM tool integration (Jira, Trello, Azure DevOps, Github Issues) and more

# INTEGRATION OF BCA - SETUP

# INTEGRATION OF BCA – PULL REQUESTS



**All checks have passed**
1 successful check

✓ ⊙ CodeScene Cloud Delta Analysis (master)   Successful in 1m — CodeScene PR Check

**Quality gates pass, meaning no code health decline**



**All checks have failed**
1 failing check

✗ ⊙ CodeScene Cloud Delta Analysis (master)   Failing after 42s — CodeScene PR Check

**Quality gates triggered, meaning some code declines in health. Click "Details" for more info.**