

# Postmortem: Building a AAA MMO for Mobile Devices Vitaliy Borodovsky

GAME DEVELOPERS CONFERENCE® 2015

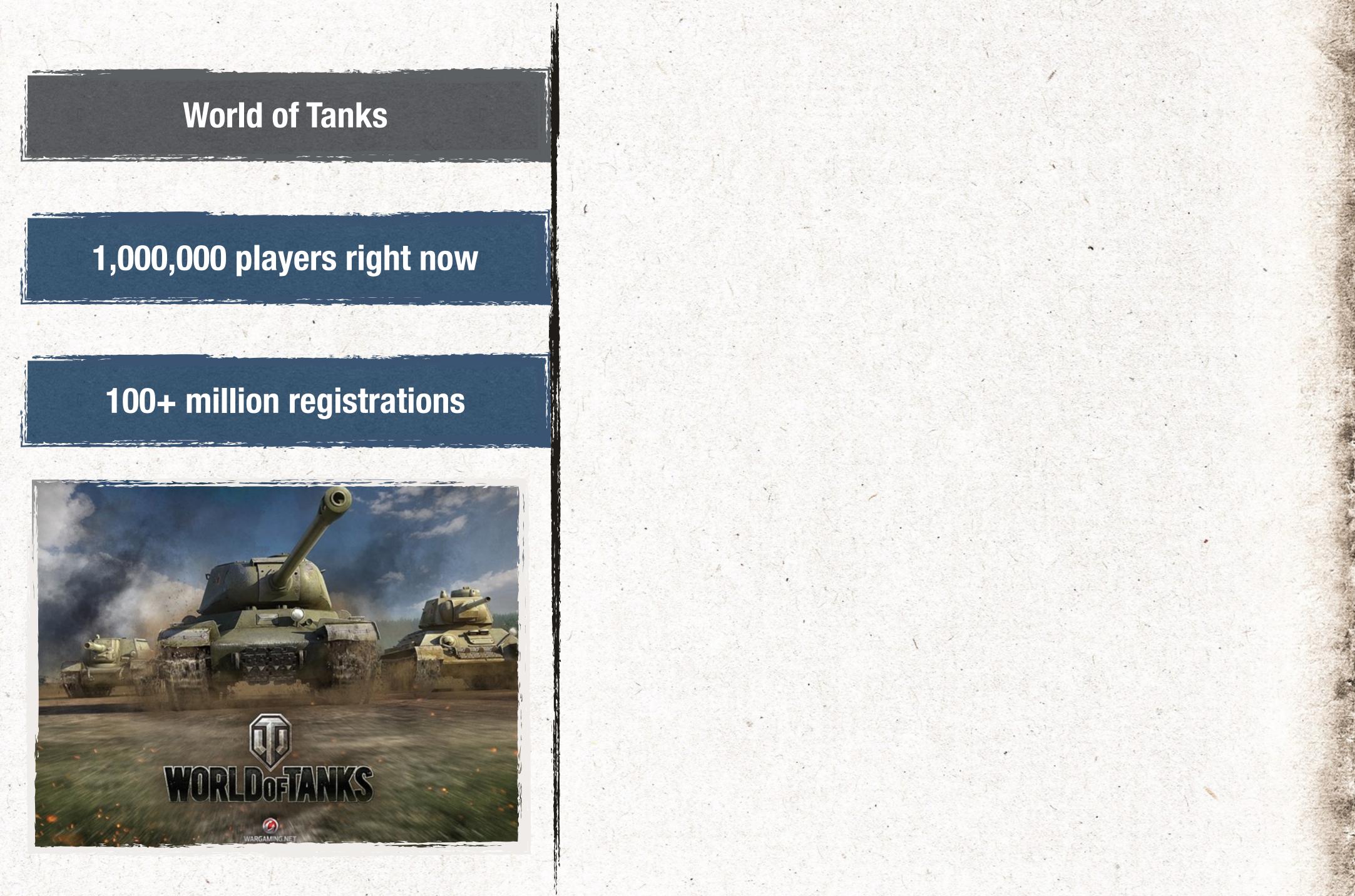


MARCH 2-6, 2015 GDCONF.COM













#### World of Tanks

#### 1,000,000 players right now

#### **100+ million registrations**



#### World of Tanks Blitz

#### 100,000 players right now

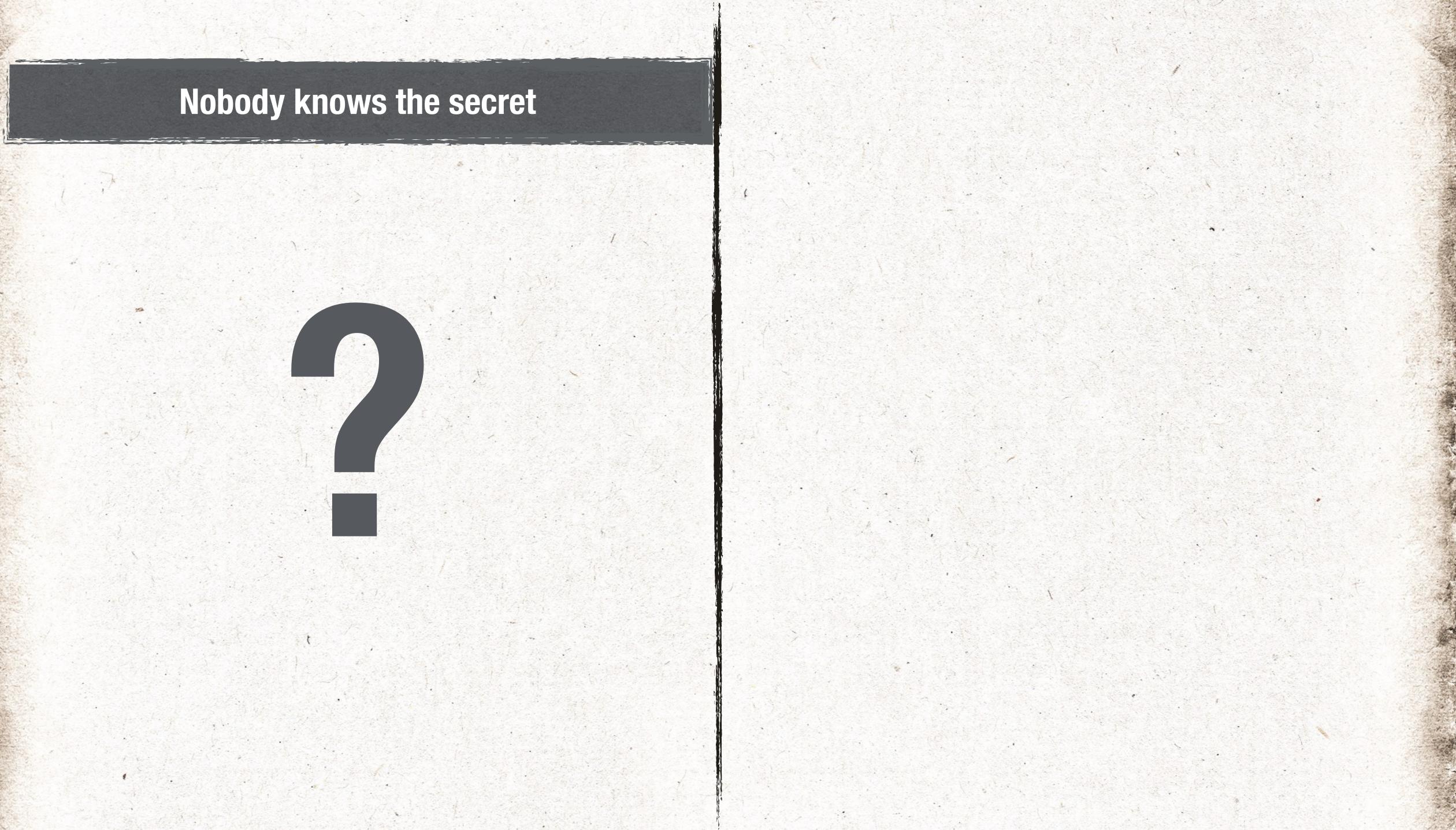
#### **20+ million registrations**











Nobody knows the secret



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# And I don't know either













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#### **Small Team**



#### **Small Team**

#### **No Management Processes**

#### **No Technical Processes**

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#### **Small Team**

#### **No Management Processes**

#### **No Technical Processes**

#### **No 3D Engine**







How can we create a fun game?

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How can we create a fun game?

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Carlos:

# 200+ Play Tests



How can we create a fun game?

#### How can we quickly prototype?

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# 200+ Play Tests



How can we create a fun game?

#### How can we quickly prototype?

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# 200+ Play Tests

# **500+ Tweaking Options**



How can we create a fun game?

#### How can we quickly prototype?

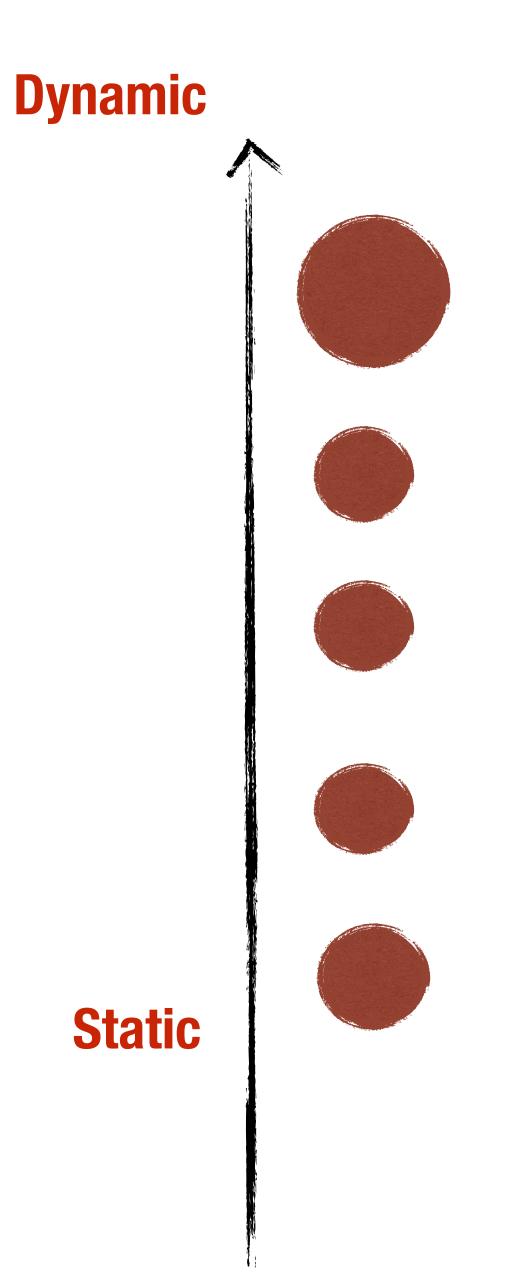
# 200+ Play Tests

# **500+ Tweaking Options**

### **20+ Control Schemes**

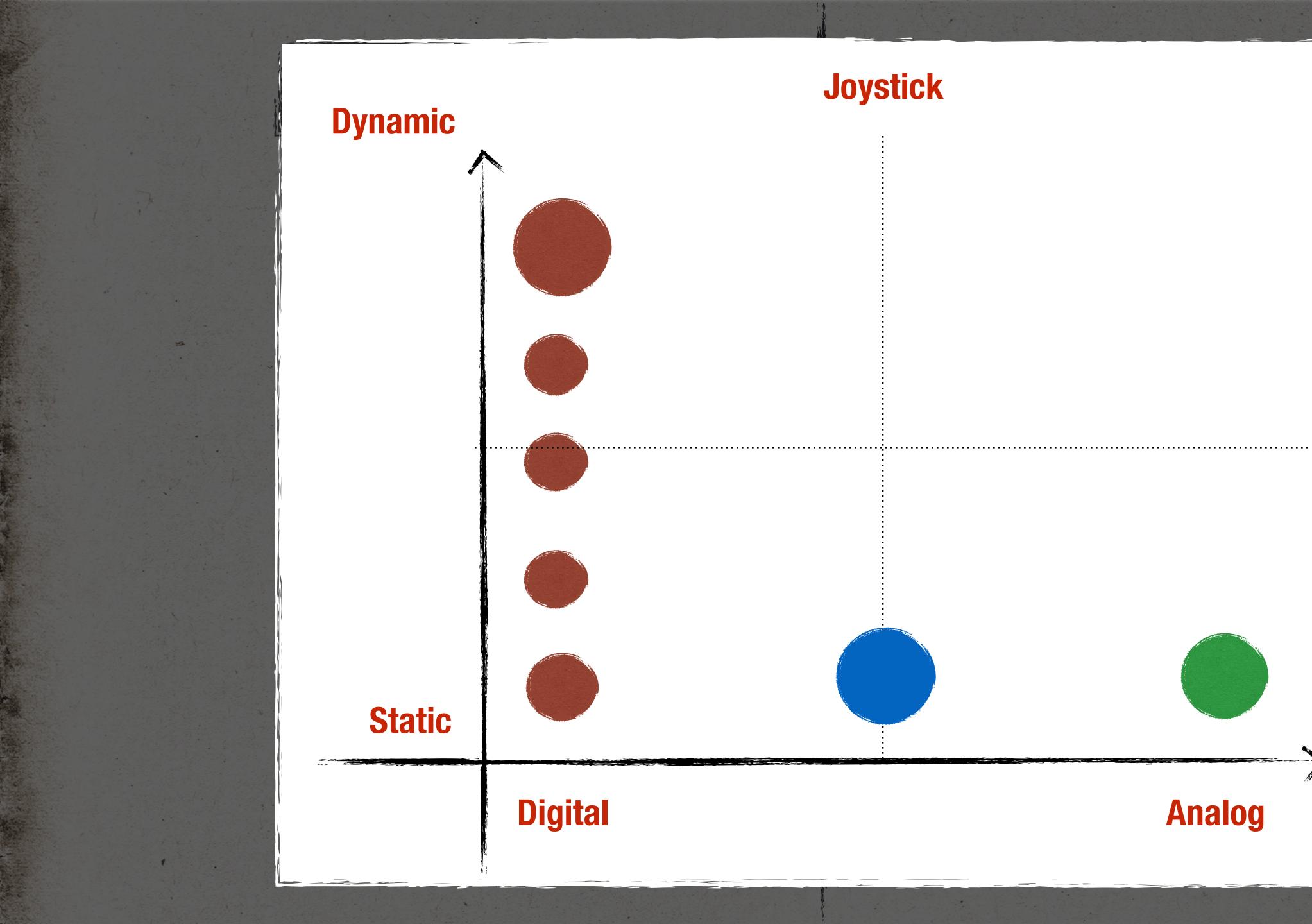






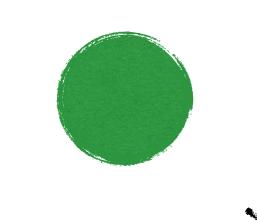
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# **Joystick**





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How can we create a fun game?

#### How can we quickly prototype?

# 200+ Play Tests

# **500+ Tweaking Options**

### **20+ Control Schemes**



How can we create a fun game?

#### How can we quickly prototype?

# 200+ Play Tests

# **500+ Tweaking Options**

#### **20+ Control Schemes**

#### Lots of corridor tests



How can we create a fun game?

#### How can we quickly prototype?

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# 200+ Play Tests

# **500+ Tweaking Options**

### **20+ Control Schemes**

### Lots of corridor tests

### **5 Focus Tests**



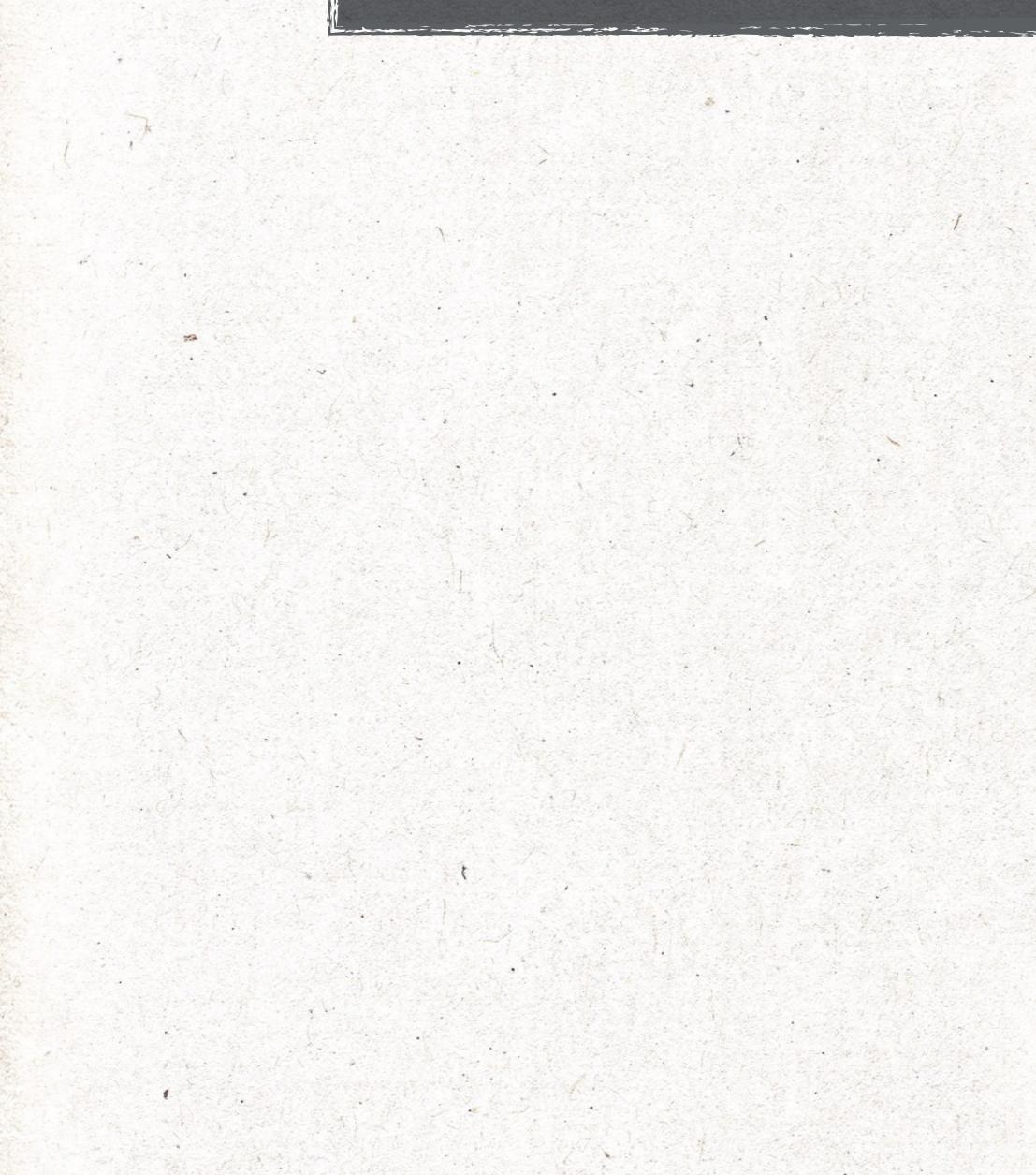


# Play your game!











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#### **Unstable trunk**



#### **Unstable trunk**

#### **Failed builds**

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#### **Unstable trunk**

#### **Failed builds**

#### **Repeated bugs**

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#### **Unstable trunk**

#### **Failed builds**

#### **Repeated bugs**

#### **Unpredictable results**

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Carlos:







# Management

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# Management

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#### How to increase predictability?



# Management

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#### How to increase predictability?

# Scrum



# Management

#### How to increase predictability?

### How to add flexibility?

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# Scrum



# Management

#### How to increase predictability?

### How to add flexibility?

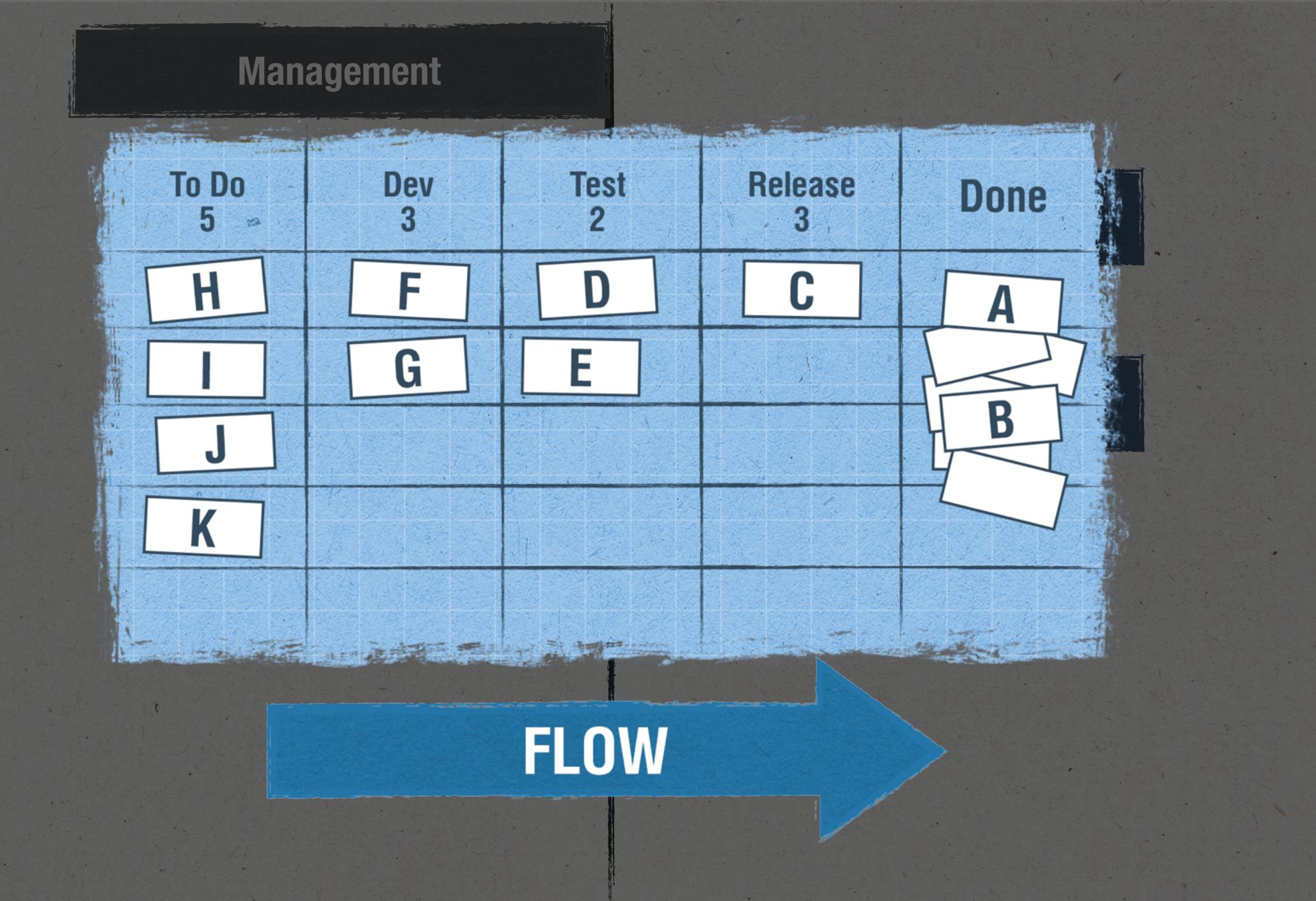
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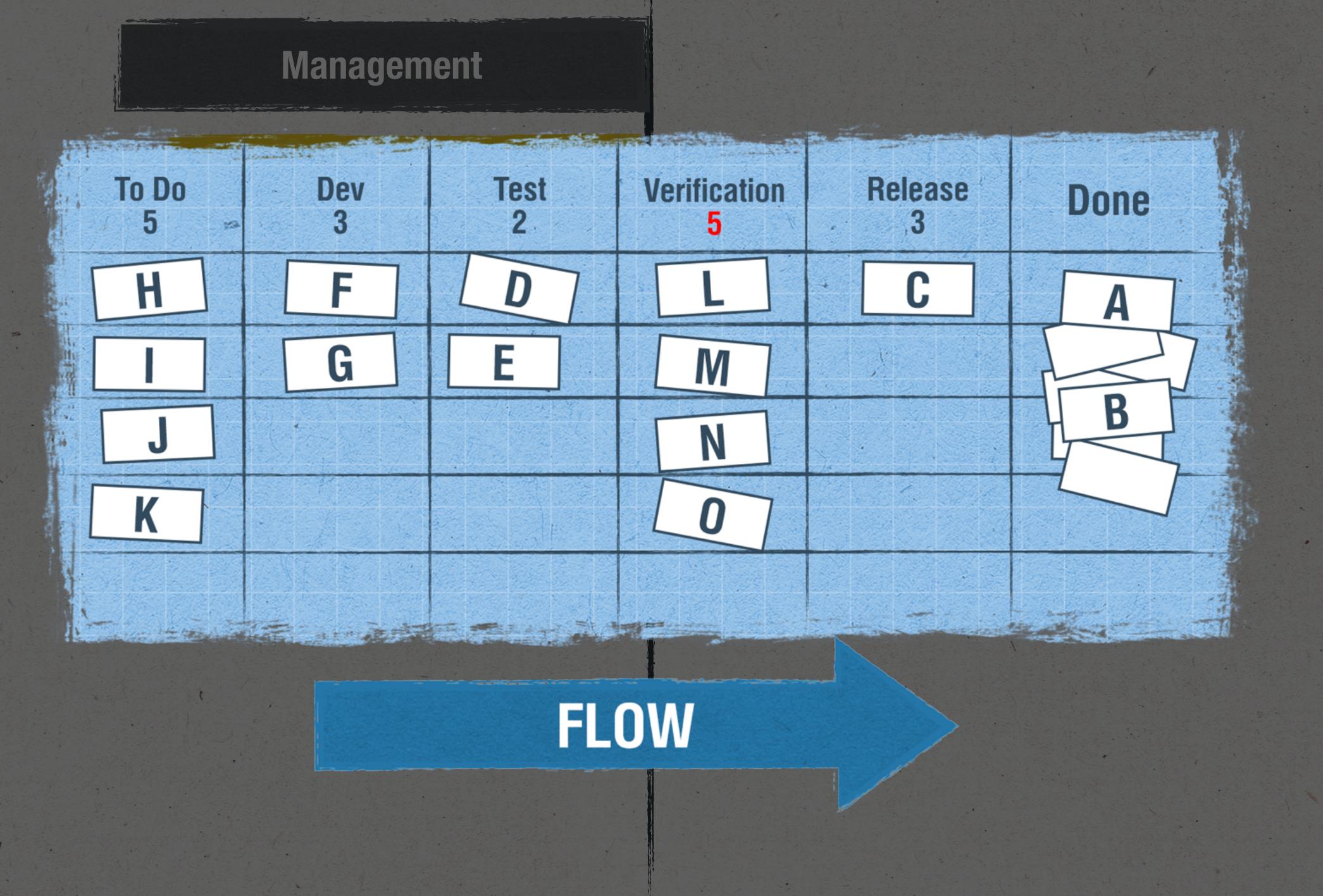
# Scrum

# Kanban

# With Scrum Mix-ins











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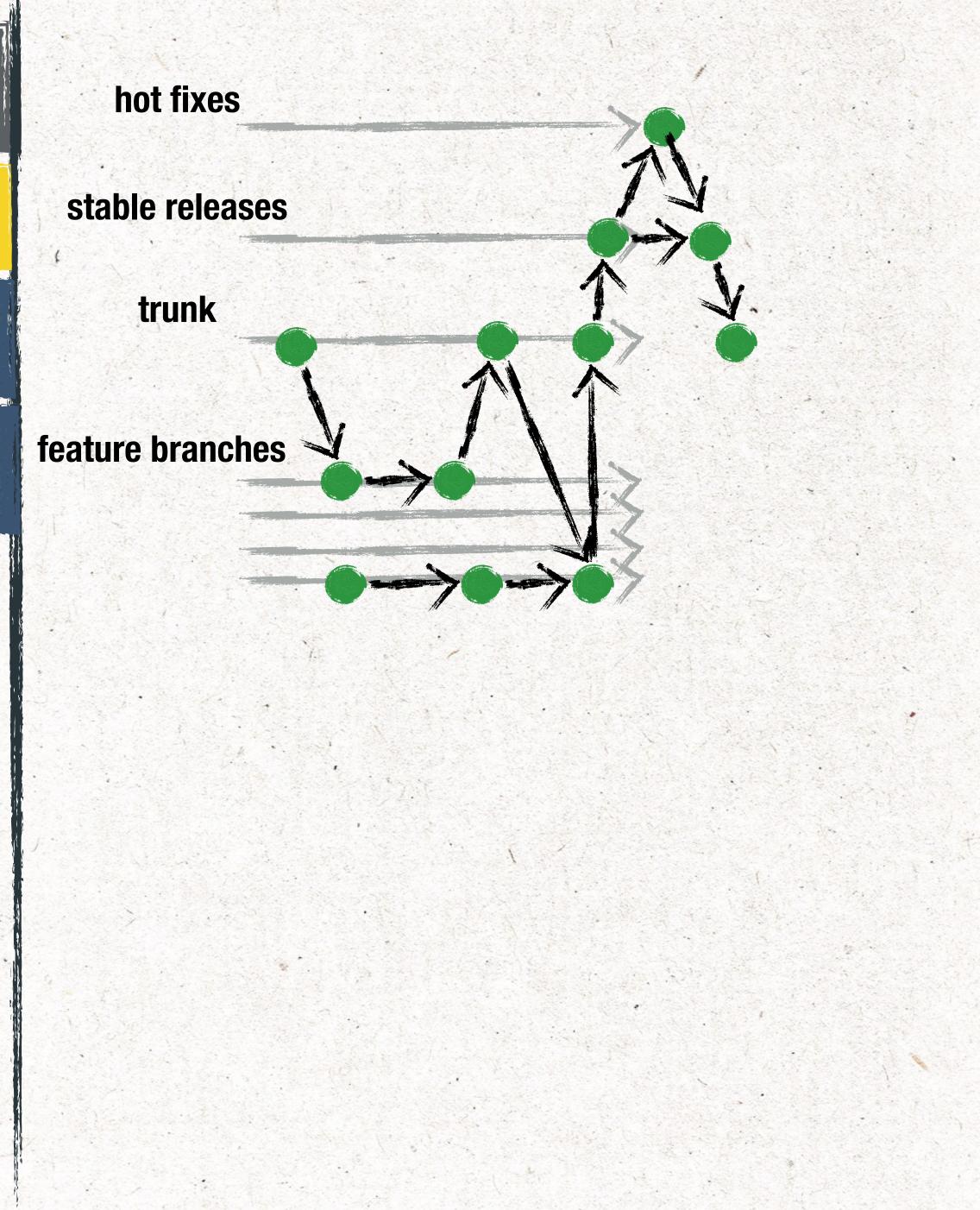


#### How to keep the trunk stable?

# Branching

# **Build machine**

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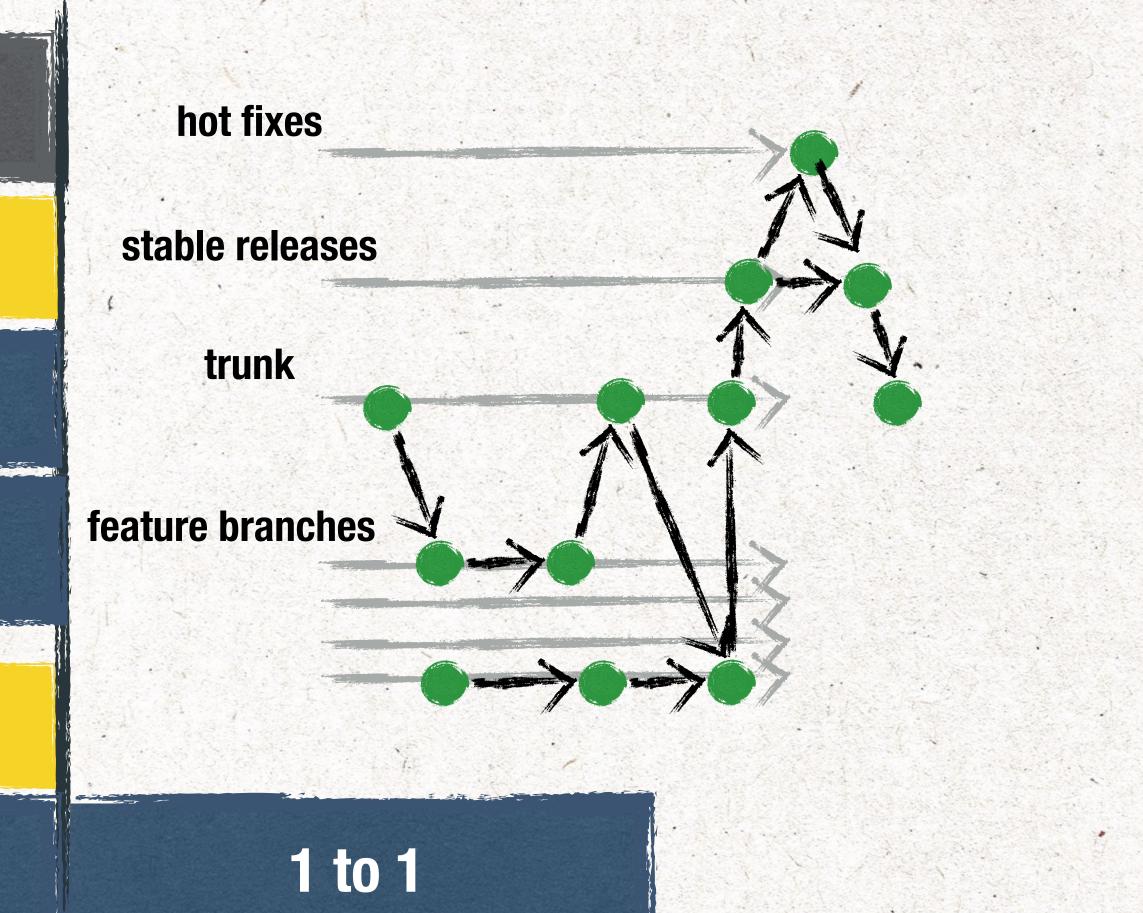
#### How to keep the trunk stable?

# Branching

# **Build machine**

#### How to improve code quality?

# **Code review**



# Column on Kanban



#### How to keep the trunk stable?

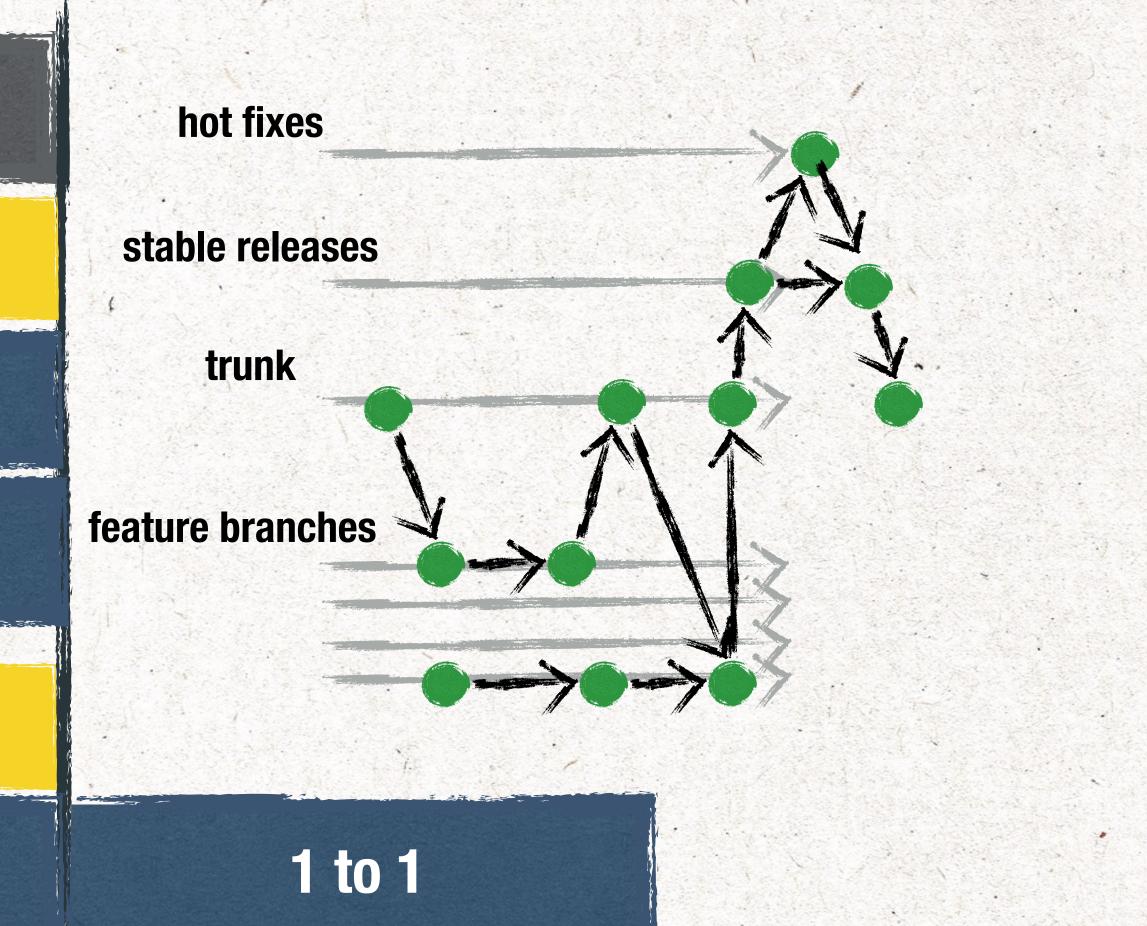
# Branching

# **Build machine**

#### How to improve code quality?

# **Code review**

## How to get higher quality?



# Column on Kanban

# Many to 1







#### **Unstable game after commits to engine trunk**

## Live on trunk

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#### **Unstable game after commits to engine trunk**

## Live on trunk

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#### **Unstable game after commits to engine trunk**

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## Live on trunk

## **Version based releases**



#### **Unstable game after commits to engine trunk**

#### Game don't want to update the engine

### **Longer migration**

# Live on trunk

#### **Version based releases**



**Unstable game after commits to engine trunk** 

#### Game don't want to update the engine

#### **Longer migration**

engine trunk engine stable game trunk game stable

release tag

## Live on trunk

#### **Version based releases**

#### No commits to trunk

## Improved branching scheme









# More technical challenges

#### Engine

## **Architecture was not scalable**

#### Not enough objects on the maps

## Performance

## Hard to add new features

#### **Slow content creation**







# **Engine Architecture**

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## **Performance**

**Scalability** 

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# **Engine Architecture**

## **Performance**

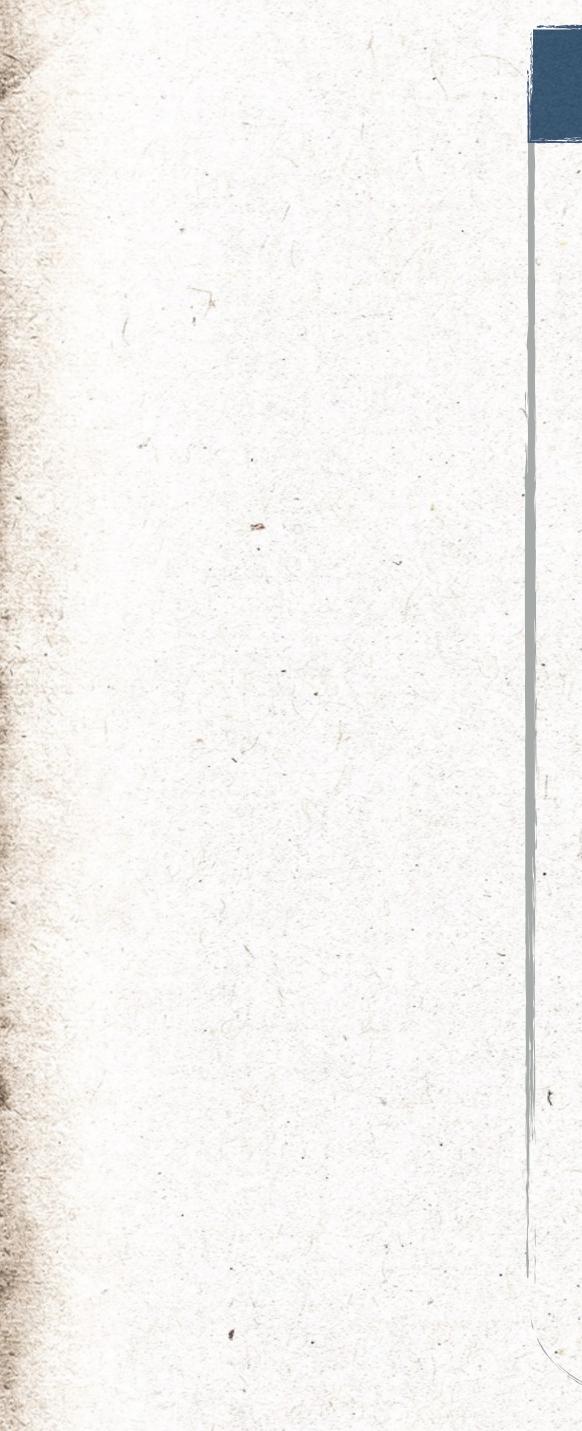
**Scalability** 

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# **Code Driven => Data Driven**

# **OOP Model => ECS Model**





# **Code+Data**

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# Render Node

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# Base Node

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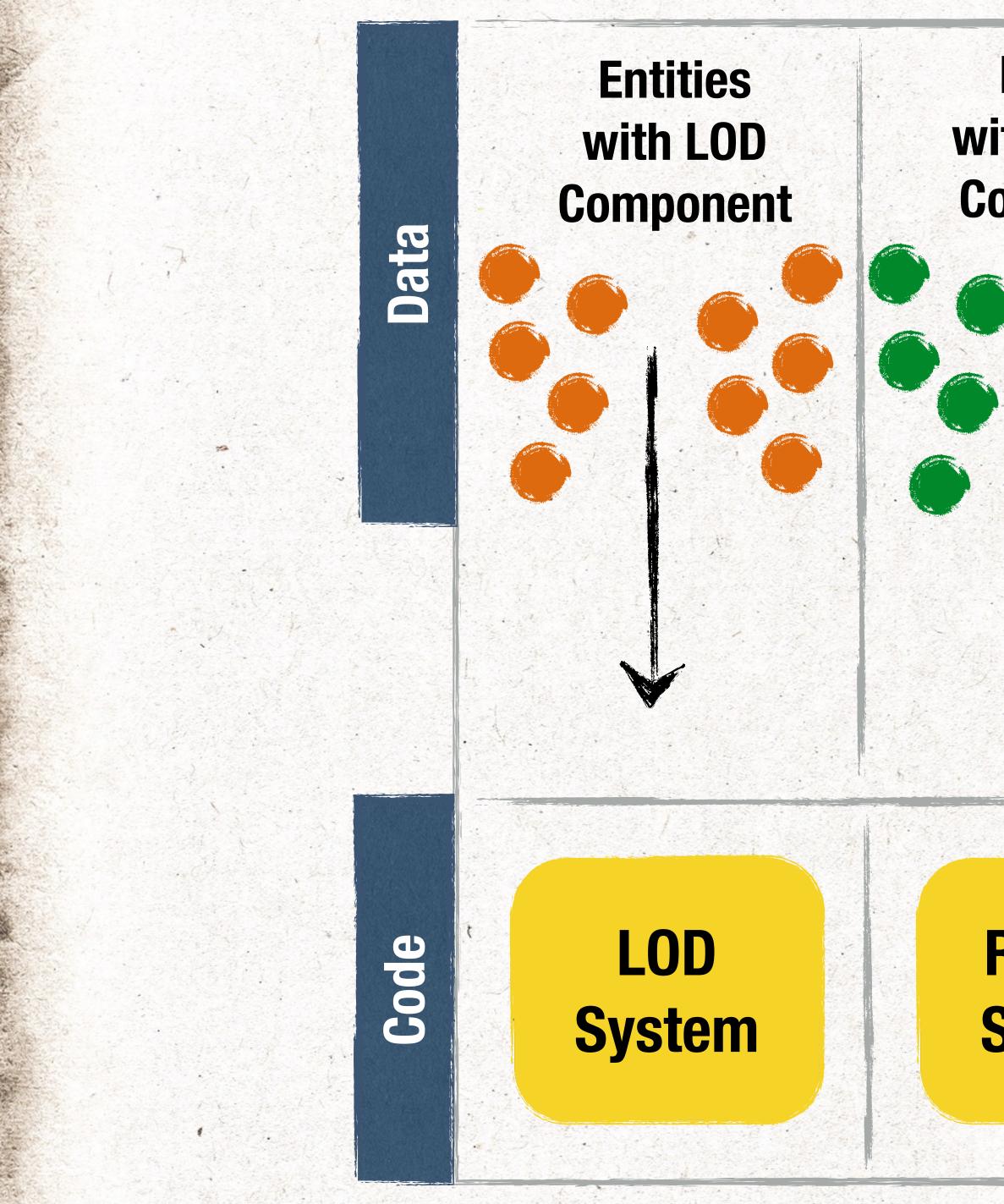
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# Switch Node

# LOD Node





# Entities with Render Component

# Entities with Switch Component

# Render System

# Switch System







# **Engine Architecture**

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# **Engine Architecture**

**Iterative Approach** 

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# 2 months **New architecture**

**1.5 months** 

## **Project Transfer**

1 month

## Optimization

**More Iterations** 

## **New features**







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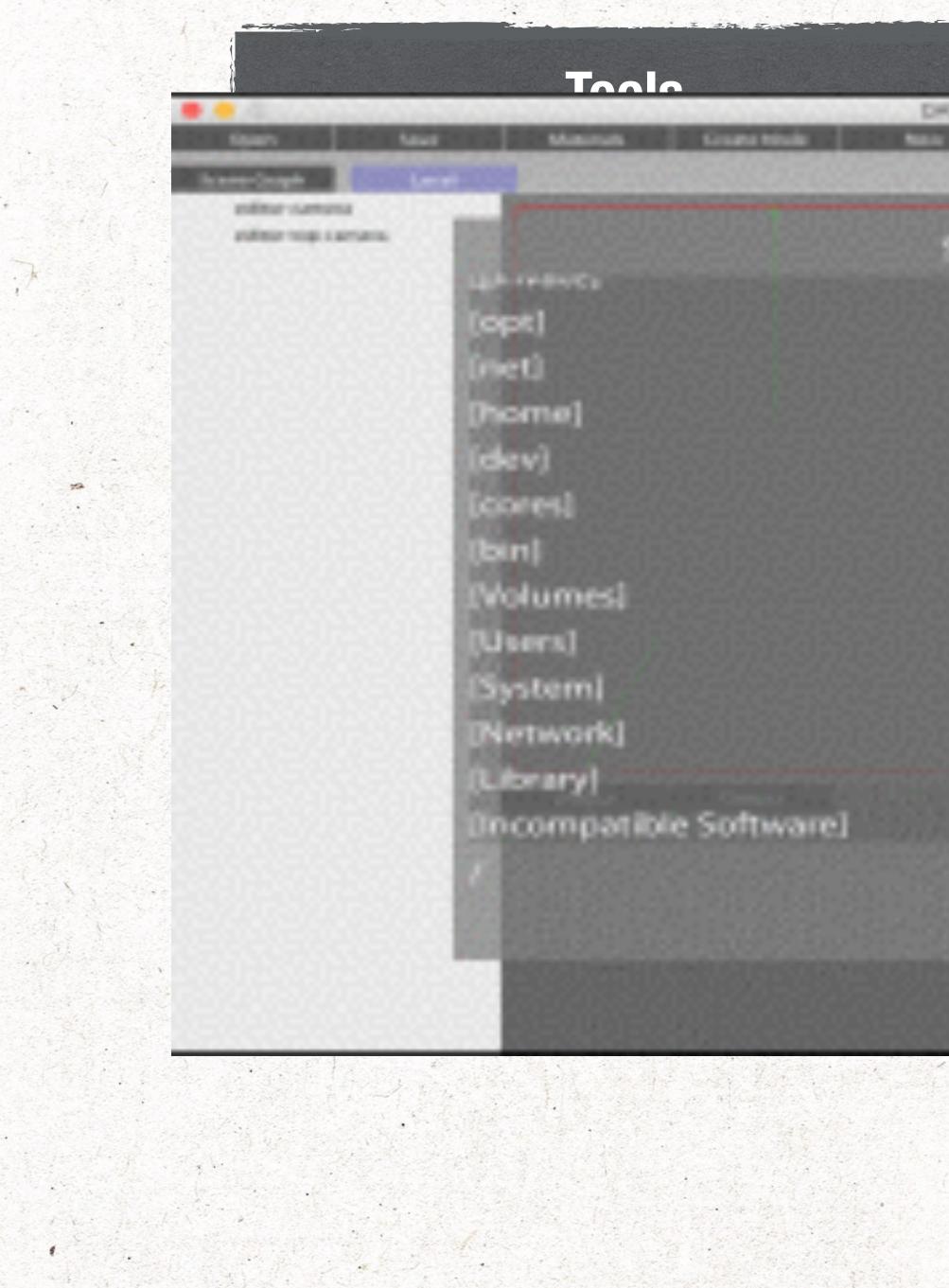
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### **First version of toolchain**

# Based on own UI framework





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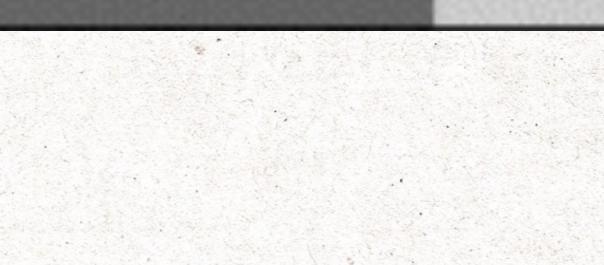
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### **First version of toolchain**

# Based on own UI framework



#### **First version of toolchain**

#### **Second iteration of toolchain**

#### **Transfer to new UI framework**

# Based on own UI framework

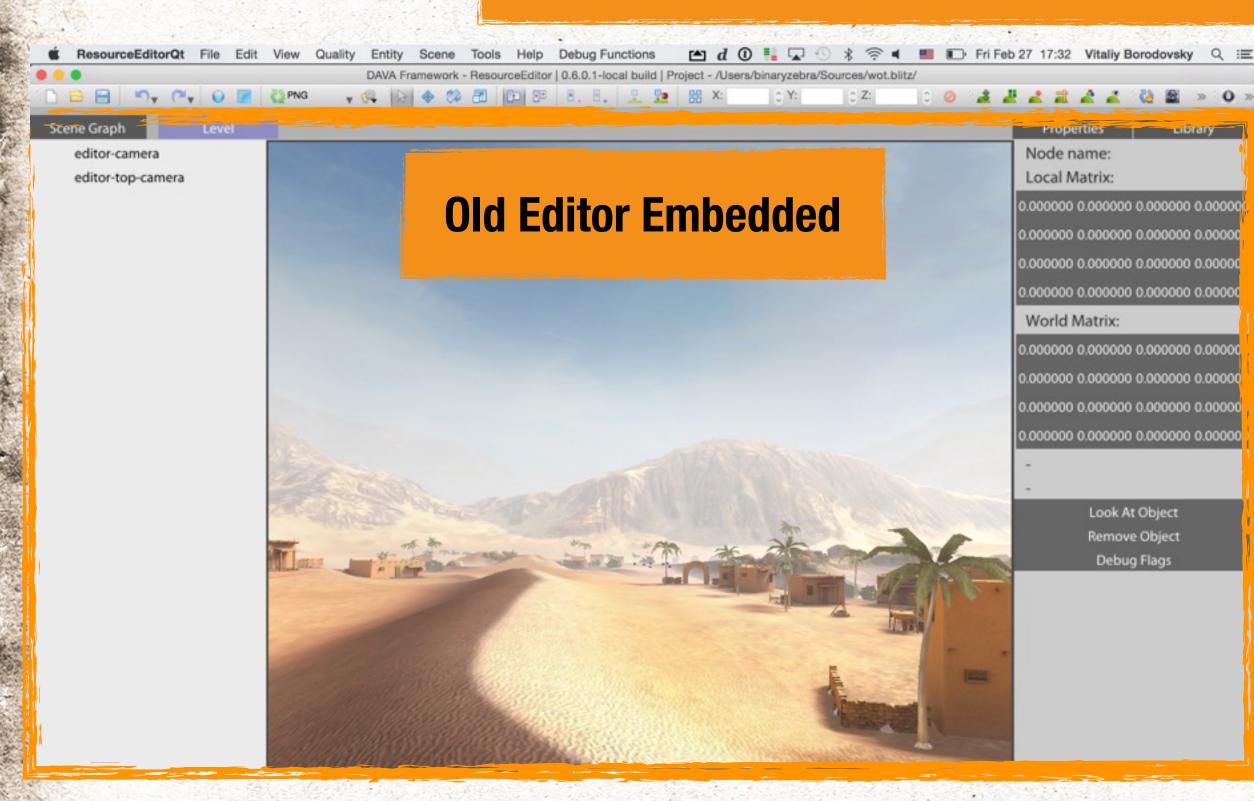
# **New UI framework for PC/Mac**



#### **First version of toolchain**

#### **Second iteration of toolchain**

#### **Transfer to new UI framework**



# **Based on own UI framework**

# **New UI framework for PC/Mac**

# 2 months

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#### **Embedded old tools to new framework**



#### **First version of toolchain**

#### **Second iteration of toolchain**

#### **Transfer to new UI framework**

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#### **New features**

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# **Based on own UI framework**

# **New UI framework for PC/Mac**

## **2** months

#### **Embedded old tools to new framework**

4 months

#### **Transfer of old functionality**



#### **First version of toolchain**

#### **Second iteration of toolchain**

#### **Transfer to new UI framework**

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# **Based on own UI framework**

# **New UI framework for PC/Mac**

## **2** months

#### **Embedded old tools to new framework**

4 months

**Transfer of old functionality** 

#### **Next Iterations**

New features on new framework



# Don't be afraid to overhaul everything!









# Tools

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#### **Tools delivery**



## Tools

#### **Tools delivery**

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	0.5.9_0.1.109	
	0.5.9_2014-08-22_14.09.220300	

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Eliminate time wasters!







# How do we overcome challenges?

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# How do we overcome challenges?

# Retrospective

# Implementation

# Challenge

# Idea / Solution

# Adaptation







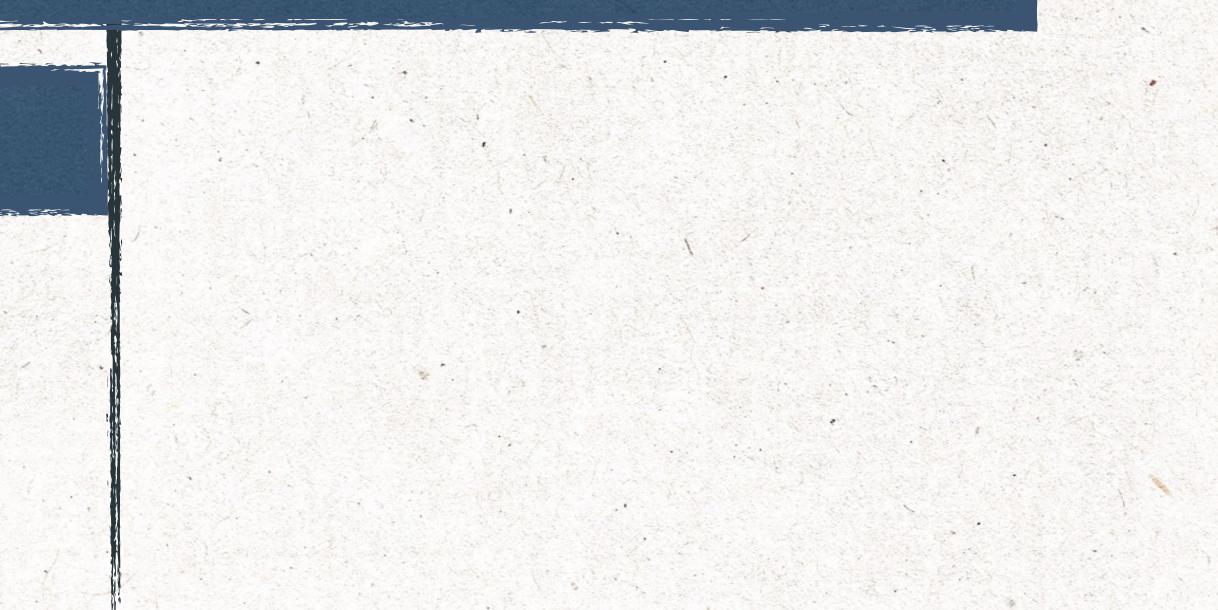
## **Constantly improve everything**

## **Right technical decisions matter!**

#### **Eliminate time wasters**

## Personalize your processes

## Don't be afraid to overhaul everything!





## **Constantly improve everything**

## **Right technical decisions matter!**

#### **Eliminate time wasters**

## Personalize your processes

## Don't be afraid to overhaul everything!

## Play your game every day!







## Links:

#### **Engine & Tools Source Code:**

#### Kanban & Scrum Making The Most Of Both

#### **Artemis Framework**

#### https://github.com/dava/dava.framework

http://www.agileinnovation.eu/wordpress/wpcontent/uploads/2010/09/ KanbanAndScrum\_MakingTheMostOfBoth.pdf

#### http://gamadu.com/artemis/



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# Thanks to the team

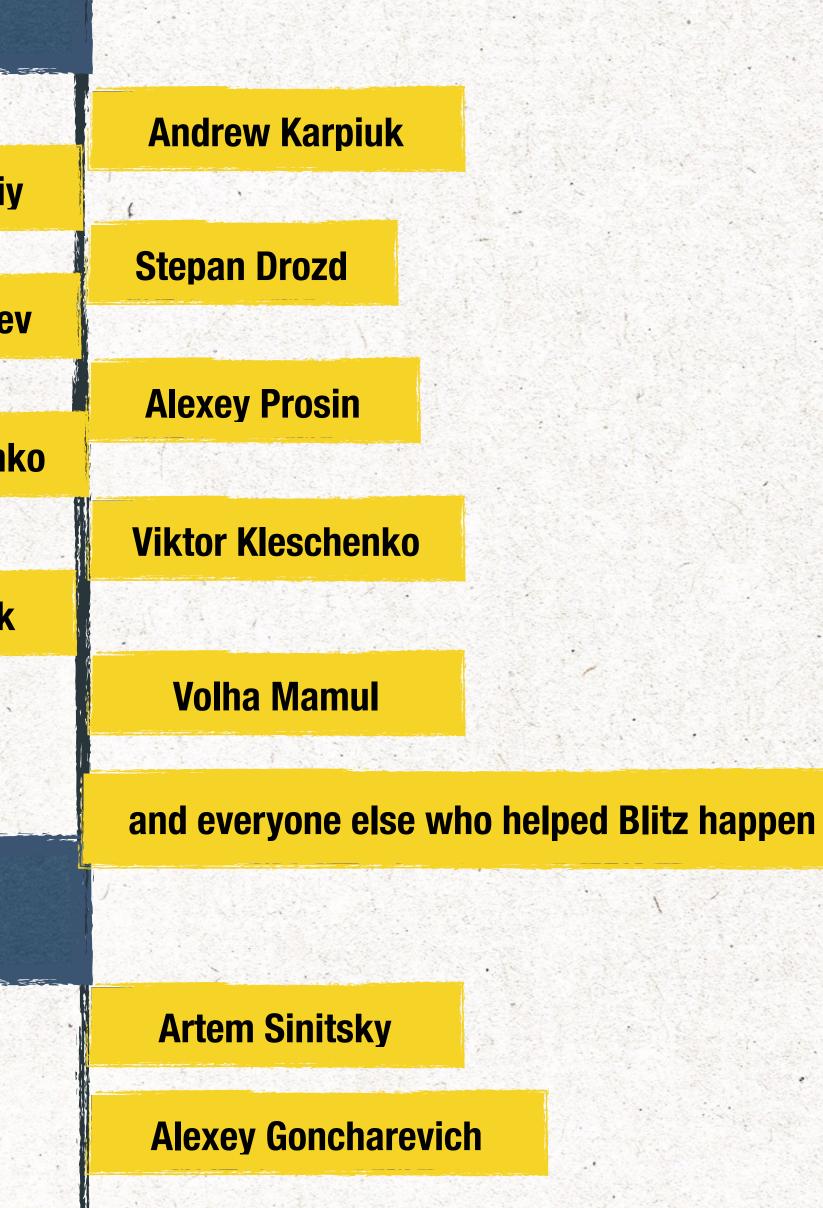
#### **Dmitry Bobrovnichiy**

**Alexey Alexeev** 

Ivan Petrochenko

**Anna Kovalenok** 

#### **Special Thanks**









# Thank you!

#### **Questions?**

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#### v\_borodovsky@wargaming.net

