Conception and Implementation of a robocup@Work refereebox

Kai Seidensticker, robOTTO

Requirements

- robcup@Work
- Referee Box Today
- Our Goals

Conception

- Overview
- Visual Design
- Feature

Timeline

- Open Questions
- Milestones

Future Work

- framework to create applications
- better design for frontend
- Morph
- eaieser deployment
  - use launchpad or reprepro

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Referee Box Today

Our Goals

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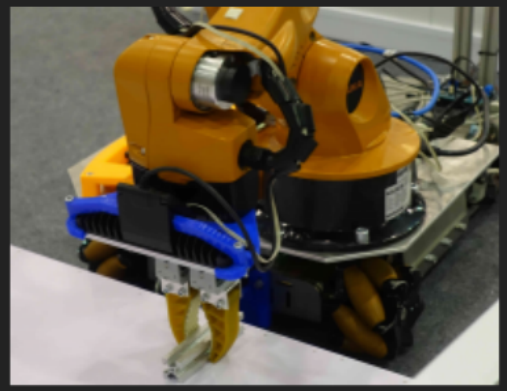
robocup@Work

- offical major league
- 5 -10 Team around the World
- a mobile manipulator solve Task in a miniatur Fabric
- technical Background
  - kinematic for manipulator
  - localisation
  - computer vision
- Focus:
  - Industry 4.0
  - Future Fab
  - Automation Technology

Kuka Youbot



robocup@Work

Requirements

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Referee Box Today

Our Goals

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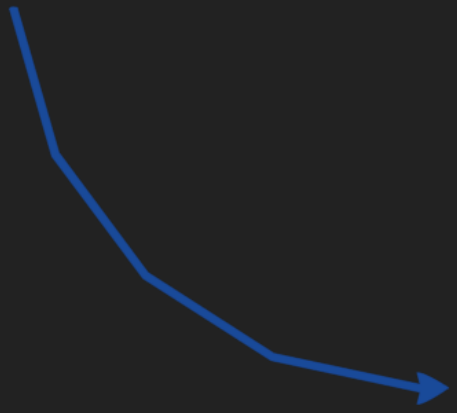
Referee Box Today

- two various referee box implementation
- no standardization
- no support for M2M communication
- no support features for referees
- pen and paper taskgeneration
- no visualisation for teams und audience



- the referee system isn't enable for a industry 4.0
- no benefit for referees, teams and league

Requirements

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Referee Box Today

Our Goals

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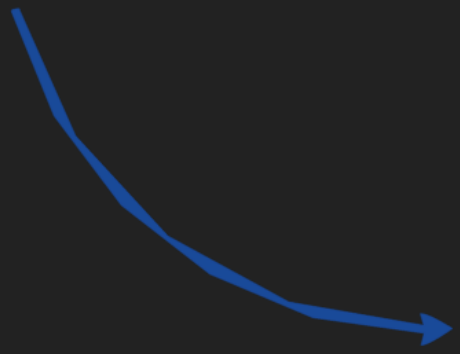
Our Goals

- one referee system for whole league
- a robocup proof solution
- uniform standards
- more referee support
- device integration (belt, roundtable)
- M2M communication
- visual support for audience



- a system for a industrial industry 4.0
- less work for the referees
- increasing the attractiveness of the league

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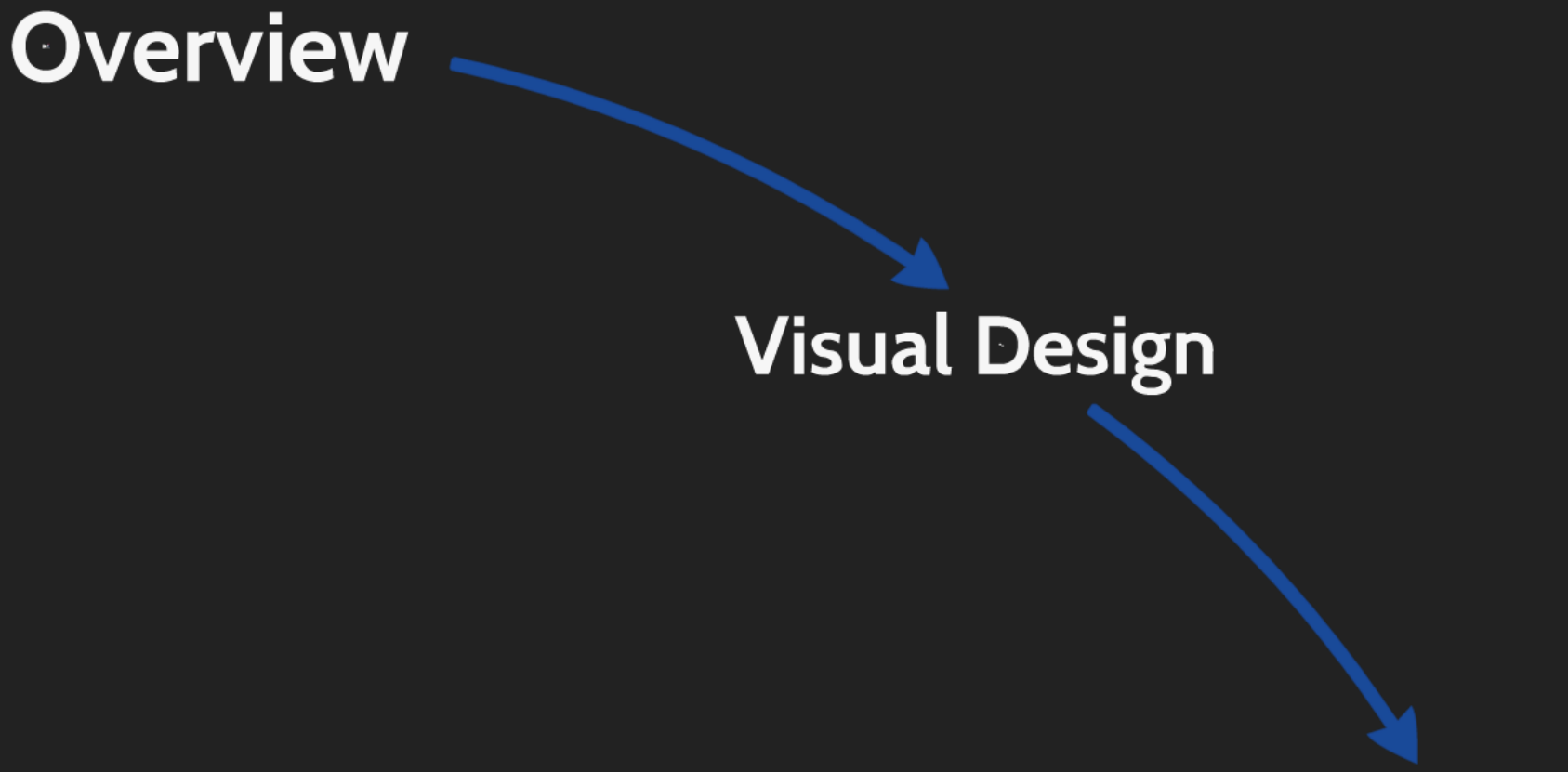

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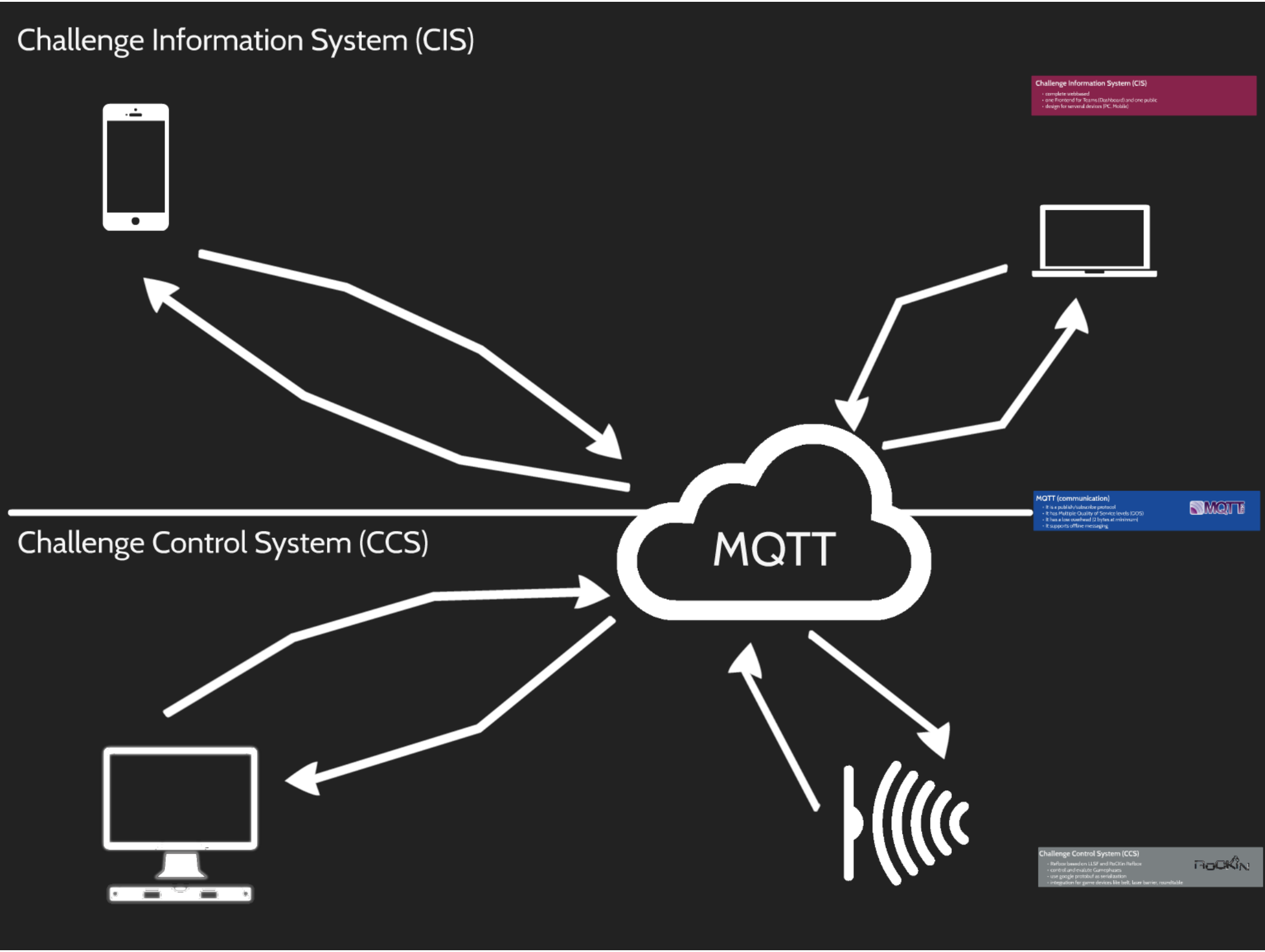
Challenge Information System (CIS)
Challenge Information System (CIS)
• complete webbased
• one Frontend for Teams (Dashboard) and one public
• design for serveral devices (PC, Mobile)
MQTT (communication)
• It is a publish/subscribe protocol
• It has Multiple Quality of Service levels (QOS)
• It has a low overhead (2 bytes at minimum)
• It supports offline messaging
MQTT
Challenge Control System (CCS)
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• Refbox based on LLSF and RoCKIn Refbox
• control and evalute Gamephases
• use google protobuf as serialization
• integration for game devices like belt, laser barrier, roundtable

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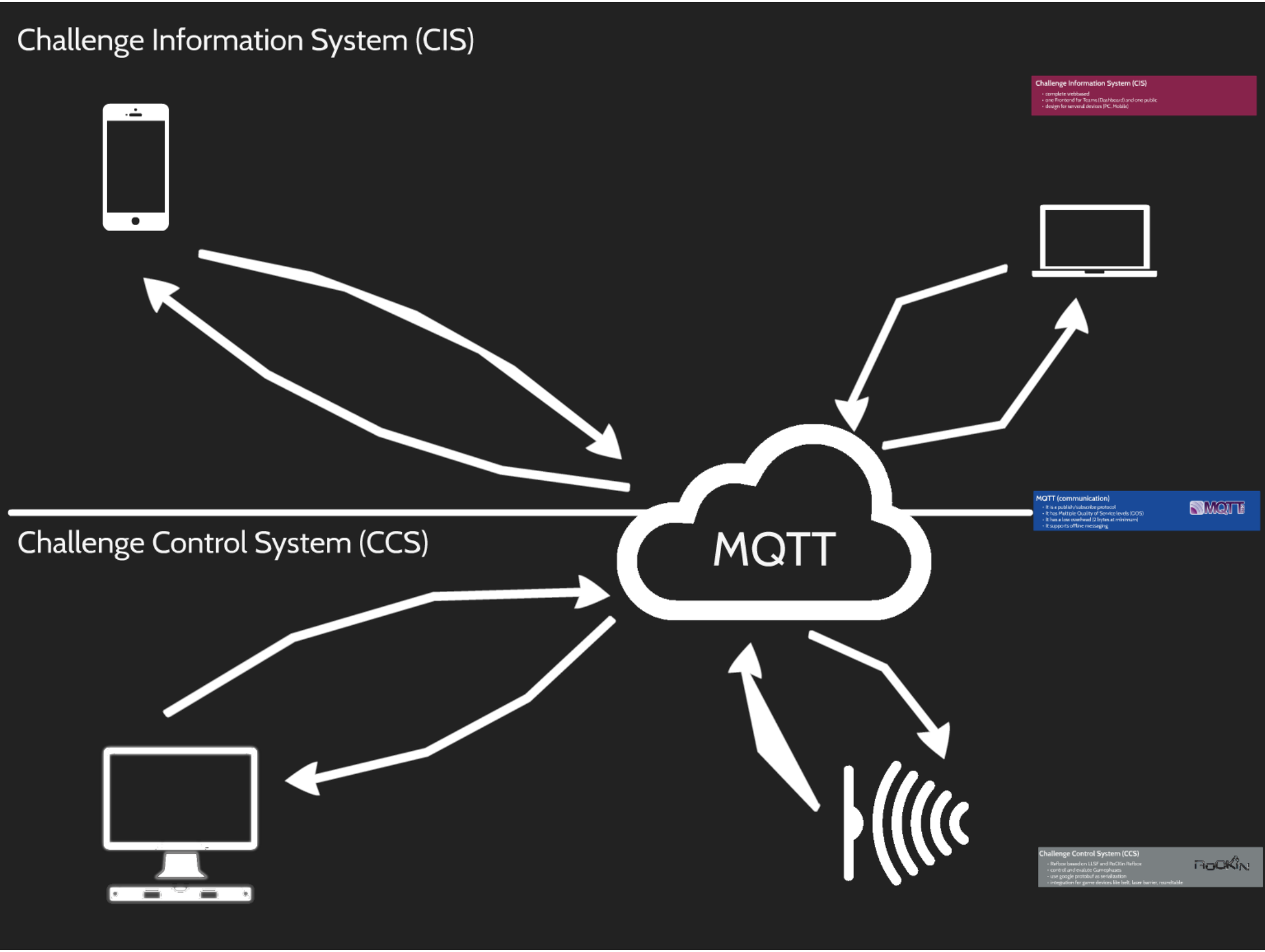
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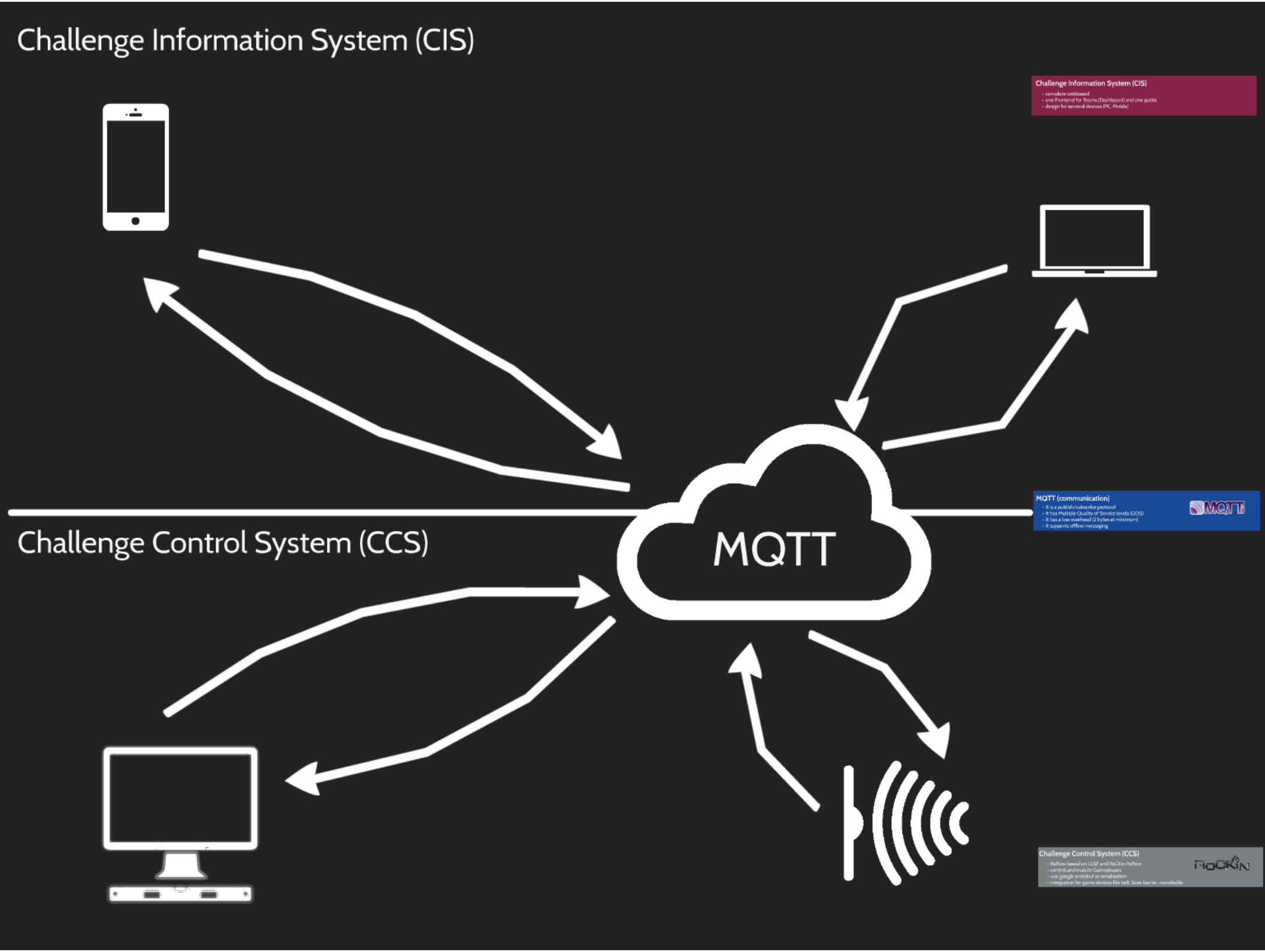
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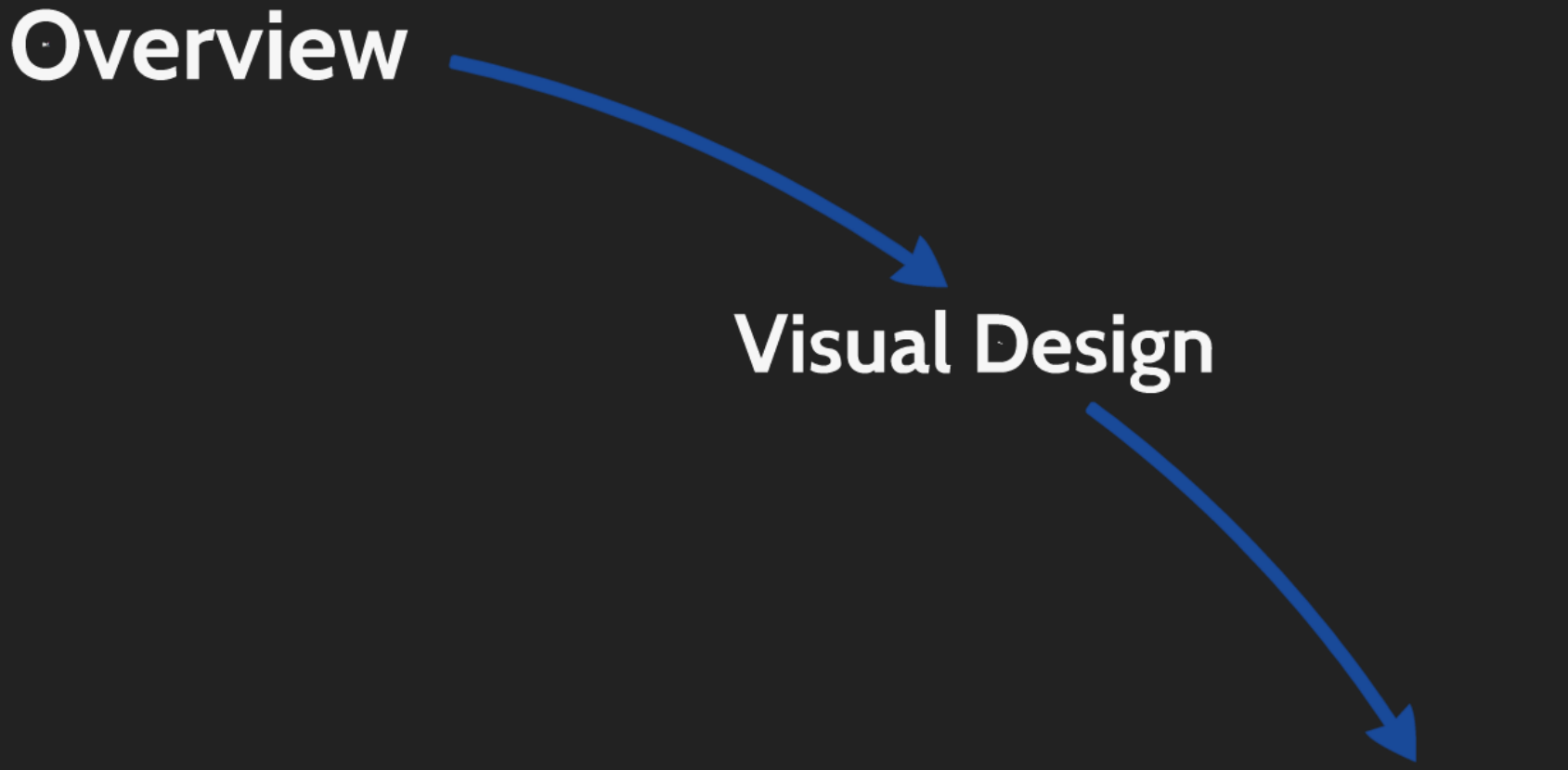

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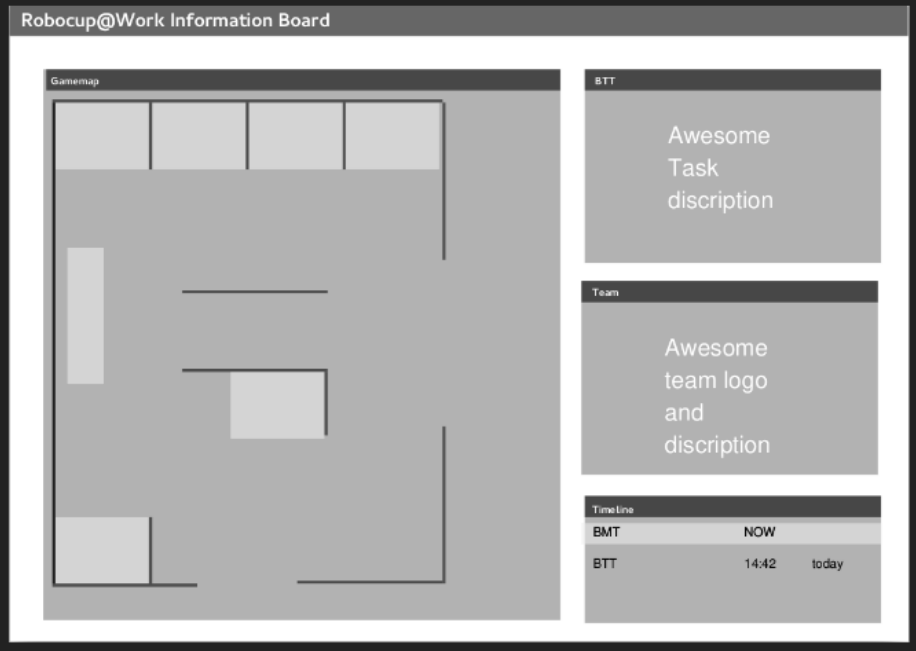
Team Dashboard, (mock version 0.7)



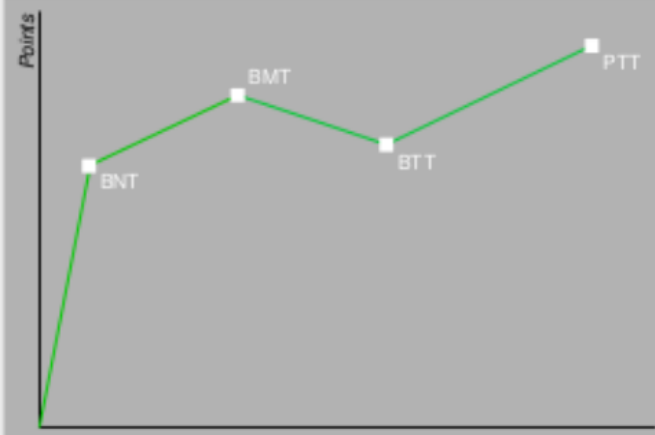
Public Dashboard, (mock version 0.7)

Dashboard

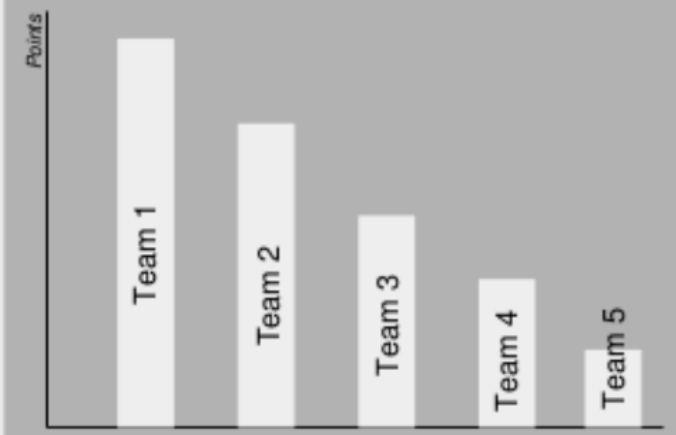
- Overview
- Tasks
- Intercom

Team Foobar

Own Results



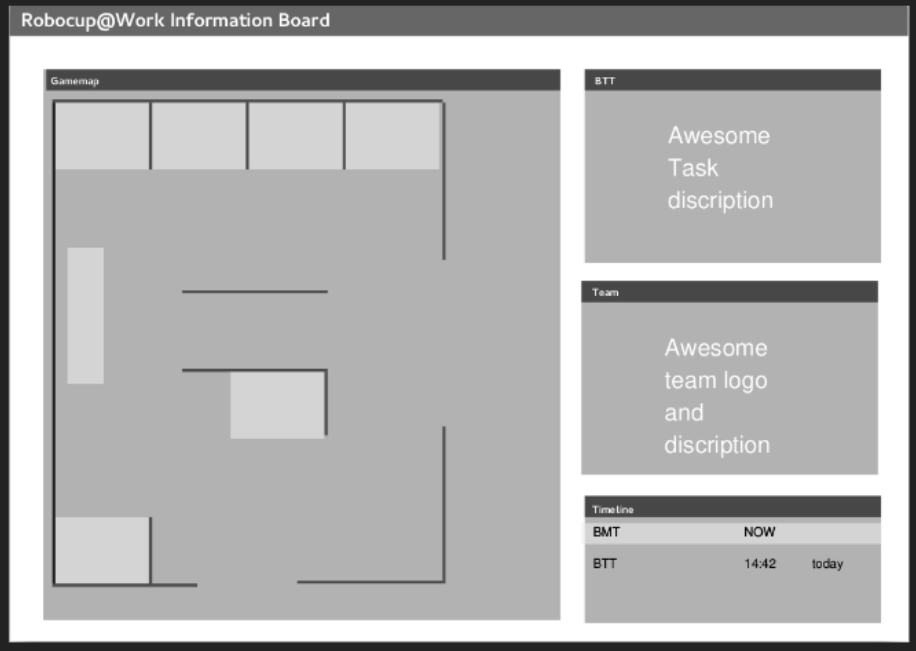
Result overall



Timeline

Team Leader Meeting	20:15	today
BMT	13:37	tomorrow

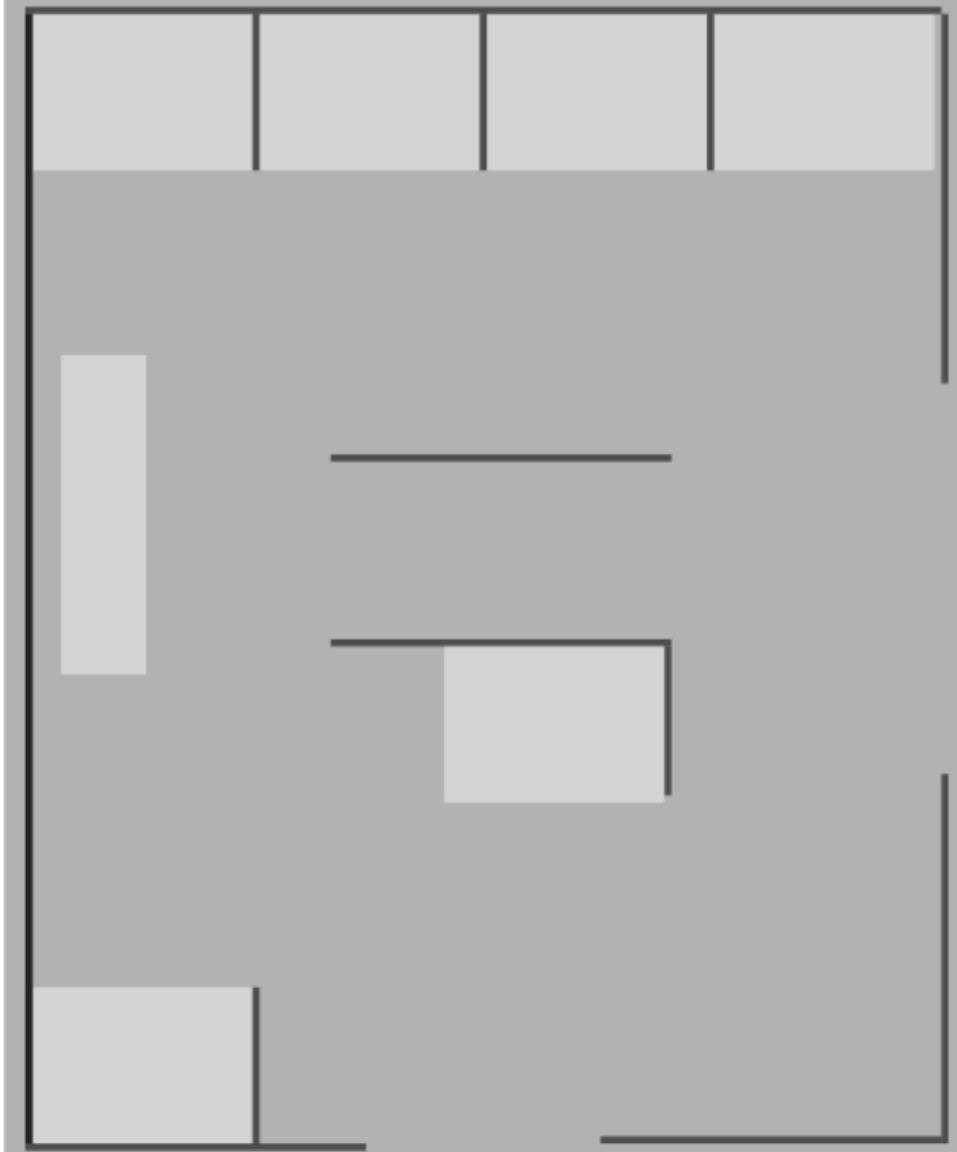
Team Dashboard, (mock version 0.7)



Public Dashboard, (mock version 0.7)

Robocup@Work Information Board

Gamemap



BTT

Awesome Task discription

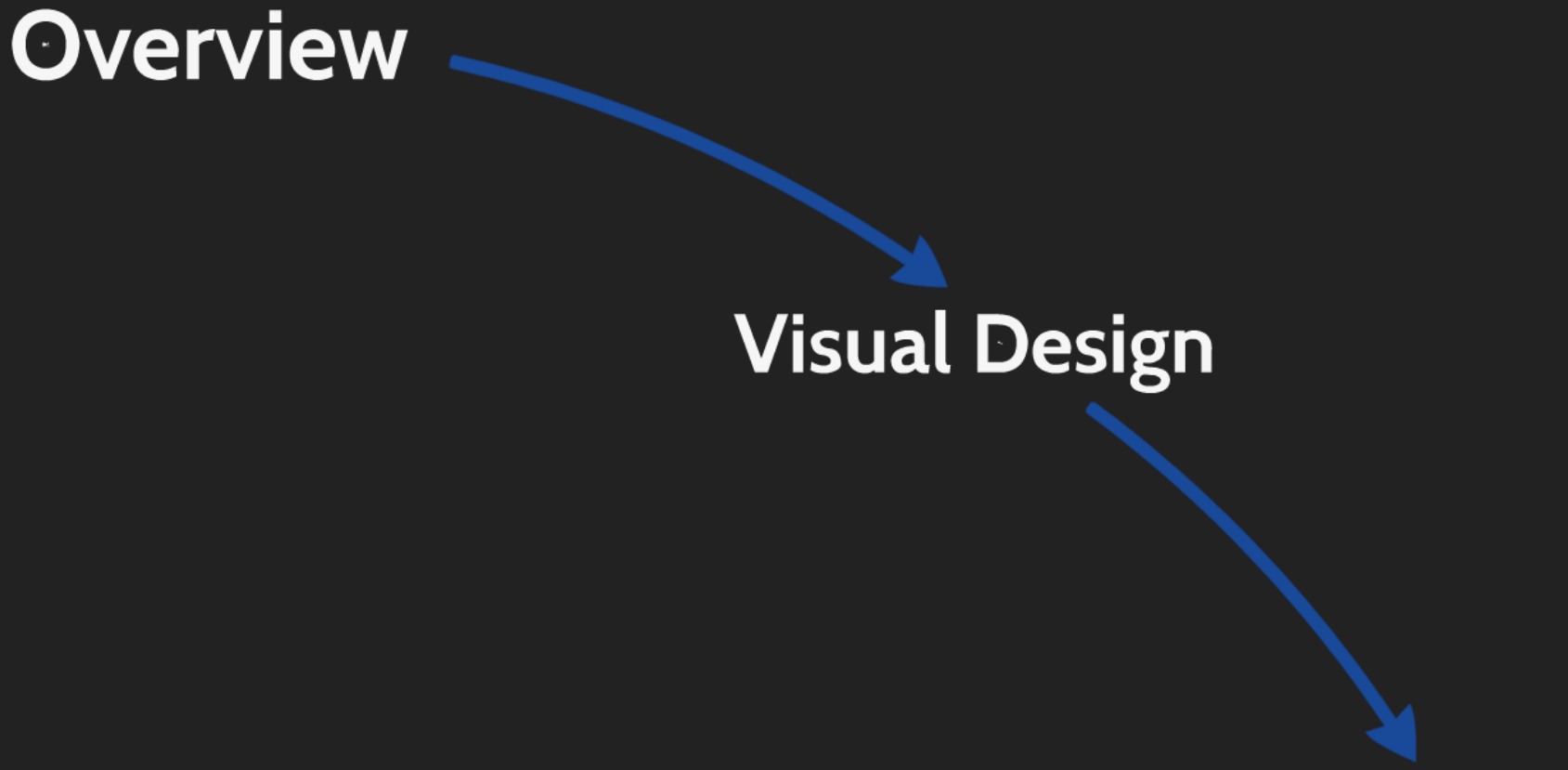
Team

Awesome team logo and discription

Timeline

BMT	NOW	
BTT	14:42	today

Conception



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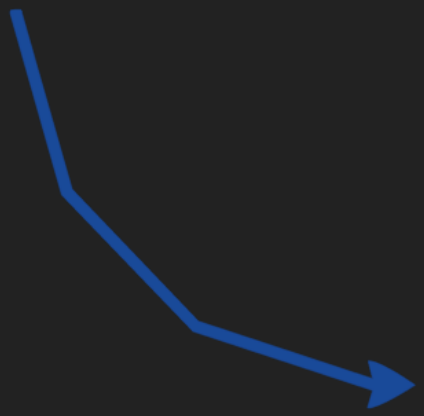
Feature

- automatization for many referee task
- M2M for devices and youbot
- automatical task generation
- visual support for audience
- better communication for teams
- workflow between mobile manipulator and model fab



communication system for Industry 4.0

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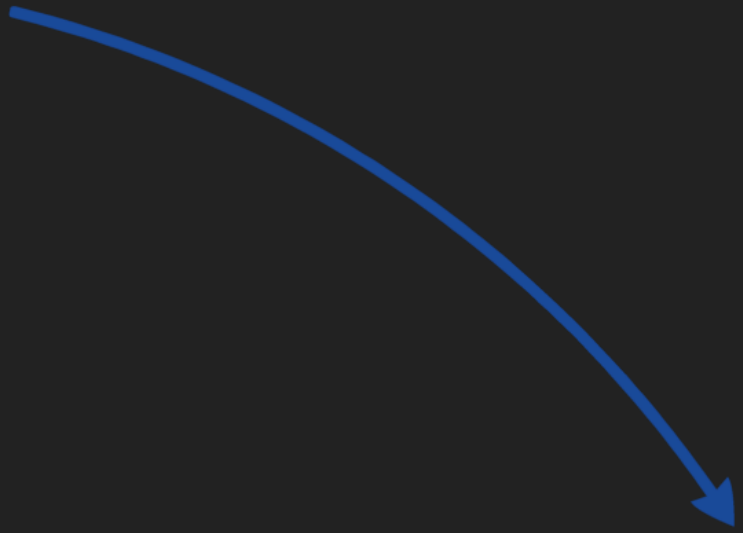

Milestones

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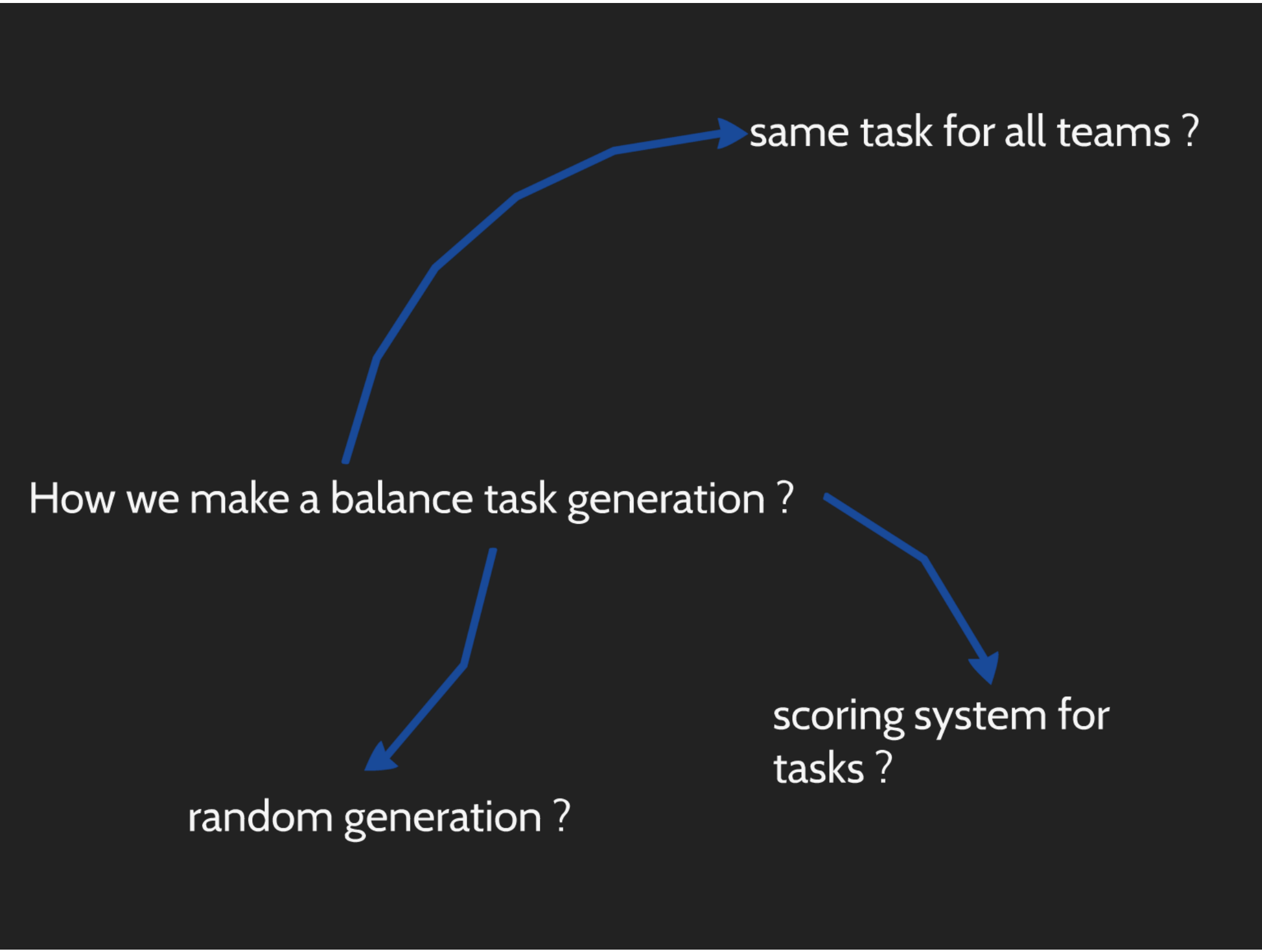
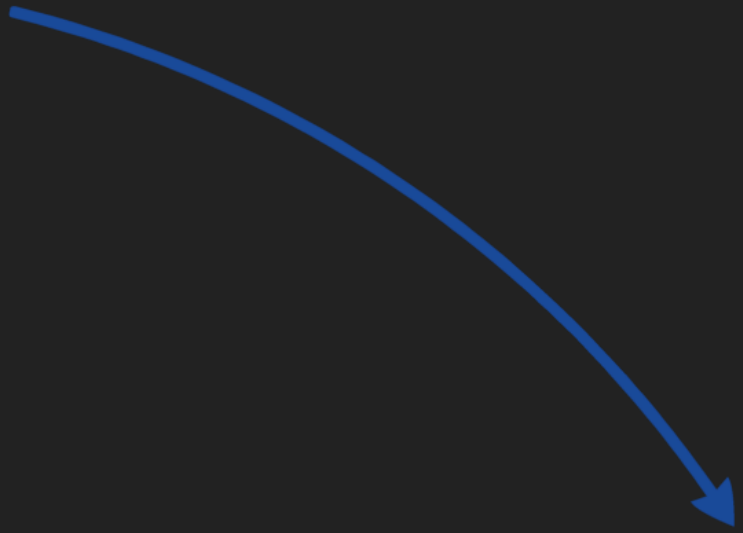

same task for all teams ?
How we make a balance task generation ?
random generation ?
scoring system for tasks ?

Timeline

Open Questions



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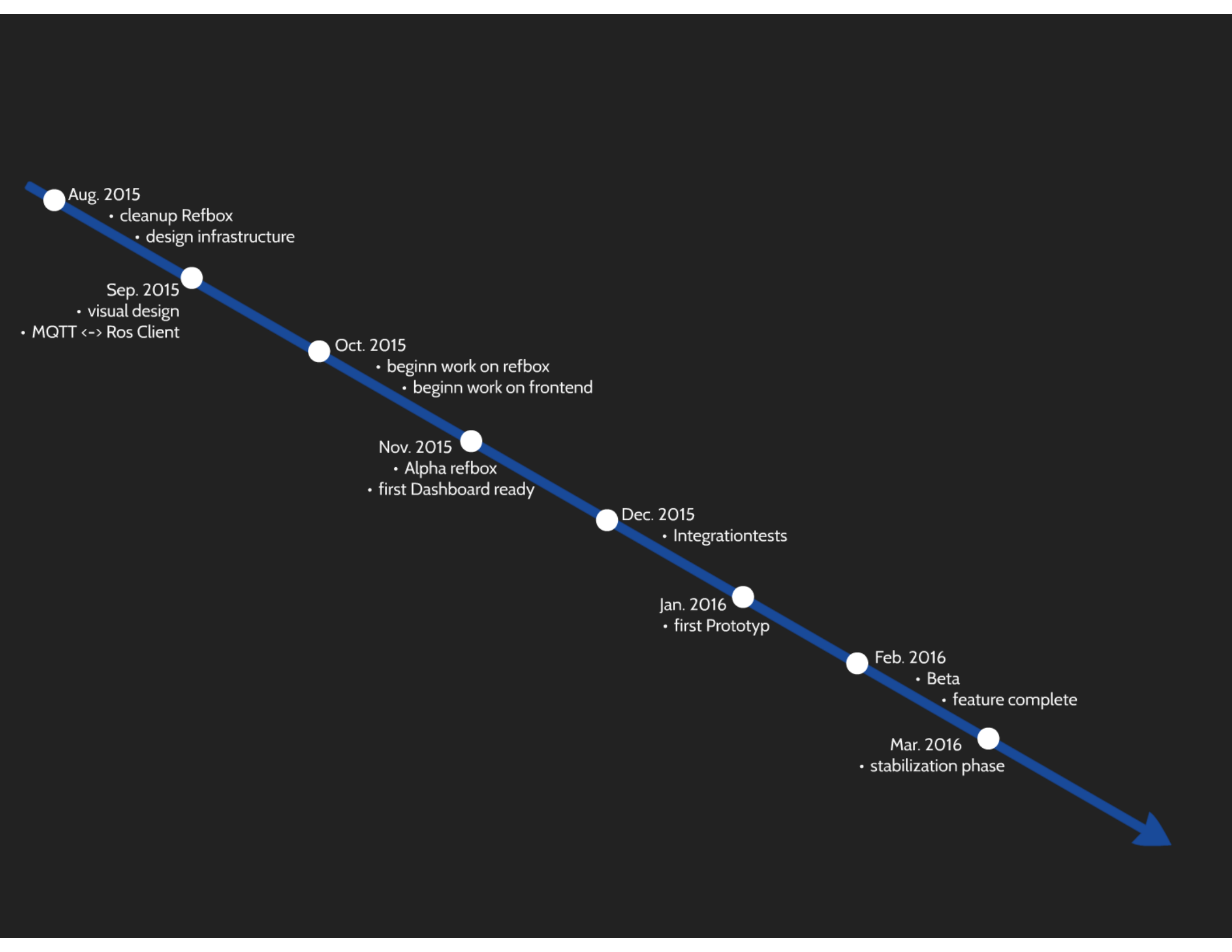
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Sep. 2015
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• MQTT <-> Ros Client
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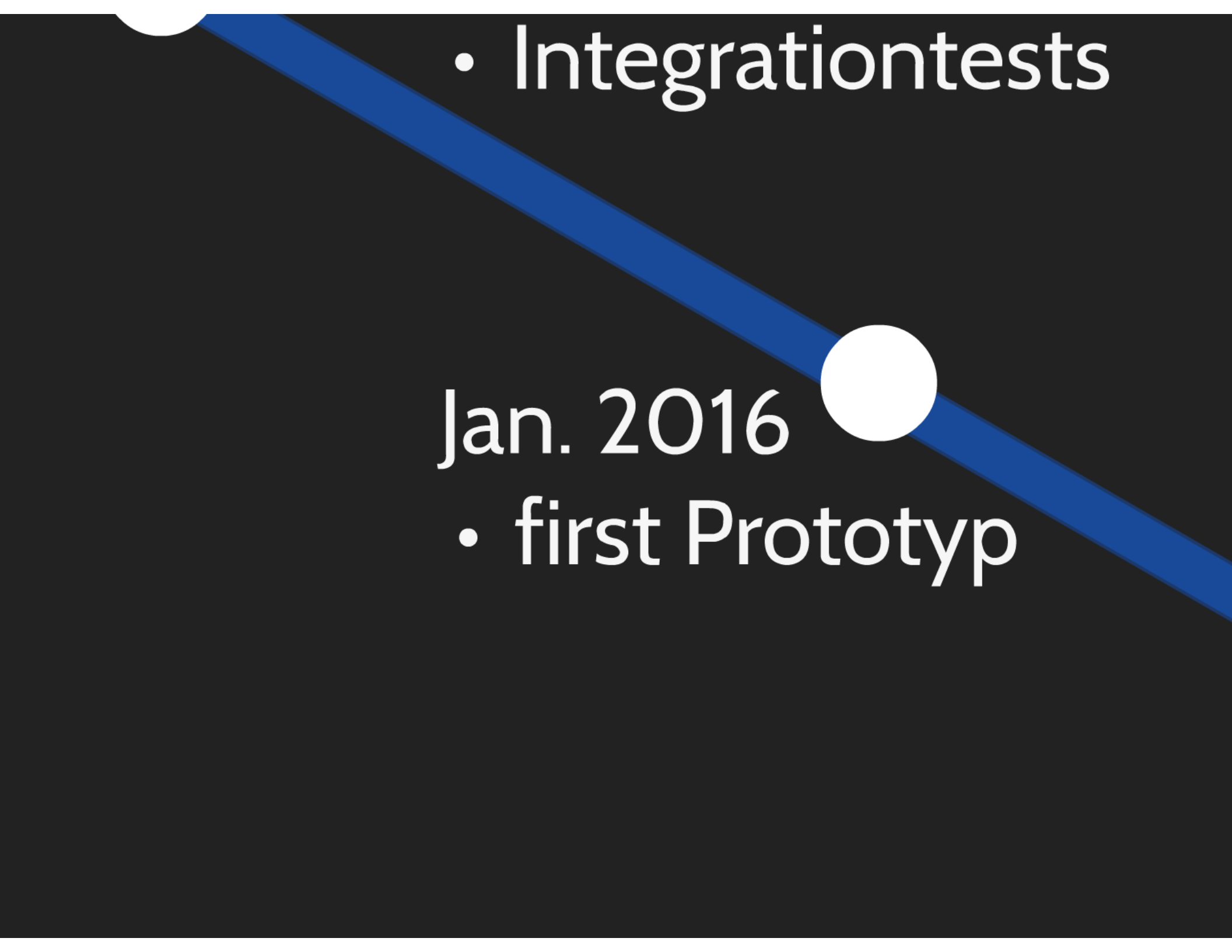
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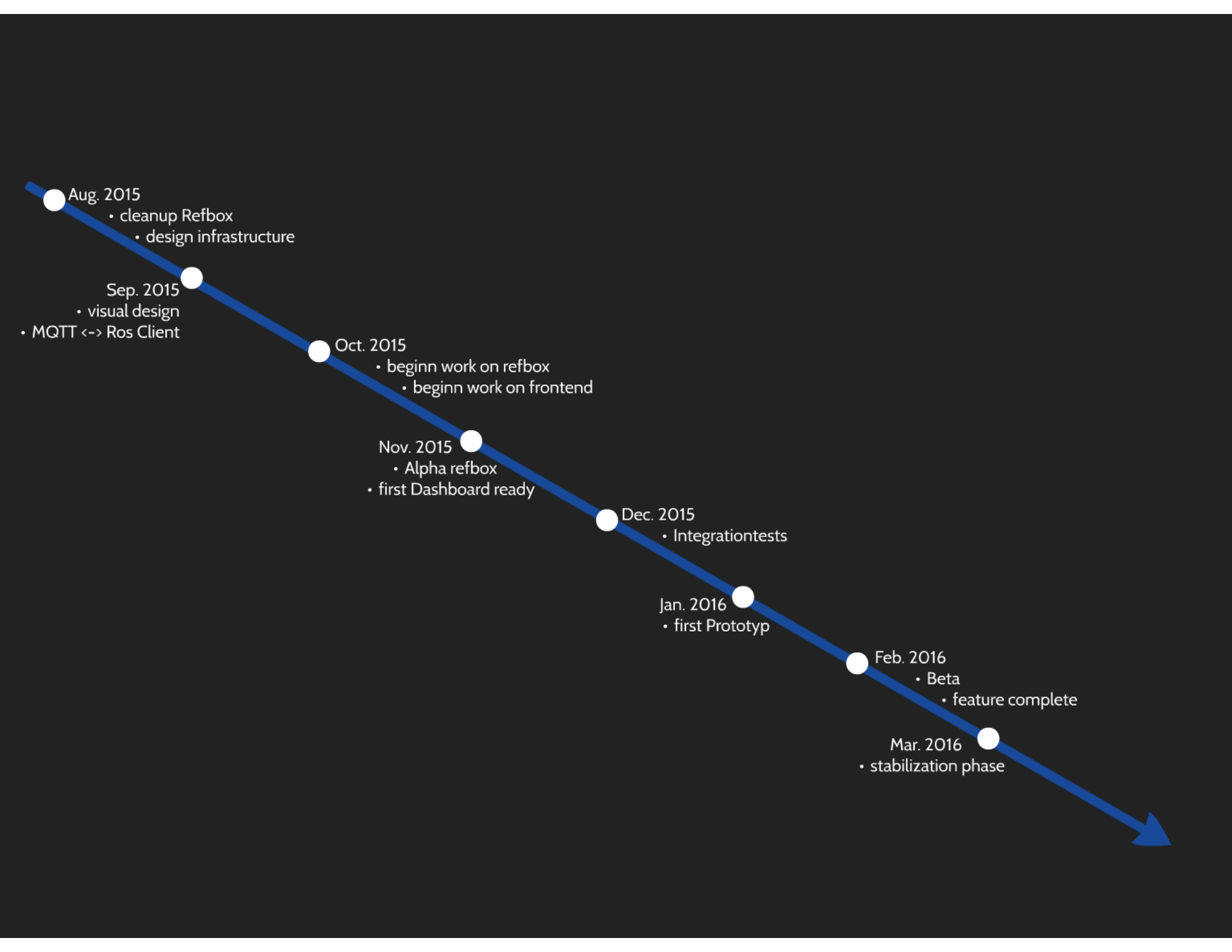
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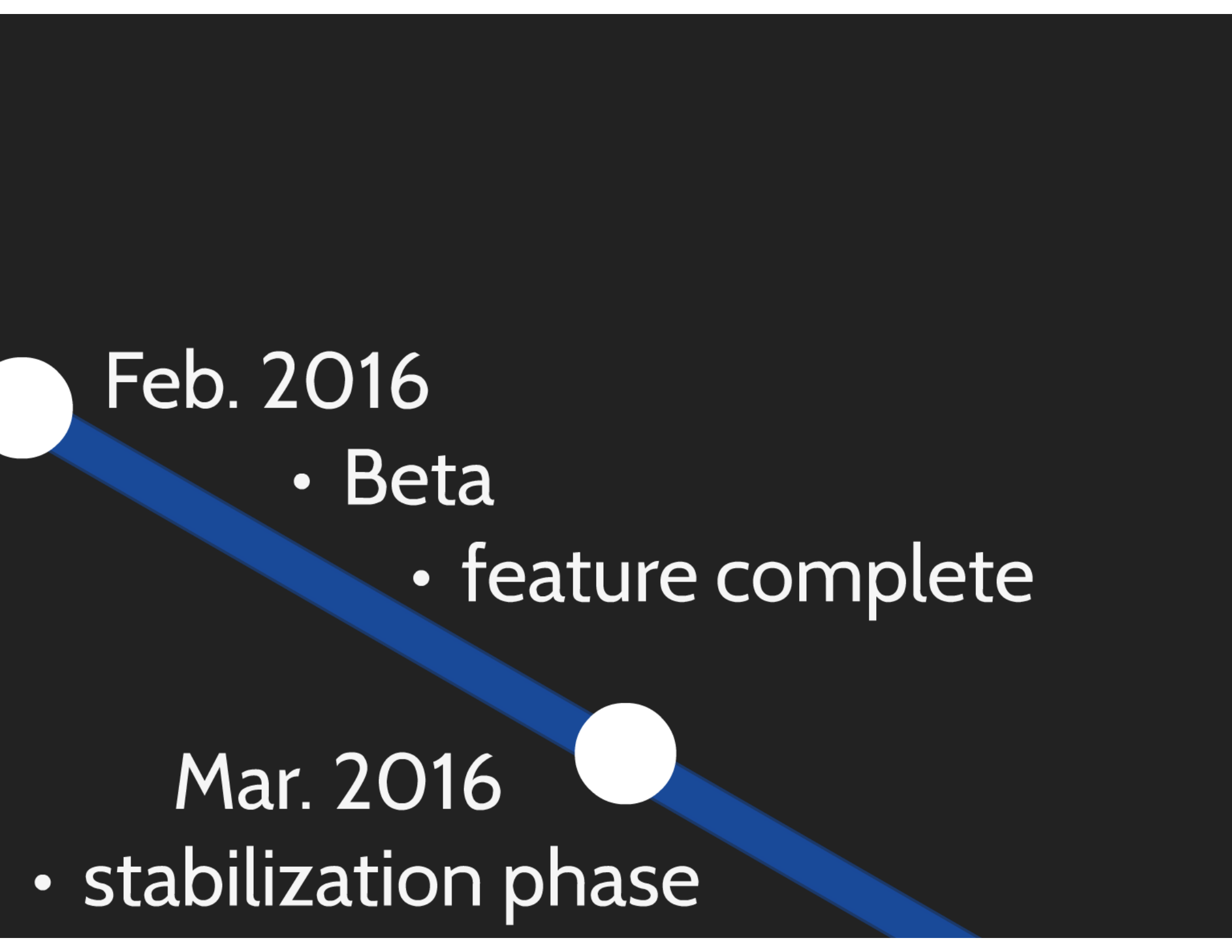
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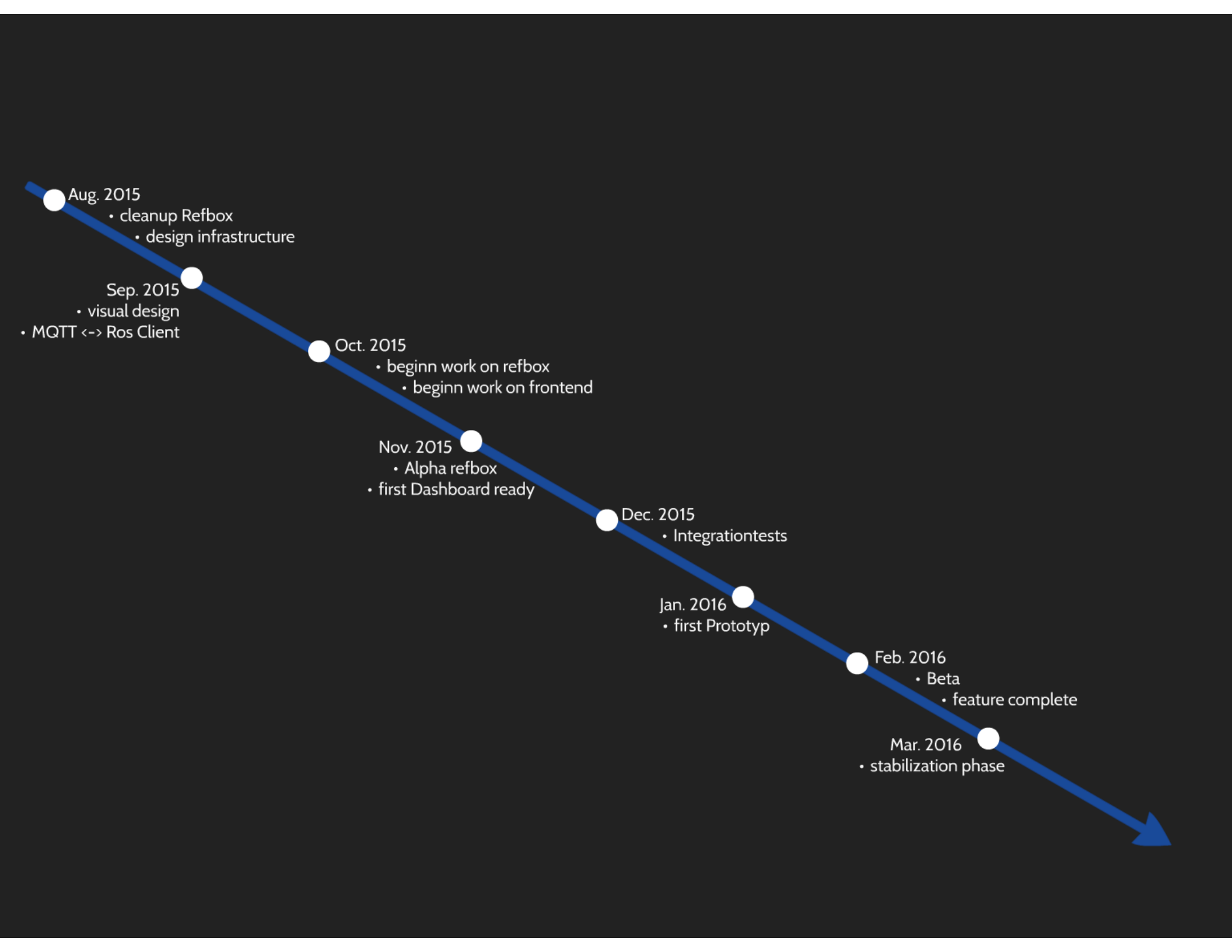
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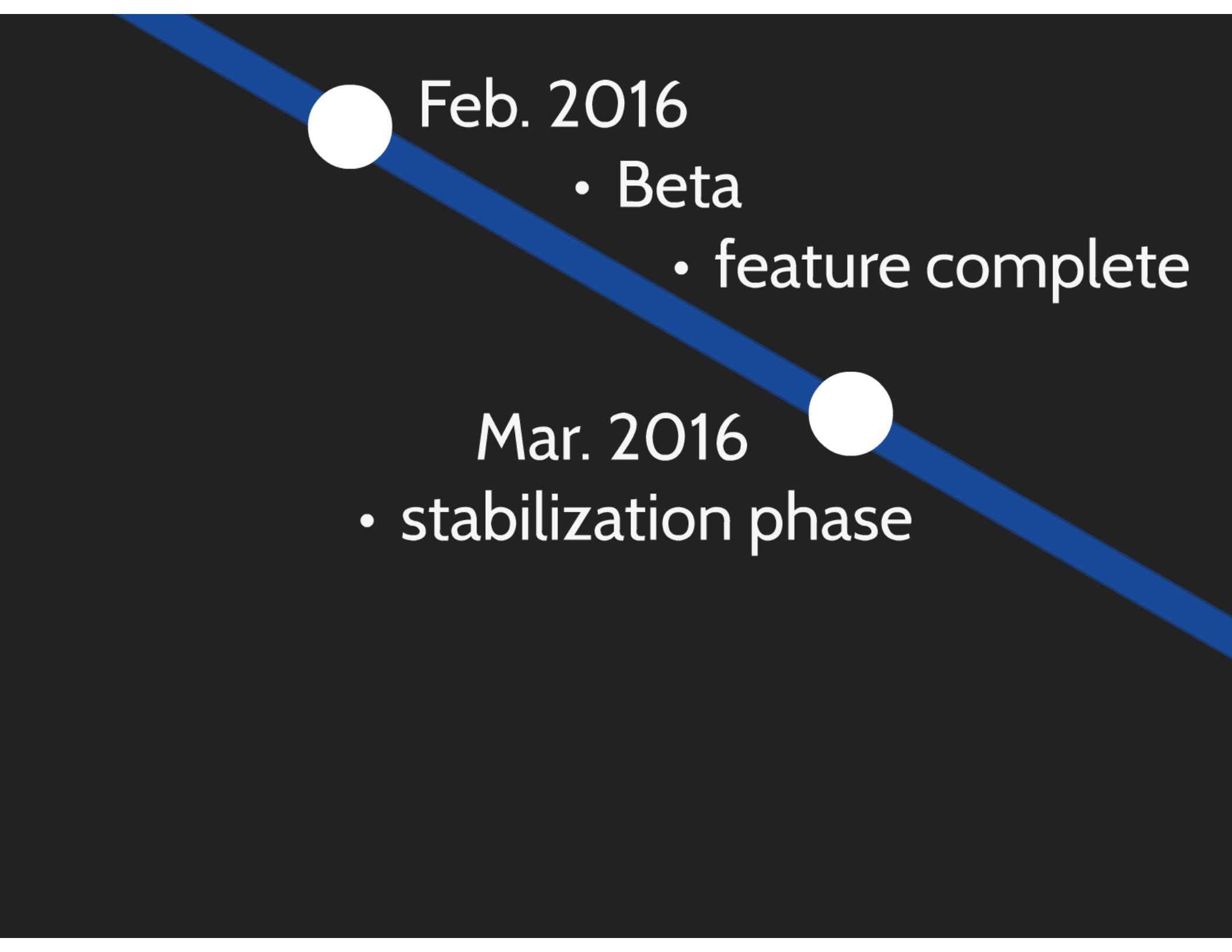
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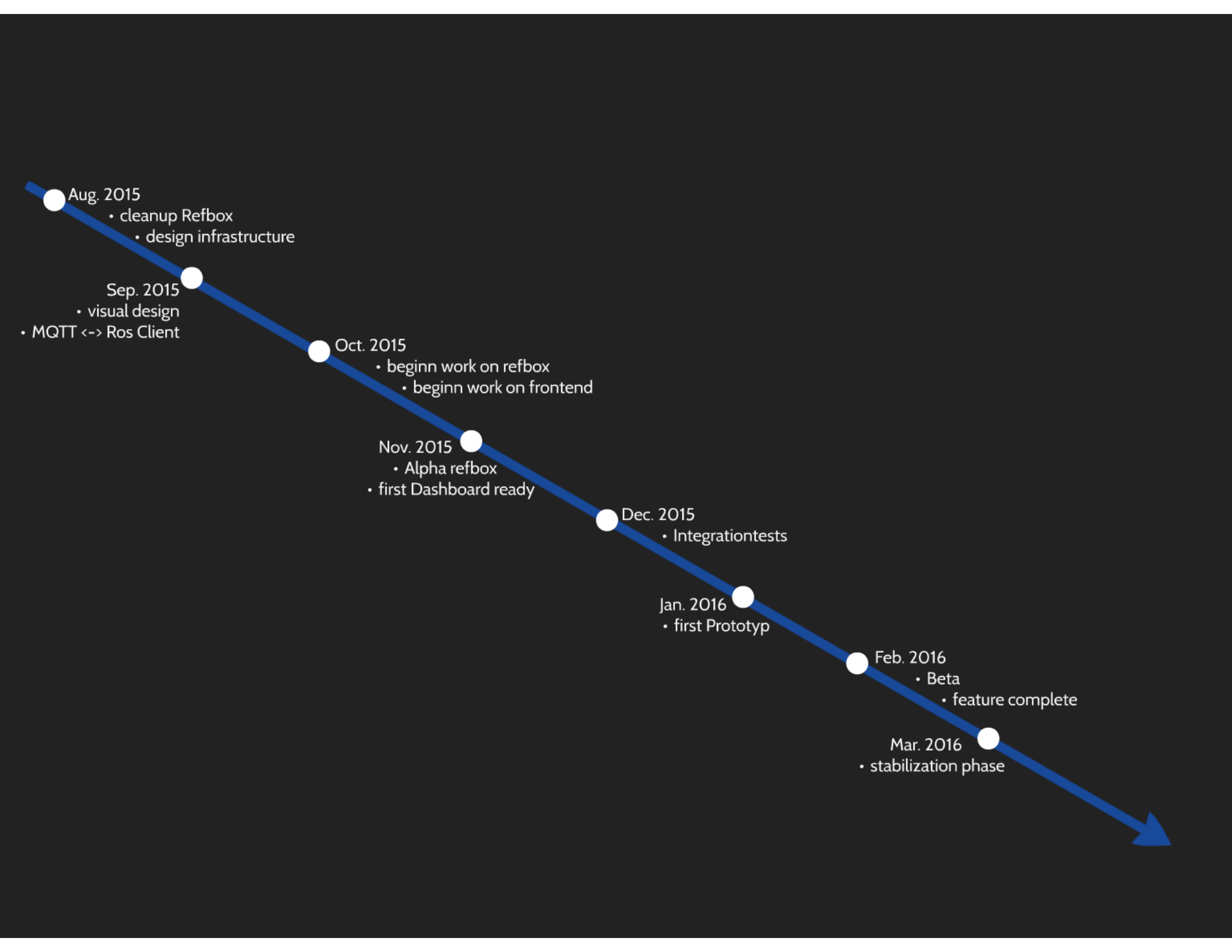
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Morph

- dev kit powered by bootstrap
- included MQTT support
- included all templates to create new frontend in CIS enviroment and style
- it's enabled a greate way for community work
- first prototyp: Q4 2016

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