Metrics that Matter for Engineering Execution

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Agenda

- **Why** (should we use metrics)?
  - The Problem
  - Do we really need to measure?
  - The benefits
  - Today in metrics
  - Positive Behaviors / Negative Examples
- **What** (should we measure)?
  - DORA - State of DevOps & Accelerate
  - Metrics that Matter
- **How** (can we rollout)?
  - Different Methods
  - How can we start?
  - The full blown vision
- **Questions**

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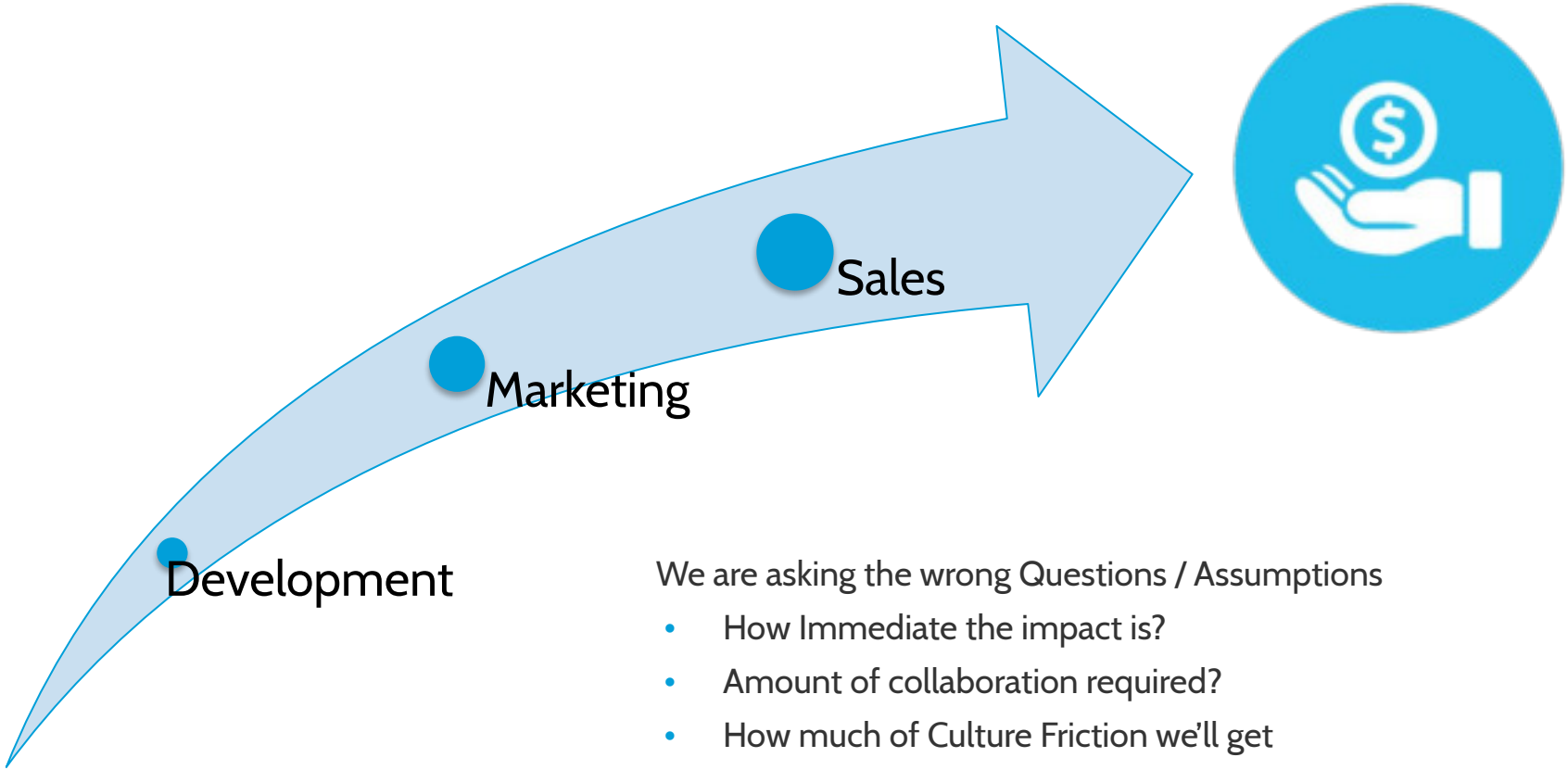
Why?

Why should we measure R&D Execution?

Executive Meeting (“We are flying blind”)

The Revenue Trail Paradox



We are asking the wrong Questions / Assumptions

- How Immediate the impact is?
- Amount of collaboration required?
- How much of Culture Friction we'll get
- **System of Record**

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“R&D” system of record is in constant motion

Planning — Coding — Testing & Deployment — Running

Planned in Project Management systems

Developed in Source Control Systems

Tested and deployed in CI/CD systems

Running in production environments

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System of Record

Why measure?

- Metrics => Culture (should be managed and not left in a vacuum)
- Why now?
  - Cloud Shift, API, Openness
  - Collaboration (Reviews etc.)
  - Industry Maturity (there's a will and a need now)
  - New Generation of developers: data is the new O^2
- Some Answers we get on "why measure":
  - Accountability
  - Pure Knowledge
  - **Affect Behaviors (our favorite)**

"We measure to encourage positive behaviors"

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Measure for positive behaviors

- Measure **Process over Output** where possible
  - Cycle Time vs. # of commits
- Measure **Leading Indicators vs. Lagging Indicators**
  - OKRs vs. KPIs
  - High Code Churn vs. Bugs
- Measure to make it **Actionable**
  - Long Living Pull Requests
- Measure with awareness to **R&D Dimensions**
  - Time: **Iterations (scrum) / Weeks (Kanban)**, Quarterly for review talks, BoD
  - People: **Team first** (Squads/Guilds), roll out for individual with caution

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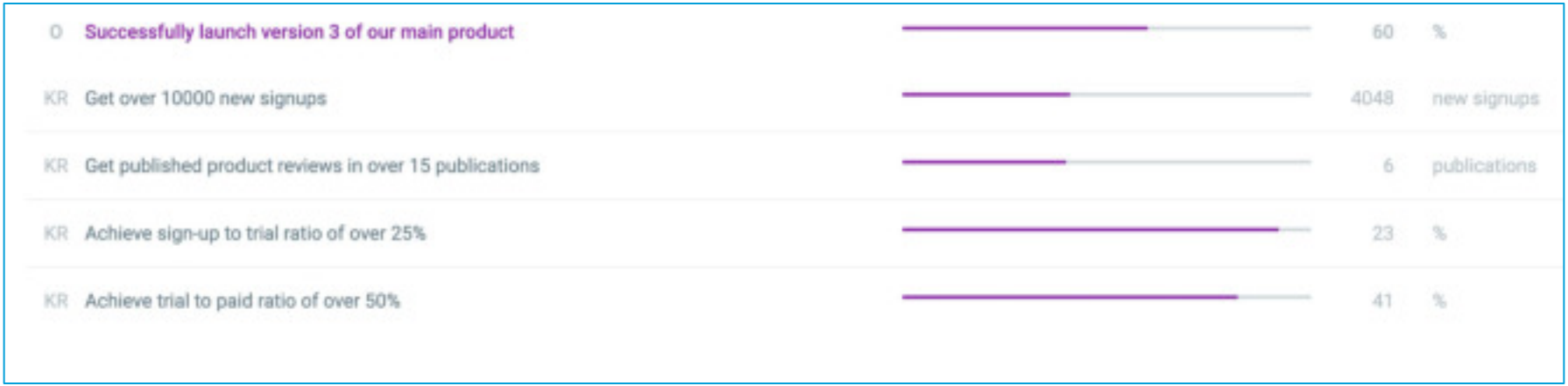
OKR Example (from okrexamples.co)



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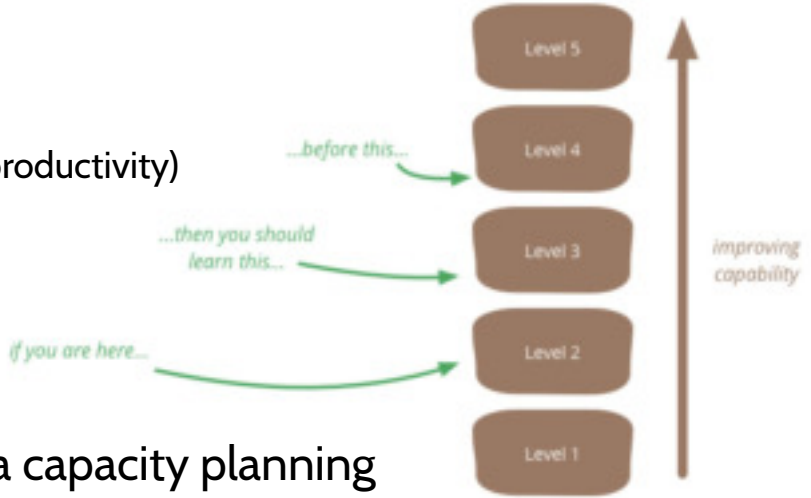
Common Pitfalls

- Don't focus on **Output Measures**:
  - # Lines of Code
  - # Commits
  - # of Pull Requests (good for frequency, not for productivity)
- Don't use **Compound Metrics**
  - 'Impact' is not actionable
- The '**While In iteration**' Agile Blindspot
- **Velocity is NOT a productivity metric**, it's a capacity planning tool
- Maturity Models ...



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The Benefits

- **Immediate Actions** (Spot Stale PRs or Risky Branches)
- **Alignment** & Goals (OKRs)
- Request **Justification** (data wins arguments)
- **Predictability** (The 'When' question)
- **Higher Purpose** (Understand our impact)

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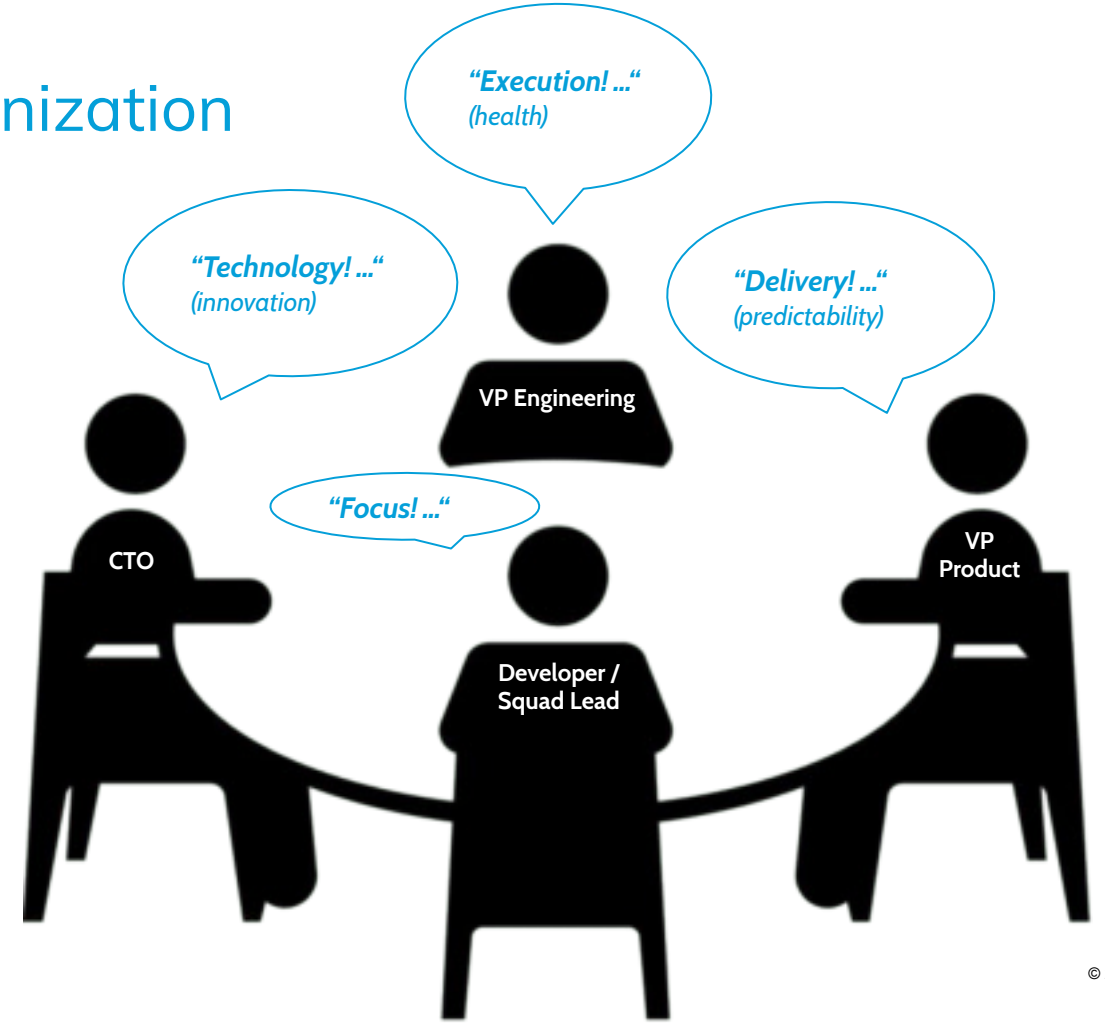
What?

What should we be measuring?

R&D Organization



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What do most teams measure?

(Based on conversations with over ~250 R&D leaders over the last 18 months)

- **Features**
  - Delivered, Actual vs. Planned
  - Usually VP Product will report
- **Velocity**
  - The business can't understand, does not measure productivity
- **Jira / Project Management Items**
  - Bugs Fixed
  - Tickets Done
  - Defect Rate (production bugs)
- **Cycle Time (JIRA)**
- **Frequency?** (Usually Monthly or one offs)
- **Team?** (Entire Organization, sometimes teams)

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DevOps Research and Assessment (DORA)

- **Assessment Based** (over 3k R&D organizations)
- Led by **Nicole Forsgren** (PhD)
- Accelerate Book / State of the DevOps Report
- Captured the **DevOps Movement Impact on Business**
- Acquired By Google in Jan/2019
- Correlated Elite R&D Groups with **4 key metrics** that they performed high - all feed each other
- Highly Opinionated, talks about a gap that's growing bigger

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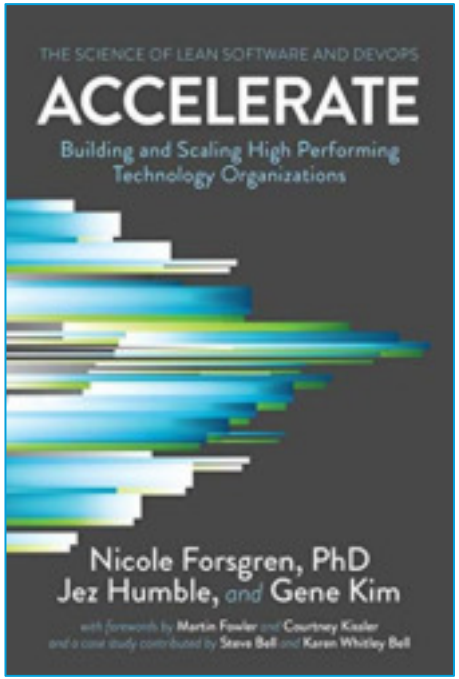
DORA - Cont.



"Software delivery is an exercise in continuous improvement, the best keep getting better, and those who fail to improve fall further and further behind."

"in today's fast-moving and competitive world, the best thing you can do for your products, your company, and your people is institute a culture of experimentation and learning, and invest in the technical and management capabilities that enable it."

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DevOps Research and Assessment (DORA)

"Lead time for changes

Deployment Frequency

Change Failure Rate

Mean Time to Restore"

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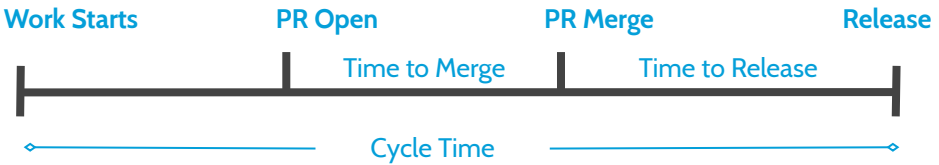
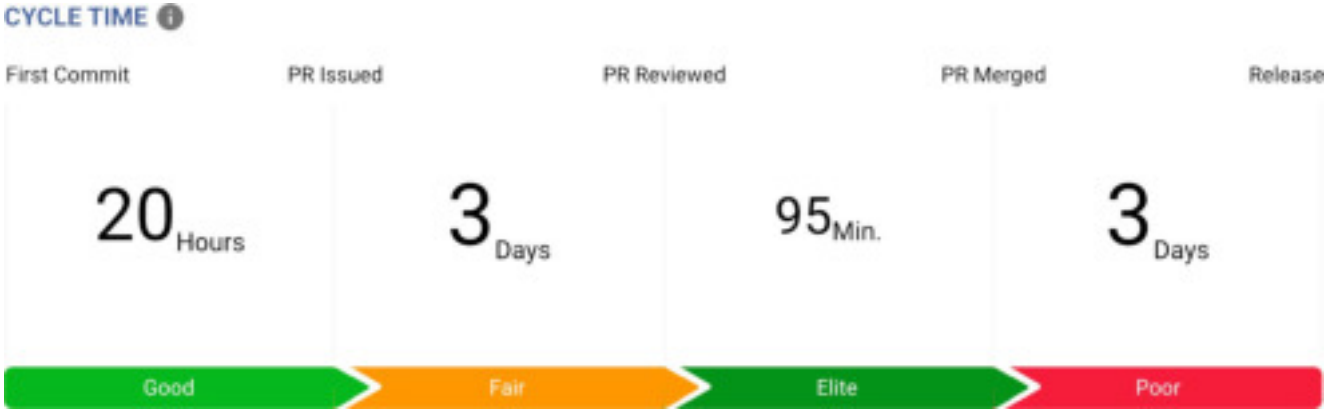
Metrics that Matter

1. Delivery
2. Quality
3. Investment





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Dimensions that Matter

- **People Sets**
  - Teams (Squads / Guilds)
  - Organization
  - **Individual Contributors?**
- **Time Intervals**
  - Daily
  - Iterations / Weeks
  - Monthly

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Delivery

What are delivery metrics?

- Phases from “work requested” to production release.
- Enables your team to deliver code to production.

Why does it matter?

- High leverage point for improvement across all teams.
- Improve predictability, time to value, work efficiency, contributor happiness, customer happiness.

Key Metrics

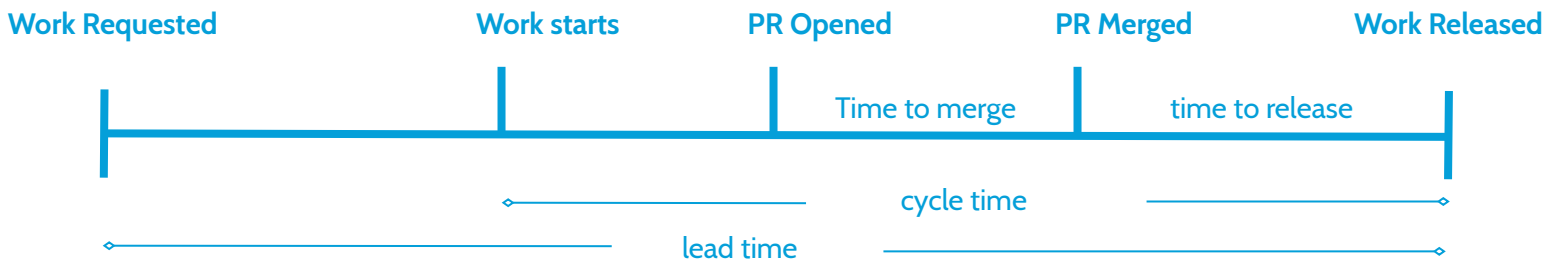
Lead Time: Work request to release

Cycle Time: Work start to release

Time to Merge: PR open to merge

Time to Release: PR merge to release

Release Frequency: Releases per day



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Delivery Performance Metrics

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Quality

What is Quality?

- Many definitions, focus on leading indicators (OKRs) vs. KPIs

Why does it matter?

- Efficiency booster or efficiency killer.
- High impact on delivery predictability.

Key Metrics

Code Retention:
% of released code that is NOT rewritten quickly

Refactoring Rate (positive!):
% of released code that's being refactored

Bugs Found in Prod (change fail rate):
Amount of bugs found in prod

Time to restore:
From prod incident to remediation

Review Depth:
Number of comments per review

Unreviewed PR Rate:
Ratio of PRs that are merged with 0 or low review

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Investment

What is an investment profile?

- Answers the question, where is my team spending time?
- Data-driven representation of effort spent by work type.

Why does it matter?

- People's time is your most scarce & precious resource.
- Control and balance.

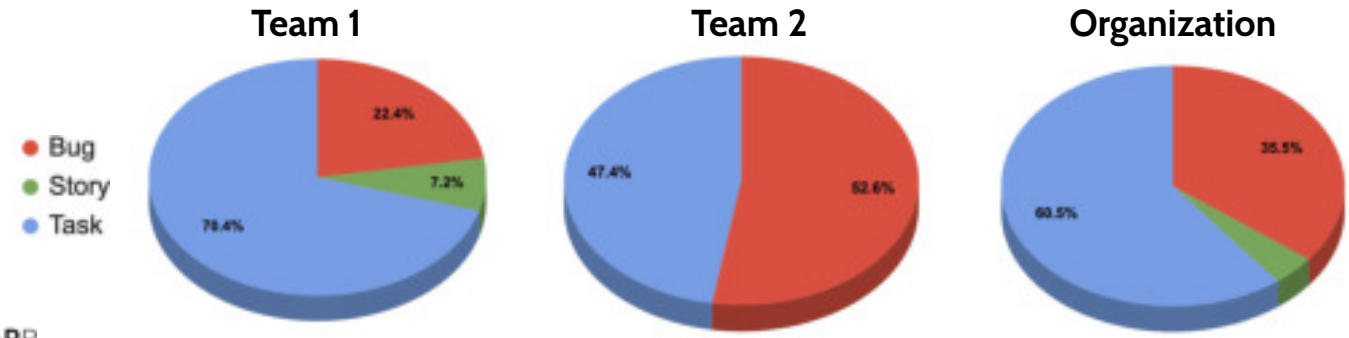
Key Metrics

Story to Bug Ratio:
Completed stories to bugs.

Story to Non-functional Ratio:
Completed stories to tasks.

Customer Commitment Percentage:
% work dedicated to commitments.

Time Distribution
% time in each state



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How?

How can we roll this out?

How to measure?

- Assessment (Like DORA)
  - Pros: Not a big investment
  - Cons: Credibility, Coverage, Accuracy* (DORA people disagree)
- Project Management Driven (e.g. JIRA)
  - Usually suffer from Poor Data Hygiene (will represent between 30% - 80%)
  - Suffers from Latency
  - Dependant in Manual updates
- Wherever the system of record is (PM, Git, CI/CD)

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How can you start?

- Get Educated
- Understand your work profile
  - Agile: Scrum / Kanban / Mixed (per team)
  - Git: Forks / Branches
  - Deployments: CD / Once every 3 weeks
  - Release Marking: Tags / Direct from Master
  - Reviews: Inside Git systems (please), just offline
  - Repos: Monorepo / Microservice per repo
- Experiment with tools, get initial visibility
- Make it Actionable from day zero

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Summary & Predictions

- Modeling the R&D system of record is in the happening
- Teams that will implement & rollout metrics elegantly will:
  - Have a culture of continuous improvement
  - Accelerate Delivery Exponentially
  - Increase the sense of impact for their teams
  - Get a seat at the executive table (more resources)
- Will open up new methods of work in the future

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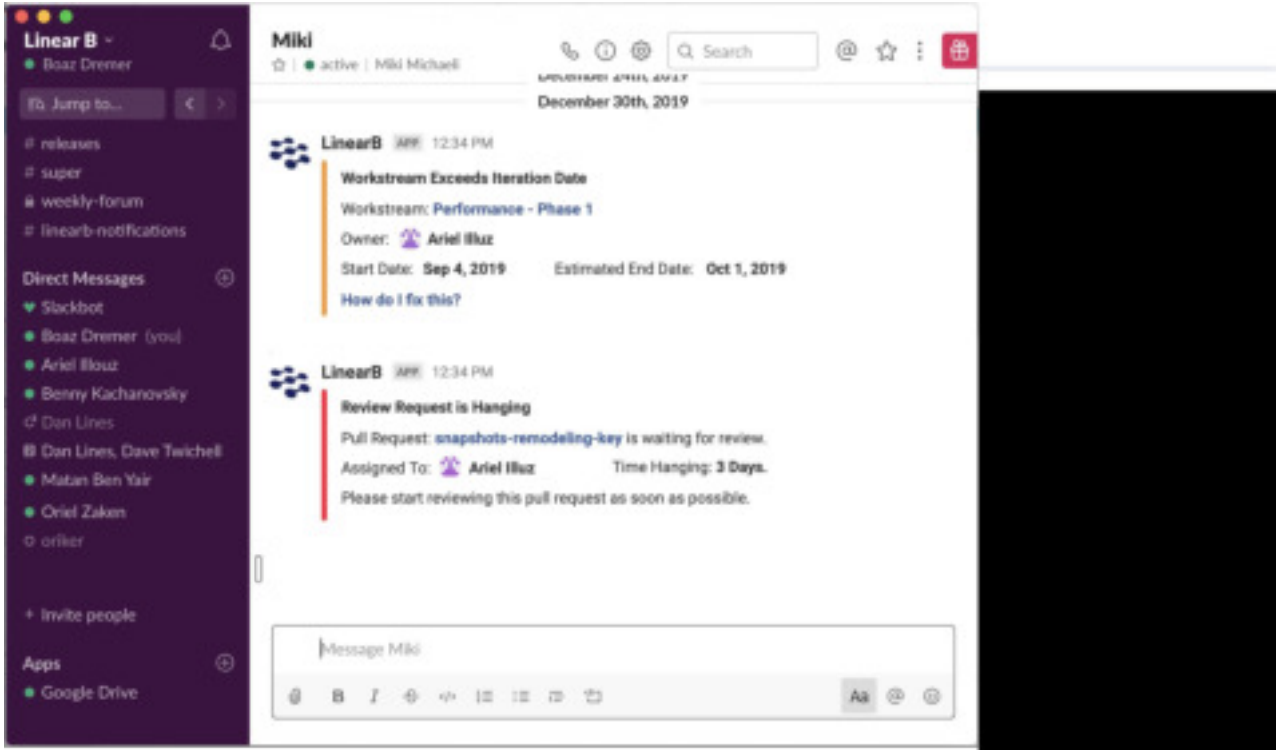
Make it actionable



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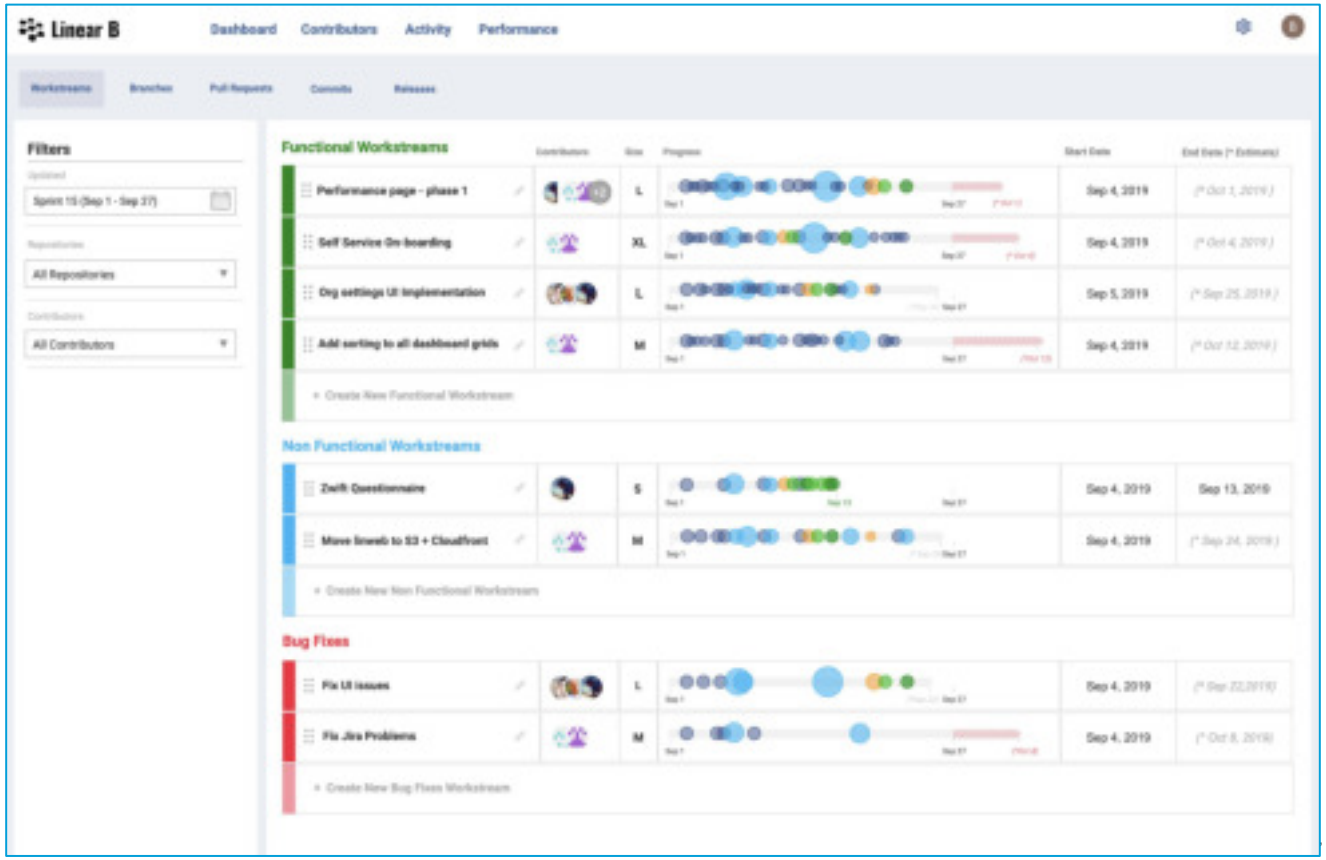
Predictability



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The end?

Questions

Email: ori@linearb.io

Free LinearB Trial: linearb.io/trial

LINEARB
The only SaaS Platform for R&D Leaders

Why do we exist

Enabling R&D teams to accelerate It's in your Workflow

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About Us

Leadership team

"We experienced the pain firsthand"

"We're here to help engineering organizations continuously improve using metrics"

Backed by

83NORTH

CISCO → CloudLock — $293 M 2016

at&t → interwise — $120 M 2007

Ori Keren

CEO

Former VP R&D
CloudLock / Cisco

"I love people and I love data"

Dan Lines

COO

Former VP of Engineering
CloudLock / Cisco

"I love the feeling of working on an improving team"

ori@linearb.io

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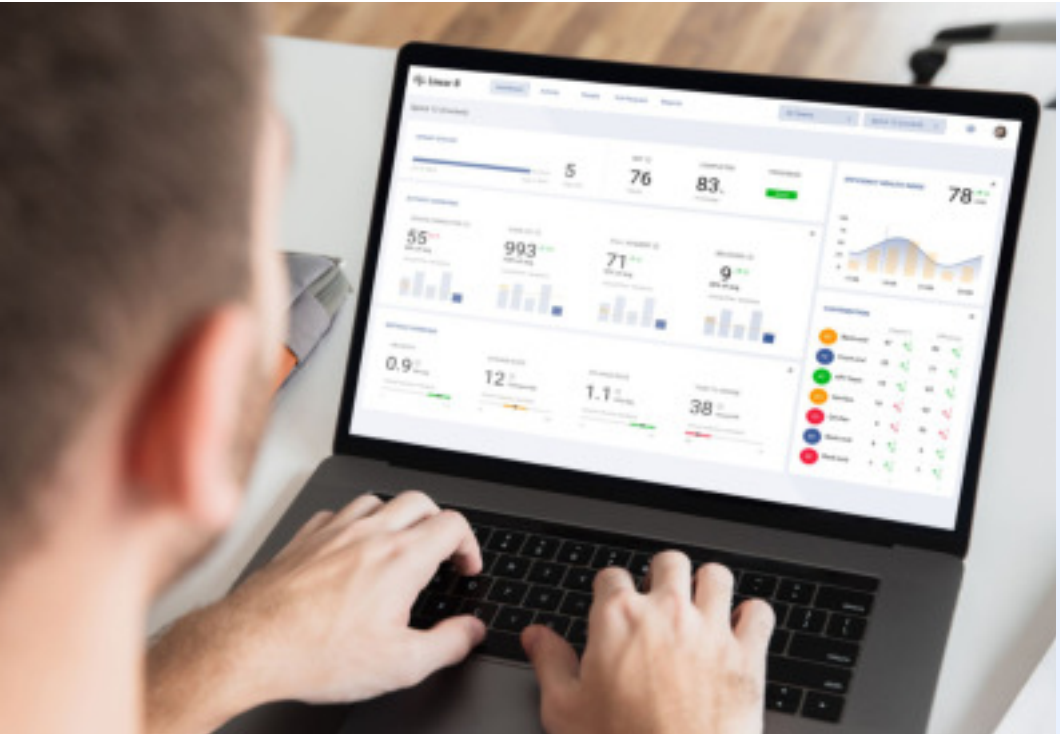
Linear B - Easy to get started



01 — SaaS based solution, easy onboard

02 — Seamless integration, no change required

03 — Public cloud and Self hosted support

04 — Connected to our customer's development tools of choice

05 — Secured, read-only calls, metadata based, no source stored

ori@linearb.io

Jira Software GitLab GitHub slack Bitbucket

Links

Aligning Business KPIs with Engineering KPIs (LinearB)

https://linearb.io/blog/align-engineering-metrics-to-your-business-kpis/

State of the DevOps (DORA)

https://cloudplatformonline.com/rs/248-TPC-286/images/DORA-State%20of%20DevOps.pdf

Increasing Engineering Tempo at Splice

https://speakerdeck.com/buritica/increasing-engineering-tempo-at-splice

Metrics that Matter (LinearB)

https://linearb.io/blog/how-software-leaders-can-use-metrics-without-damaging-culture/

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