



GOTO Copenhagen 2017
Conference Oct. 1-3, 2017

Scaling Engineering teams

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Overview

Speed. Stability. Quality. Growth

- Engineering teams
- Inflection Points
- Growth Phases
- Managing Inflection Points

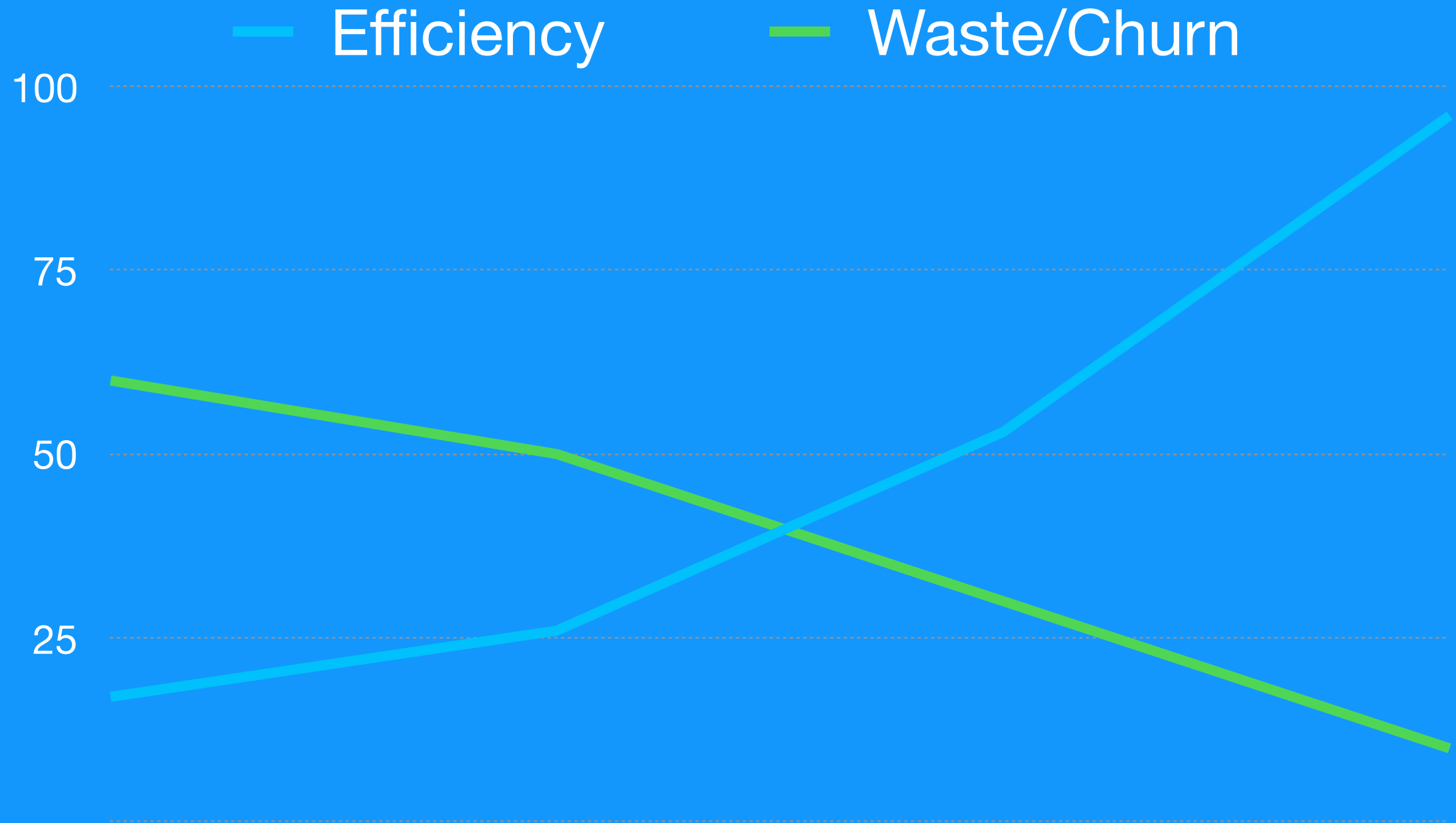


Scaling Engineering Teams

A **S**ystem for **E**xpanding **T**teams

as close as possible to when it's actually needed

Ultimate goal



Engineering teams

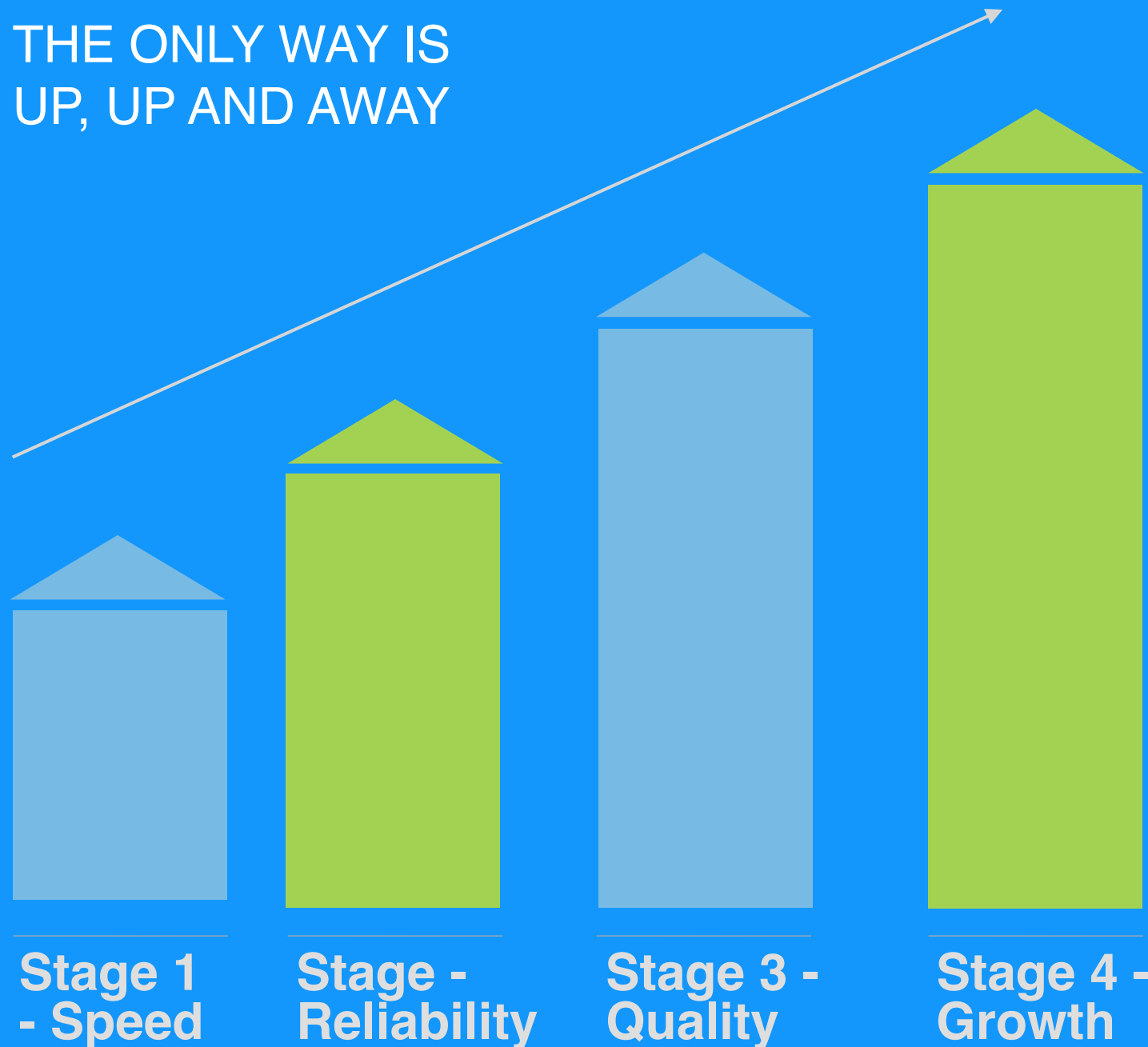
- Have you ever watched your best engineer turn into your weakest link?
- Have you seen key team members get constantly sidetracked by critical but disruptive tasks?
- Have you ever worked with a team that's kicking ass only to hear from other departments that the team's ability to get stuff done is being questioned?

Engineering excellence

- Training and mentorship
- Open and honest conversations
- Tools and clear measurements of success
- Set expectations, constantly and consistently

Company stages (and Inflection points)

THE ONLY WAY IS
UP, UP AND AWAY



Stage I <> Speed

no(policy, procedure. day-to-day-management)



Code

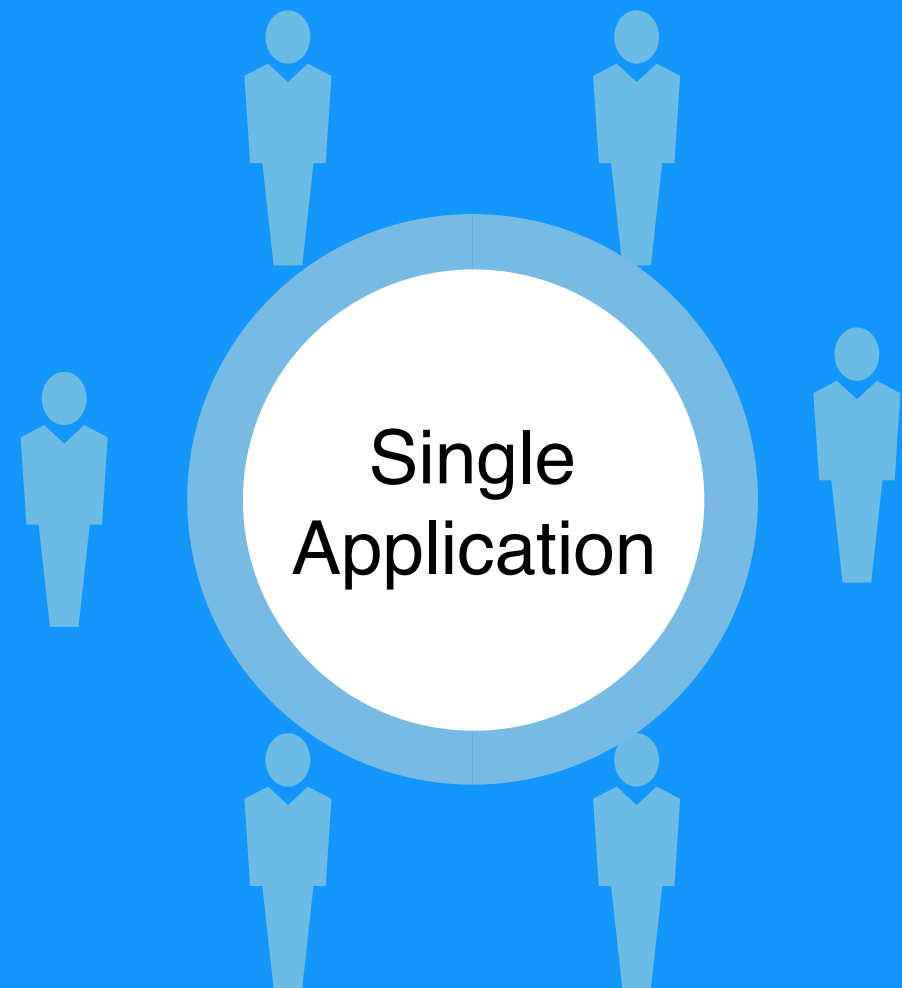
Learn

Course
Correct

Repeat

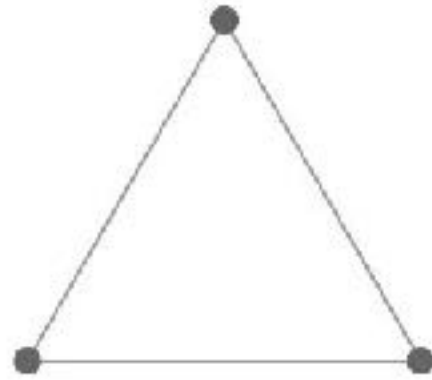
Team Composition: Doers

- Prototypers
- Entrepreneurs
- Hire for culture fit

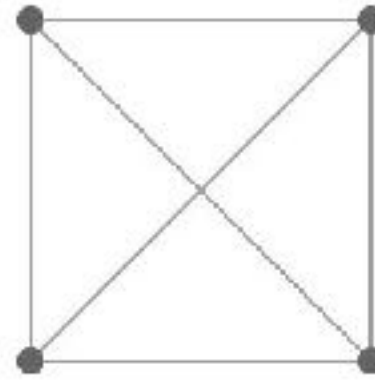


Hiring more
engineers almost
doubles the lines
of
communication.

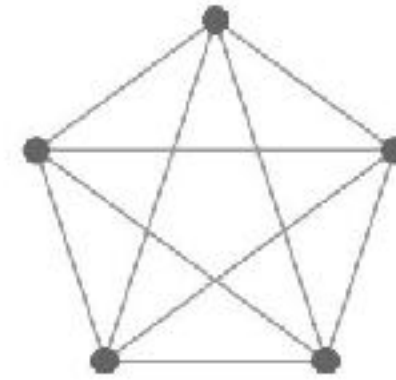
$$n(n-1)/2$$



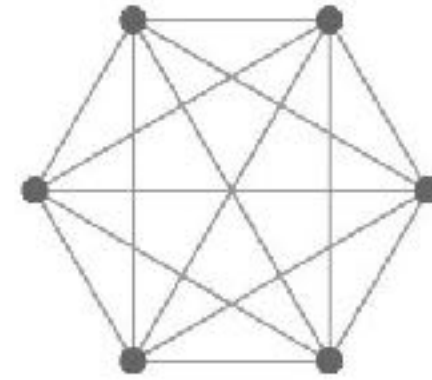
3 people, 3 lines



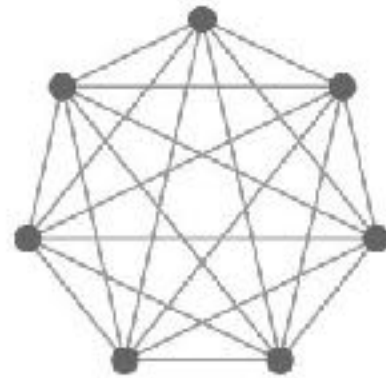
4 people, 6 lines



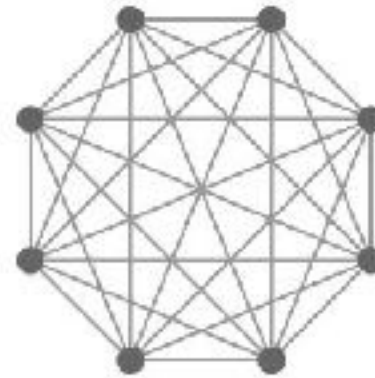
5 people, 10 lines



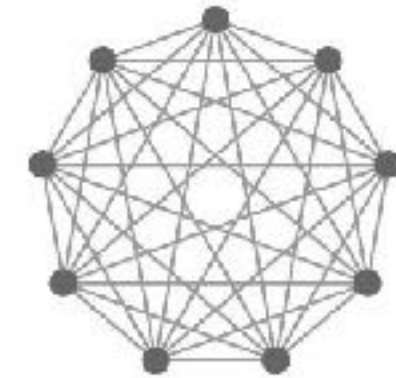
6 people, 15 lines



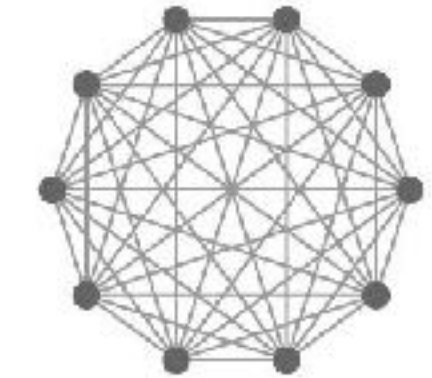
7 people, 21 lines



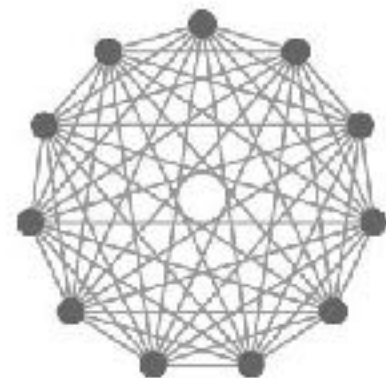
8 people, 28 lines



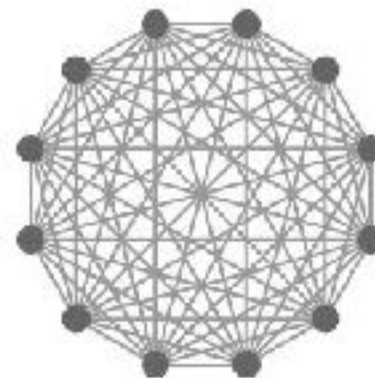
9 people, 36 lines



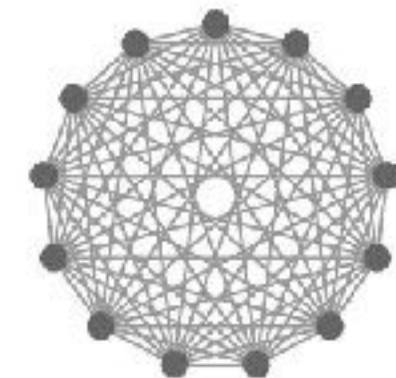
10 people, 45 lines



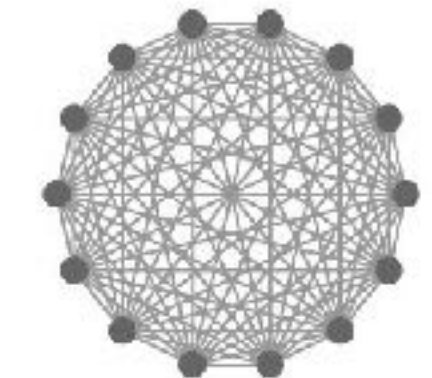
11 people, 55 lines



12 people, 66 lines



13 people, 78 lines

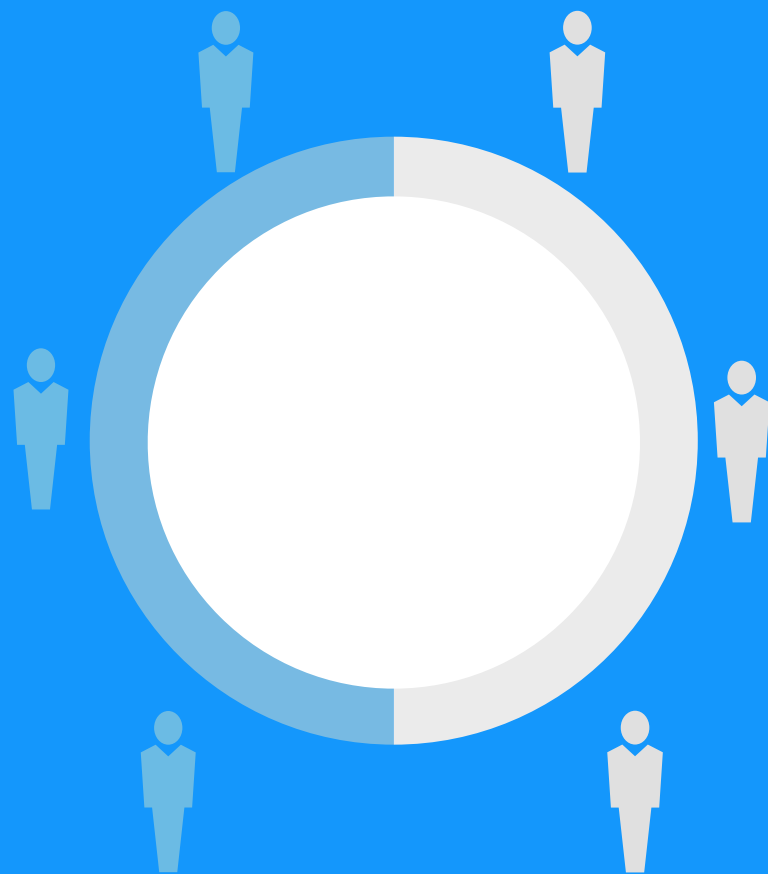


14 people, 91 lines

Stage I warning signs ...

- Whats When a doer turns into a “weakest link”
- Members are sidetracked by critical but disruptive tasks
- When the team’s ability to execute is questioned, externally

Stage II <> Stability



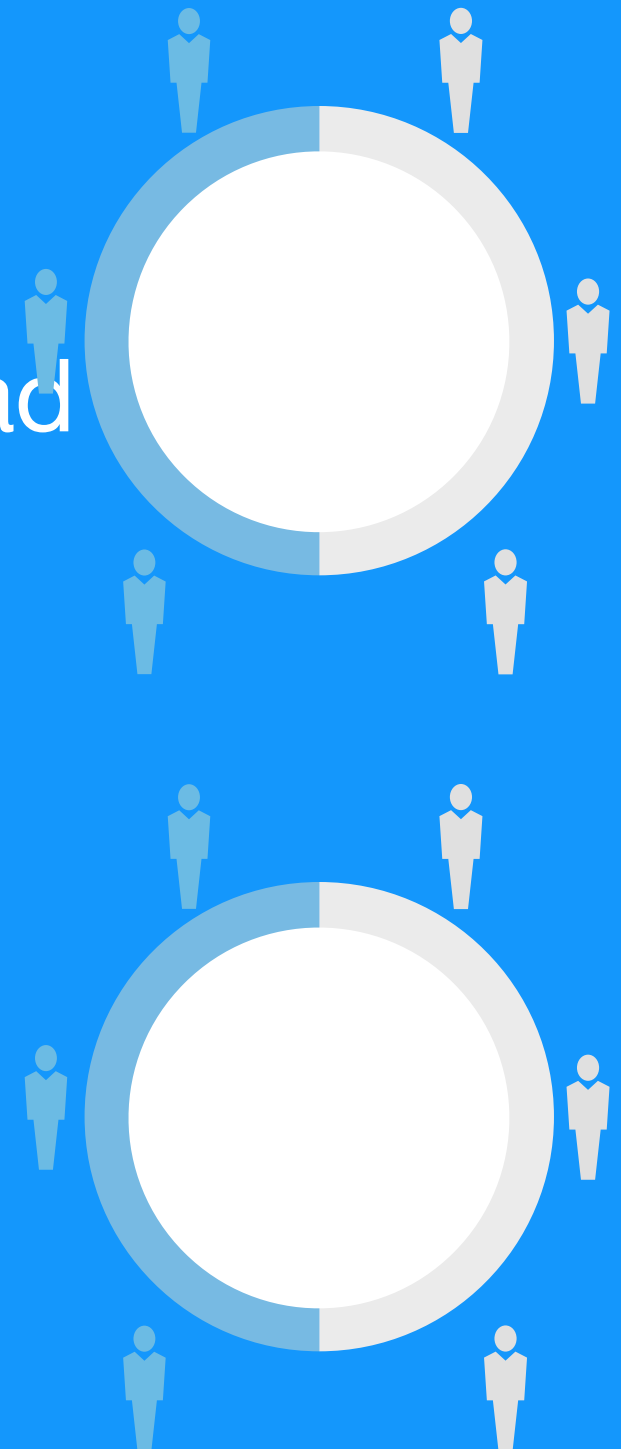
- Communication channels
- Stand ups
- Status updates
- Team debriefing

Stage II Team Composition: Specialists

- Existing team members become specialists
- Suite of applications and data
- Hire for culture add

Stage III <> Quality

- two deg. of communication overhead
- Multiple departments
- Products, KPIs, SLAs
- Suite of applications and data



Stage III <> Quality

- Speed vs Quality
- Thats not my job
- Hiring: domain expertise

Stage III Team Composition:

Slow and Steady

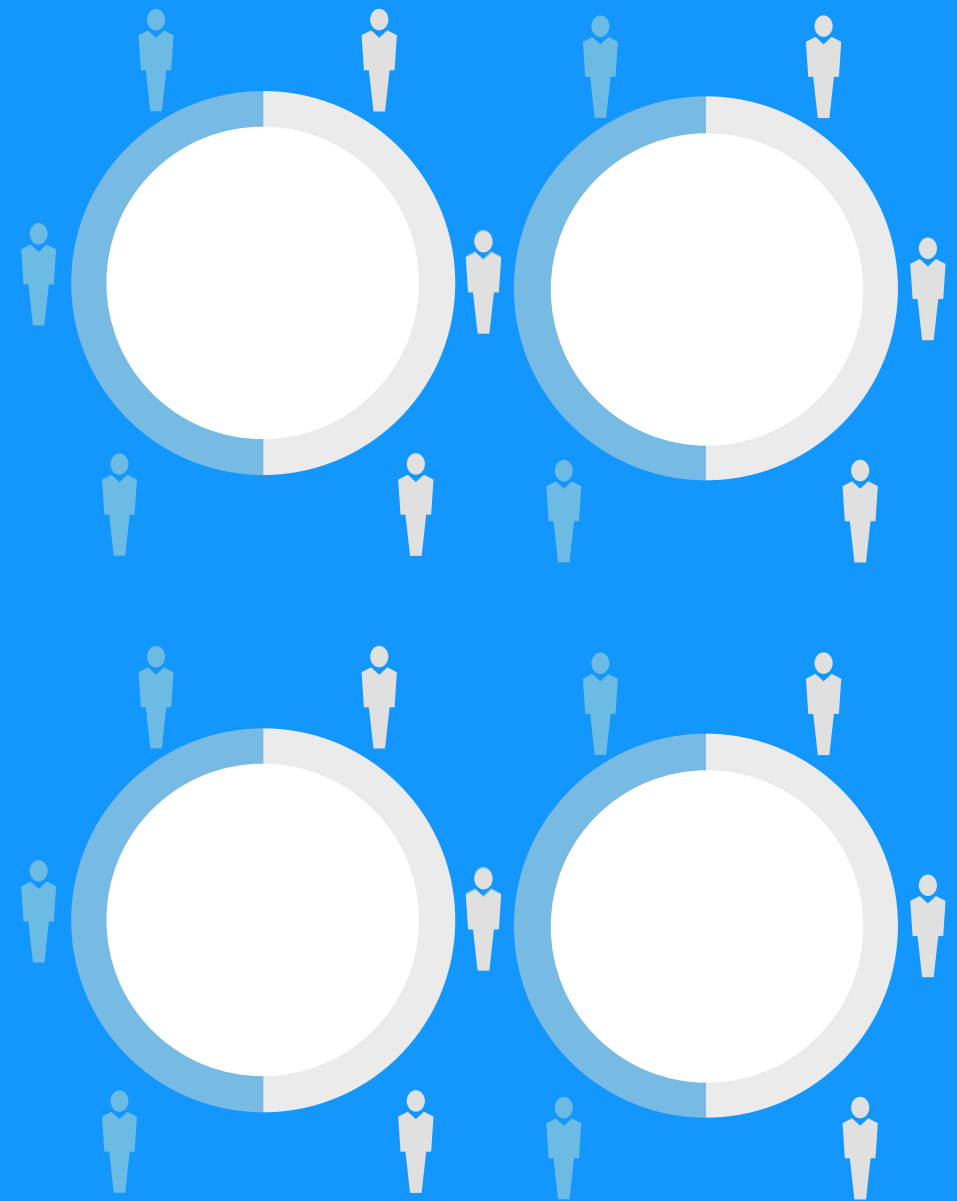
- Team players
- Engineering managers
- Methodical engineers
- Domain experts

Stage III warning signs ...

- Can't ship on time
- Don't have a predictable process
- Not saying no to enough customer requests
- Repeatedly getting pulled off tasks

Stage IV <> Growth

- Multiple degrees of communication overhead
- Multiple departments in multiple locations
- Executive team
- Software architect



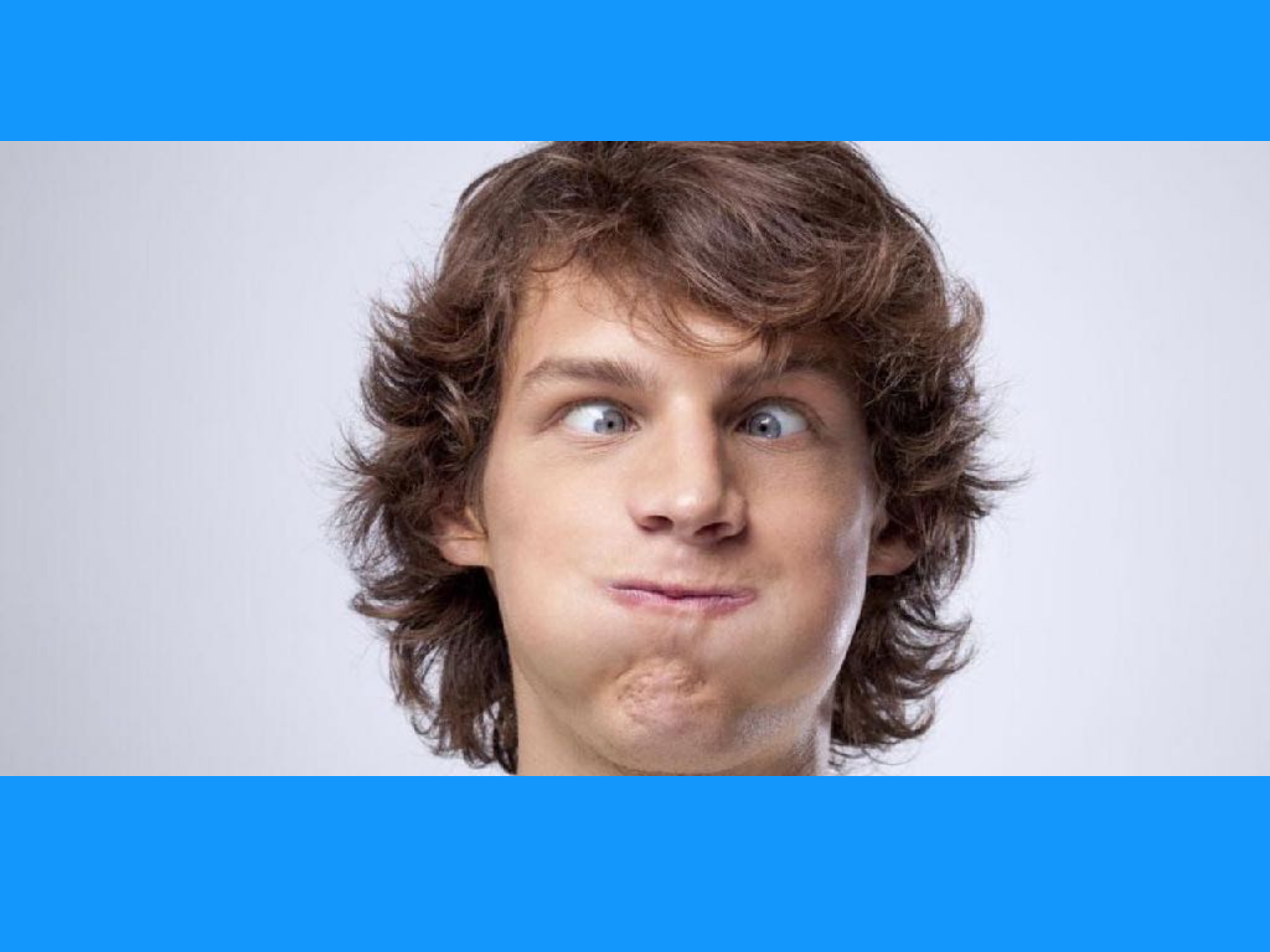
Other stages ...

- Internationalization
- Mergers and Acquisitions
- Spin Offs

Whats next?

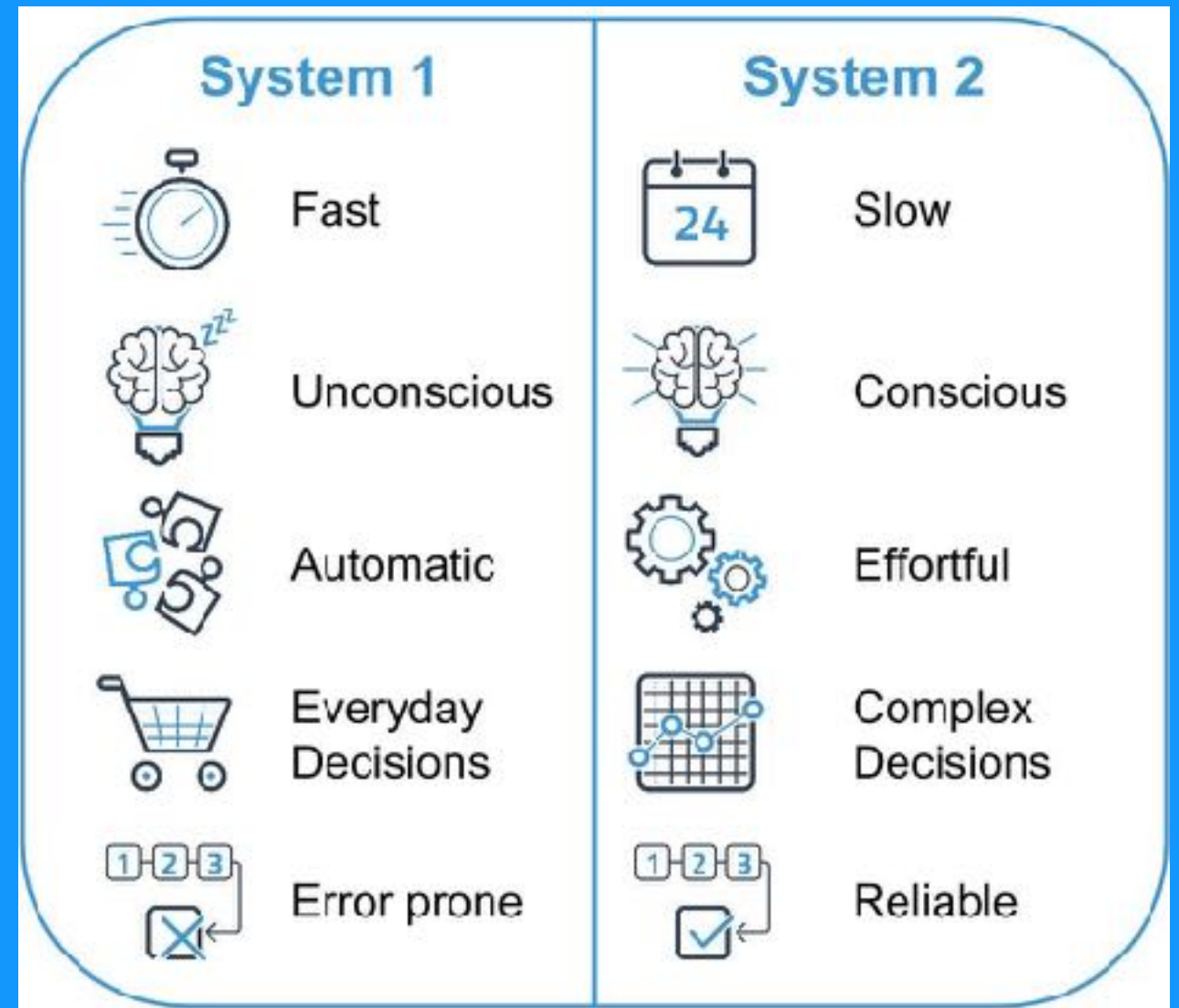
Manage Inflection Points

- Recognition
- No consistent indicators
 - Team size, funding amount, revenue
 - Warning signs



System 1 vs System 2

- System 1
 - Quick decisions
 - Based on very little information
 - Prone to biases
- System 2
 - Thoughtful and rational
 - Filter the biases of System 1





Changing direction

- Reset expectations for:
 - technical output
 - definition of quality
 - process and metrics
 - communication with others

Changing direction

- Manage careers of those whose skills dont suit a phase
- Core values
- Pipeline of candidates

Summary

- Build fast and manage inflection points
- Constant investment in team
- Your job = scale the team by managing communication
- Team you built will handle the technology

References

- The Innovator's Dilemma by Clayton M. Christensen
- Seth Blank's Scaling Engineering teams medium post
- Thinking Fast and Slow by Daniel Kahneman
- High Output Management by Andrew Grove
- The Hard Thing about Hard Things by Ben Horowitz

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