

# CSE 403

Teams/Organizations/Individuals  
Fall 2012

September 26, 2012

# Teams

It seems obvious that a larger group of people working together can get more done, more quickly than a smaller group (or an individual).

But, surprisingly, this is not always the case.

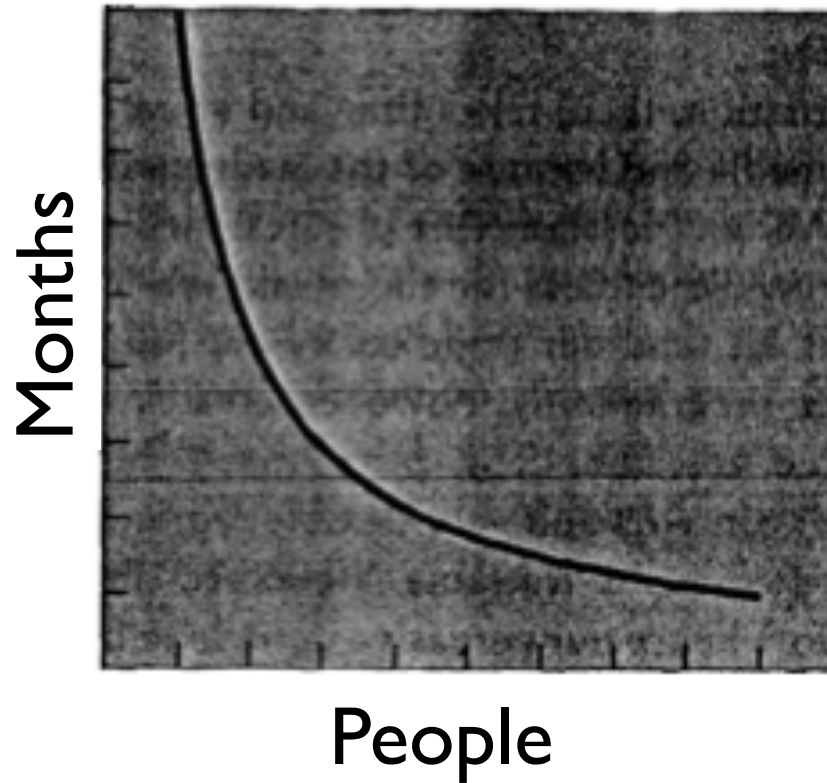
Nonetheless, we work in teams in attempt to do more stuff, faster.

Why work in teams?

# Division of labor

- Divide and conquer
- “If it takes 1 person 4 hours to paint a house, how long will it take 10 people?”
- Can you really partition the task?
- Is there overhead?

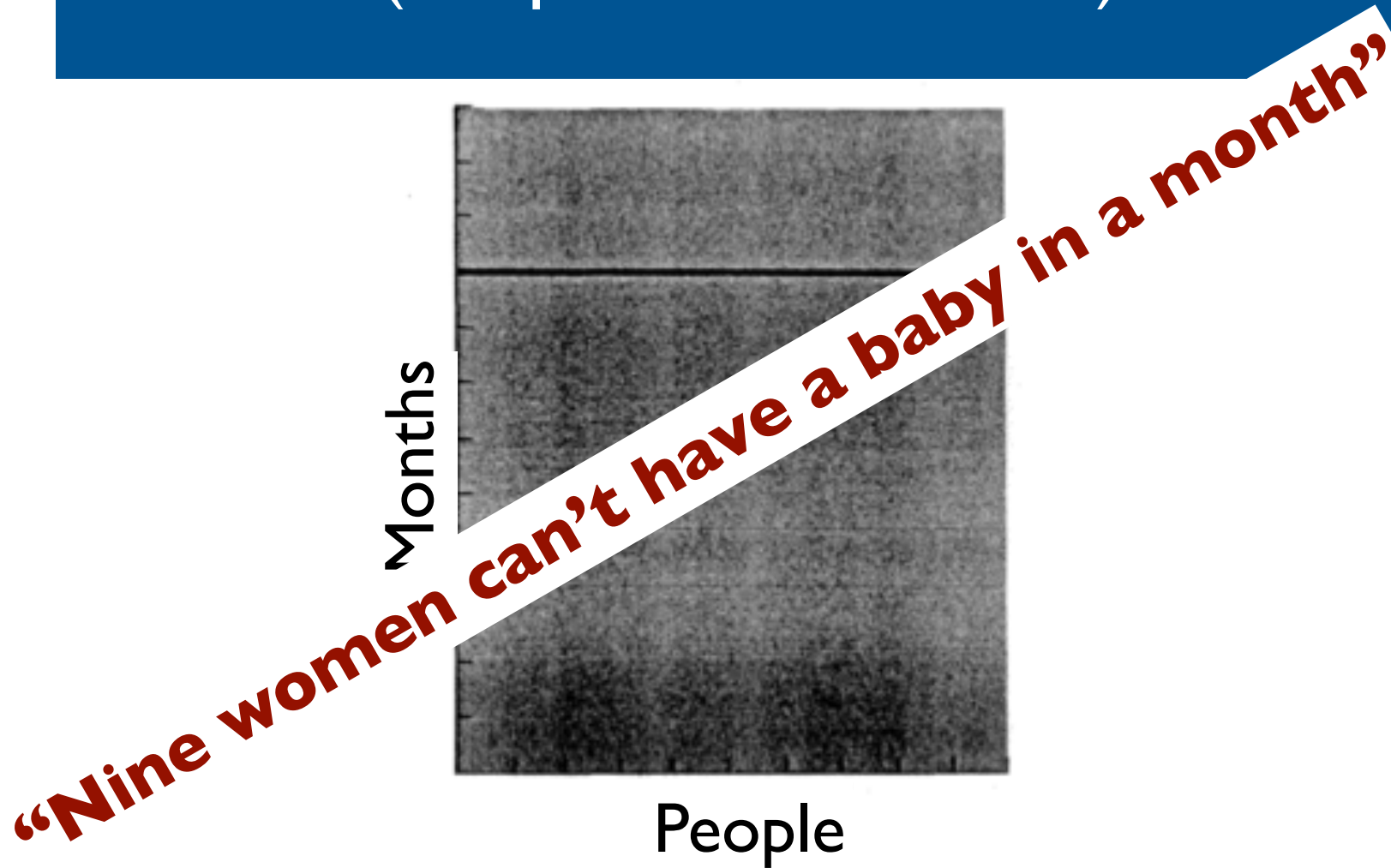
# Time vs. Workers (Perfectly partition-able task)



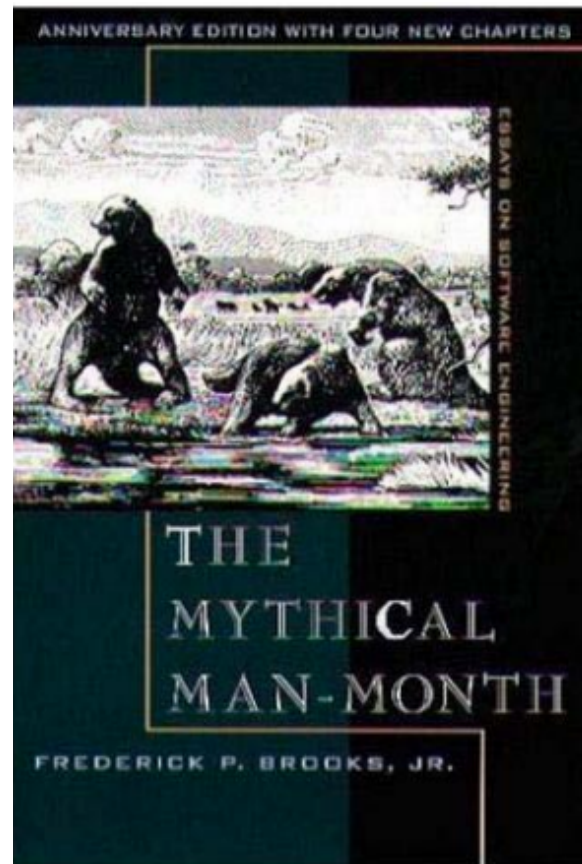
# Can we paint the house in 24 minutes?

- What if there is only 3 brushes?
- What if there is only 1 can of paint?
- What if not all people are equally competent painters?
- Is it possible to go even faster? (get task done in less than 24 minutes)

# Time vs. Workers (Un-partitionable task)



Aside: This is still a great book.





# Specialization and Expertise



Knows everything

vs.



User Interface



Domain Expert



Database



Facebook API's

# Redundancy, reliability, fault tolerance



Expert

- Leaves the company
- Goes on vacation
- Hit by bus

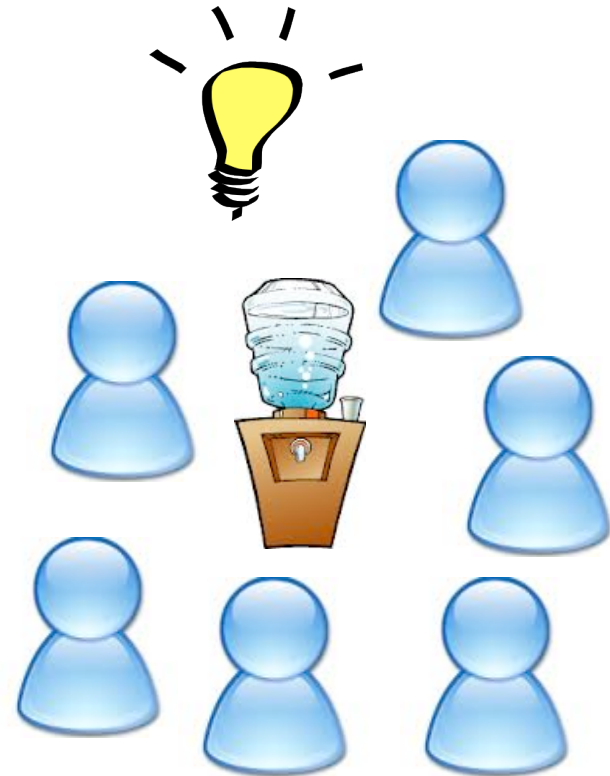


Backup(s)

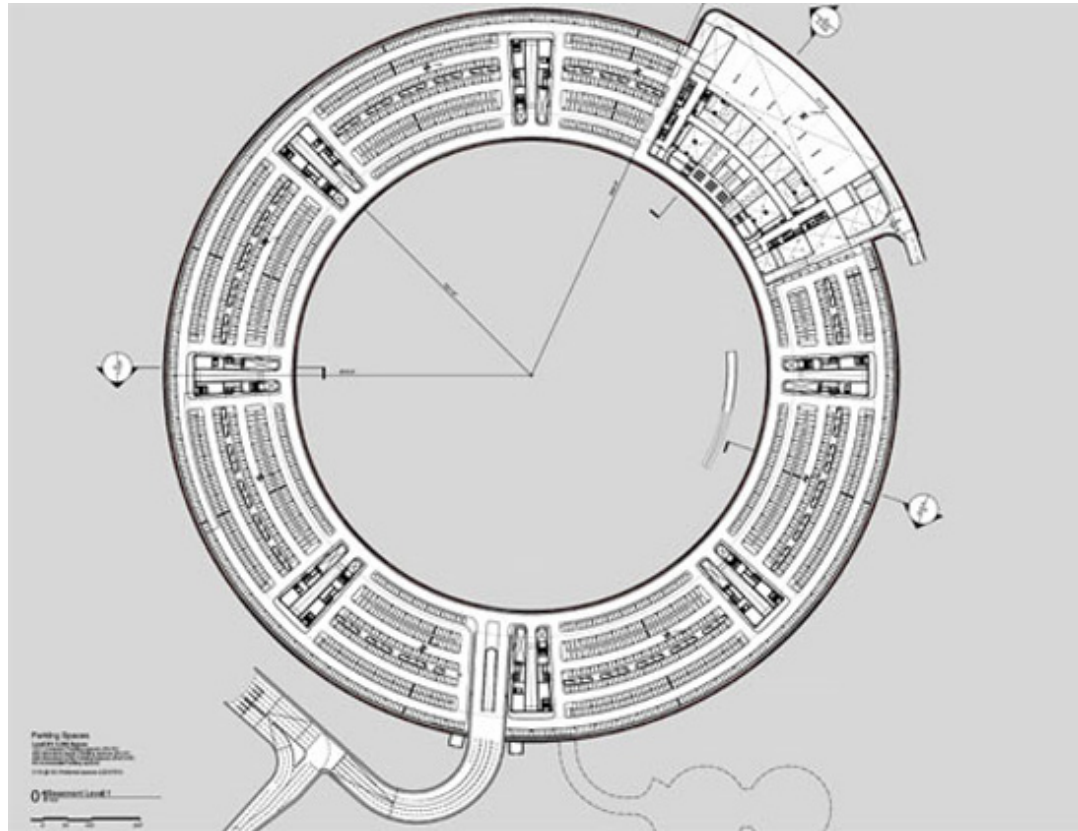
# Synergy of human interaction



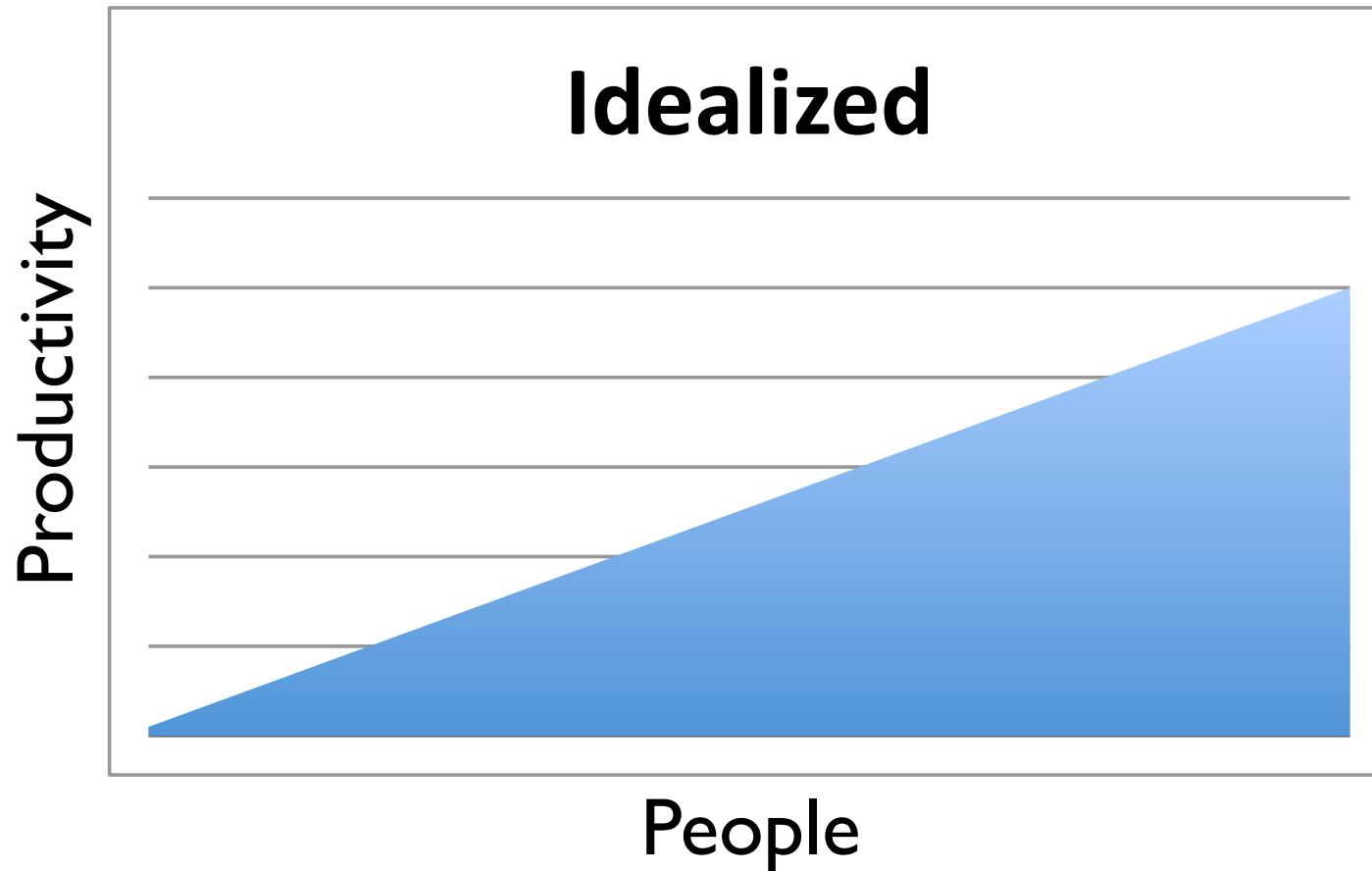
vs.



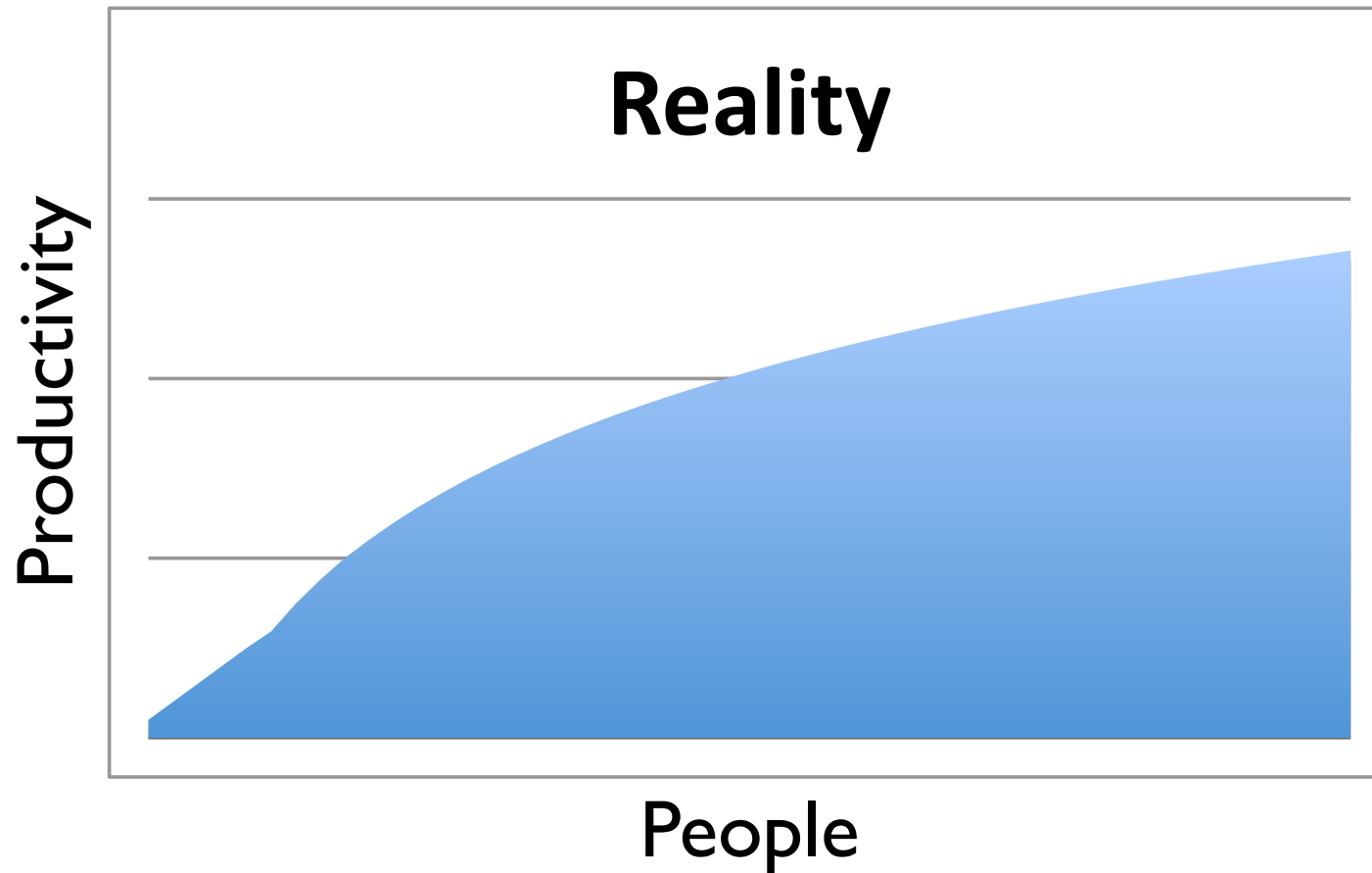
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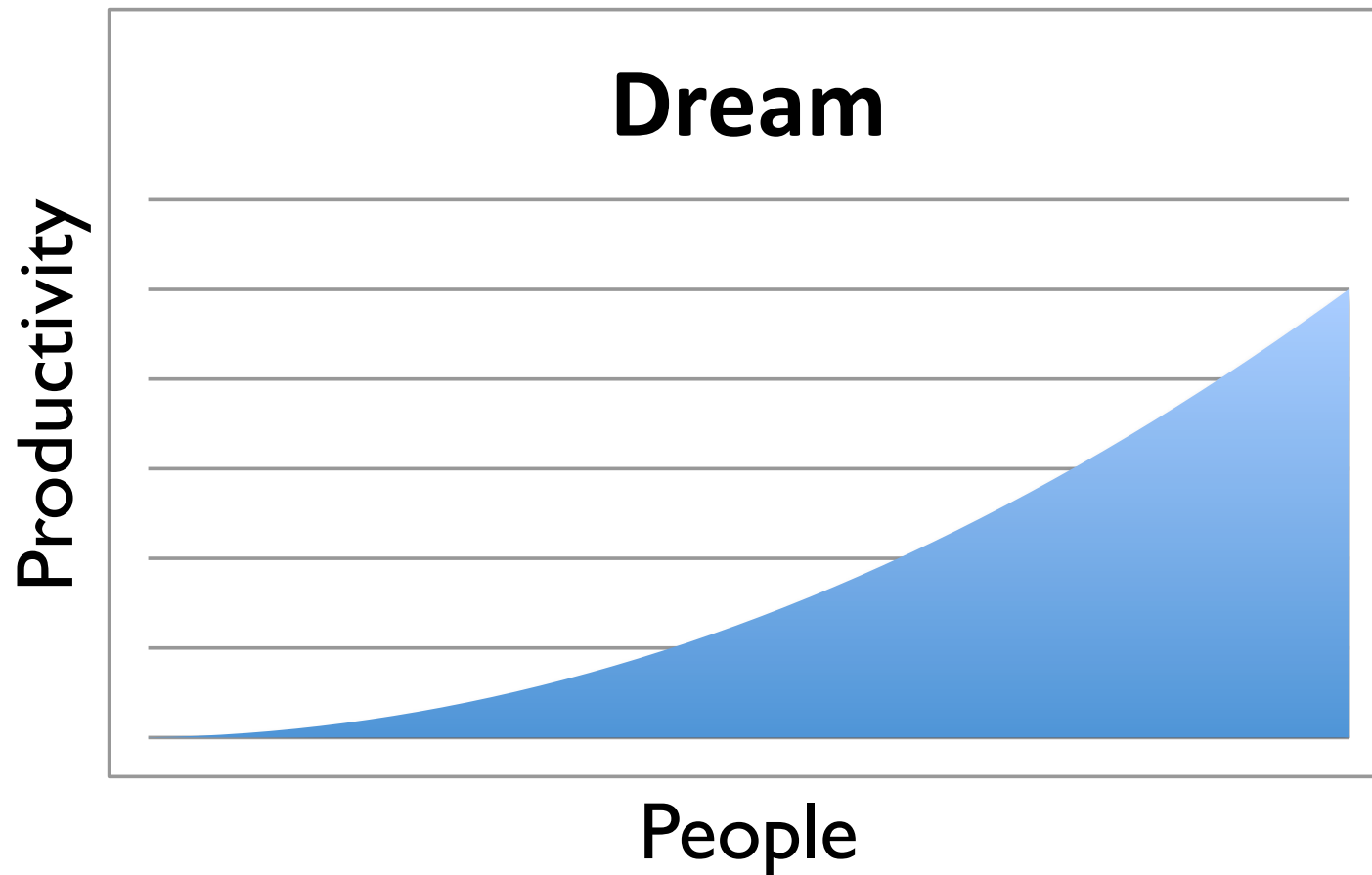
# People vs. Productivity



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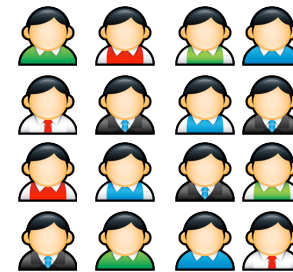


# People vs. Productivity

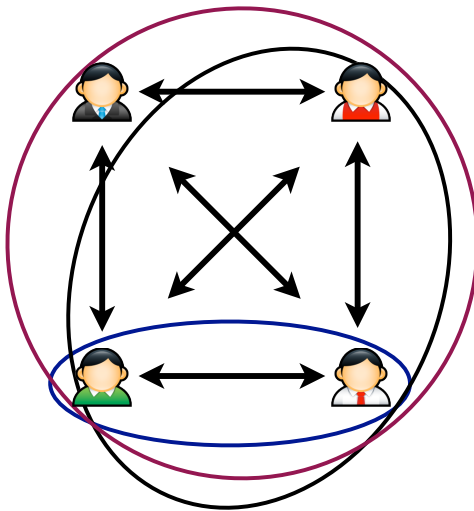




# Why doesn't this scale as you add people (in theory)?



Group of 4



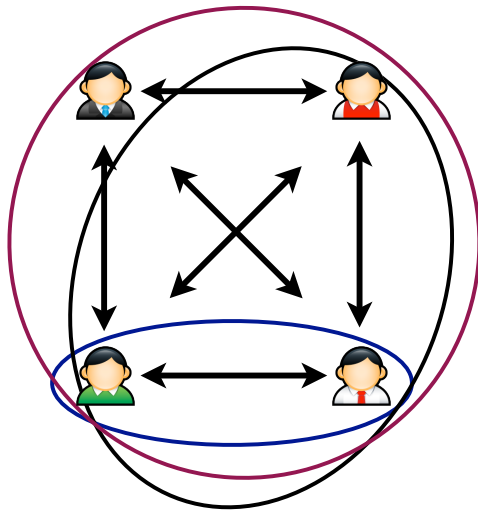
Number of pairwise communications is  $O(n^2) = 6$

Number of subgroups is  $O(2^n) = 16$

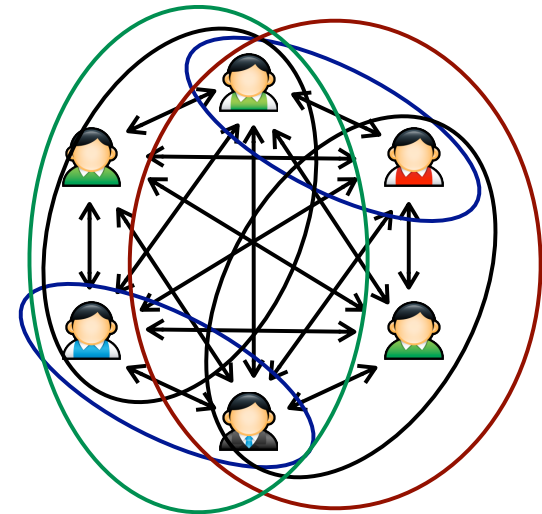
Plus some other factors we'll talk about later

So, as you grow from 4 people to 6 people....

Group of 4



Group of 6



Number of pairwise communications grows from 6 to 15  
Number of subgroups grows from 16 to 64

# Understanding individuals is key to building great teams

- Strengths
- Weaknesses
- Skills
- Motivations
- Personality types
- Competing interests
- Personal politics

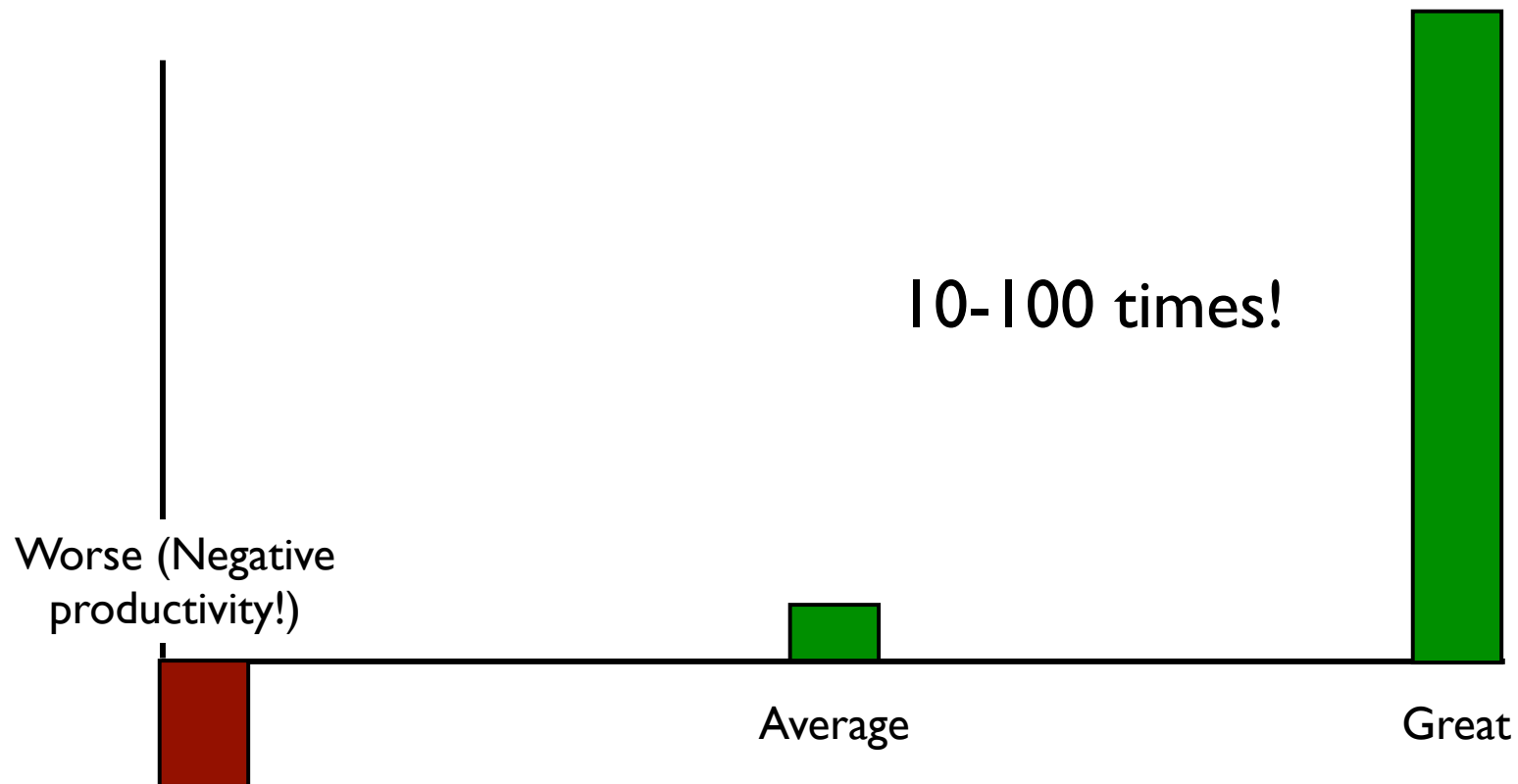
# Personality types (Myers-Briggs)

## Four Vectors

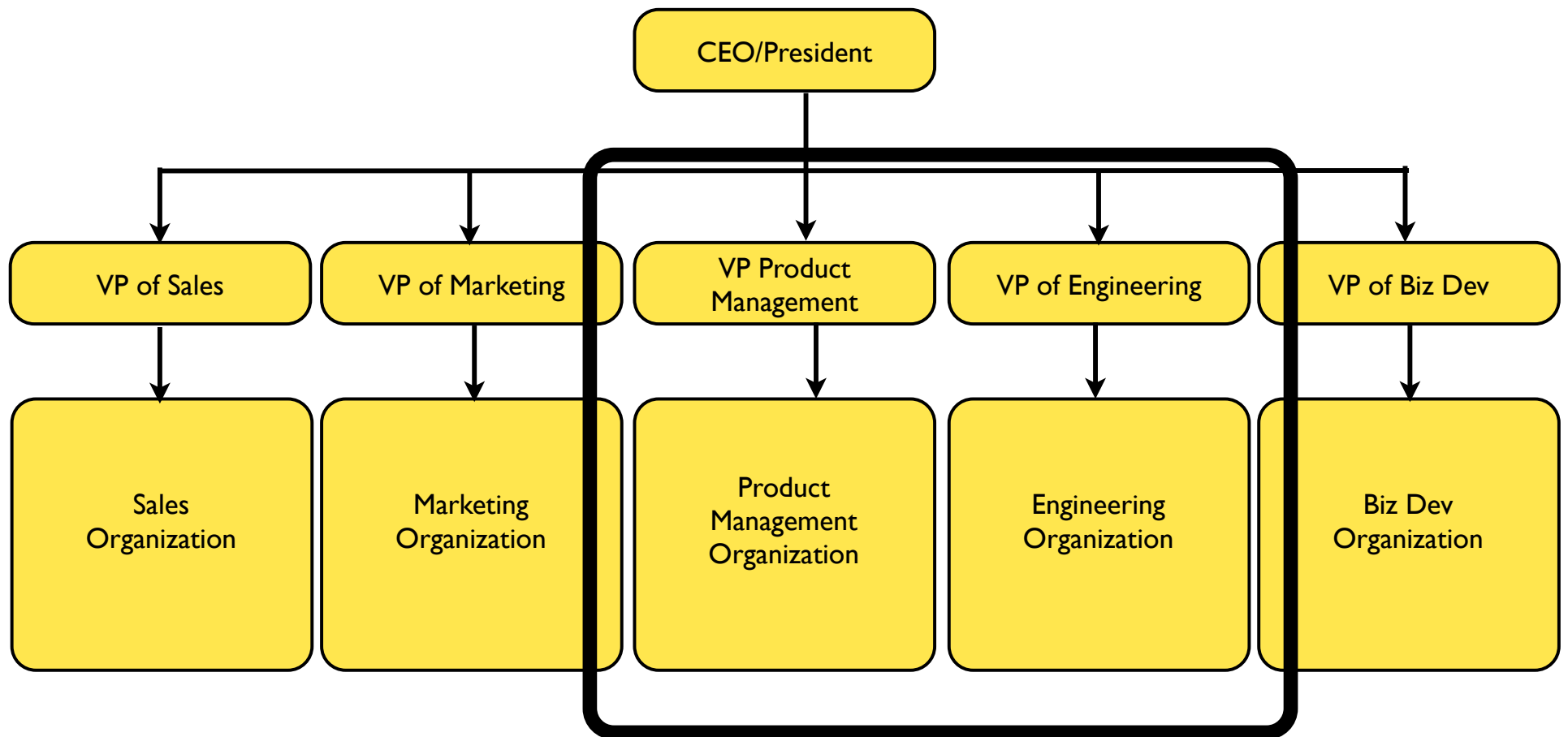
- Extrovert(E)-Introvert(I)
- Sensing(S)-Intuition(N)
- Thinking(T)-Feeling(F)
- Judging(J)-Perception(P)

	<b>NF</b> <i>Valuing</i> <small>Manifesting universal values and valuing people</small>	Possible				<b>NT</b> <i>Visioning</i> <small>Pulling people with ideas to an optimistic future</small>
		<b>ENFJ</b> <b>Teacher</b> <small>Smooth talking charmers. Very inspiring &amp; motivational. Often idealists. People leaders &amp; persuaders. Great salespeople. Very relationship-oriented. Like to motivate groups.</small>	<b>INFJ</b> <b>Counselor</b> <small>Work is to inspire others to achieve great things. Great awareness of human possibilities. Serious academicians. Often professors or other themselves to a religious order.</small>	<b>INTJ</b> <b>Mastermind</b> <small>If they say they are going to do something, they do it. Likely to be corporate leaders, scientists. Believe everything has room for improvement. Superior planners and visionaries of systems.</small>	<b>ENTJ</b> <b>Field Marshall</b> <small>Very leadership-oriented. Likely to be top executives, business persons. Big on reducing inefficiency, ineffectiveness. Take charge people. Can be overwhelming to less outgoing types.</small>	
Personal		<b>ENFP</b> <b>Champion</b> <small>Second only to ESTPs for fun. Most fun filled with excitement and charisma. Very enthusiastic and creative. Often teachers, artists, writers. Great need for diversity and change.</small>	<b>INFP</b> <b>Healer</b> <small>Notable sensibility aiding society. Different from ISFPs, they try to tackle long term problems. Often psychologists or counselors. Want to save the whales and rainforests.</small>	<b>INTP</b> <b>Architect</b> <small>Dissect analysts of problems to be solved. Often physicists, scientists. Alone about of types. Critical thinkers.</small>	<b>ENTP</b> <b>Inventor</b> <small>Want one exciting challenge after another. Love to problem solve. Good at analogies, consider themselves full of ingenuity and ideas. Often involved in groupies, systems analysis, design.</small>	Logical
		<b>ESFP</b> <b>Performer</b> <small>Number one in fun and enthusiasm. Always invite ESFPs to your party. The most generous of all types. Warm, handy, vibrant people. Excellent at customer service.</small>	<b>ISFP</b> <b>Composer</b> <small>Quietly harmonious with acute observation. Very observing, benevolent. Individualized work with people in need. Work to solve problems of the immediate such as homelessness, stopping hunger.</small>	<b>ISTP</b> <b>Operator</b> <small>Heads only by anything else. Flashed with the rush of his keen excitement. A few of these and the utility they offer. Incredibly hand mechanical devices, can take apart &amp; reassemble anything.</small>	<b>ESTP</b> <b>Promoter</b> <small>Excitement seekers. Never feel more alive than when taking risks. Great negotiators on the front end. Excellent promotional &amp; entrepreneurial capabilities if someone else follows through.</small>	
	<b>SF</b> <i>Relating</i> <small>Including and building trustworthiness</small>	<b>ESFJ</b> <b>Provider</b> <small>Hosts &amp; warmers. Conciousness of this type makes them excellent at entertaining, coordinating. May be teachers, nurses. Very conscious of appearances, should shoulds.</small>	<b>ISFJ</b> <b>Protector</b> <small>A high sense of duty. Upholders of family tradition. Often found in traditional helping professions including nursing, elementary education, etc.</small>	<b>ISTJ</b> <b>Inspector</b> <small>Does of what should be done. Masters at compiling practical details and adding tedious touches. Get it done people. Superior administrators. Duty bound &amp; obligated, often military.</small>	<b>ESTJ</b> <b>Supervisor</b> <small>Administrators, workers, stars of strength in community. Local models, parents, employees. Often promoted to management positions. Dependable, consistent, straightforward.</small>	<b>ST</b> <i>Directing</i> <small>Action from a strategic perspective</small>
		Present				

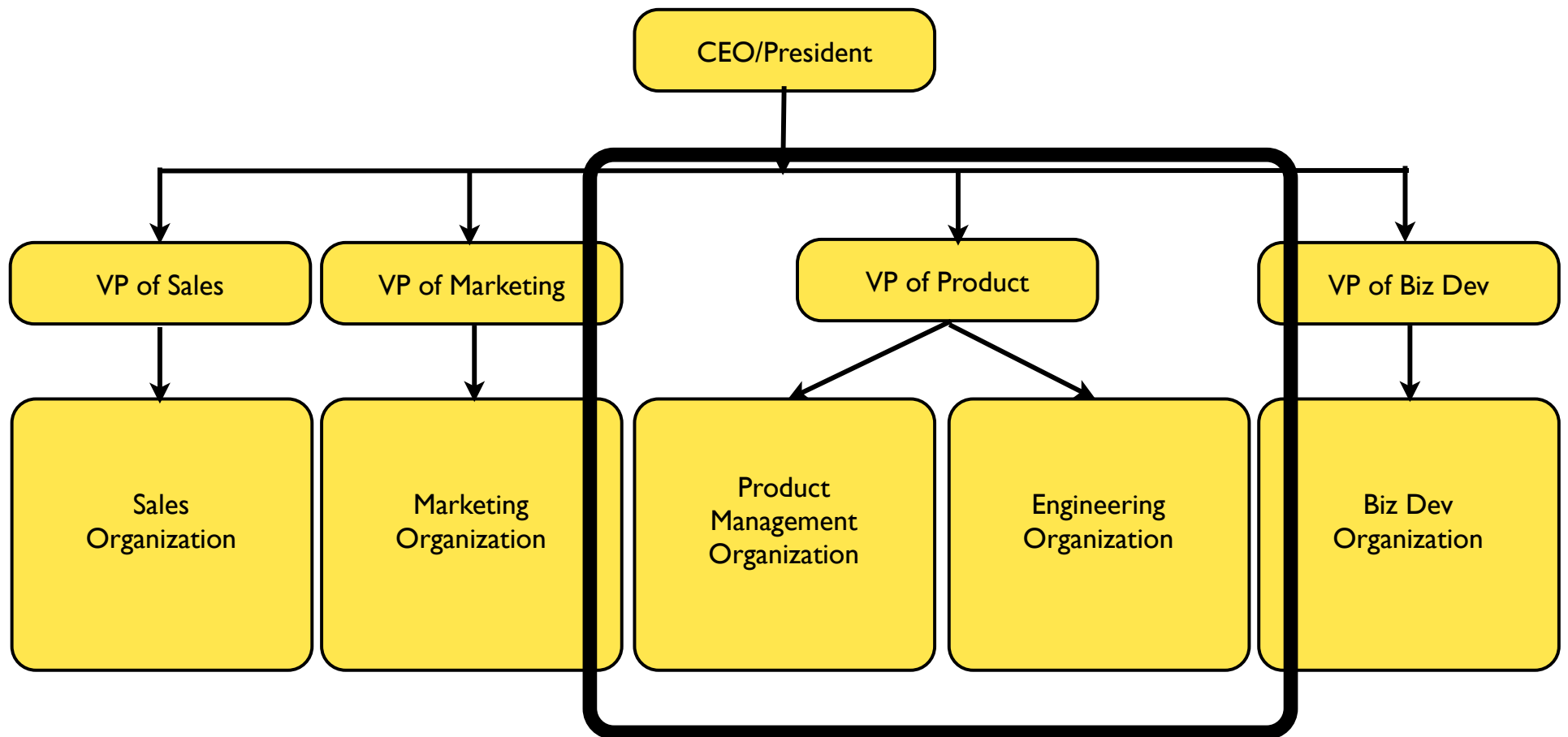
Q: How much more productive is a great software engineer than an average (median) engineer?



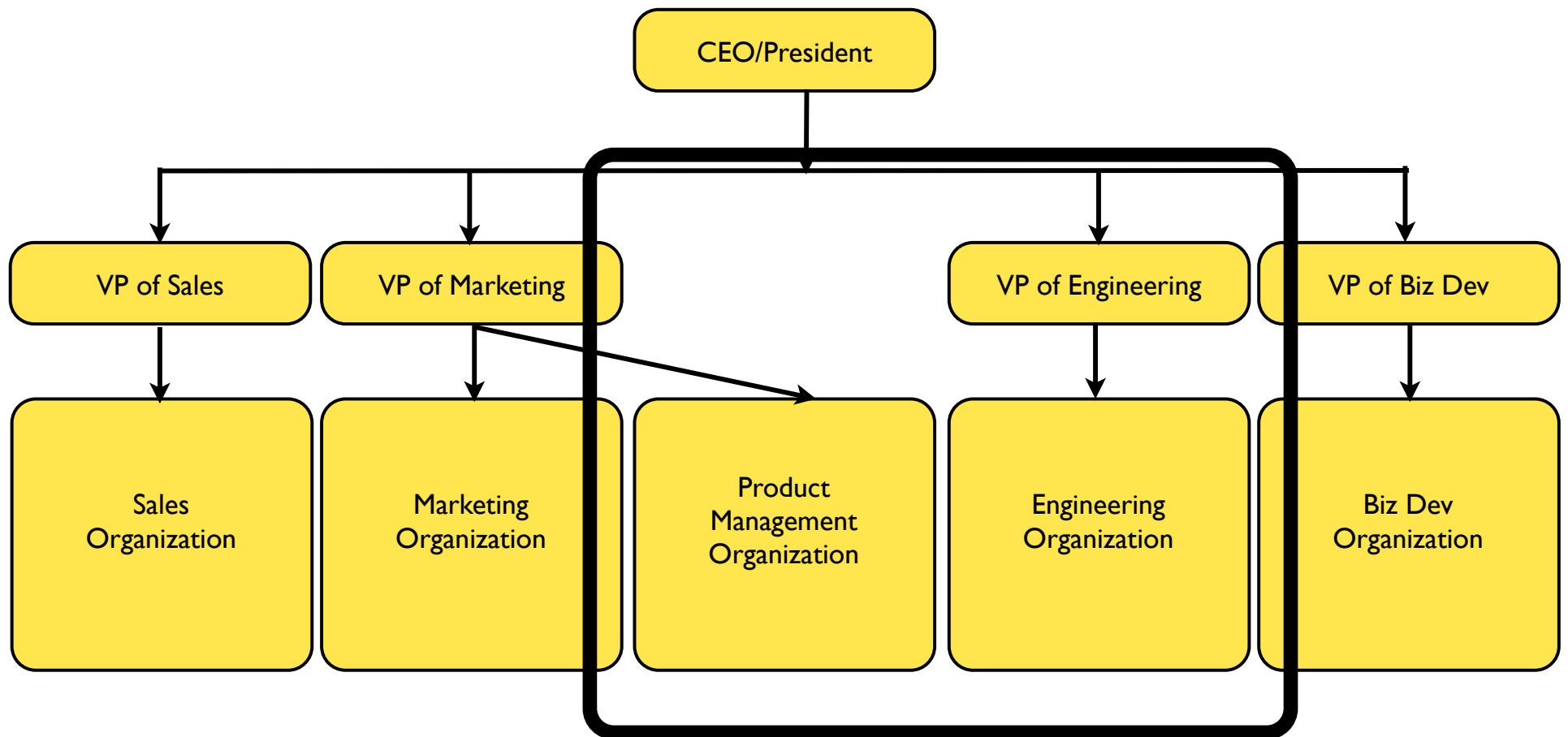
# Typical corporate organization



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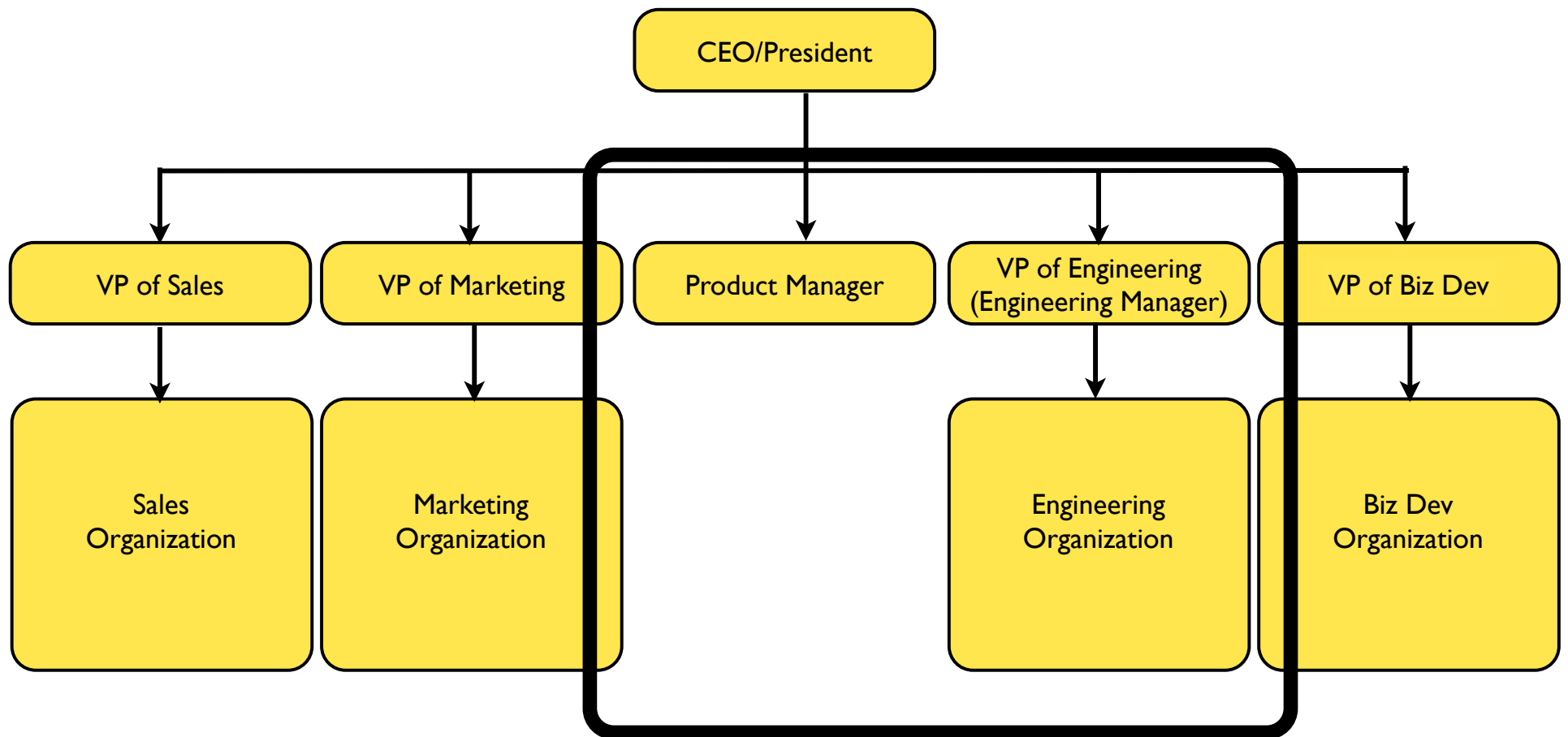


# Typical corporate organization

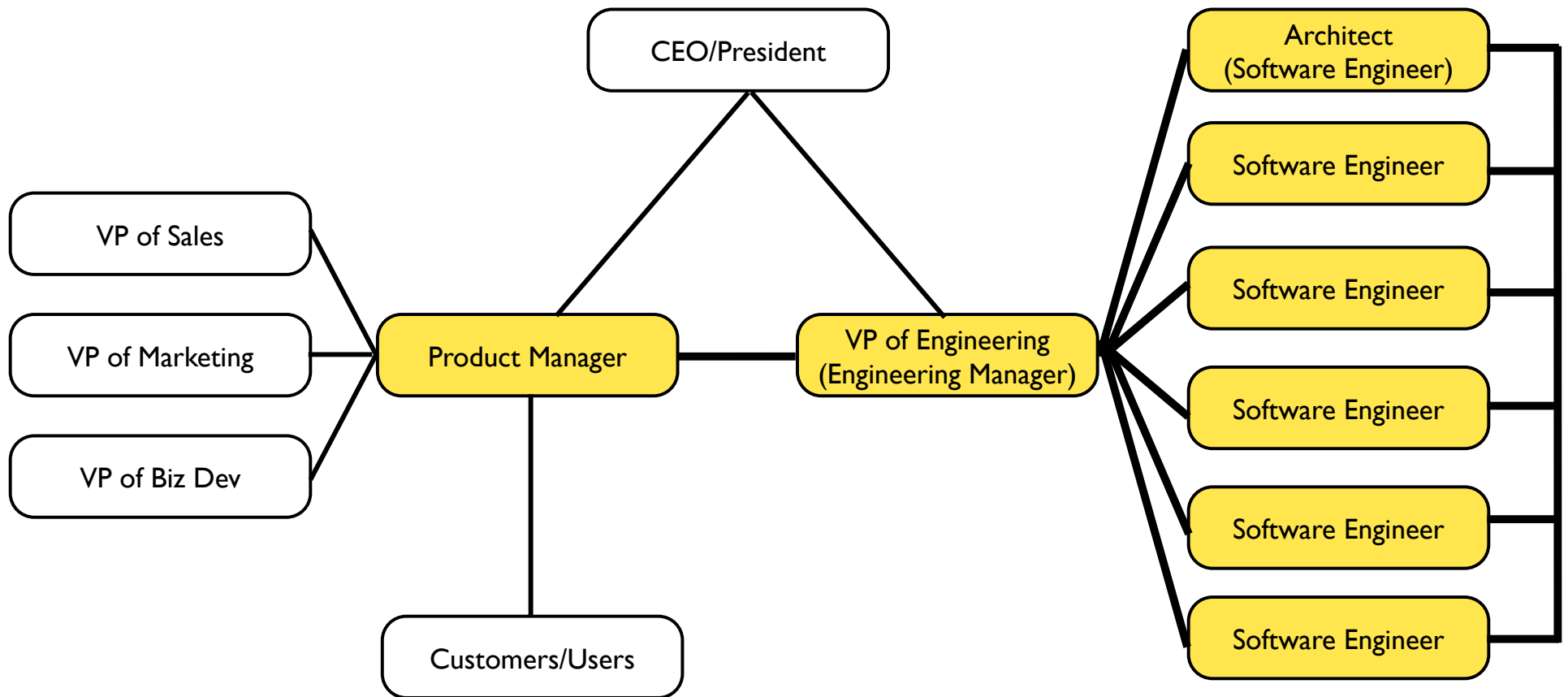




# Typical Small Company



# Product and engineering is where software engineering happens!



# Product manager is a central figure

- Defines vision (with CEO), product requirements
- Outbound interface to CEO, sales, marketing, biz dev, customers
- Inbound interface to engineering through engineering manager
- Figures out the product process w/ engineering manager
- Negotiates features, schedules with engineering manager
- Collects customer feedback
- Project management? Product marketing?

# Engineering manager is responsible for product deliverable

- Manages engineering team
- Responsible for all aspects of engineering output (features, timeliness, quality)
- Figures out the engineering process
- Recruiting engineering team
- Schedule
- SW development, quality insurance, operations
- Technically involved?
- Project management?
- Motivation

# What do engineers do?

- Write code (and design software)
- Sometimes “architect”
- Tools and infrastructure management
- Quality Assurance (Testing)
- Operations?
- Interact with the product manager
- Interact externally? (with customers, across organizations)

# The curious ambiguity of the “PM”

- Product manager
- Project manager
- Product marketing (manager)
- Program manager

# Project manager

- Sometimes not a full time “position” but a role that is filled
- Sometimes coupled with product manager or engineering manager
- Keeps track of what every one is done
- Understands the schedule
- Synchronizes rest of company with engineering
- Might not have a role of authority
- We’ve described role in 3 minutes -- you can get a masters degree in project management!

# Your project

- Product manager
- Engineering manager
- Architect
- Toolsmith
- Engineer
- Engineer
- Engineer

**But someone must  
also be the project manager**



# Project role assignments

## Individuals

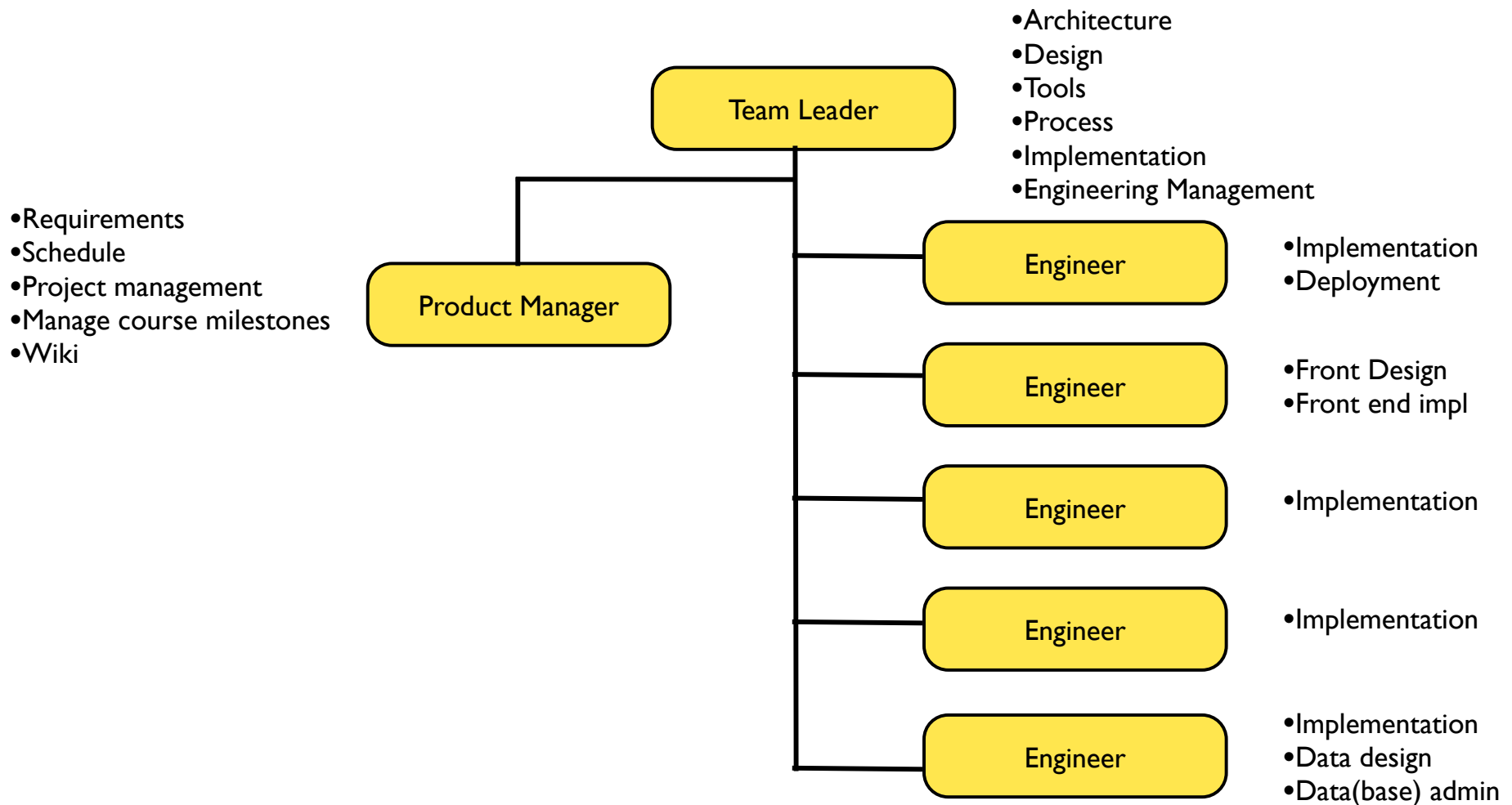
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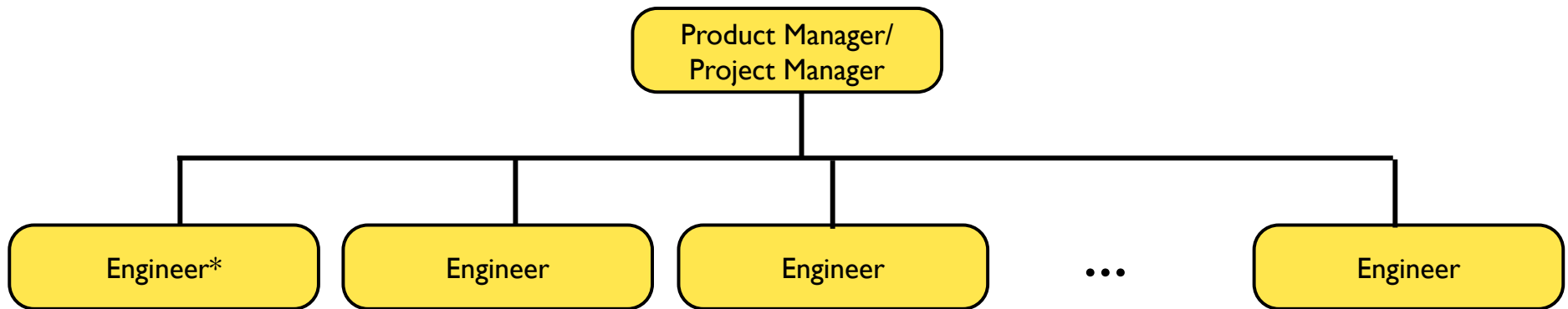
## Roles

- Product manager
- Project manager
- Engineering manager
- Architect
- Toolsmith
- Engineer

# Potential structure



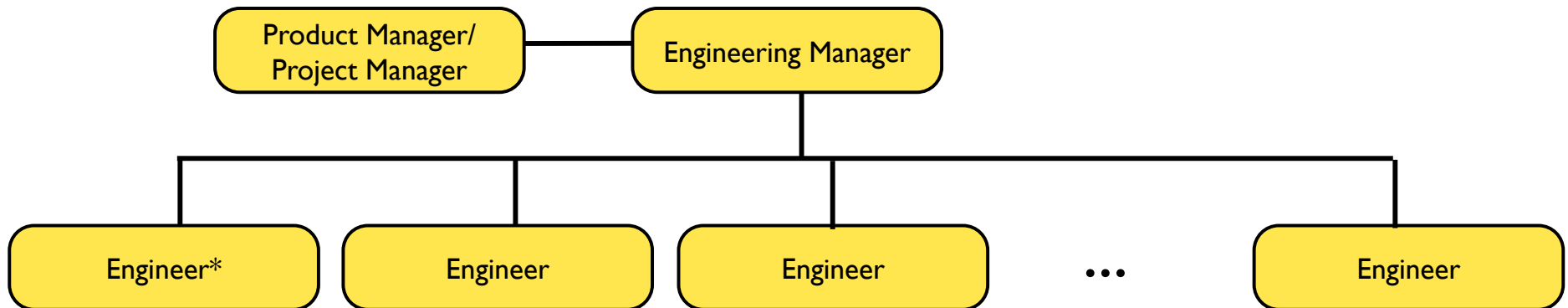
# Product manager leads



\* Architect/Technical Lead

(Never seen this work in the real world!)

# PM and engineering managers are peers



\* Architect/Technical Lead

This works in the real world because both the PM and engineering manager report to someone else

# Non-hierarchical structure (no lead/“boss”)



\* Project manager

Note: regardless of how you decided to organize, you must have a project manager

# Project manager for your project

- Required for your project, regardless how you organize yourselves
- Coordinates with a TA assigned to your project
- Manages all documents, write ups, communication
- Keeps track of the schedule
- Checkpoints with individuals of the team

# Project manager weekly status report

- Written weekly document shared with TA (posted on your wiki)
- Four components
  - What you said you were going to do this week
  - What you did this week
  - What you are going to do next week
  - Issues
- Require all team members to produce an individual status report that roles up to the team report?

# Take aways

- There is never a perfect organizational structure
- Scale by blindly adding bodies will fail
- Organization structures must accommodate individuals
- “PM” is a loaded word
- We’ll dig in more later in the quarter
- You must figure out your organizational structure



One more thing...

# (User) Designer

- Works closely with product manager and engineering team
- Expresses requirements as a user interface/experience, mostly visually
- What does the product do?
- Captures the “essence” of the product, company, functionality
- Might be an engineer (but not necessarily by training)

# (User) Designer Responsibilities

Vision/Requirements

Fonts

Logos/Iconography

User interface

User experience

(Photoshop) Mockups

HTML/CSS/JavaScript(?)