

Estimating: Tips for Upping Your SWAG

Speaker: Drew Shefman

Company: Twin Technologies

Website: http://bit.ly/EstPresoBlog

Welcome to the PMI Houston Conference & Expo and Annual Job Fair 2015

- · Please put your phone on silent mode
- Q&A will be taken at the close of this presentation
- There will be time at the end of this presentation for you to take a few moments to complete the session survey. We value your feedback which allows us to improve this annual event.



## **ESTIMATING:**

#### TIPS FOR UPPING YOUR SWAG\*



Drew Shefman

drew.shefman@ twintechs.com

@dshefman



**PMI** Houston Conference 2015

#### What's in it for me?

- A handful of tips and traps for delivering "good estimates"
- Resources for further information







# What's wrong with this estimate?

This presentation will be

2463 seconds with 537 seconds of Q&A



tweet answers using: #estimatingPreso







#### This is not about:

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#### This is not about:

 Math or complex statistical equations



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#### This is not about:

- Math or complex statistical equations
- Improving your estimates by 5 - 20%



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#### This is not about:

- Math or complex statistical equations
- Improving your estimates by 5 - 20%
- Estimation software or services



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#### This is about:

 The art of estimation (versus the science)



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- The art of estimation (versus the science)
- Professionalism in delivering estimates



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- The art of estimation (versus the science)
- Professionalism in delivering estimates
- Definitions around estimates



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- The art of estimation (versus the science)
- Professionalism in delivering estimates
- Definitions around estimates
- Psychology affecting estimates



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- The art of estimation (versus the science)
- Professionalism in delivering estimates
- Definitions around estimates
- Psychology affecting estimates
- Improving your estimates by > 100%



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537 seconds of Q&A
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#### Is it for me?

 I've said, "I think it will take x; so I'll say 3x to be safe"



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- I've said, "I think it will take x; so I'll say 3x to be safe"
- My estimate was WAAAAAY off on a previous project





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#estimatingPreso

- I've said, "I think it will take x; so I'll say 3x to be safe"
- My estimate was WAAAAAY off on a previous project
- I've accepted a project / deadline that had a low probability of success
- I'm human :)



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#### Who Am I?

- Software Craftsman / Scrum Master
- 18+ years professional development experience
- Technical Lead @ Twin Technologies
- Professor @ University of Houston







Drew Shefman @dshefman

drew.shefman@twintechs.com





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#### Who is Twin Technologies?

We are a technology consulting services firm using software to help organizations achieve new heights in productivity and profit while strengthening brand and image.

We feature business optimization solutions that deliver a better customer experience from the creation and distribution of assets; to the connection, consumption and transaction of those assets with their client targets.



- > HDQ in Albany, NY
- Adobe Premiere Partner
- Brightcove Premiere Partner
- Google Partner
- Accenture, HP and IBM delivery partner

Twin Technologies...





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#### Who Are You\*?

Team Member







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with
537 seconds of Q&A
#estimatingPreso

#### Who Are You\*?

Team Member doing the work



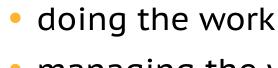




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#### Who Are You\*?

Team Member



managing the work







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#### Who Are You\*?

Team Member

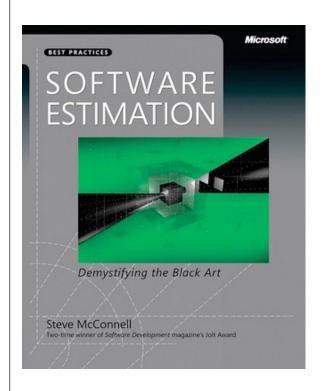


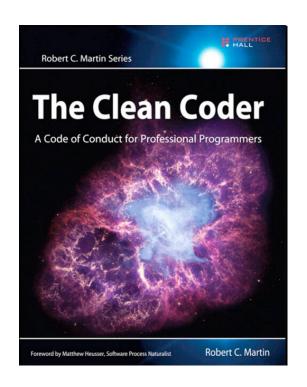
- doing the work
- managing the work
- securing the work

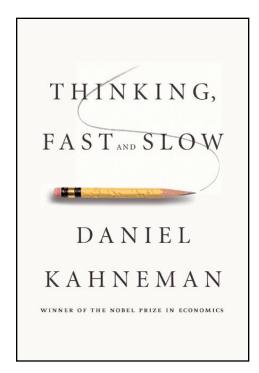




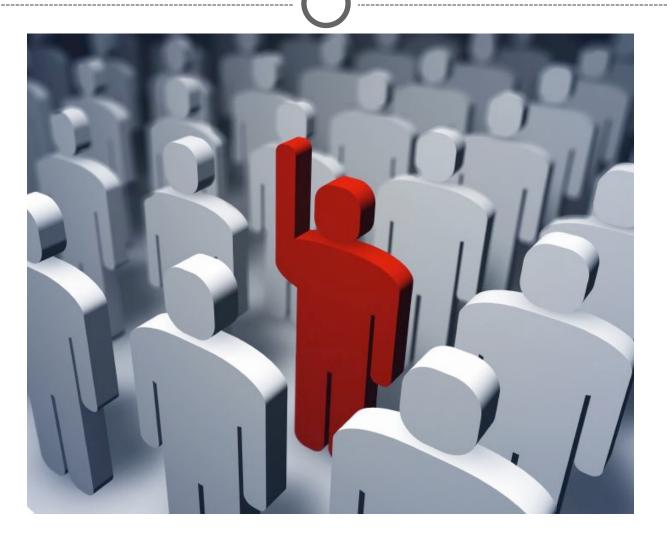
#### Resources



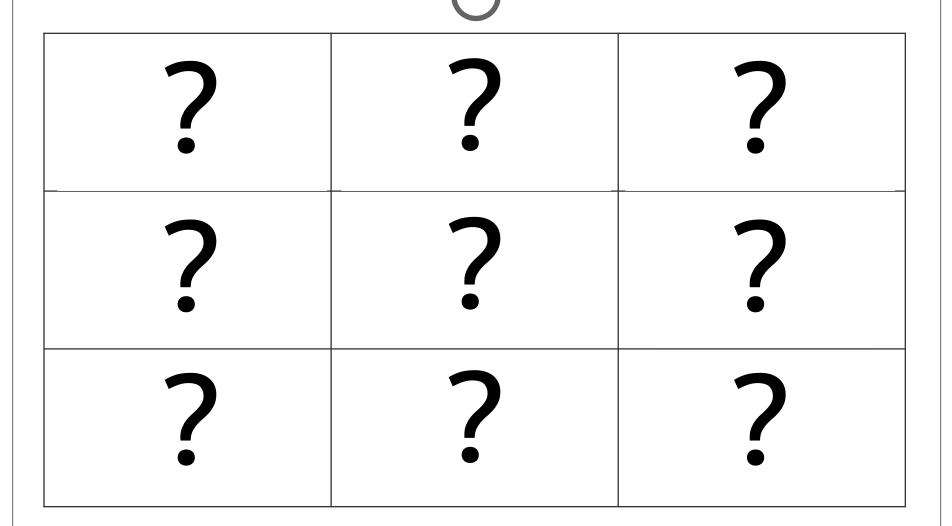




### **Do NOT wait**



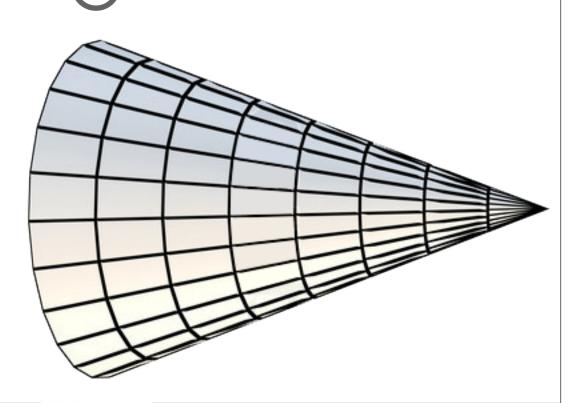
## Goal: 9 takeaway tips





# When can I use these estimating techniques?

WHEN YOU ARE AT
THE BIG END OF
THE CONE



#### The Cone?

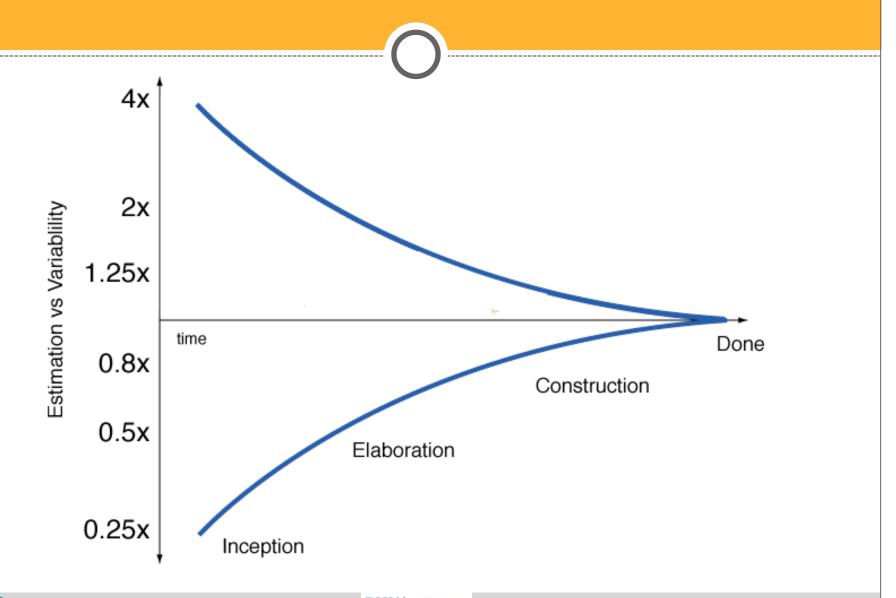
Not this cone.....



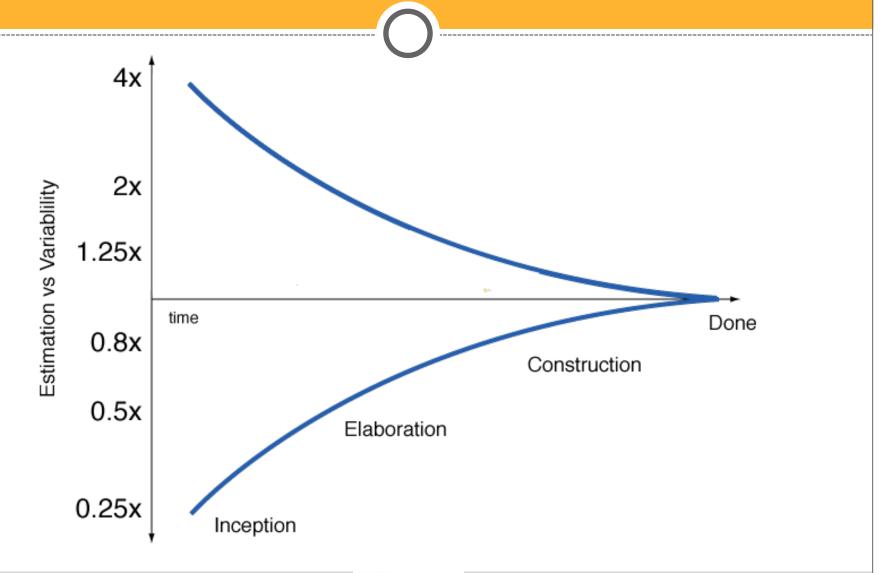
#### The Cone?

Not this cone.....





### The Cone of Uncertainty





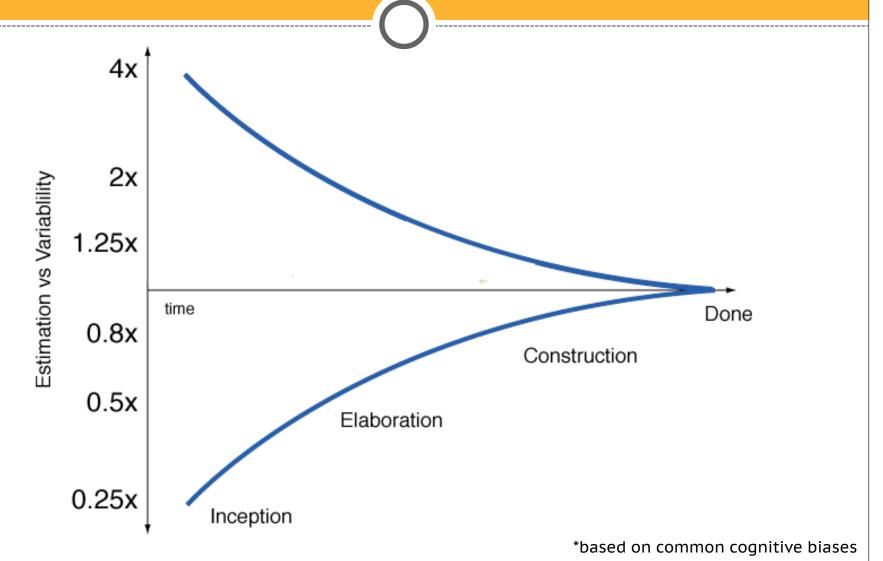
# Cone of Uncertainty

#### Definition:

The phenomenon wherein uncertainty of influencing factors diminishes over time



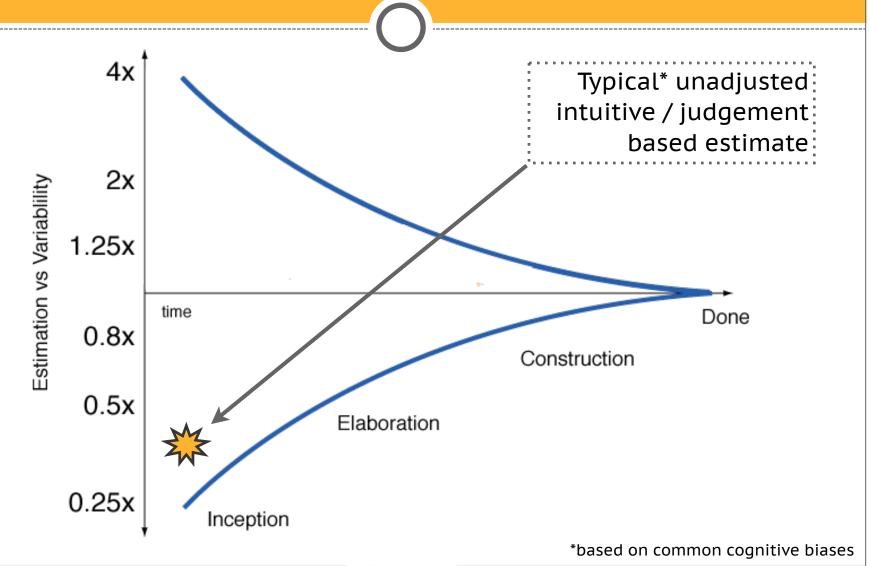
#### Where does 3x come from?







#### Where does 3x come from?





## What's wrong with this estimate?

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## Issue: "Estimate"



You keep using that word.

I do not think it means what you think it means.





Estimate definition interpretations

#### **Estimate**

- A tentative evaluation or rough calculation
- A preliminary calculation of the cost / duration of a project

The American Heritage Dictionary, 2nd College Edition, 1985.







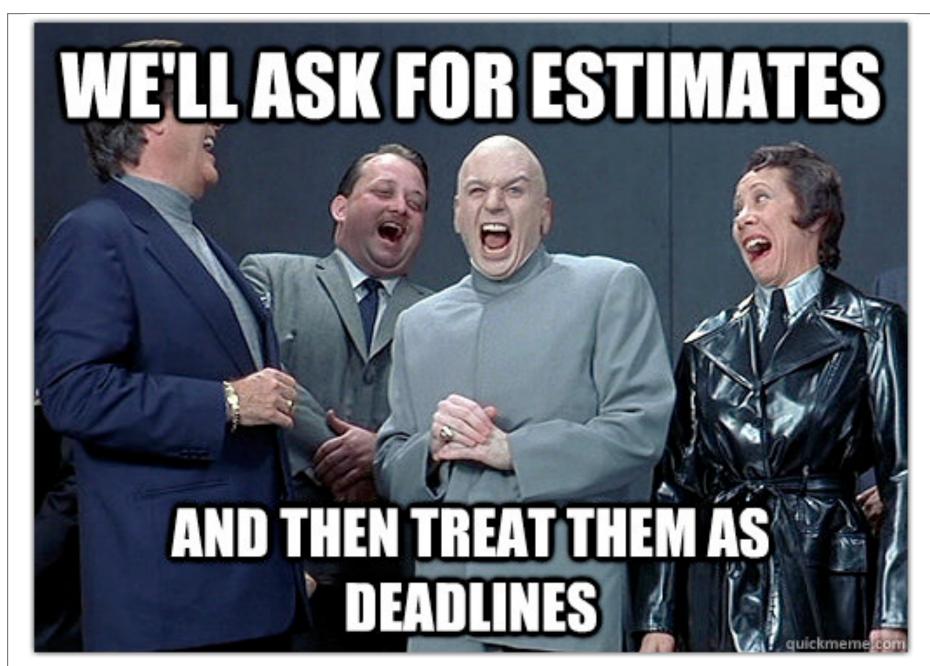
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#### <u>Target</u>

 A statement of a desirable business objective





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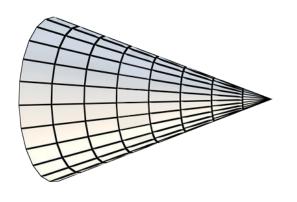
#### Commitment

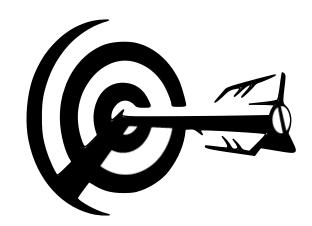
 A promise to deliver defined functionality at a specific quality level by a certain date

## **Tip: Estimate or Target?**

1

When asked to provide an estimate, determine if you are supposed to be estimating or hitting a target.









Estimating or hitting a target.

## What it looks like:

Needs to be ready in 3 months for tradeshow.

All features will take 5 months.

What is more important?

All features, or something for tradeshow?

We **need** something for the tradeshow.

I'll plan for delivering as many features as possible in 3 months



## **TRAP**



Estimating or hitting a target.





Estimating or hitting a target.

### TRAP

Estimates should be the result of a computation, and thus only the inputs to the computation can change.





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Estimates should be the result of a computation, and thus only the inputs to the computation can change.

Estimates are non-negotiable, targets and commitments <u>are</u> negotiable.

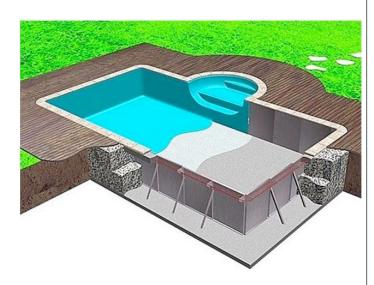




Estimating or hitting a target.

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## Estimates are non-negotiable?





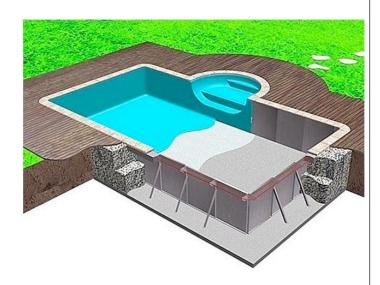


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## Estimates are non-negotiable?

Pool Size:







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Pool Size:

10'x10'x5'







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CL 7

**Cost Estimate:** 

 $\sim$ \$20K or \$40 / ft<sup>3</sup>





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CL 7

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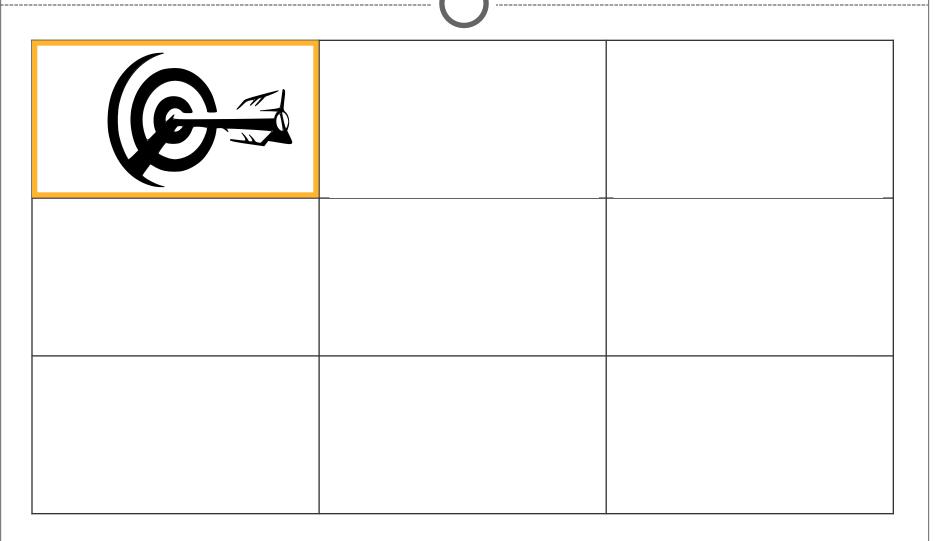


Cost Estimate:

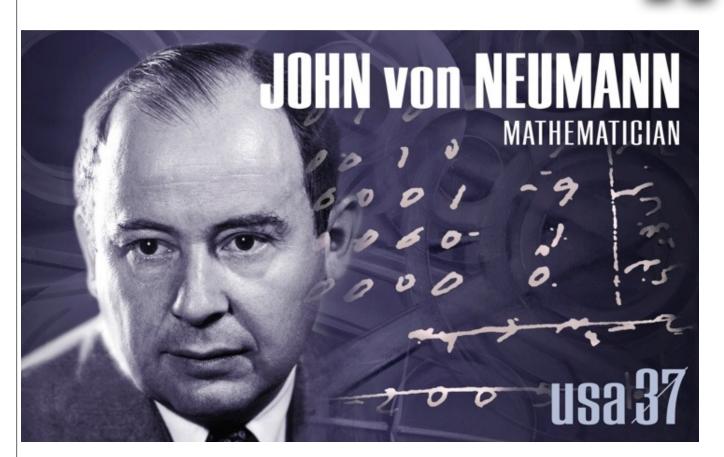
 $\sim$ \$20K or \$40 / ft<sup>3</sup>

How do you lower the estimate?

## **Tip Summary**



## **Issue: Precision**



There is no sense in being precise when you don't even know what you are talking about.



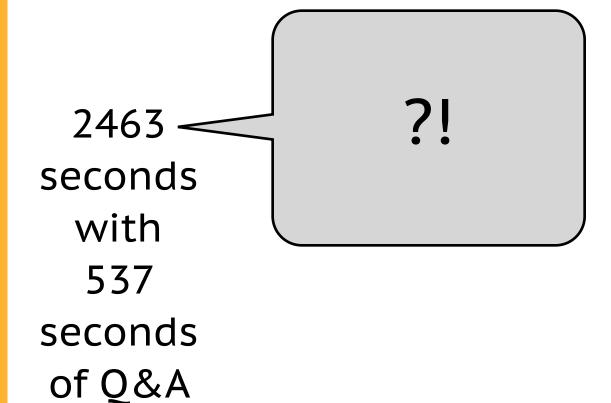


Estimate definition interpretations



Unwarranted precision

## **Unwarranted Precision**







Estimate definition interpretations



Unwarranted precision

## **Precision vs Accuracy**

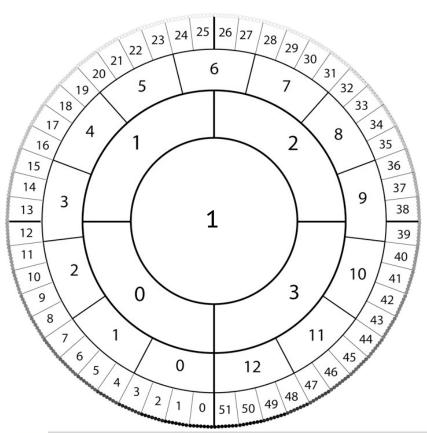
Example	Precise	Accurate
PI = 3.14159		
PI = 3		
PI = 3.37882		
Project will take 1 year		
Project will take 395.7 days +/- 2 months		
Project will require 7214 staff hours		

## **Tip: Coarse Units**

2

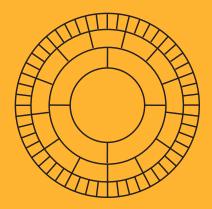
Present your estimates in units that are consistent with the estimates underlying accuracy

- Years
- Quarters
- Months
- Weeks
- Days
- Hours



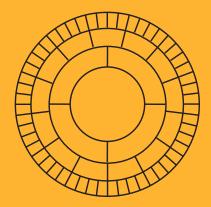






Use units in sync with accuracy



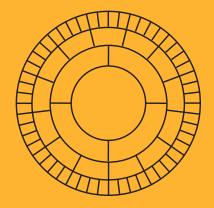


Use units in sync with accuracy

## **Smallest whole unit**

> 5 hours == 1 Day

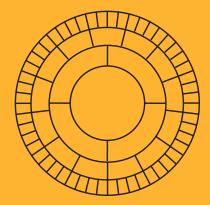




Use units in sync with accuracy

- > 5 hours == 1 Day
- > 4 days == 1 Week

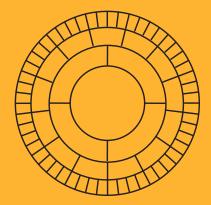




Use units in sync with accuracy

- > 5 hours == 1 Day
- > 4 days == 1 Week
- > 3 weeks == 1 Month

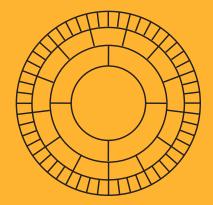




Use units in sync with accuracy

- > 5 hours == 1 Day
- > 4 days == 1 Week
- > 3 weeks == 1 Month
- > 2 months == 1 Quarter

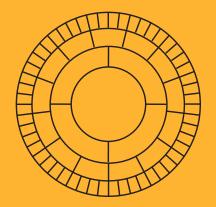




Use units in sync with accuracy

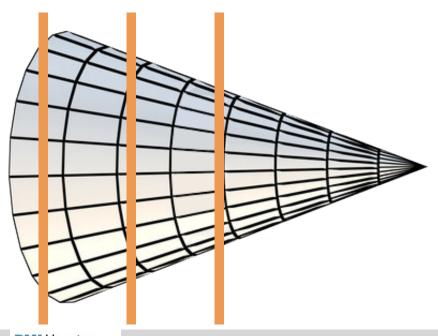
- > 5 hours == 1 Day
- > 4 days == 1 Week
- > 3 weeks == 1 Month
- > 2 months == 1 Quarter
- > 3 Quarters == 1 Year



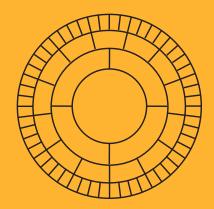


Use units in sync with accuracy

## **TRAP**



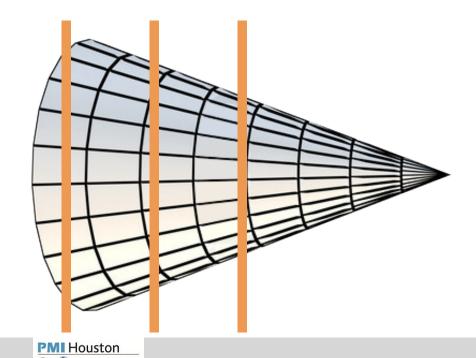




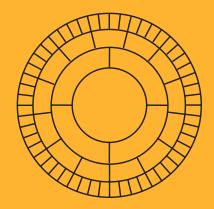
Use units in sync with accuracy

### **TRAP**

An estimate is not a one time event, reestimate throughout the project to tighten up the precision







Use units in sync with accuracy

## What it looks like:



This project should take about a quarter, but I'll refine my estimate in 2 weeks after I get into it....

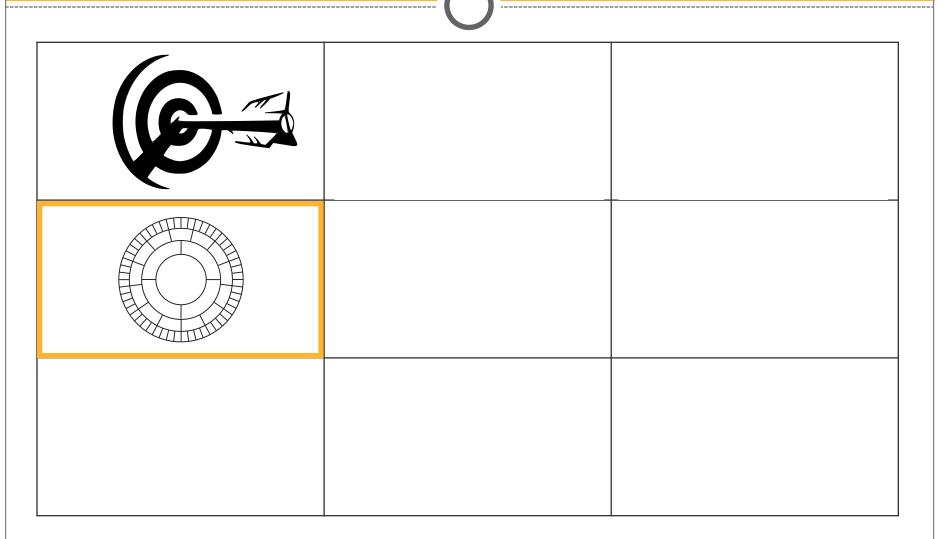
Now that I've worked on it some, this project will take 9 weeks to finish.



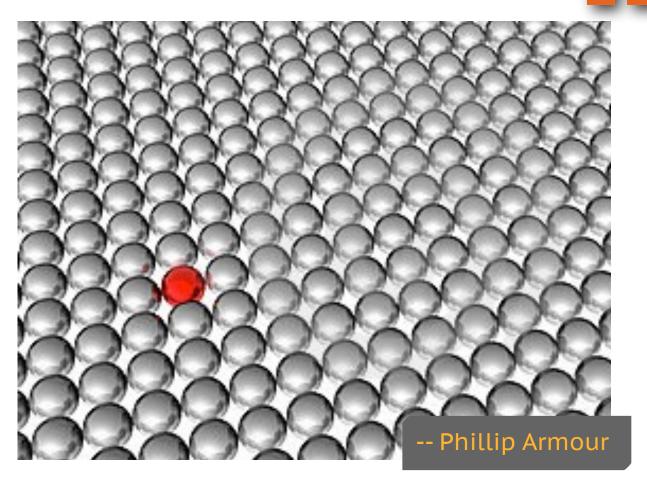




## **Tip Summary**



## **Issue: Distribution**



The process is called estimation, not exactimation











Estimate definition interpretations

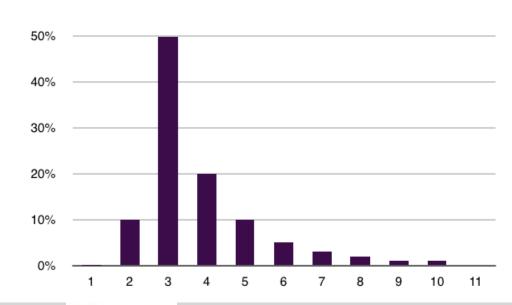


Unwarranted precision



Probability distribution not represented

# Estimates are probability statements







Estimate definition interpretations



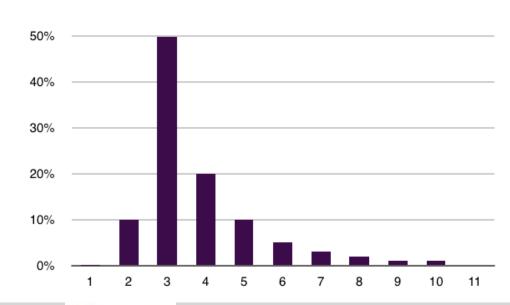
Unwarranted precision



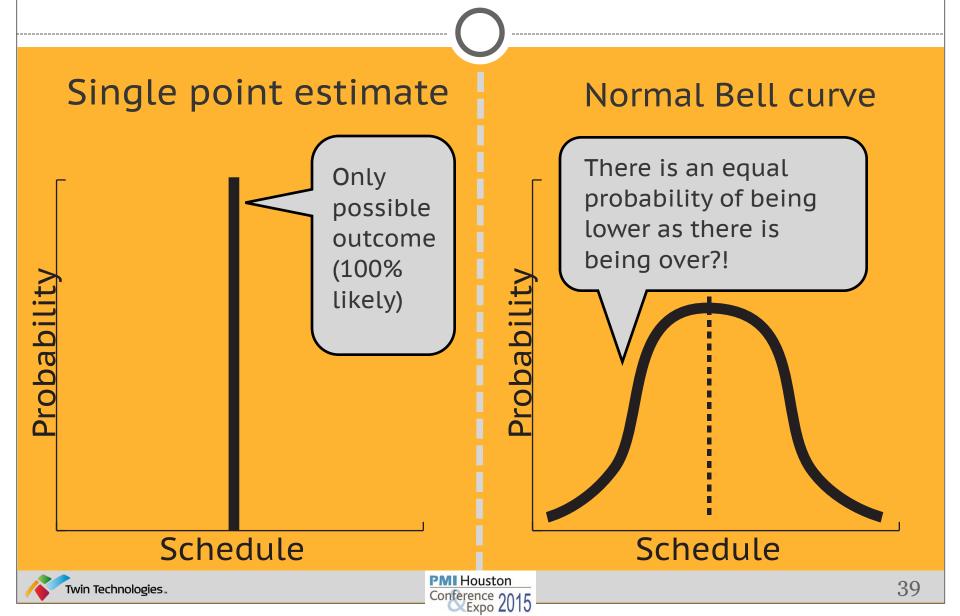
Probability distribution not represented

## Estimates are probability statements

Does your estimate represent the probability distribution?



#### Unrealistic expectations







Estimate definition interpretations

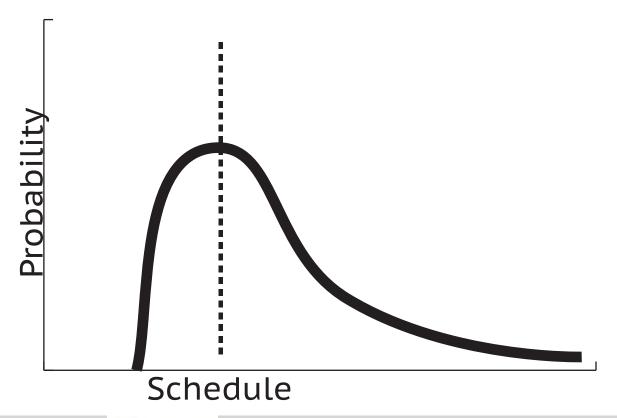


Unwarranted precision



Probability distribution not represented

## Limited positive outcome; unbounded negative outcome







Estimate definition interpretations

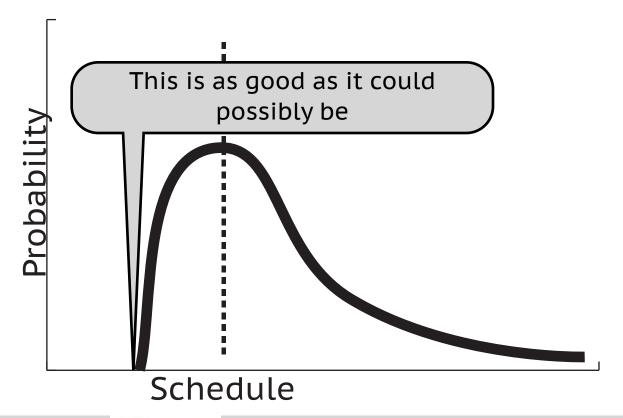


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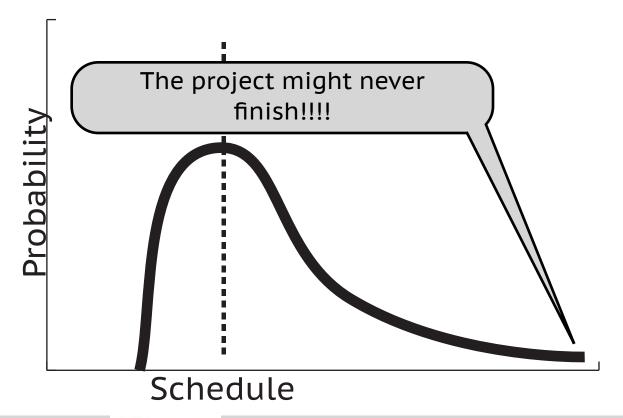


Unwarranted precision



Probability distribution not represented

## Limited positive outcome; unbounded negative outcome



Present the estimate with explicit uncertainty

6 months +5 months -1 month





3

Present the estimate with explicit uncertainty

6 months +5 months -1 month

Present the estimate with explicit uncertainty

- 6 months +5 months -1 month
- Extra Credit: Add Risk Quantification



Present the estimate with explicit uncertainty

- 6 months +5 months -1 month
- Extra Credit: Add Risk Quantification

Impact	Description
+2 months	20% new features
+1 month	External dependency delivered late
+1 month	Unexpected team size fluctuations
+1 month	Code reuse less than anticipated
-0.5 months	Code reuse better than anticipated
-0.5 months	External dependency delivered early





Explicitly express uncertainty

#### **TRAP**







Explicitly express uncertainty

#### **TRAP**

Beware of your <u>intuitive</u> confidence in your numbers







Explicitly express uncertainty

#### The trap looks like:



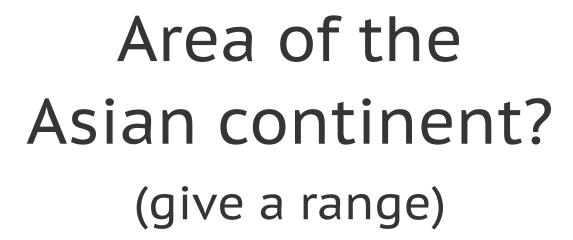
It feels like this task should take 3-5 days, most likely 3 1/2.



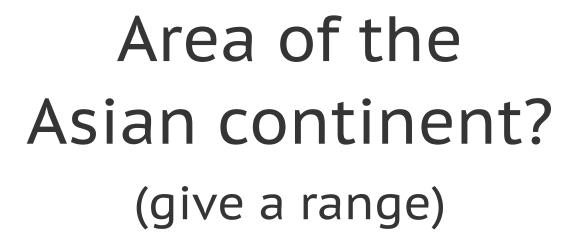


I'm 80% sure that I should be able to finish this within a week.



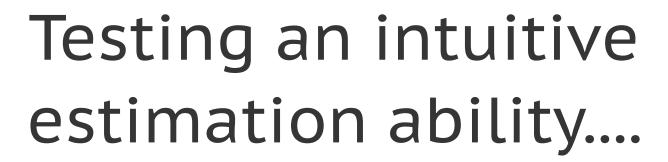






17,139,000 sq miles

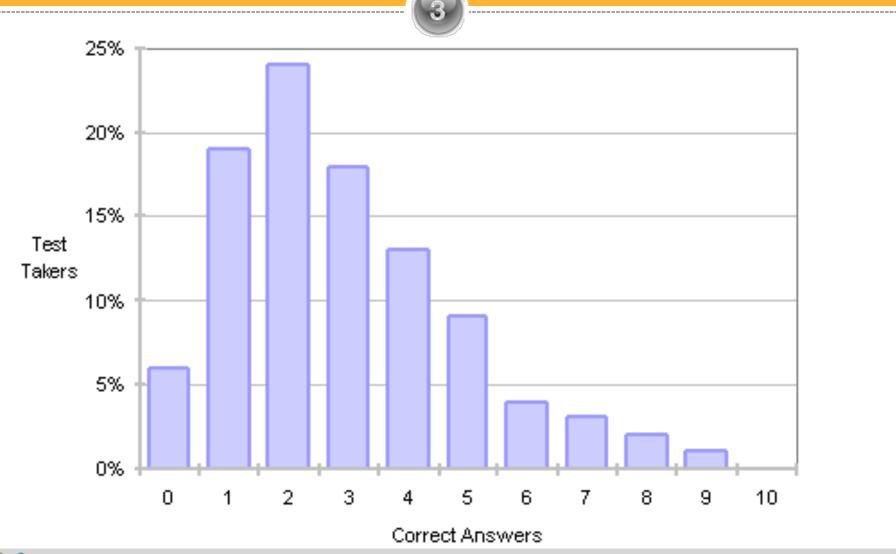




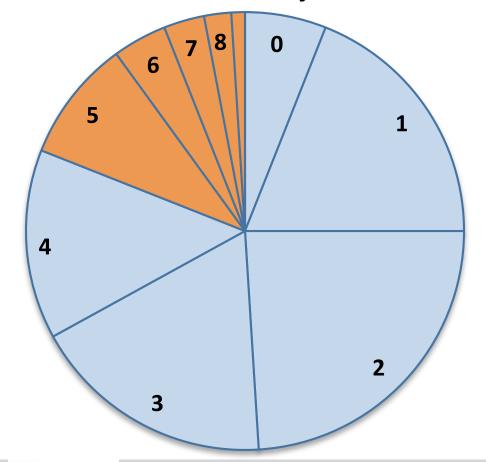
- 3
- 1. Surface temperature of the sun
- 2. Latitude of Shanghai
- 3. Area of the Asian continent
- 4. The year of Alexander the Great's birth
- 5. Total value of U.S. currency in circulation in 2004
- 6. Total volume of the Great Lakes
- 7. Worldwide box office receipts for the movie Titanic
- 8. Total length of the coastline of the Pacific Ocean
- 9. Number of books published in the US since 1776
- 10. Heaviest blue whale ever recorded





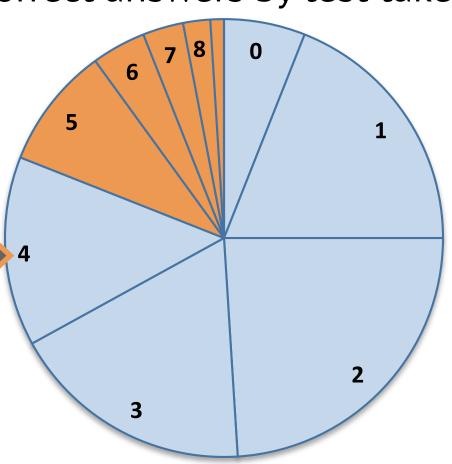


Correct answers by test taker



Correct answers by test taker

80% of the time, we estimate 60% inaccurately









Explicitly express uncertainty

### **Anatomy of Intuitive Estimates**

- 1. Rich-Mode makes an instant decision about size of estimate
- 2. Logic-Mode evaluates #1 against first available experiences
- Logic-Mode adjusts estimate but is constrained by #1









Explicitly express uncertainty

### **Anatomy of Intuitive Estimates**

#### Rich-Mode:

Can't be influenced

#### Logic-Mode:

Can use the remaining tips to help express the uncertainty







Explicitly express uncertainty

#### **TRAP**

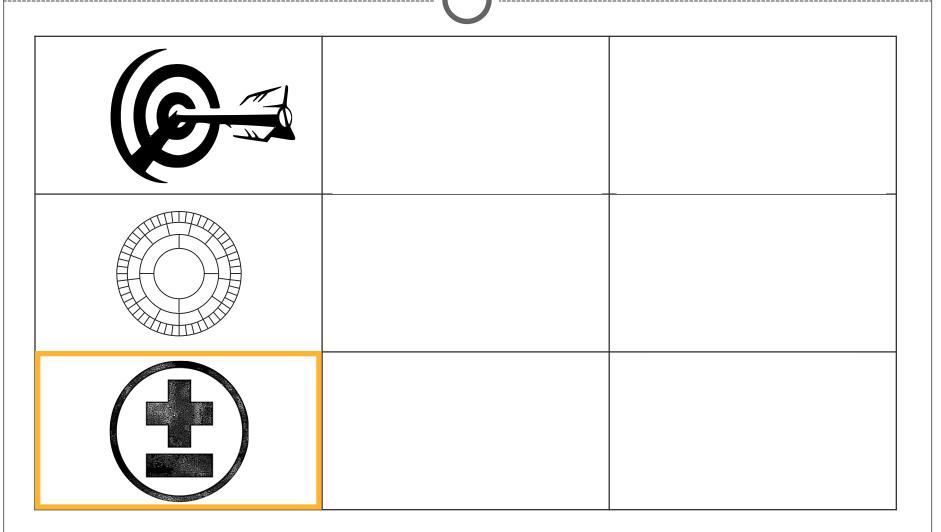
Beware of your <u>intuition</u>, unless empirical evidence supports otherwise



According to my notes, similar tasks have taken 3-5 days. I'd expect this to be roughly 3 1/2.



#### **Tip Summary**







Explicitly express uncertainty

#### **TRAP**

Beware of your <u>intuition</u>, unless empirical evidence supports otherwise



According to my notes, similar tasks have taken 3-5 days. I'd expect this to be roughly 3 1/2.



### What is the best way to get better estimates?

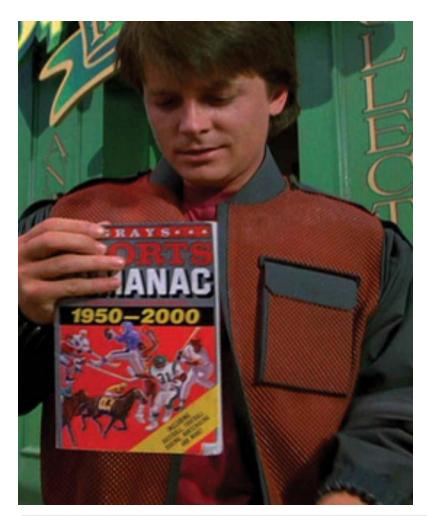


### What is the best way to get better estimates?

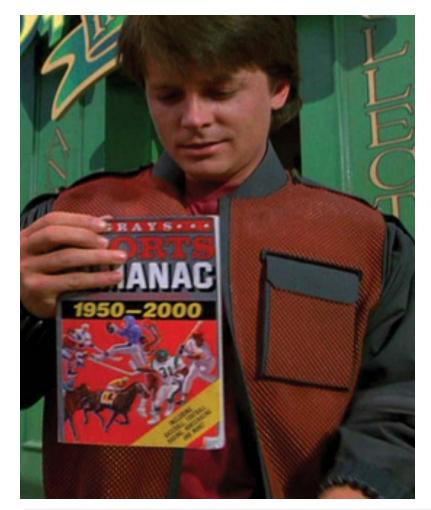
# HISTORICAL DATA



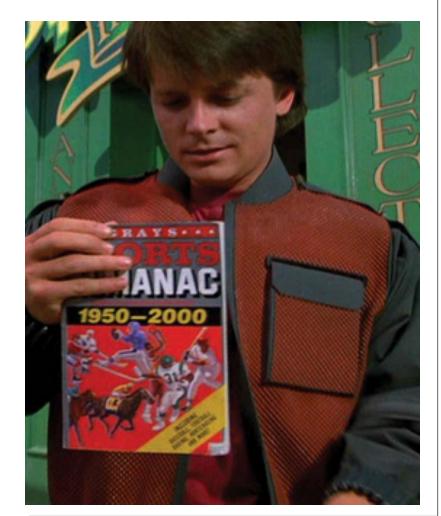




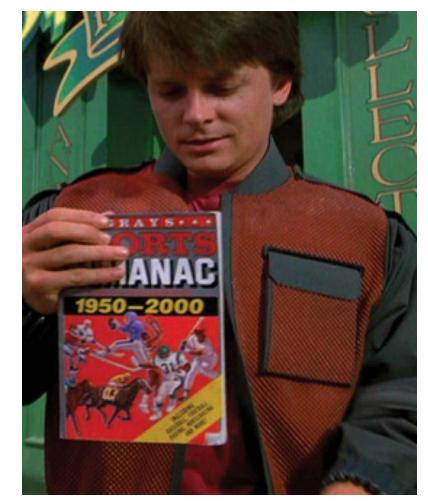
 Already accounts for organizational influences



- Already accounts for organizational influences
- Avoids subjectivity and unfounded optimism



- Already accounts for organizational influences
- Avoids subjectivity and unfounded optimism
- Reduces estimation politics

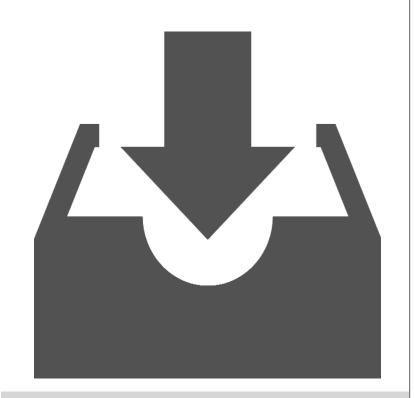






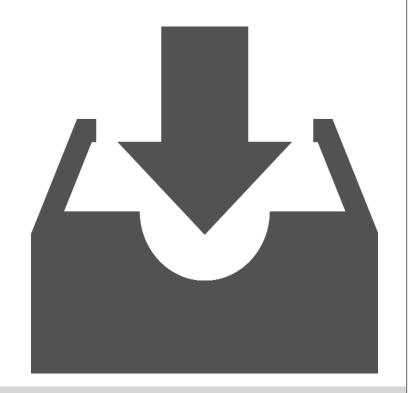
#### Tip: Collect Historical Data

- Size (Lines of Code / or something countable)
- Effort (staff months)
- Time (calendar months)
- Defects (classified by severity)



#### Tip: Collect Historical Data

- Size (Lines of Code / or something countable)
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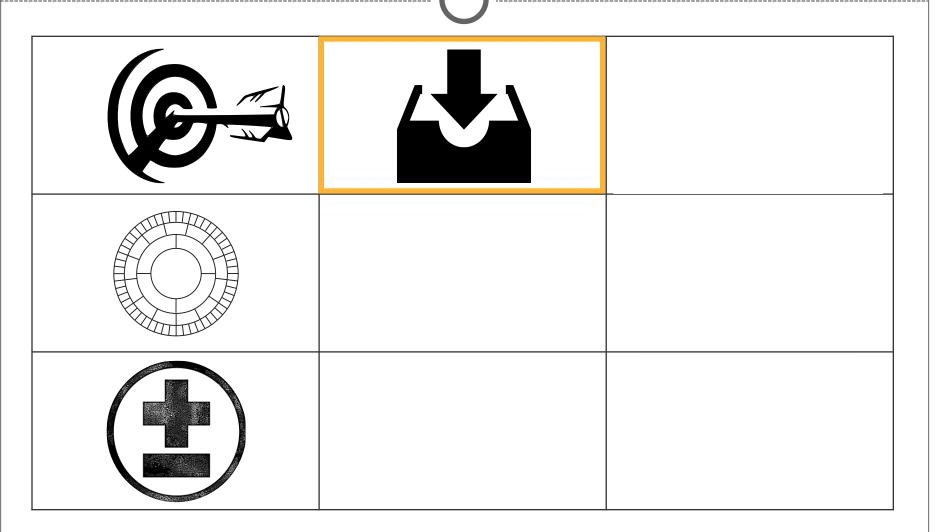
Collect Historical Data



### How to collect historical data

- Distinguish countable items on tracking software
- Do not aggregate for the whole day
- Isolate each task, story, and defect in your reporting

#### **Tip Summary**



### What is the best way to get better estimates?



# What is the best way to get better estimates?



OR

COMPUTE



### **Tip: Count & Compute**

- Count when you can
- Compute when you can't count
- Rely on intuition as an absolute last resort, if you can't count or compute



### Tip: Count & Compute...What

- **(5)**
- Marketing requirements
- Features
- Use cases
- Stories
- Function points
- Pages / Screens /Dialogs
- Change requests
- Lines of Code
- Classes
- Defects







### # of people in room example



#### Counted:

Ticketing has 167 tickets = 167 people



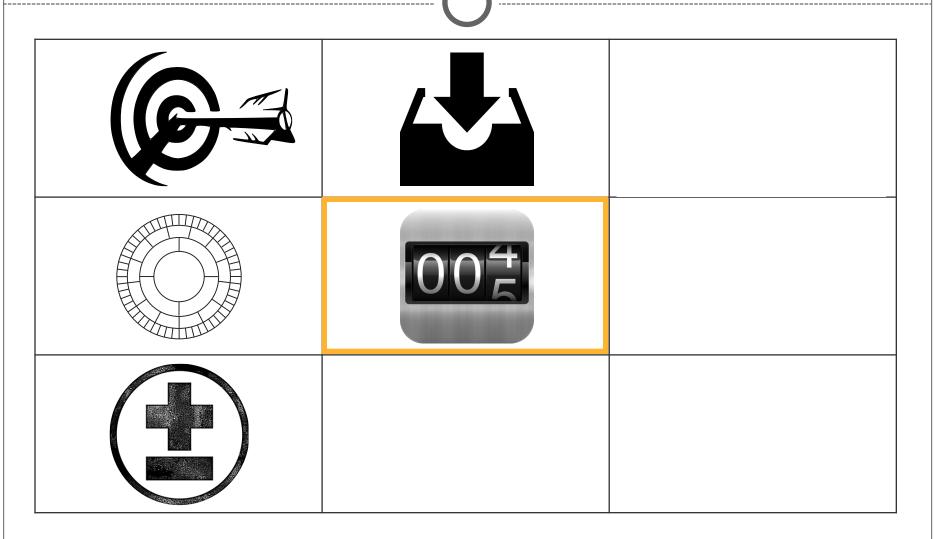
#### Computed:

 $20 \times 10$ -top tables = 200 people

#### Intuited:

Room capacity is 500, and ~50% full = 250 people

### **Tip Summary**



### **Probability Range**



What about the probability range?

Best & Worst Case?

#### **Best Case - Done**

Best case...
happens naturally

It is the way that the human brain is wired.



#### **Best Case - Done**

Best case...
happens naturally

It is the way that the human brain is wired.

Optimism Bias



#### **Best Case - Done**

Best case...
happens naturally

It is the way that the human brain is wired.

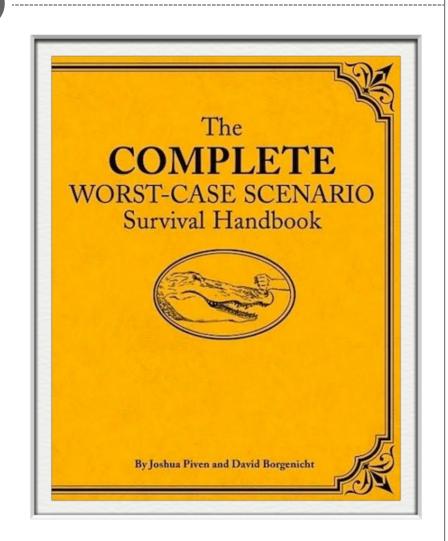
- Optimism Bias
- Planning Fallacy



### **Getting to the Worst Case**

- 1. Pre-Mortem
- Someone else doing the work

3. Common omitted activities



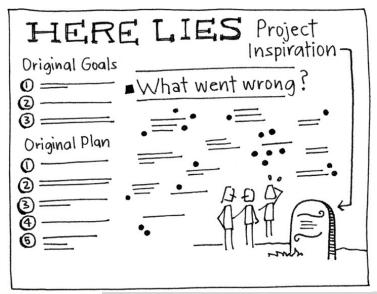


- 1. Pre-Mortem
- 2. Someone else doing the work
- 3. Common omitted activities



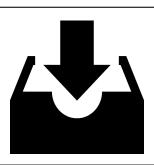
#### **TIP: Pre-mortem**

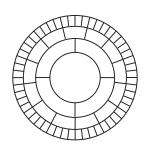
- Imagine one year in the future
- The project is a disaster
- Write a brief history of the disaster.



### **Tip Summary**















- 1. Pre-Mortem
- 2. <u>Someone else</u> doing the work
- 3. Common omitted activities

# TIP: Someone else doing the work

- Choose an actual person that you know (doesn't have to be a team member) potentially capable of doing the work.
- Estimate based on your perception of their abilities







### **Tip Summary**





- 1. Pre-Mortem
- 2. Someone else doing the work
- 3. <u>Commonly</u> omitted activities

# Commonly Omitted: Requirements

- Setup / Installation
- Deployment modes
- Data Conversion utility
- Security
- Survivability
- + many more









- 1. Pre-Mortem
- 2. Someone else doing the work
- 3. <u>Commonly</u> <u>omitted activities</u>

# Commonly Omitted: Development

- Maintaining build scripts
- Creating test data
- On-boarding team members
- Supporting the build
- Version control management
- + many more







- 1. Pre-Mortem
- 2. Someone else doing the work
- 3. <u>Commonly</u> <u>omitted activities</u>

# Commonly Omitted: Non-development

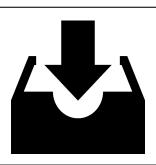
- Troubleshooting hardware/software
- Vacations
- Weekends
- Training
- Company Meetings
- + many more



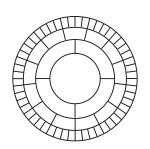


### **Tip Summary**



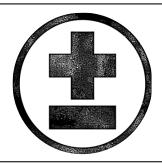










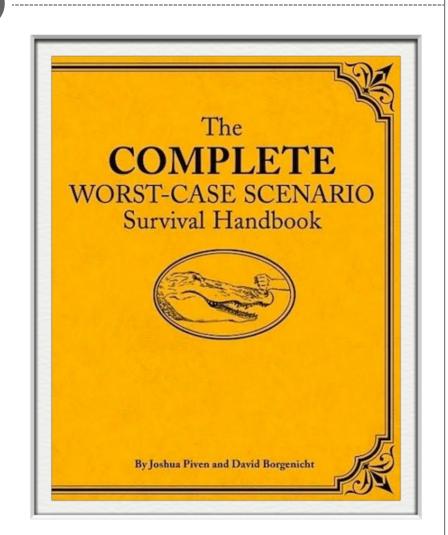




### **Getting to the Worst Case**

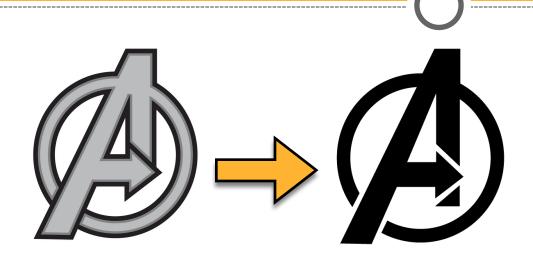
- 1. Pre-Mortem
- Someone else doing the work

Common omitted activities



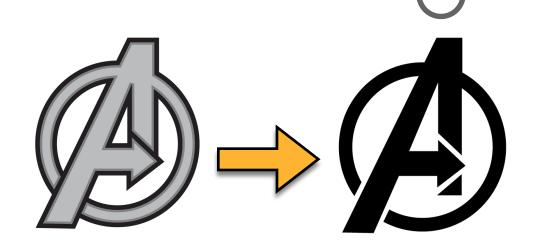






The current logo on the site/app needs to be swapped out for the new one





could

What

The current logo on the site/app needs to be swapped out for the new one

wrong?





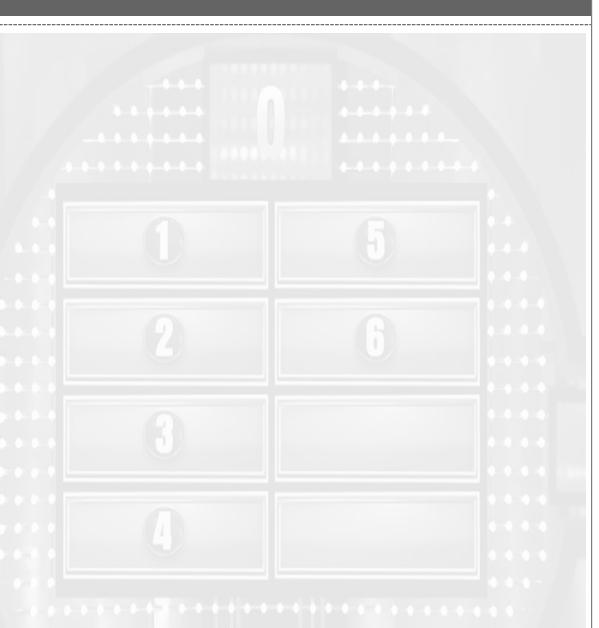


















What could go wrong?

Not approved by all / legal









- Not approved by all / legal
- Incorrect size / file format









- Not approved by all / legal
- Incorrect size / file format
- Multiple locations / file names









- Not approved by all / legal
- Incorrect size / file format
- Multiple locations / file names
- Transparency / background issues



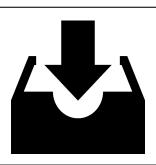




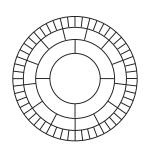
- Not approved by all / legal
- Incorrect size / file format
- Multiple locations / file names
- Transparency / background issues
- Alternate versions needed (mobile / resolutions)

### **Tip Summary**



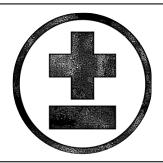














Peter can you give me a hard date when you'll be done?

No, Mike. Like I said, it'll probably be done in 3, maybe 4 days

Can we say 4 then?

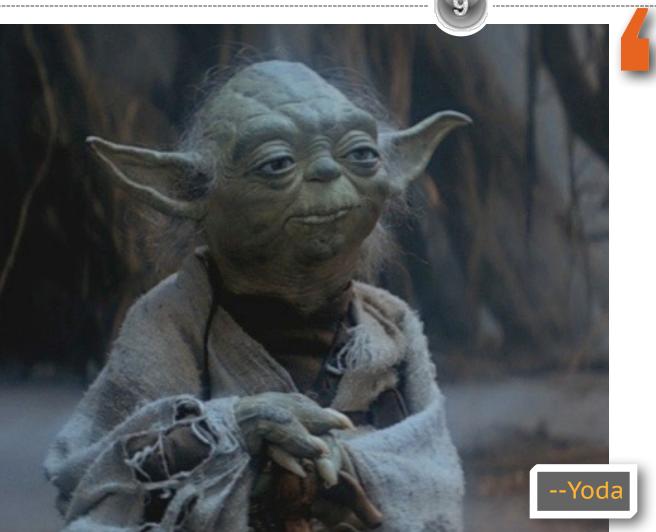
No, it **could** be 5 or 6.

Ok, Peter, but can you **try** to make it no more than 6 days?









NO!

Try not!

DO or DO NOT, There is no try.









The promise to try means...



Admission that you've been holding back





- Admission that you've been holding back
- There is a reservoir of extra effort that you can apply





- Admission that you've been holding back
- There is a reservoir of extra effort that you can apply
- The goal is attainable





- Admission that you've been holding back
- There is a reservoir of extra effort that you can apply
- The goal is attainable
- Interpreted as a commitment to succeed



You are LYING

if you trust your estimate and





There is no reserve of effort available

You are LYING

if you trust your estimate and



You are LYING

if you trust your estimate and



There is no reserve of effort available

 There is no new / different plan of attack / behavior change that will result in success

You are LYING

if you trust your estimate and



There is no reserve of effort available

 There is no new / different plan of attack / behavior change that will result in success

 There is no new information available that changes your estimate.



**Resolution:** 

Have the courage to say no.



**Resolution:** 

Have the courage to say no.





**Resolution:** 

Have the courage to say no.

- You can, should, and have to say NO, and stick to it.
- Be very clear and explicit about your COMMITMENT



#### The Try Trap... Continued

Ok, Peter, but can you **try** to make it no more than 6 days?

No, Mike. I can work on it for a day and provide a revised estimate, if that helps.

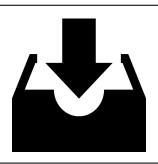
But what if it is still 6 days after the revised estimate?!

Then you can decide if it is still worthwhile pursuing.

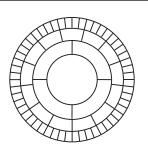






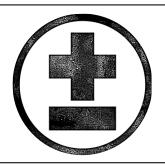
















# Software Estimate: Redefined

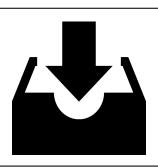
The primary purpose of software estimation is not to predict a project's outcome;

the purpose is to determine whether the targets are realistic enough to control the project to meet them.

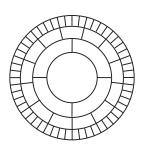
#### **Good Estimate**

A good estimate provides a clear enough view of the project reality to allow the leadership to make good decisions about controlling the project to hit its targets



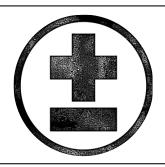








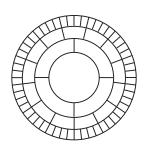




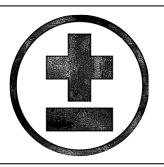










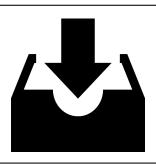




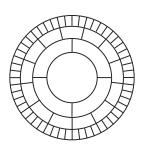






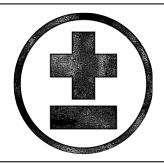












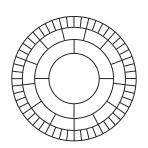


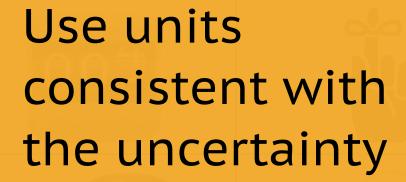


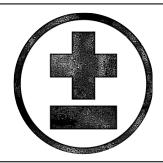






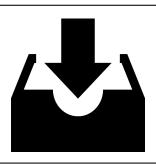




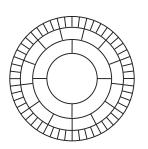






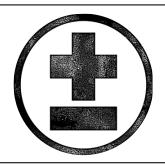








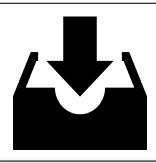




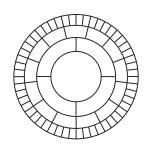






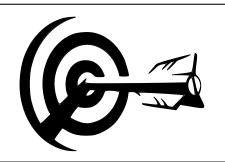


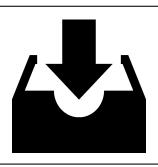




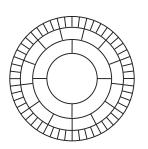


Express the uncertainty explicitly



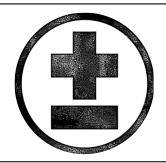






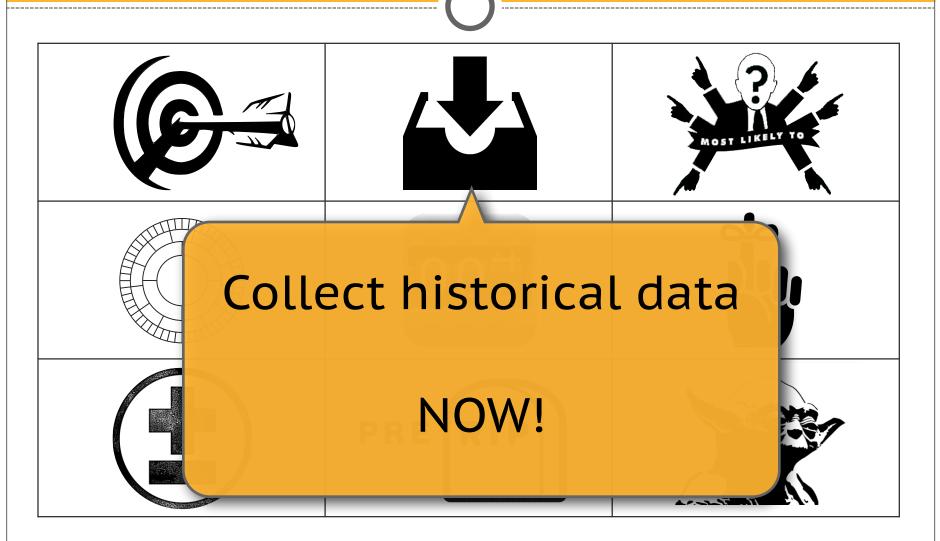






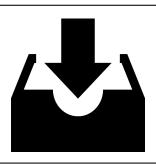




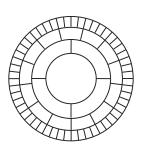






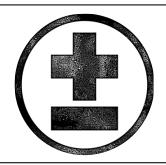






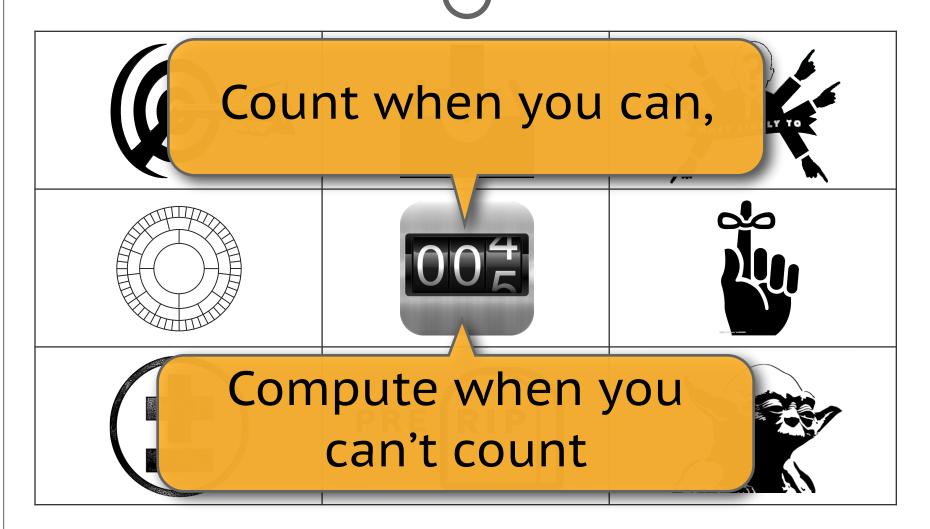


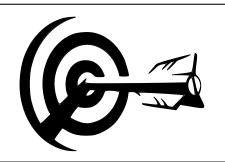


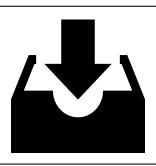




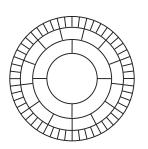






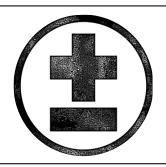










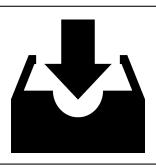




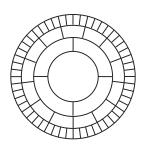






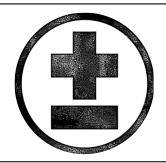
















Worst case:
Someone else doing
the work





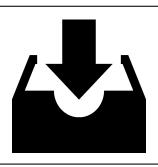




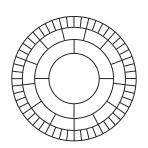






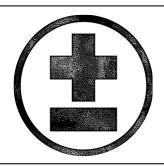
















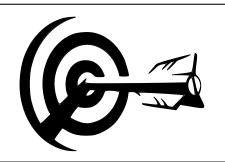


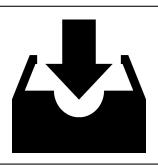




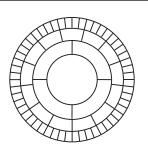






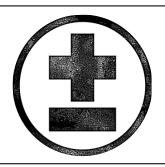








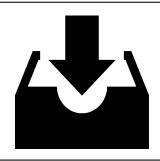














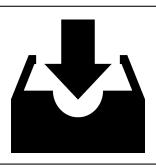
Do or do not, there is no try



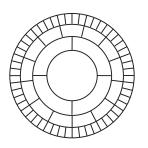






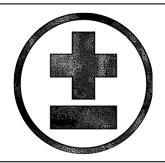










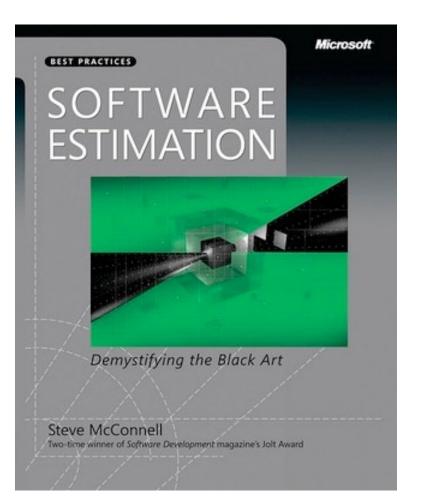


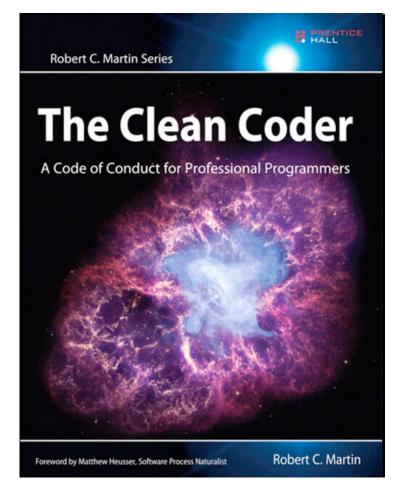




#### Tip: Read these Books

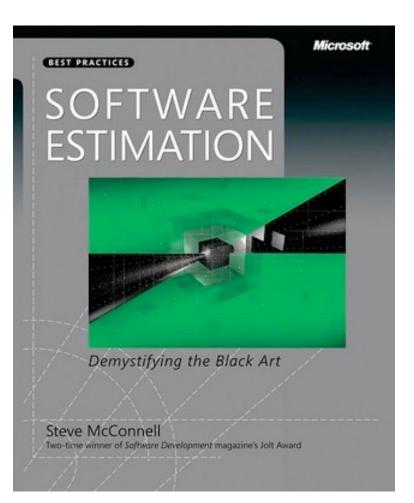






#### Tip: Read these Books





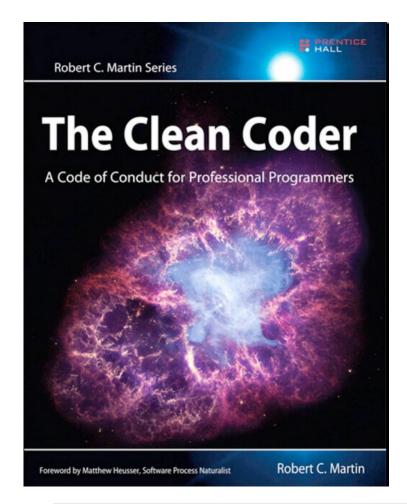
- ~120 Estimating tips / techniques
- Tips are categorized by:
  - What is estimated
    - Size
    - Effort
    - Schedule
    - Features
  - Size of Project
    - S, M, L
  - Stage that estimate applies
    - Early, Middle, Late
  - Iterative or Sequential
  - Accuracy possible
    - Medium High



#### Tip: Read these Books



- What it means to be a true software craftsman
- Dealing with conflict, tight schedules, and unreasonable managers
- Handling pressure and avoiding burnout
- Fostering environments where programmers and teams thrive
- When / how to say "no"
- When / how to say "yes"



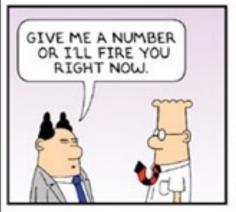
#### Humor





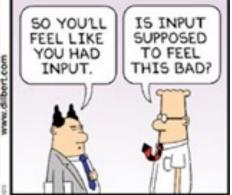












#### A&Q





Drew Shefman @dshefman



### Contact Information

- · Speaker: Drew Shefman
- Company: Twin Technologies
- Website:http://bit.ly/EstPresoBlog
- Twitter: @dshefman
- E-mail: drew.shefman@twintechs.com

#### Thank You

