

ESTIMATING: TIPS FOR UPPING YOUR SWAG*

*(SCIENTIFIC WILD A\$\$ GUESS)



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@dshefman

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





What's Wrong?

This is not about:

2463 seconds
with
537 seconds of Q&A
#estimatingPreso



What's Wrong?

2463 seconds
with
537 seconds of Q&A
#estimatingPreso

This is not about:

- Math or complex statistical equations



What's Wrong?

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This is not about:

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



What's Wrong?

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#estimatingPreso

This is not about:

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



What's Wrong?

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537 seconds of Q&A
#estimatingPreso

This is about:



What's Wrong?

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537 seconds of Q&A
#estimatingPreso

This is about:

- The art of estimation
(versus the science)



What's Wrong?

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This is about:

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



What's Wrong?

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This is about:

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



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This is about:

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



What's Wrong?

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This is about:

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



What's Wrong?

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Is it for me?



What's Wrong?

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537 seconds of Q&A
#estimatingPreso

Is it for me?

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



What's Wrong?

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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"
- My estimate was WAAAAAY off on a previous project



What's Wrong?

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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"
- My estimate was WAAAAAY off on a previous project
- I've accepted a project / deadline that had a low probability of success



What's Wrong?

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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"
- 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 :)

What's Wrong?

2463 seconds
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537 seconds of Q&A
#estimatingPreso



UNIVERSITY of
HOUSTON



CERTIFIED INSTRUCTOR

Who Am I?

- Software Craftsman / Architect
- 17+ years professional development experience
- Technical Lead @ Twin Technologies
- Professor @ University of Houston
- Adobe Certified Expert / Instructor



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What's Wrong?

2463 seconds
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537 seconds of Q&A
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Who Are You*?

Team
Member



* My SWAG on who you are



What's Wrong?

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Who Are You*?

Team
Member



- doing the work

* My SWAG on who you are



What's Wrong?

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Who Are You*?

Team
Member



- doing the work
- managing the work

* My SWAG on who you are



What's Wrong?

2463 seconds
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Who Are You*?

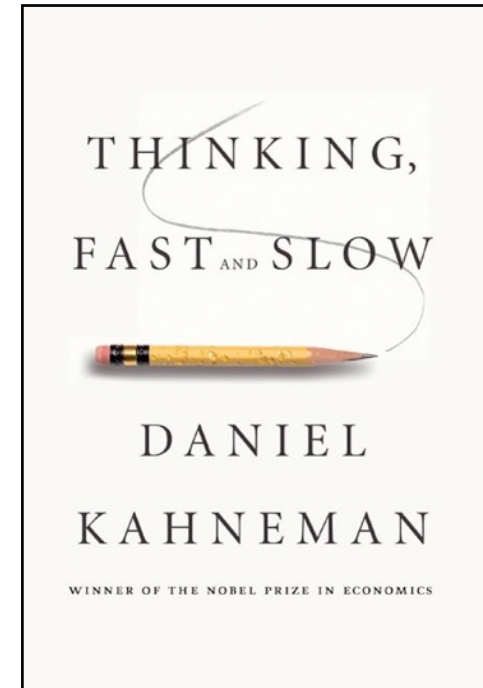
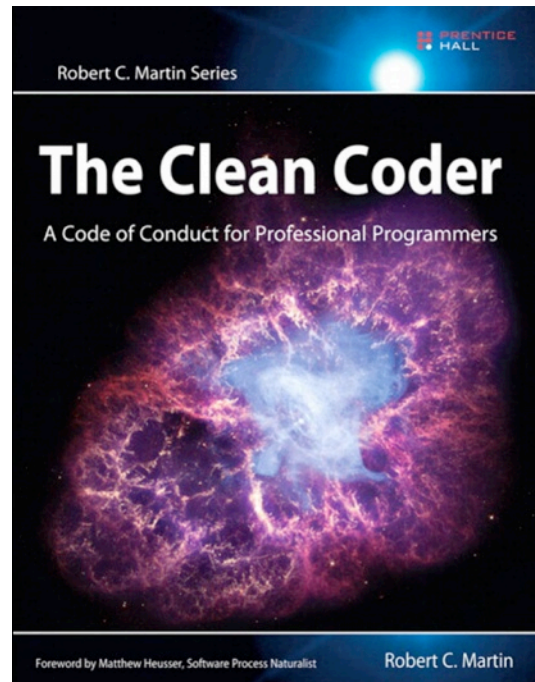
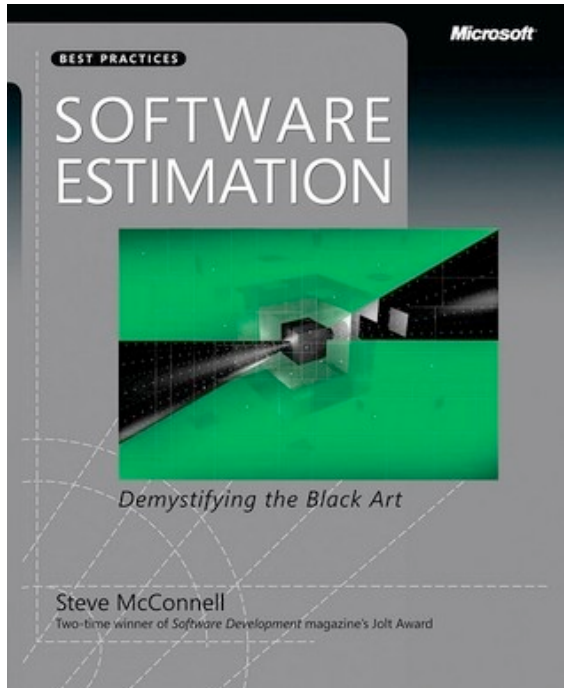
Team
Member



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

* My SWAG on who you are

Resources



Do NOT wait



Goal: 9 takeaway tips

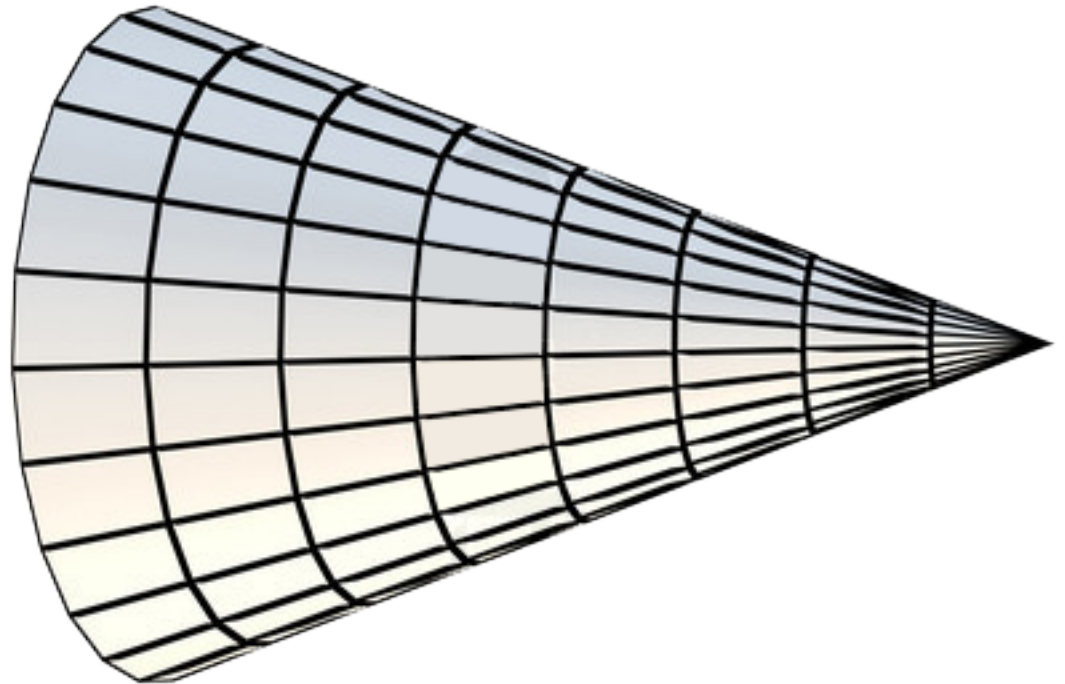


?	?	?
?	?	?
?	?	?

When can I use these estimating techniques?



**WHEN YOU ARE AT
THE BIG END OF THE
CONE**

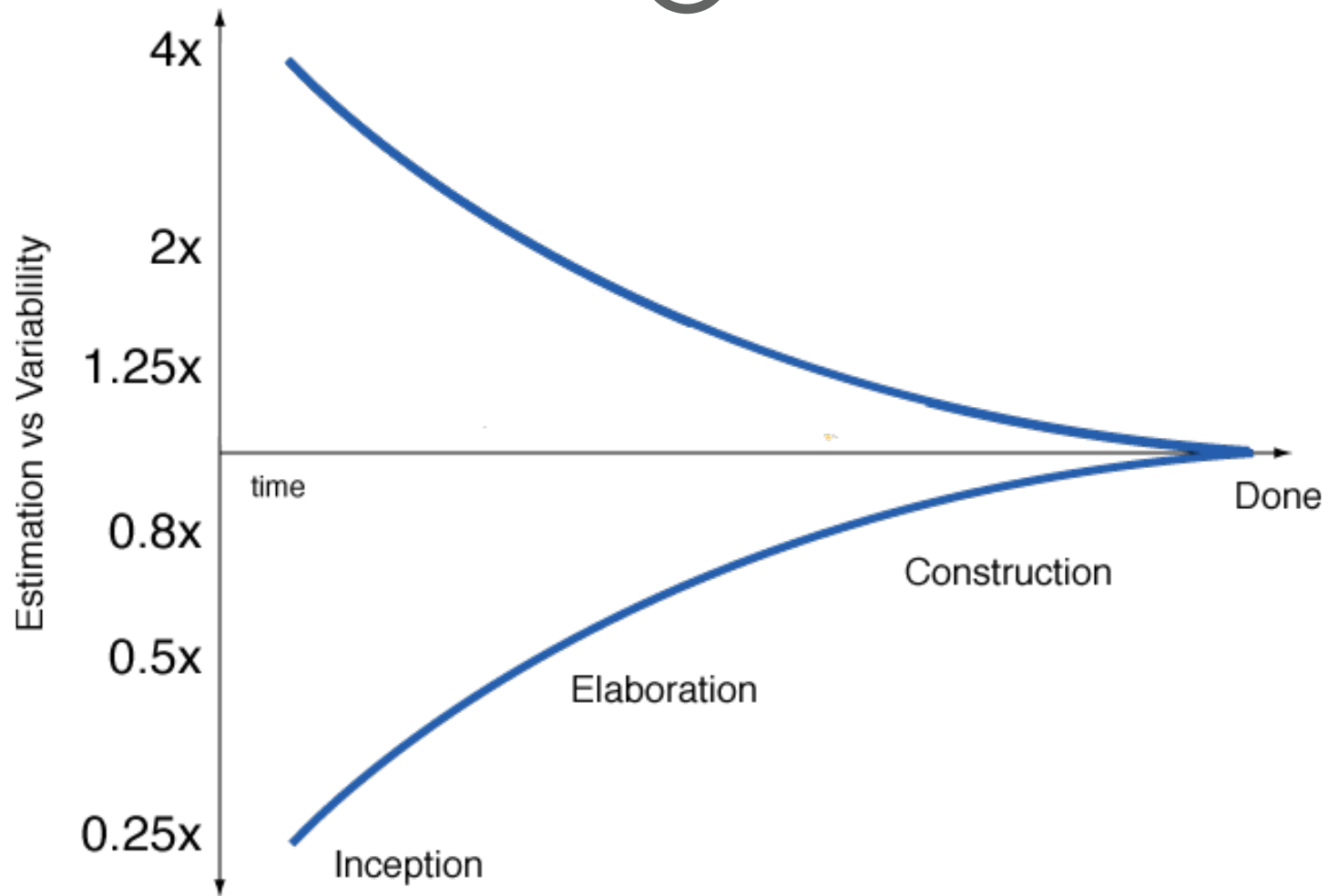


The Cone?

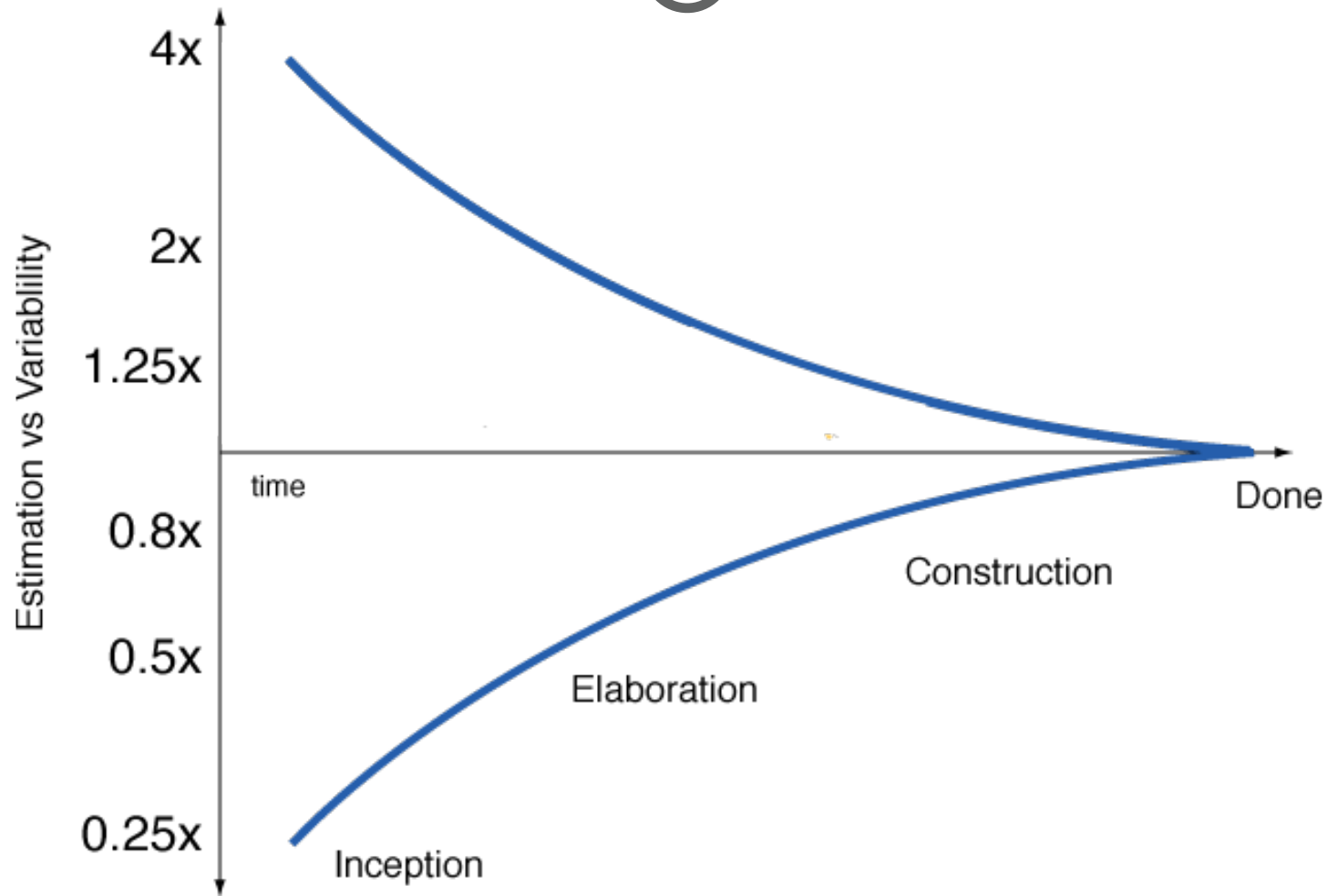


Not this cone.....





The Cone of Uncertainty



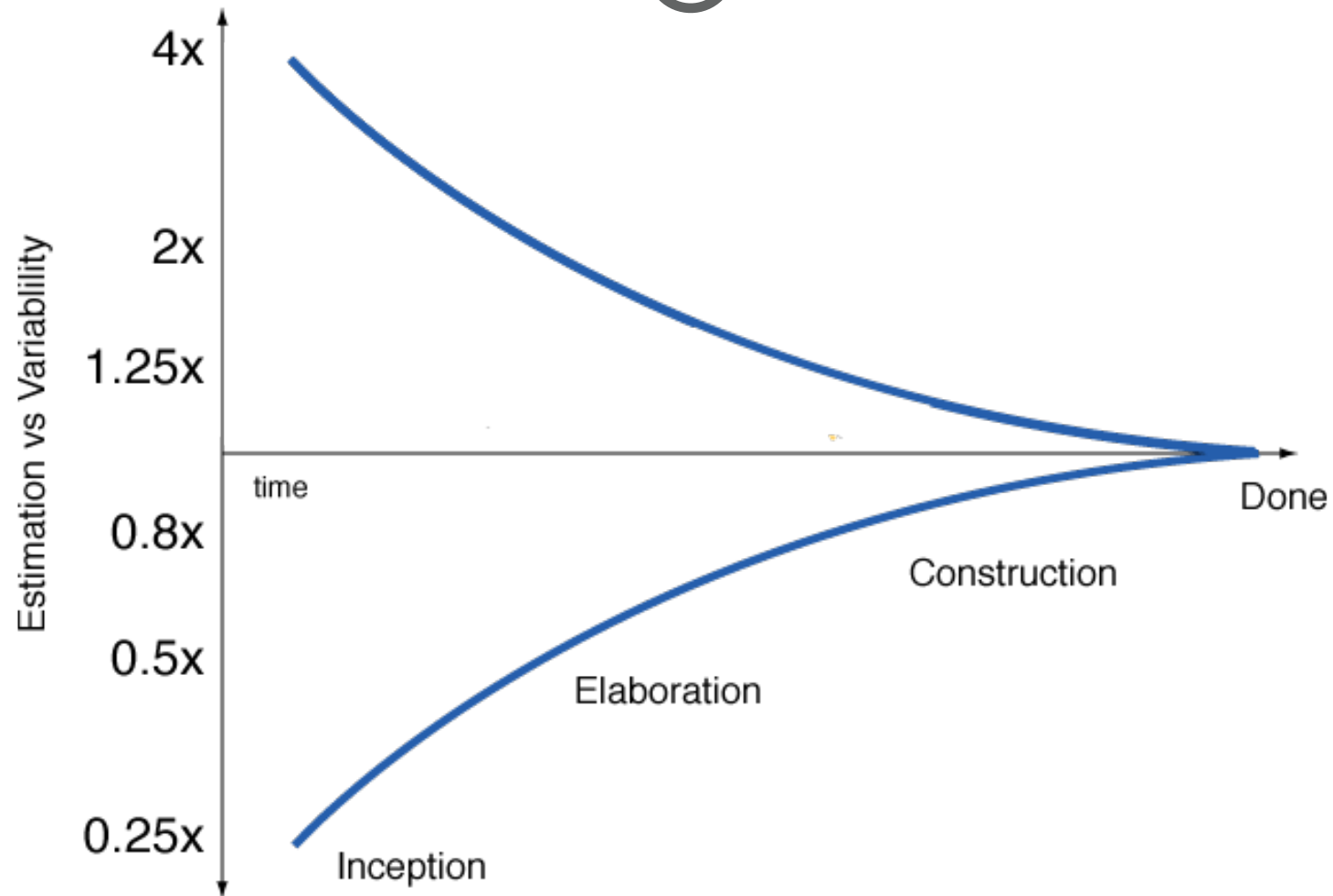
Cone of Uncertainty

Definition:

The phenomenon wherein uncertainty of influencing factors diminishes over time

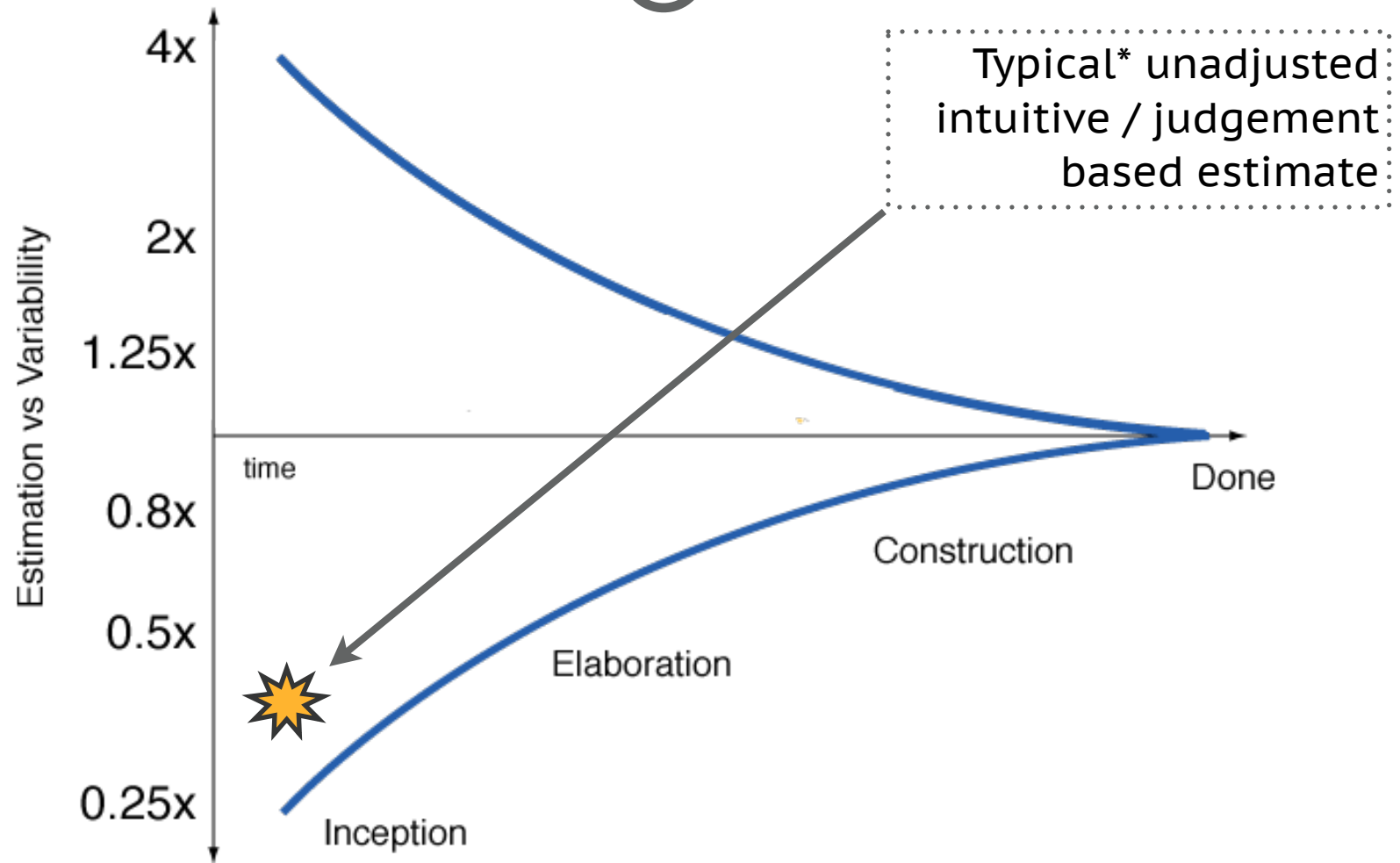


Where does 3x come from?



*based on common cognitive biases

Where does 3x come from?



*based on common cognitive biases

What's wrong with this estimate?



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Lets look at the tweets....#estimatingPreso



Issue: “Estimate”



--Inigo Montoya

“ You keep using that word.

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

”



Issues



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.





Issues



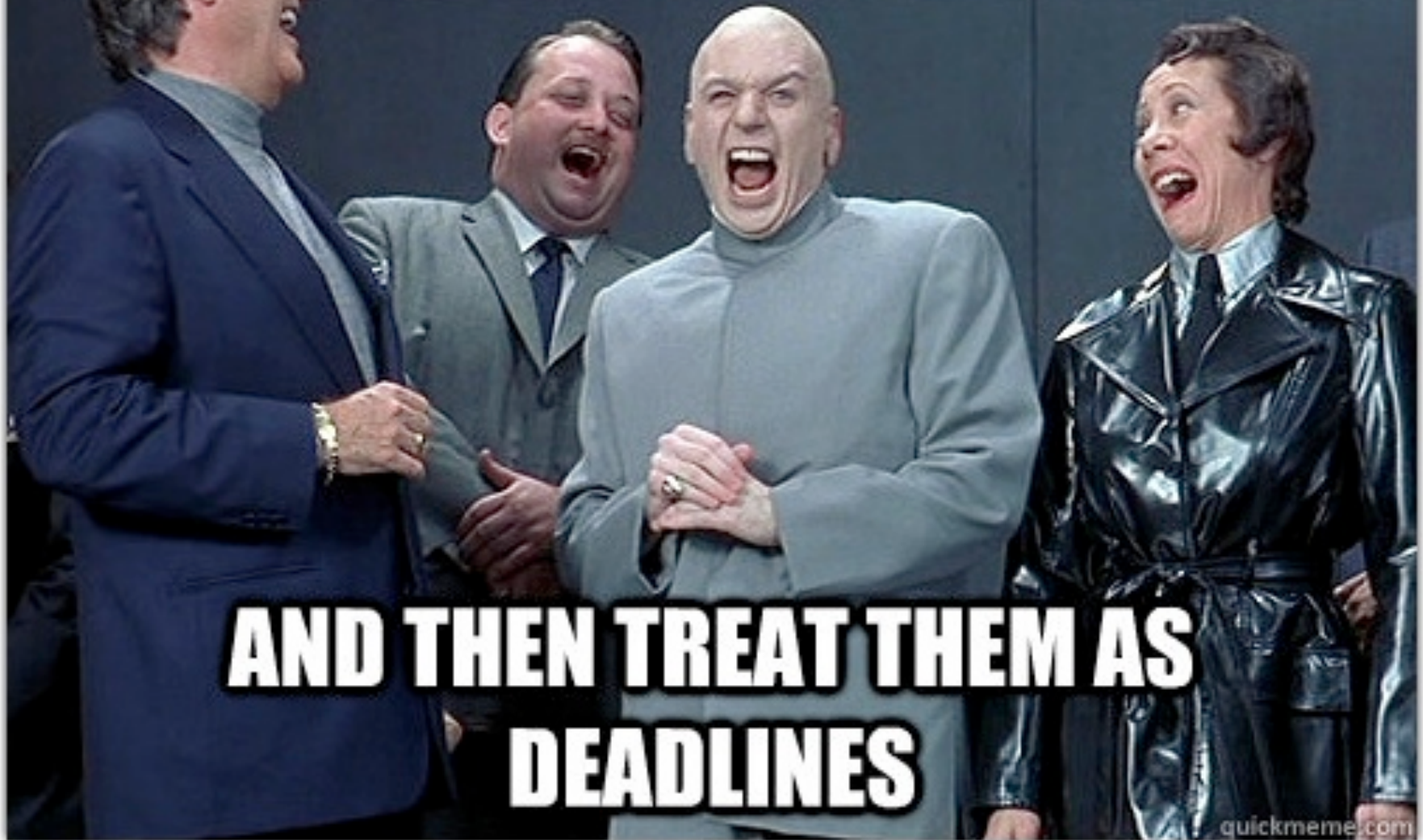
Estimate
definition
interpretations

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.

WE'LL ASK FOR ESTIMATES



**AND THEN TREAT THEM AS
DEADLINES**

quickmeme.com



Issues



Estimate
definition
interpretations

Estimate

- A preliminary calculation of the cost / duration of a project



Issues



Estimate
definition
interpretations

Estimate

- A preliminary calculation of the cost / duration of a project

Target

- A statement of a desirable business objective



Issues



Estimate
definition
interpretations

Estimate

- A preliminary calculation of the cost / duration of a project

Target

- A statement of a desirable business objective

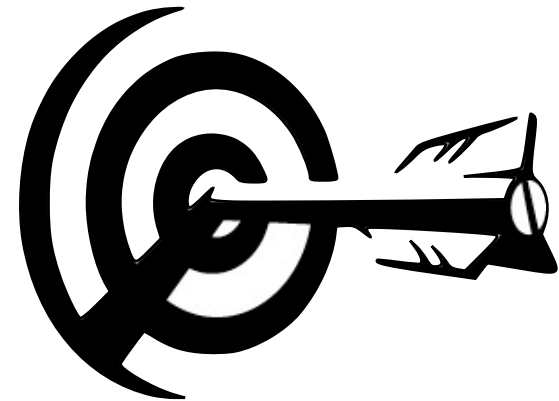
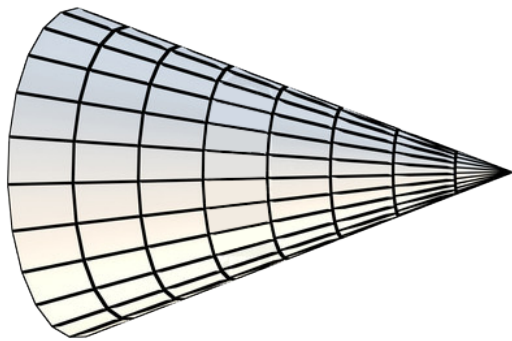
Commitment

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

Tip: Estimate or Target?

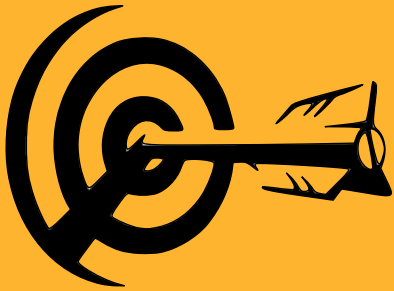
1

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



1

Tip



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?

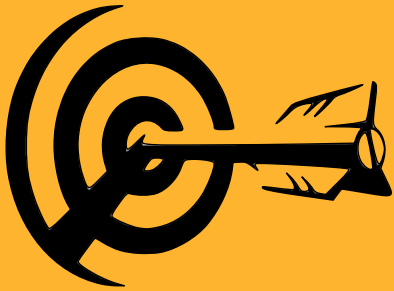
All features, or
something for tradeshow?

We **need** something for
the tradeshow.

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

1

Tip



Estimating or
hitting a target.

TRAP

1

Tip

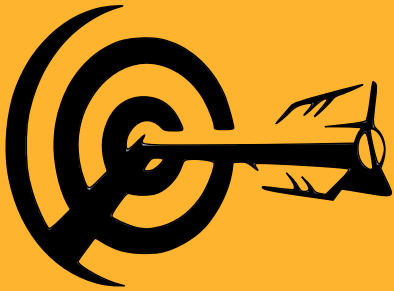


Estimating or
hitting a target.

TRAP

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

Tip



Estimating or
hitting a target.

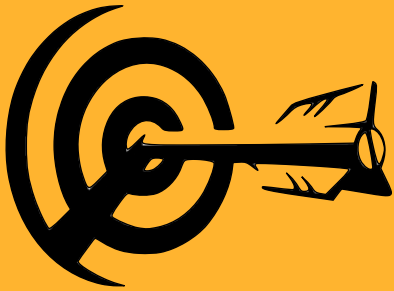
TRAP

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 are negotiable.

1

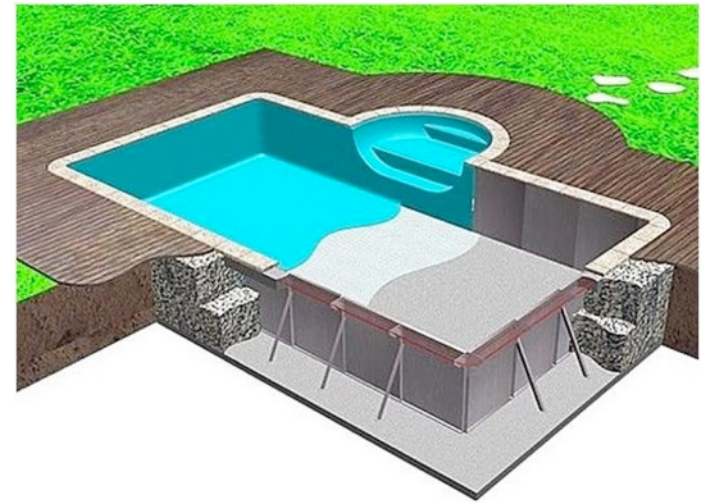
Tip



Estimating or hitting a target.

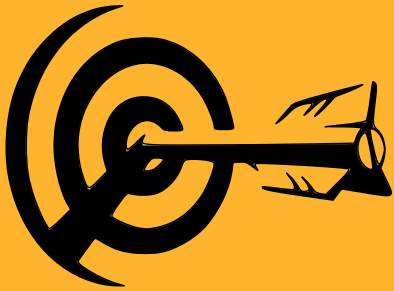
Estimates are non-negotiable, targets and commitments are negotiable.

Estimates are non-negotiable?



1

Tip

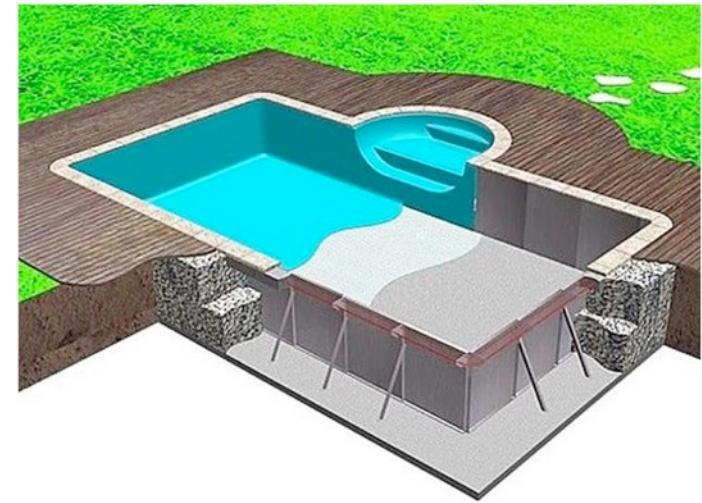


Estimating or hitting a target.

Estimates are non-negotiable, targets and commitments are negotiable.

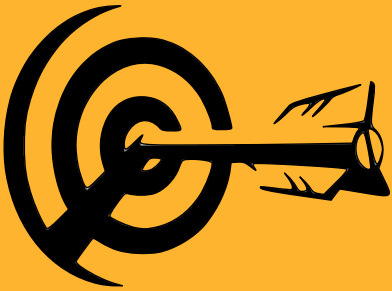
Estimates are non-negotiable?

Pool Size:



1

Tip

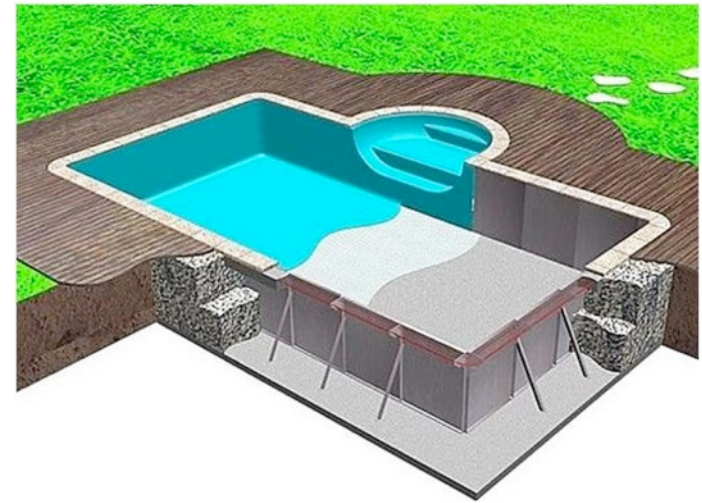


Estimating or
hitting a target.

Estimates are non-
negotiable, targets
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Estimates are non-negotiable?

Pool Size:
10'x10'x5'



1

Tip

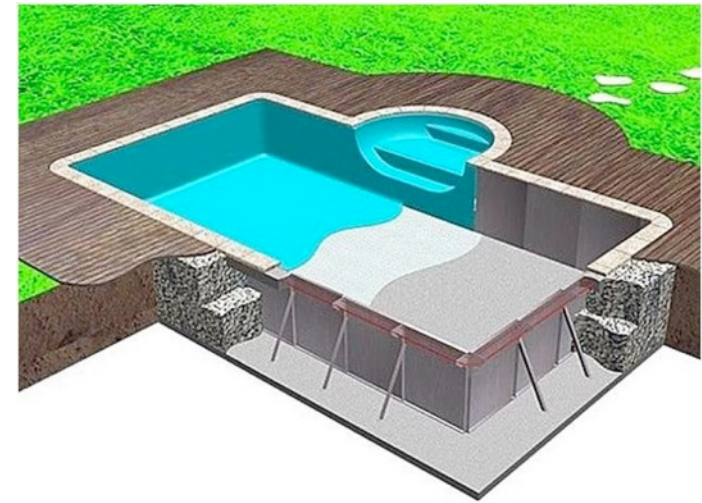


Estimating or
hitting a target.

Estimates are non-
negotiable, targets
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are negotiable.

Estimates are non-negotiable?

Pool Size:
10'x10'x5'



Cost Estimate:
~\$20K or \$40 / ft³

1

Tip



Estimating or hitting a target.

Estimates are non-negotiable, targets and commitments are negotiable.

Estimates are non-negotiable?

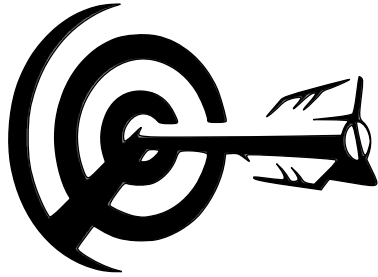
Pool Size:
10'x10'x5'



Cost Estimate:
~\$20K or \$40 / ft³

How do you lower the estimate?

Tip Summary

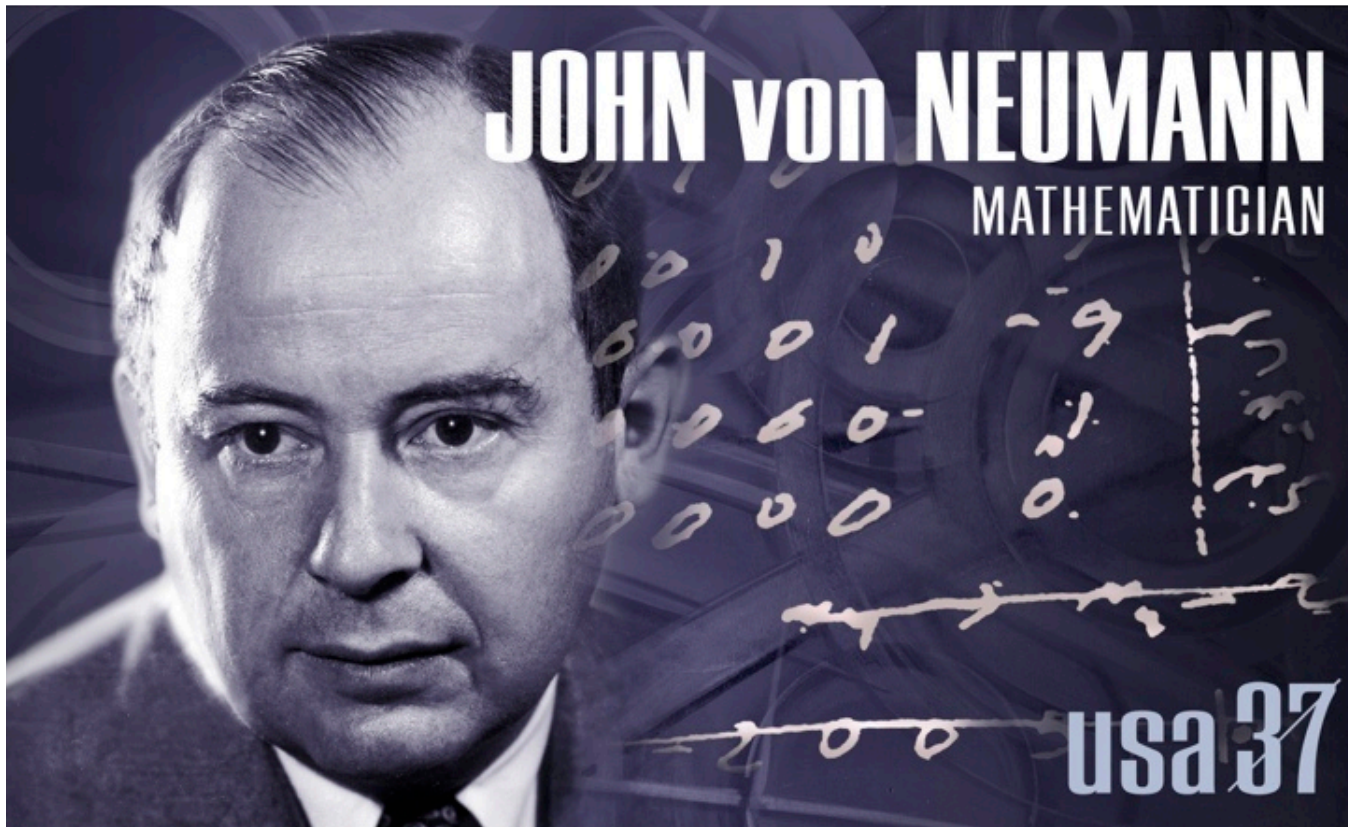


Issue: Precision

“

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

”





Issues



Estimate
definition
interpretations



Unwarranted
precision

Unwarranted Precision

2463
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with
537
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of Q&A

?!



Issues



Estimate
definition
interpretations



Unwarranted
precision

Precision vs Accuracy

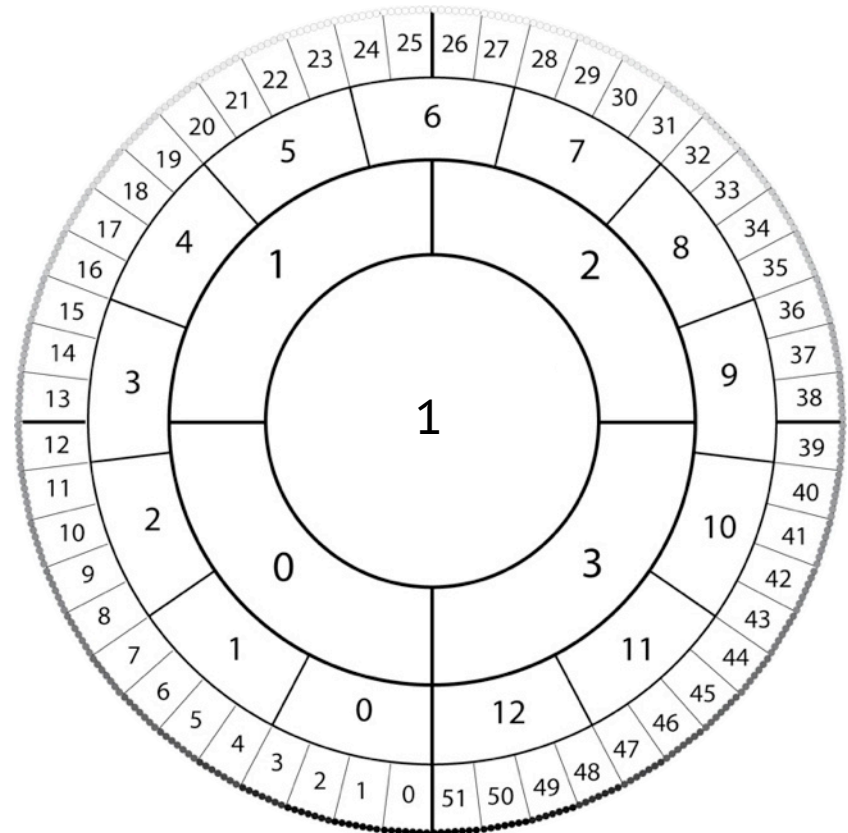
Example	Precise	Accurate
PI = 3.14159		
PI = 3		
PI = 3.37882		
Project will take 1 year		
Project will take 395.7 days +/- 2 months		
Project will require 7214 staff hours		

Tip: Coarse Units

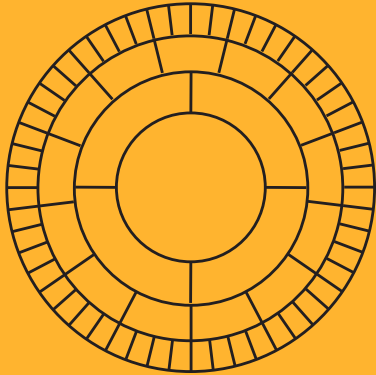
2

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

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



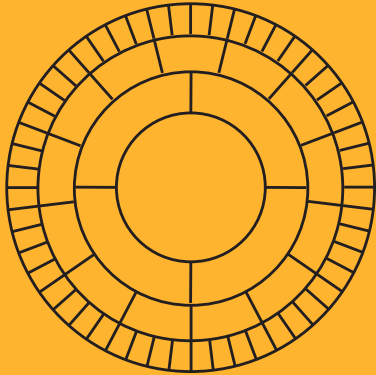
Tip



Use units in sync
with accuracy

Smallest whole unit

Tip

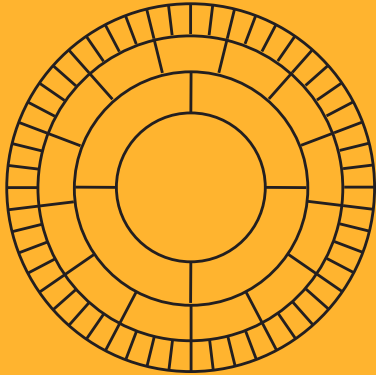


Use units in sync
with accuracy

Smallest whole unit

> 5 hours == 1 Day

Tip



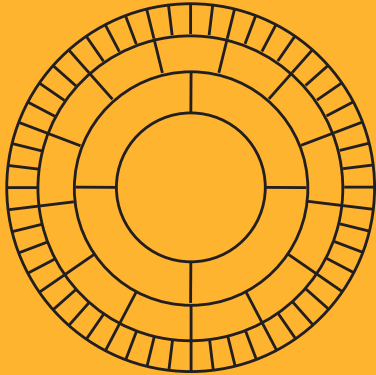
Use units in sync
with accuracy

Smallest whole unit

> 5 hours == 1 Day

> 4 days == 1 Week

Tip



Use units in sync
with accuracy

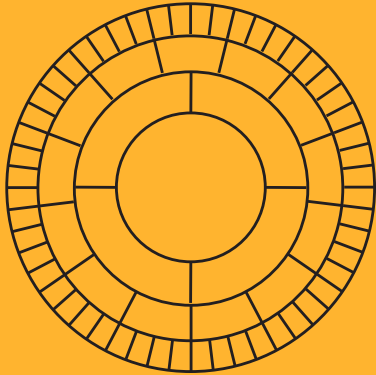
Smallest whole unit

> 5 hours == 1 Day

> 4 days == 1 Week

> 3 weeks == 1 Month

Tip



Use units in sync
with accuracy

Smallest whole unit

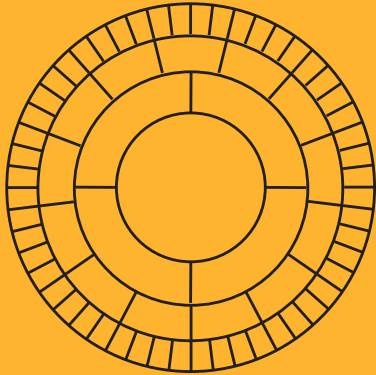
> 5 hours == 1 Day

> 4 days == 1 Week

> 3 weeks == 1 Month

> 2 months == 1 Quarter

Tip



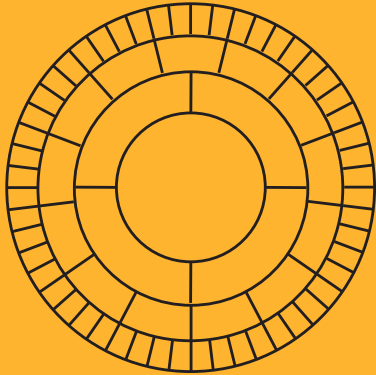
Use units in sync
with accuracy

Smallest whole unit

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

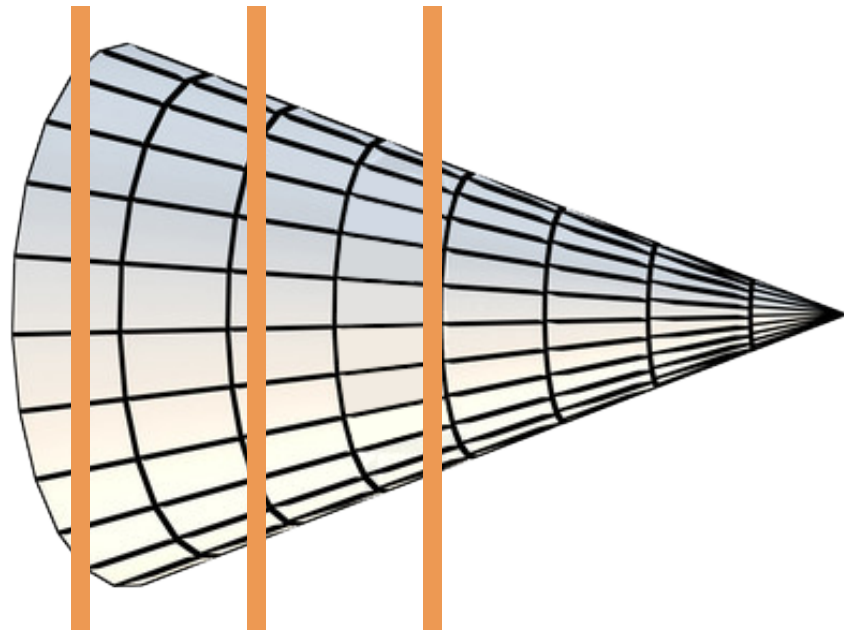
2

Tip

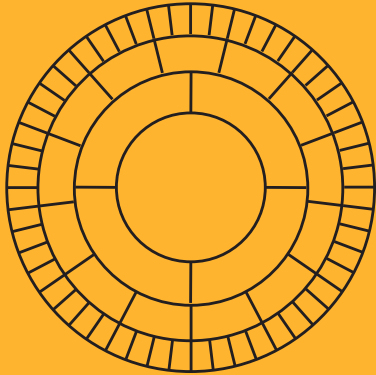


Use units in sync
with accuracy

TRAP



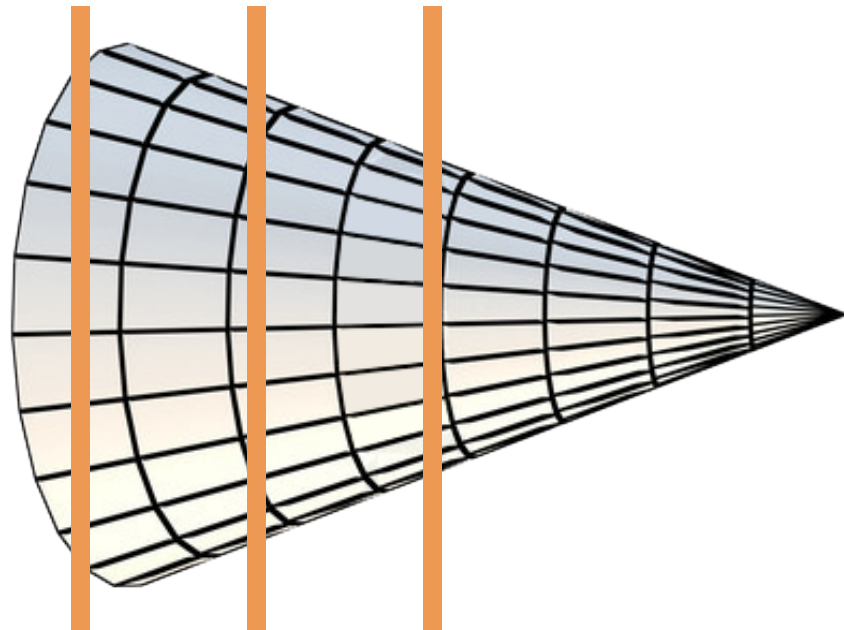
Tip



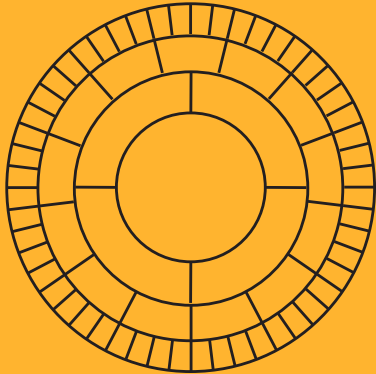
Use units in sync
with accuracy

TRAP

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



Tip



Use units in sync
with accuracy

What it looks like:

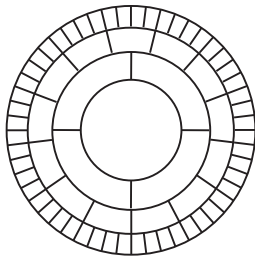
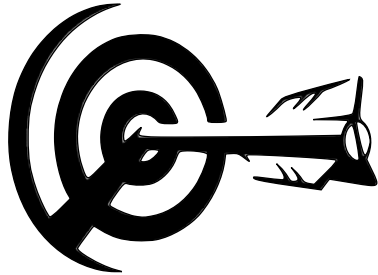
“

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.

”

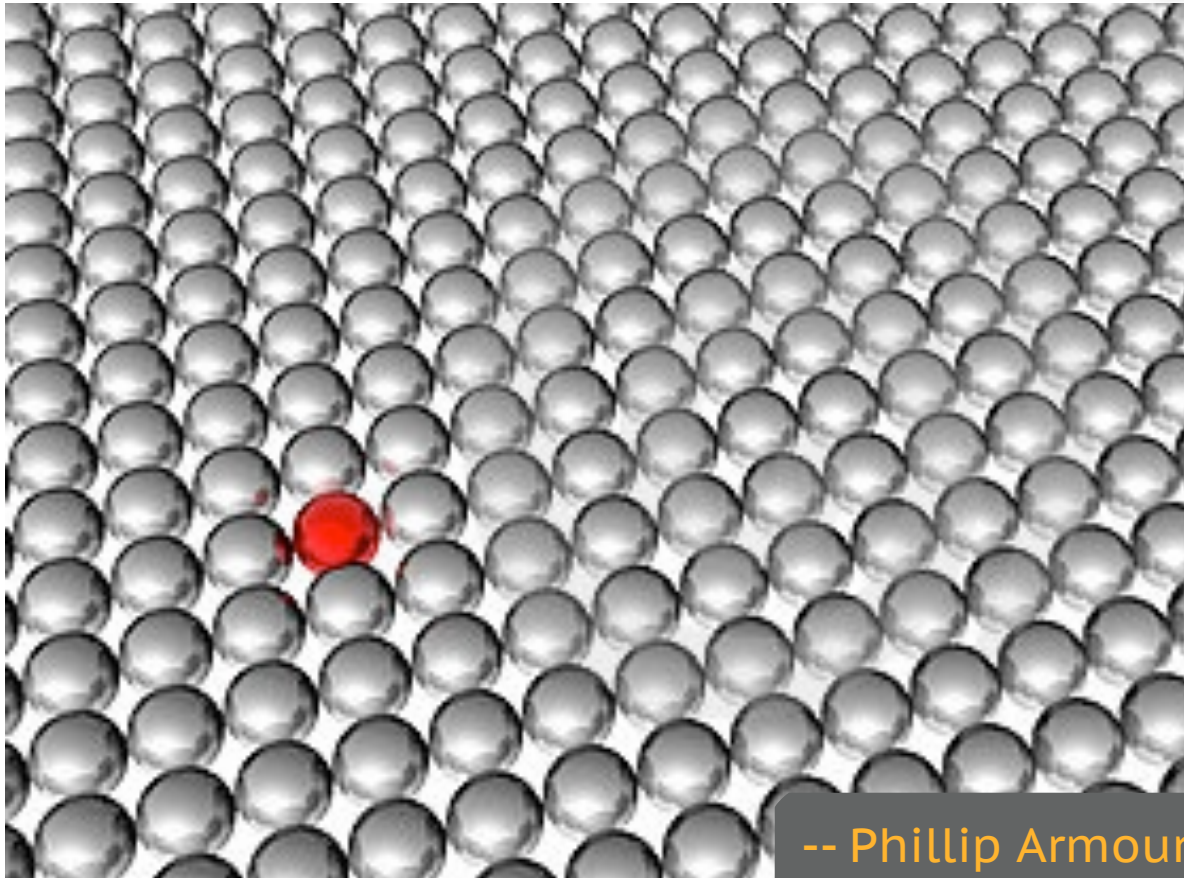
Tip Summary



Issue: Distribution



The process is called estimation, not exactimation



-- Phillip Armour



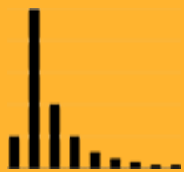
Issues



Estimate
definition
interpretations

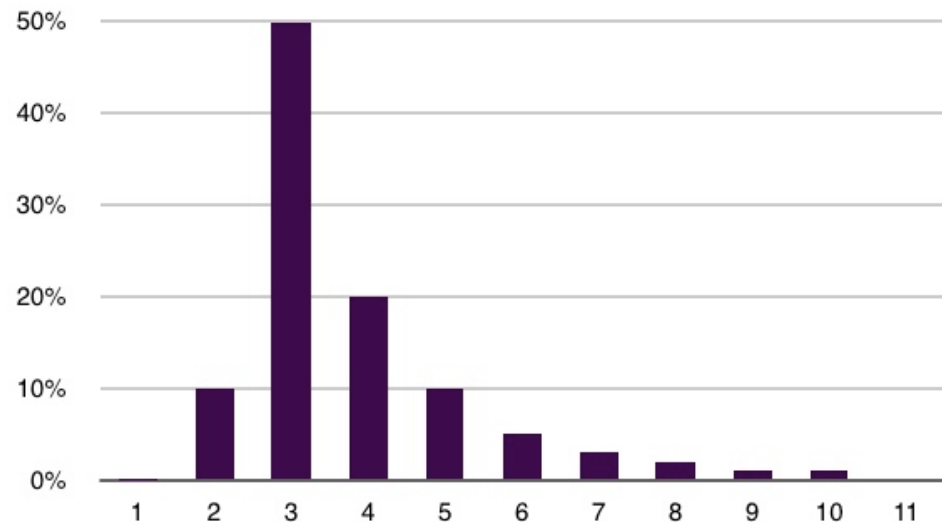


Unwarranted
precision



Probability
distribution
not
represented

Estimates are probability statements





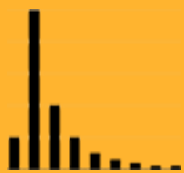
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Estimate
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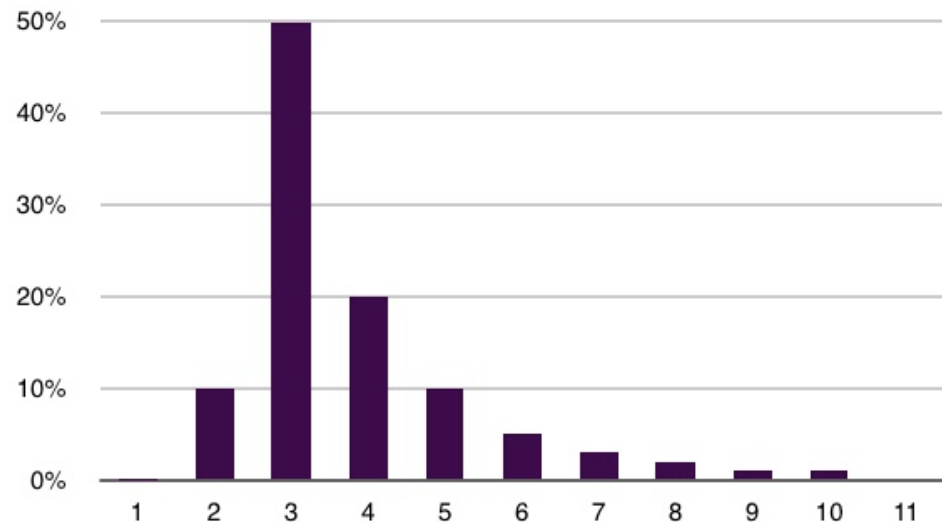
Unwarranted
precision



Probability
distribution
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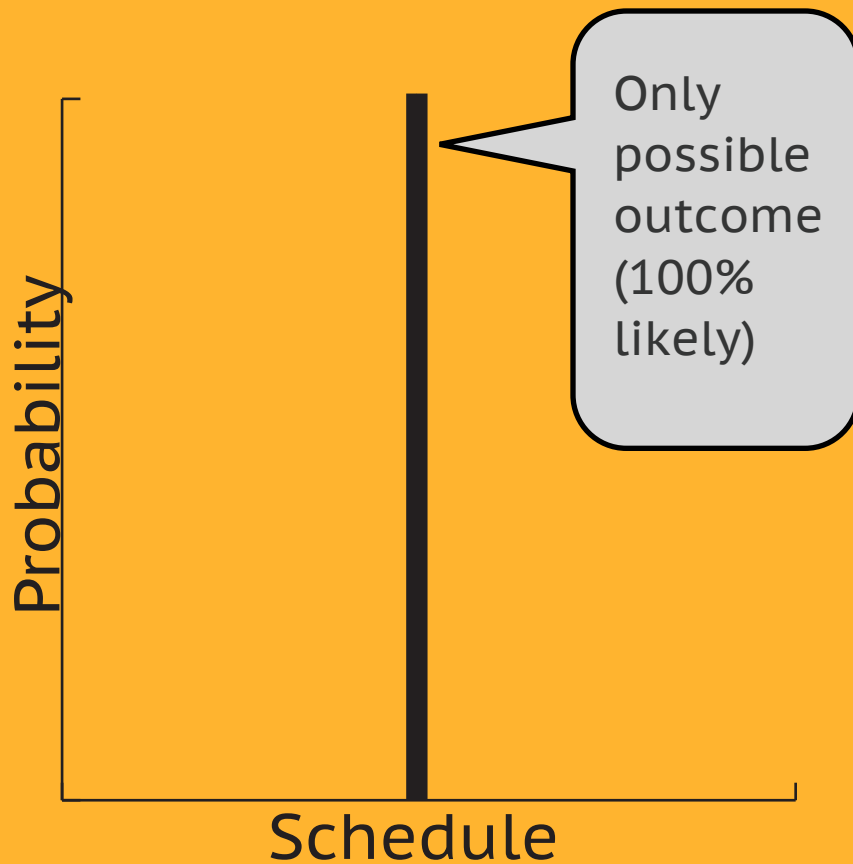
Estimates are probability statements

Does your estimate represent the
probability distribution?

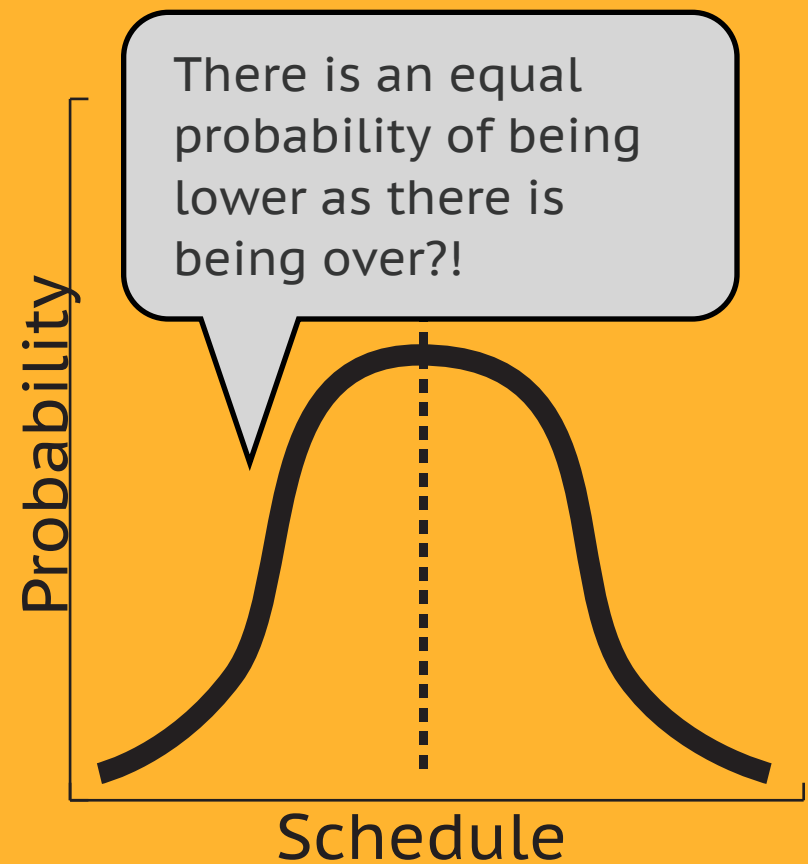


Unrealistic expectations

Single point estimate



Normal Bell curve



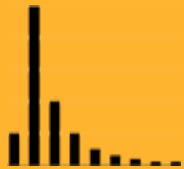
Issues



Estimate
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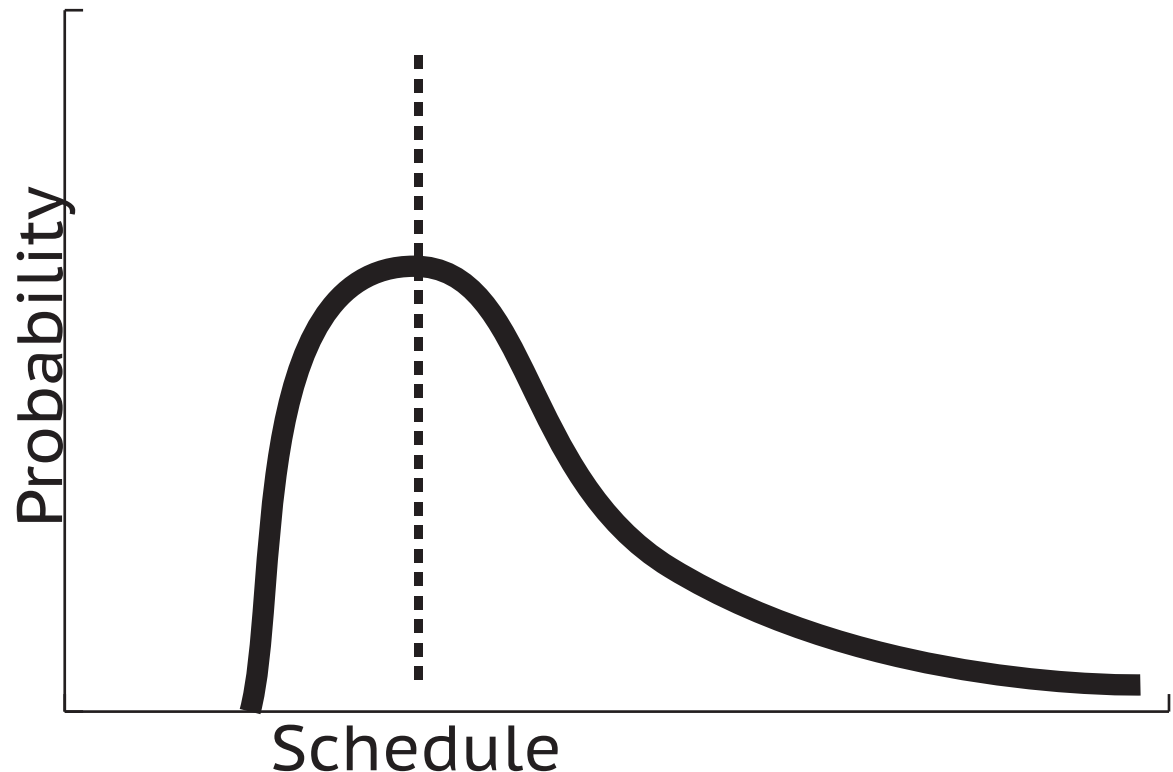


Unwarranted
precision



Probability
distribution
not
represented

Limited positive outcome; unbounded negative outcome



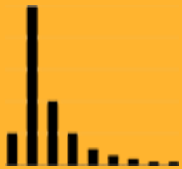
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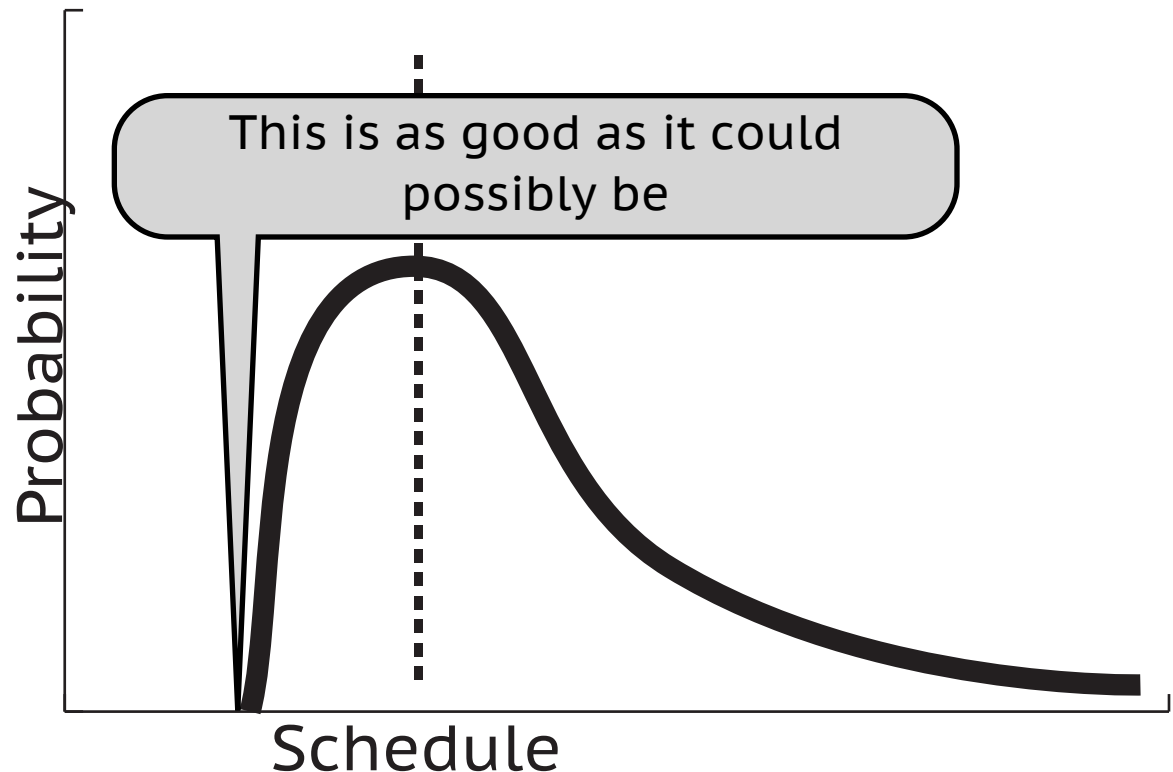


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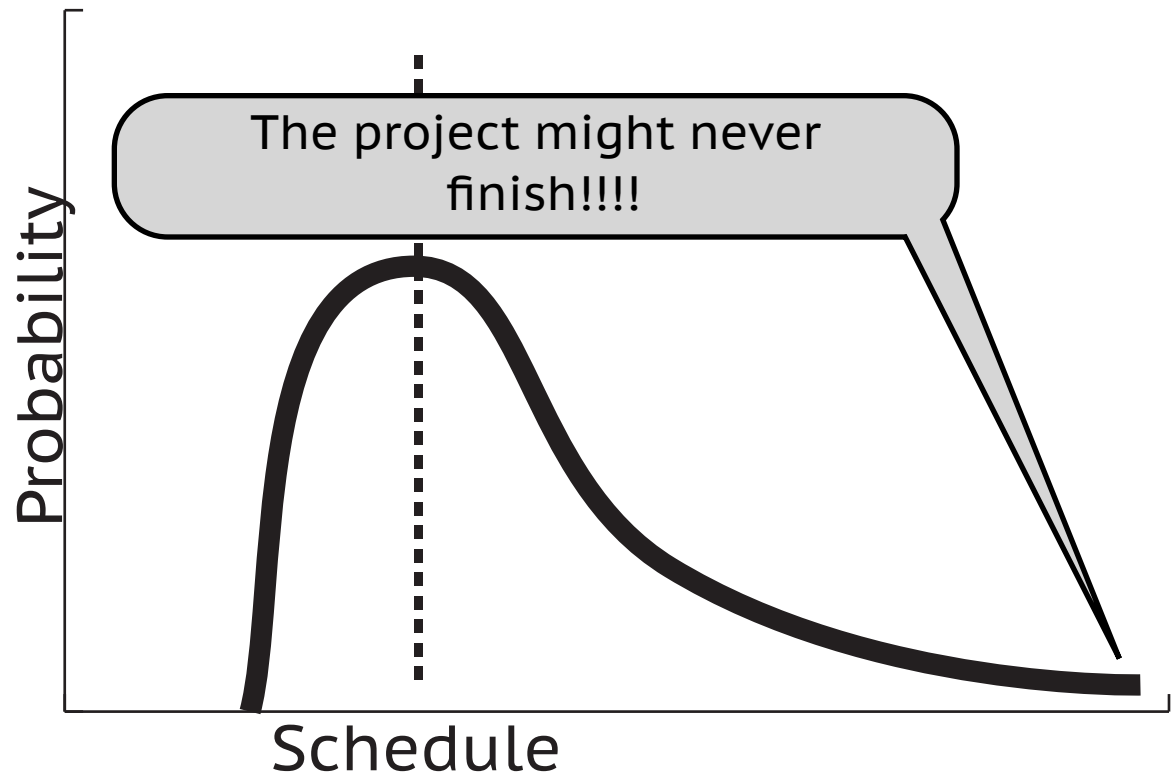


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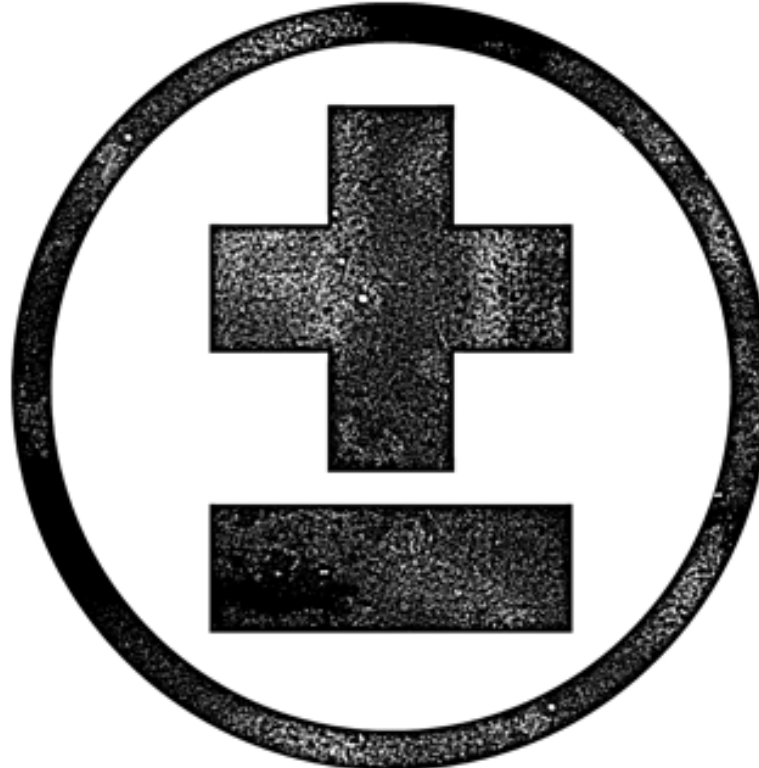


Tip: Explicit Uncertainty

3

Present the estimate with explicit uncertainty

- 6 months +5 months -1 month



Tip: Explicit Uncertainty

3

Present the estimate with explicit uncertainty

- 6 months +5 months -1 month

Tip: Explicit Uncertainty

3

Present the estimate with explicit uncertainty

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

Tip: Explicit Uncertainty

3

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

Tip



Explicitly express
uncertainty

TRAP



Tip



Explicitly express
uncertainty

TRAP

Beware of your intuitive
confidence in your numbers





Tip



Explicitly express
uncertainty

The trap looks like:

“

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

”



I'm 90% sure that I should
be able to finish this within
a week.

How Good an Estimator are you?

3



How Good an Estimator are you?

3

Area of the
Asian continent?



How Good an Estimator are you?

3

Area of the
Asian continent?

17,139,000 sq miles



How Good an Estimator are you?

3

Testing an intuitive
estimation ability...

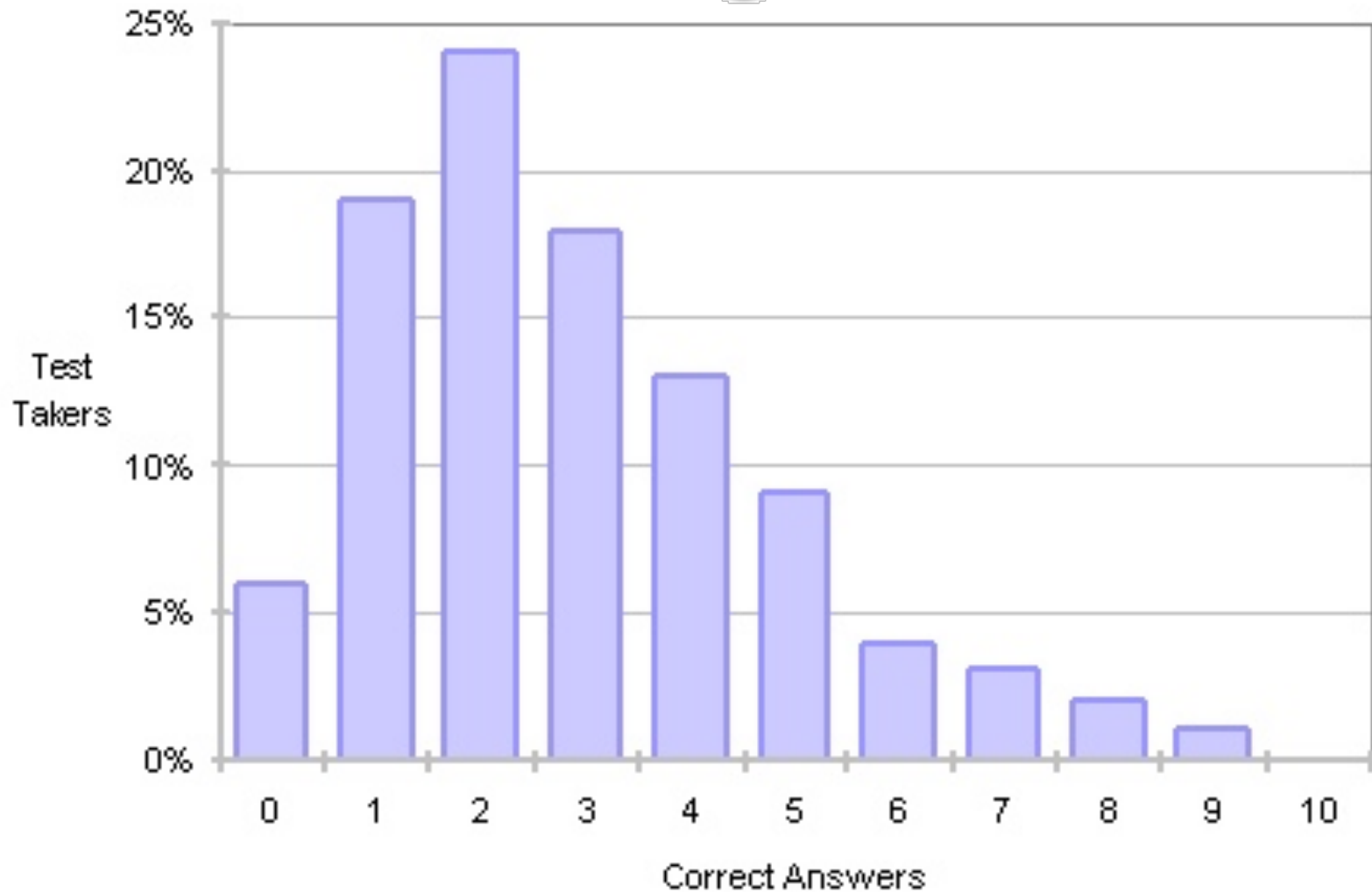
How Good an Estimator are you?

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

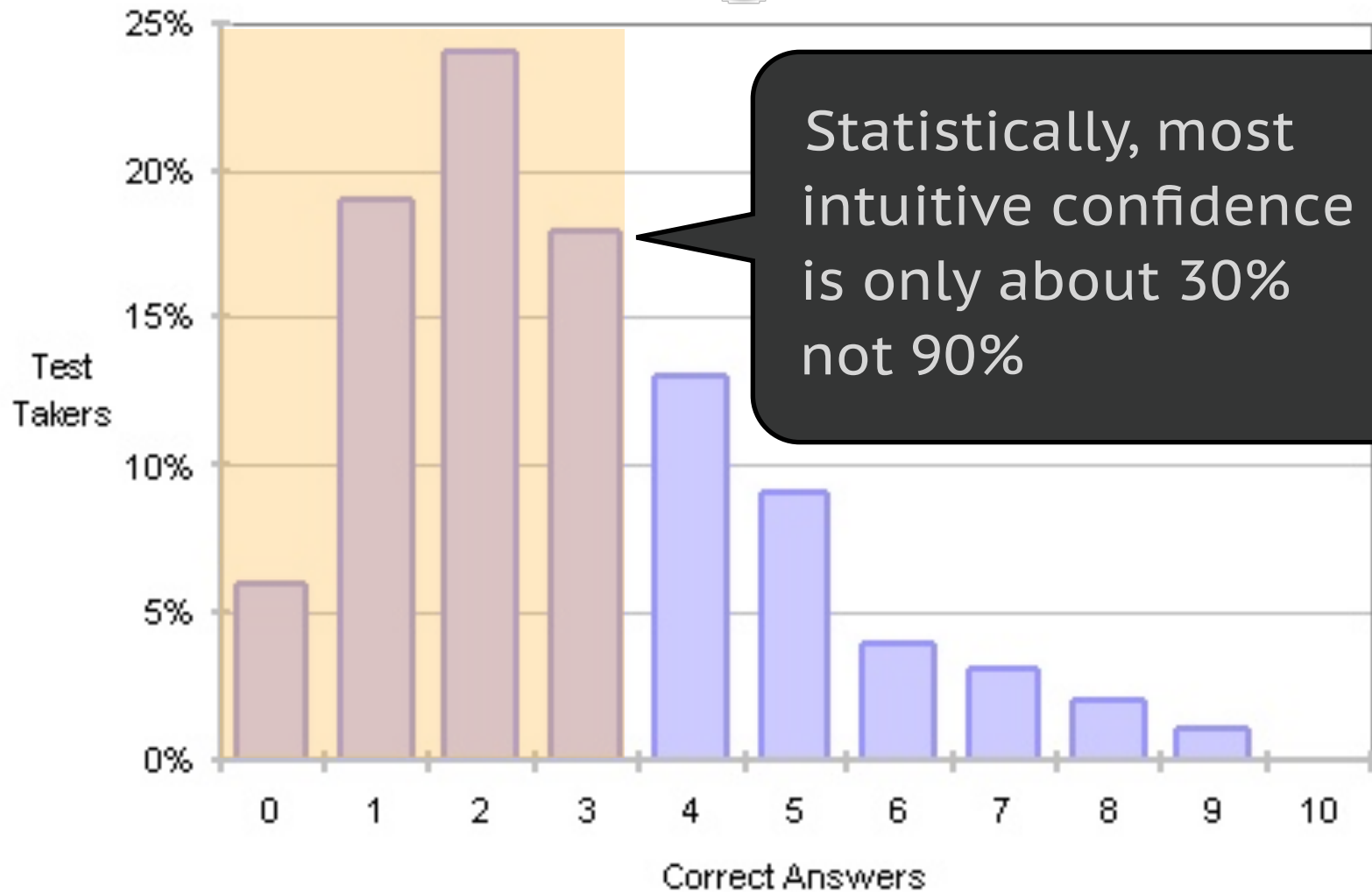
How Good an Estimator are you?

3



How Good an Estimator are you?

3



Tip



Explicitly express uncertainty

TRAP

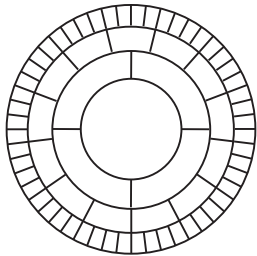
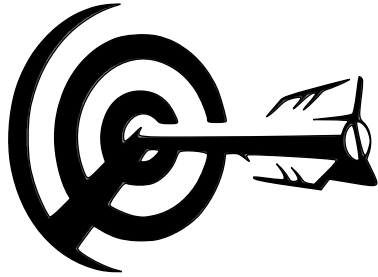
Beware of your intuition, unless empirical evidence supports otherwise

“

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

”

Tip Summary



Tip



Explicitly express uncertainty

TRAP

Beware of your intuition, unless empirical evidence supports otherwise

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

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What is the best way to get better estimates?

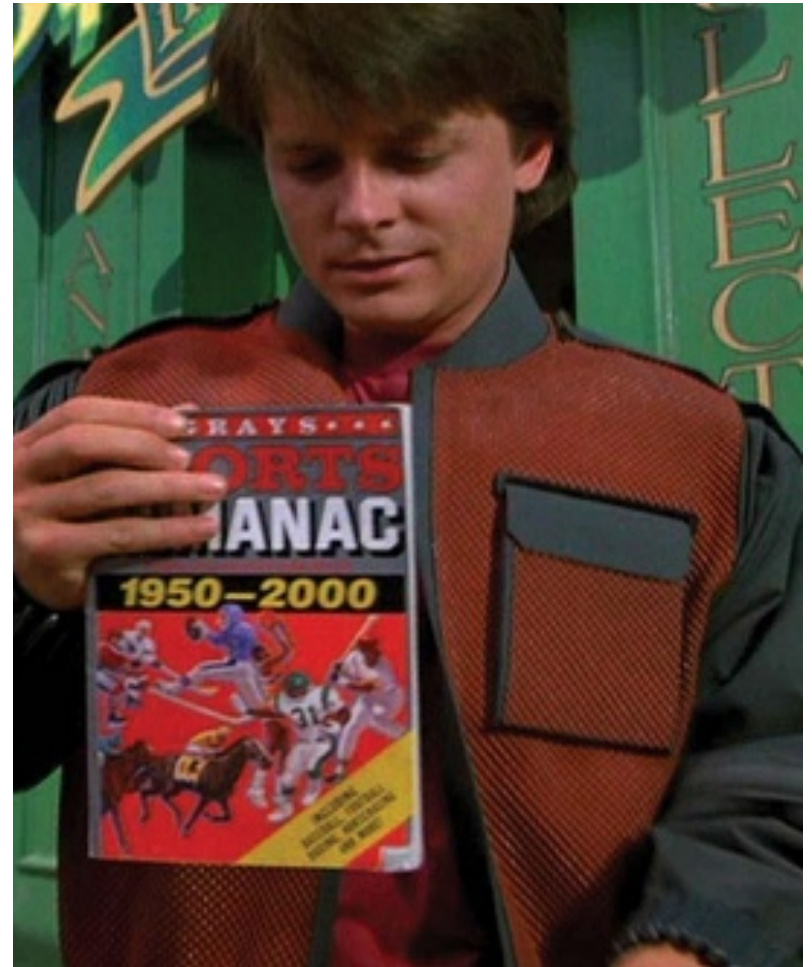


What is the best way to get
better estimates?

HISTORICAL DATA

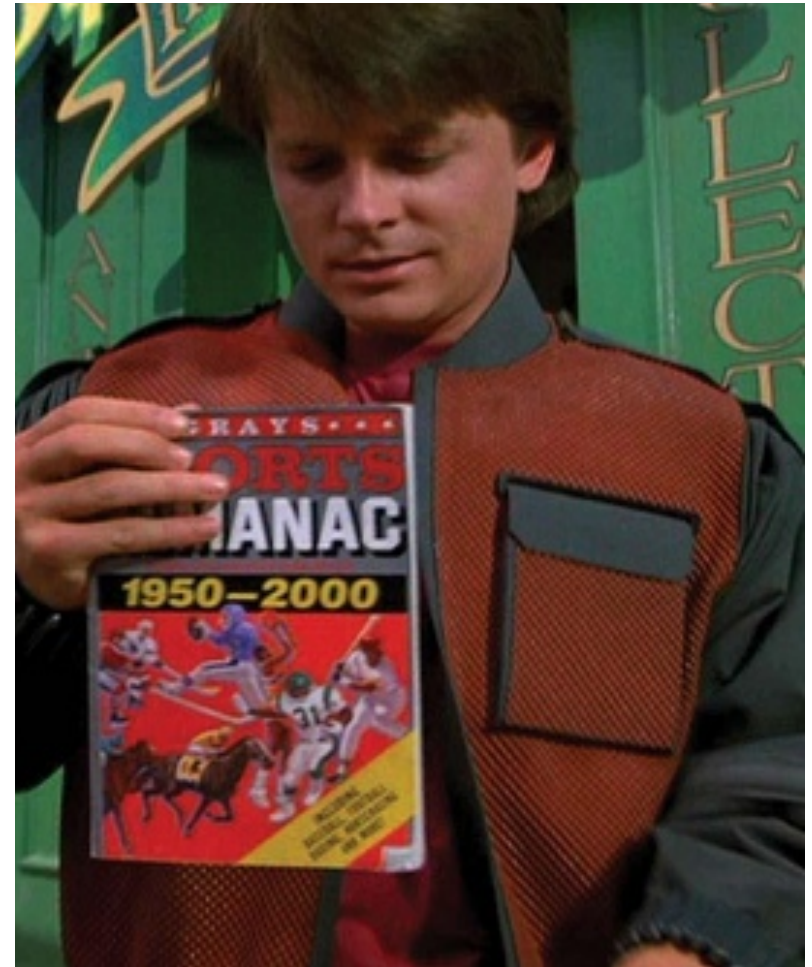


Historical Data



Historical Data

- Already accounts for organizational influences



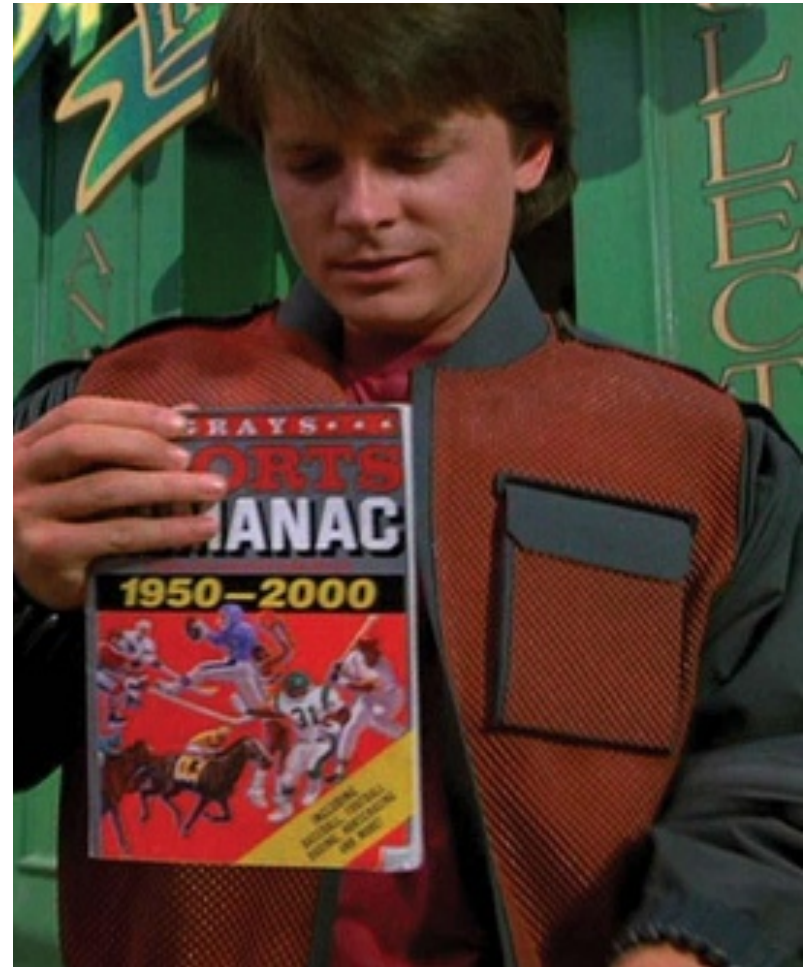
Historical Data

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



Historical Data

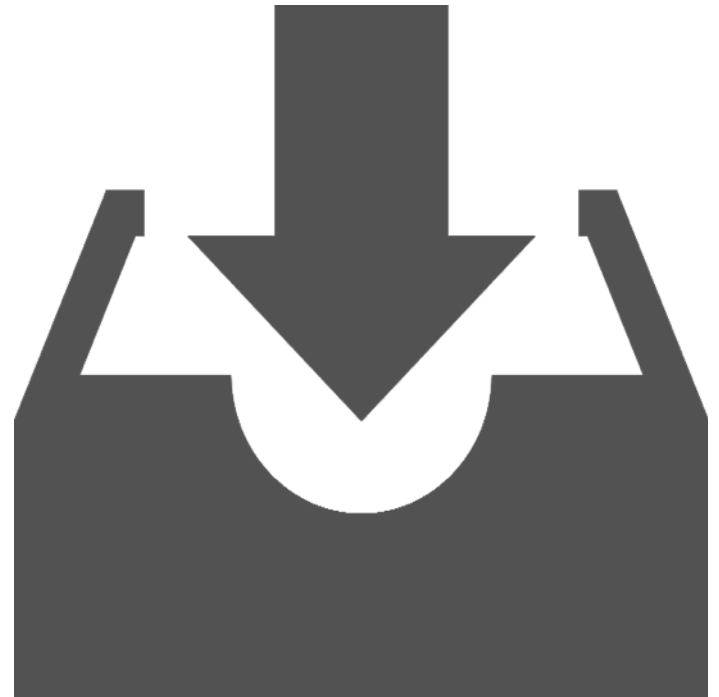
- Already accounts for organizational influences
- Avoids subjectivity and unfounded optimism
- Reduces estimation politics



Tip: Collect Historical Data

4

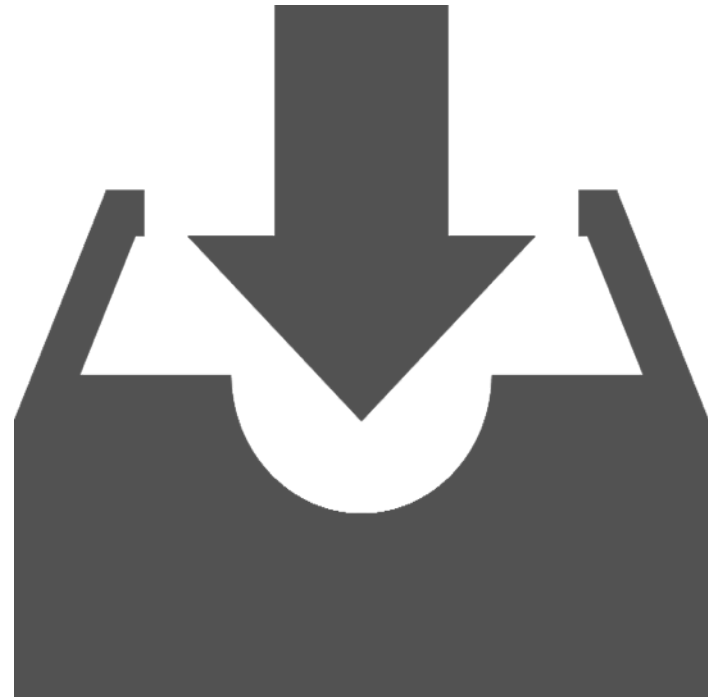
- Size (Lines of Code / or something countable)
- Effort (staff months)
- Time (calendar months)
- Defects (classified by severity)



Tip: Collect Historical Data

4

- Size (Lines of Code / or something countable)
- Effort (staff months)
- Time (calendar months)
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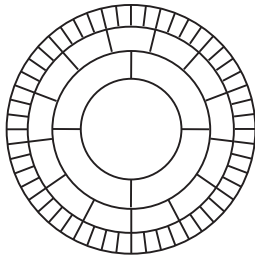
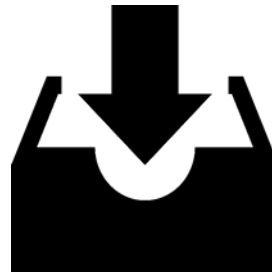
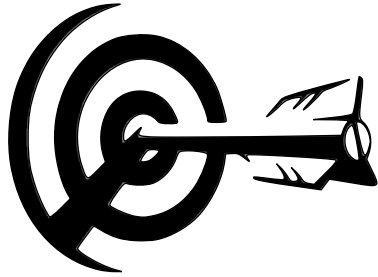
Collect Historical Data



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?



COUNT

OR

COMPUTE

Tip: Count & Compute

5

- 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

5

Counted:

Ticketing has 167 tickets = 167 people



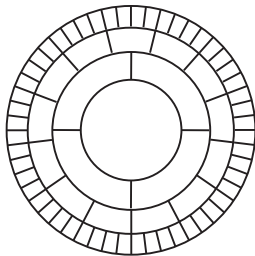
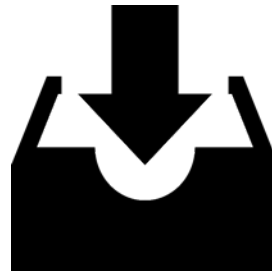
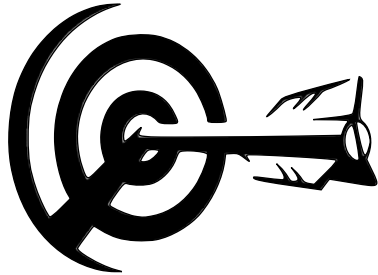
Computed:

20 x 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

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It is the way that
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- Optimism Bias



Best Case - Done

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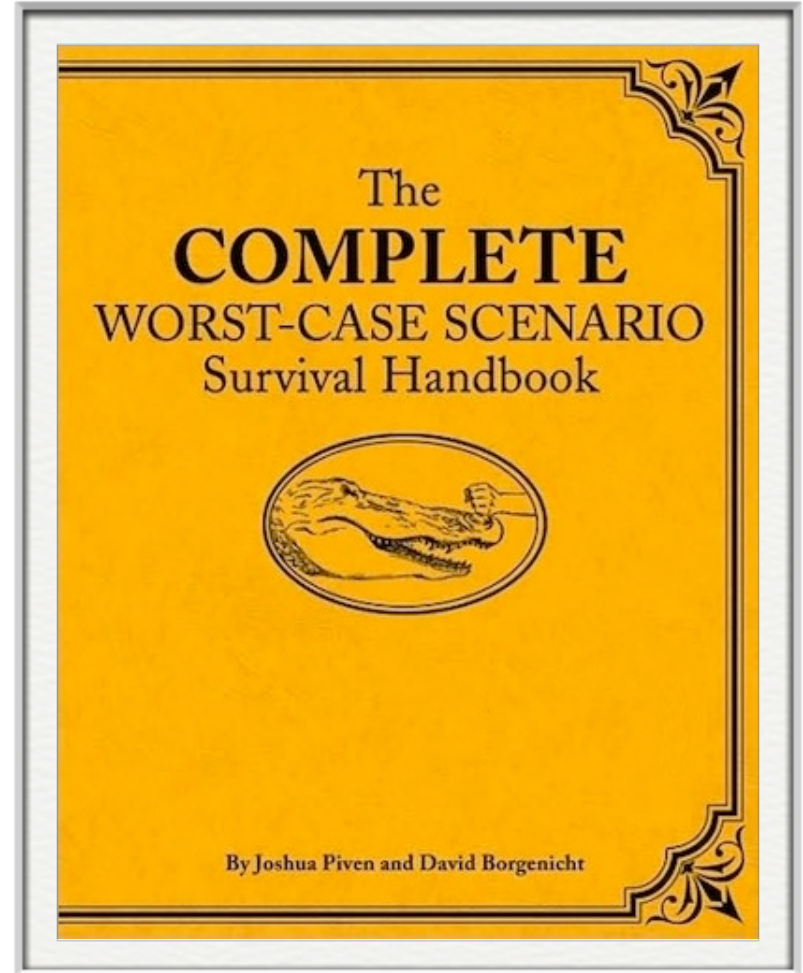
It is the way that
the human brain
is wired.

- Optimism Bias
- Planning Fallacy



Getting to the Worst Case

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



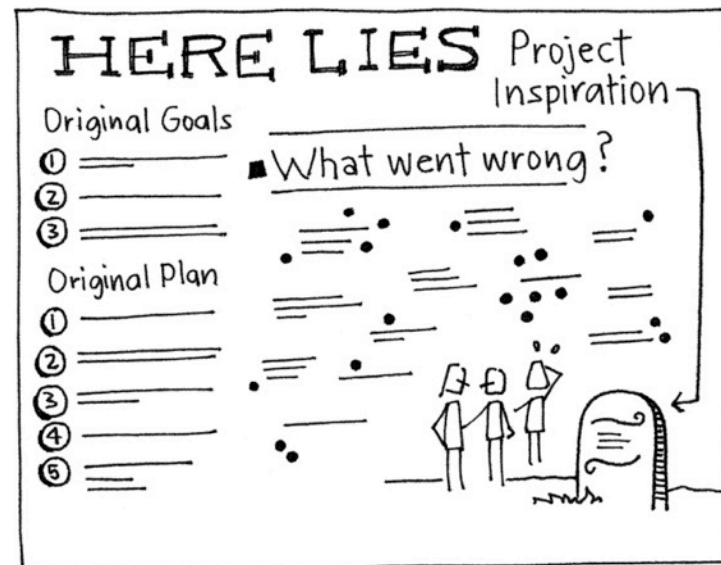
Getting to Worst Case

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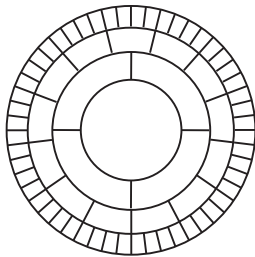
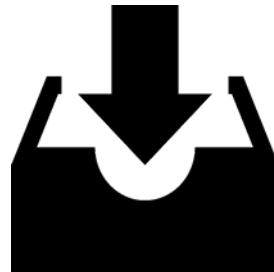
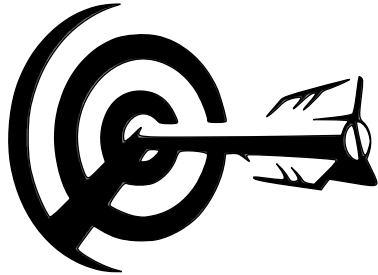


TIP: Pre-mortem

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



Tip Summary



Getting to Worst Case

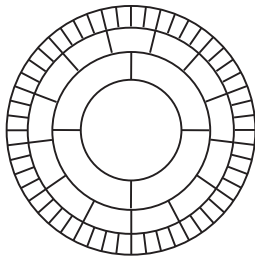
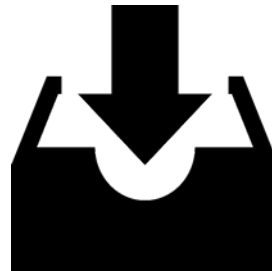
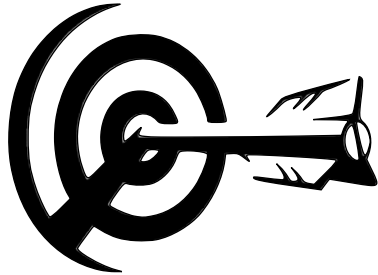
1. Pre-Mortem
2. Someone else doing the work
3. Common omitted activities

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



Getting to Worst Case

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

Commonly Omitted: Requirements

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



Getting to Worst Case

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

Commonly Omitted: Development

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



Getting to Worst Case

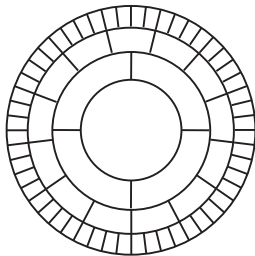
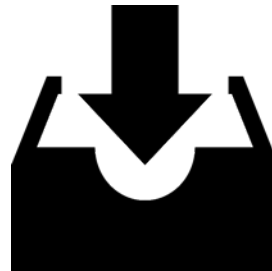
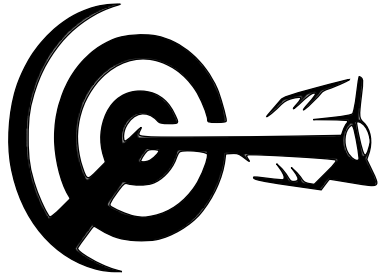
1. Pre-Mortem
2. Someone else doing the work
3. Commonly omitted activities

Commonly Omitted: Non-development

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



Tip Summary



The Try Trap

“



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?

”

The Try Trap

9



--Yoda

“ NO!

Try not!

DO or DO
NOT, There
is no try.

”



The Try Trap

The promise
to try
means...





The Try Trap

The promise
to try
means...



- Admission that you've been holding back



The Try Trap

The promise
to try
means...



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



The Try Trap

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



The Try Trap

The promise
to try
means...



- 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



The Try Trap

You are
LYING

if you trust your
estimate and





The Try Trap

You are
LYING

if you trust your
estimate and



- There is no reserve of effort available



The Try Trap

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



The Try Trap

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.



The Try Trap

Resolution:

**Have the courage to
say no.**



The Try Trap

Resolution:

**Have the courage to
say no.**





The Try Trap

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?

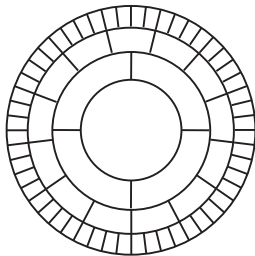
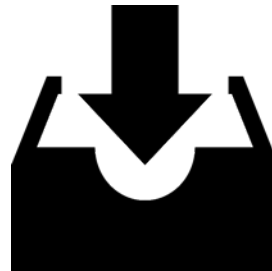
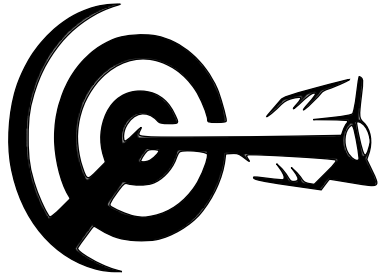
No, Mike. I can work on it for a day and provide a revised estimate, if that helps.

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

Then you can decide if it is still worthwhile persuing.



Tip Summary



Software Estimate: Redefined



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

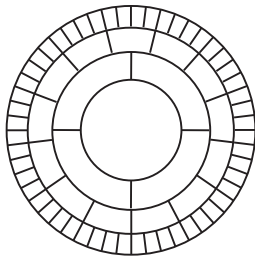
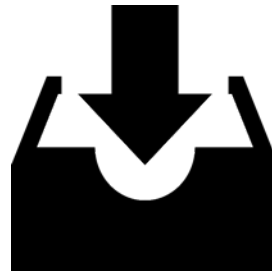
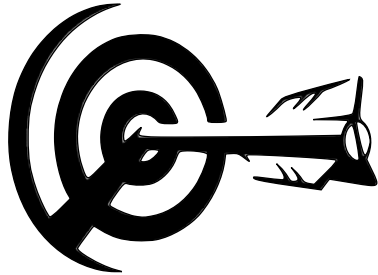
the purpose is to determine whether the targets are realistic enough to control the project to meet them.

Good Estimate

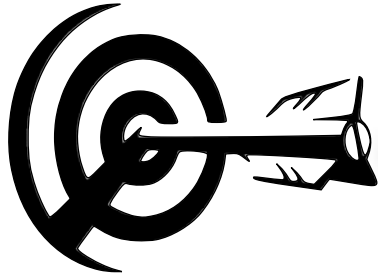


A good estimate provides a clear enough view of the project reality to allow the leadership to make good decisions about controlling the project to hit its targets

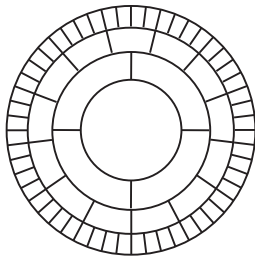
Tip Summary



Tip Summary



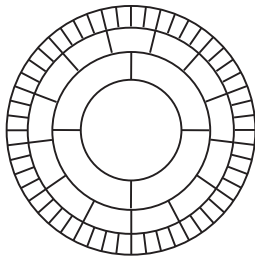
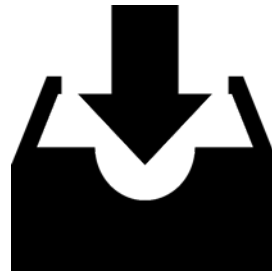
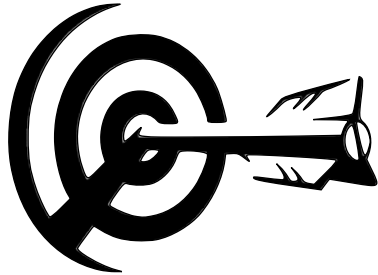
Are you estimating
or hitting a target?



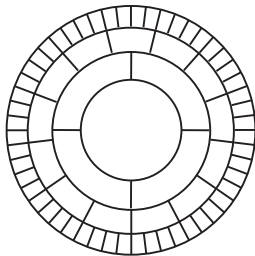
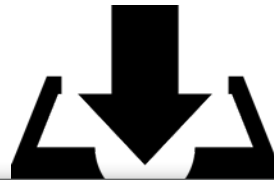
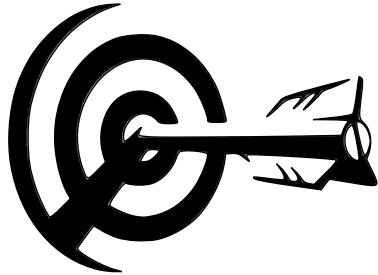
PRE



Tip Summary

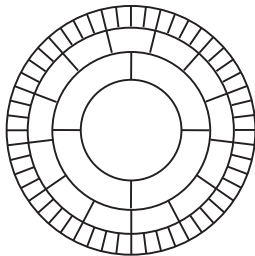
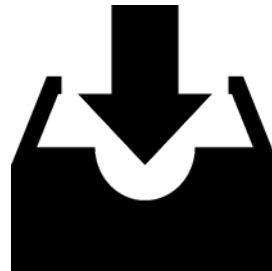
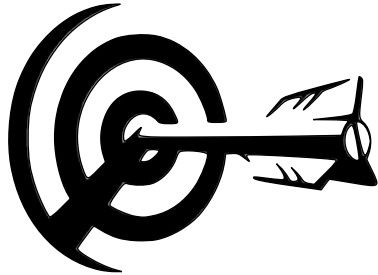


Tip Summary

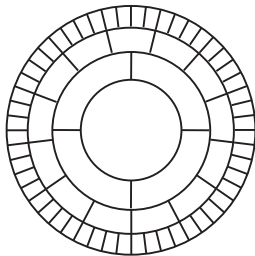
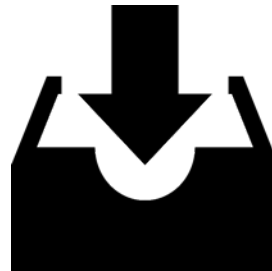
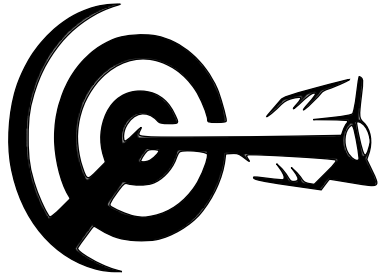


Use units
consistent with
the uncertainty

Tip Summary

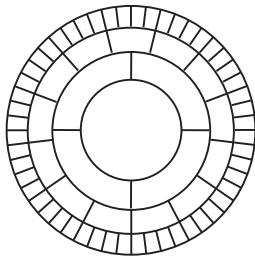
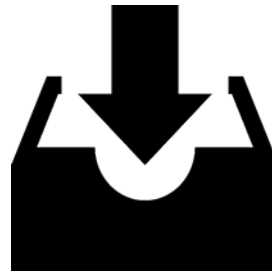
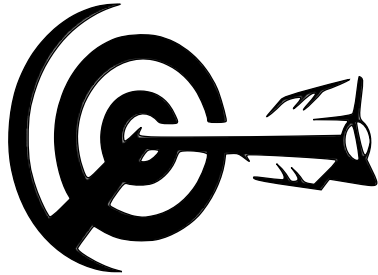


Tip Summary

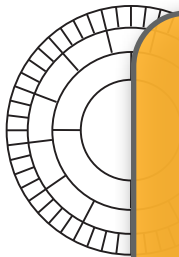
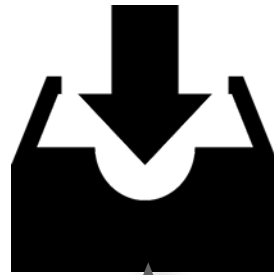
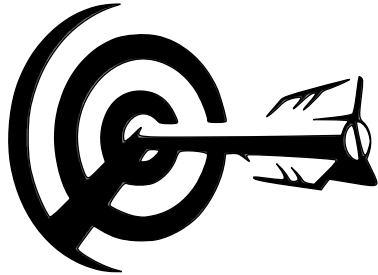


Express the
uncertainty
explicitly

Tip Summary



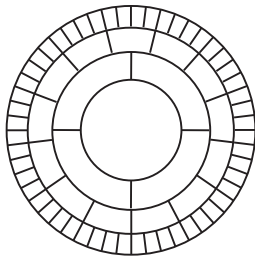
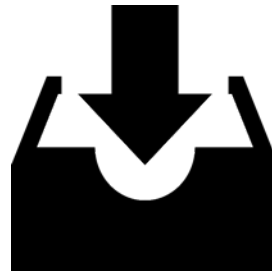
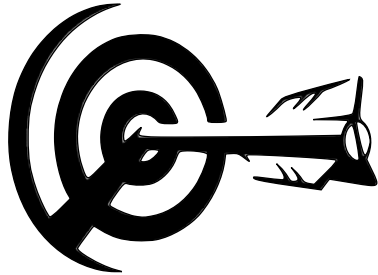
Tip Summary



Collect historical data

NOW!

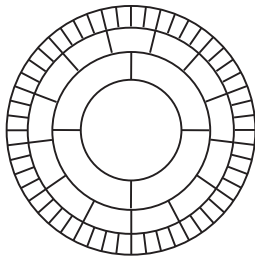
Tip Summary



Tip Summary



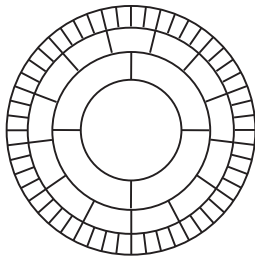
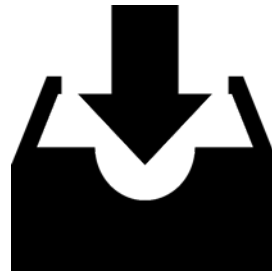
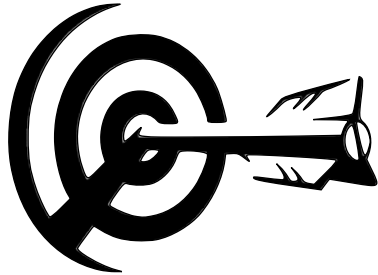
Count when you can,



Compute when you
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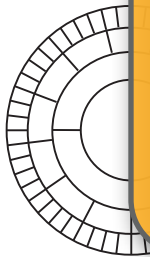


Tip Summary



Tip Summary

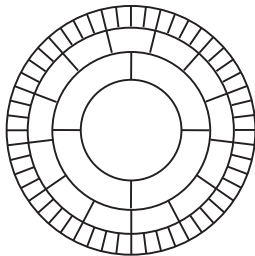
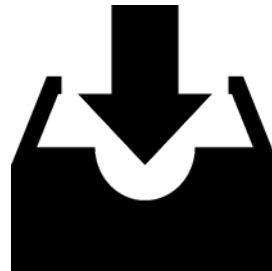
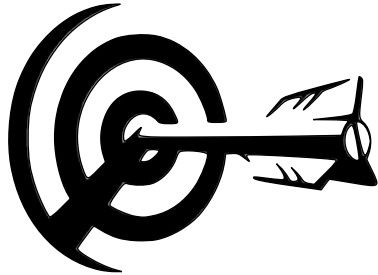
Worst case:
Pre-mortem



PRE



Tip Summary

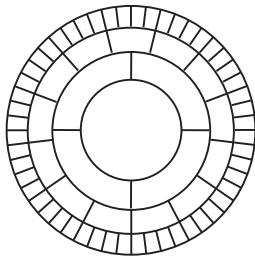
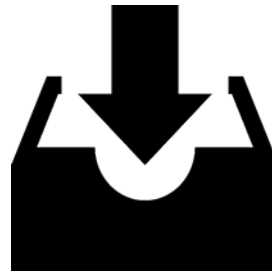
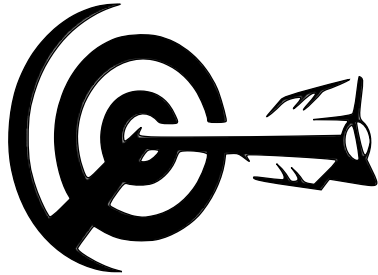


Tip Summary

Worst case:
Someone else doing
the work



Tip Summary



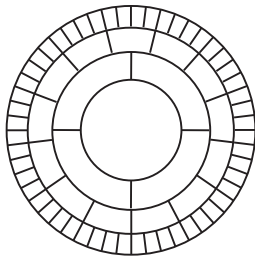
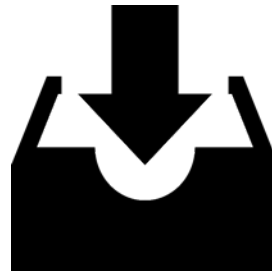
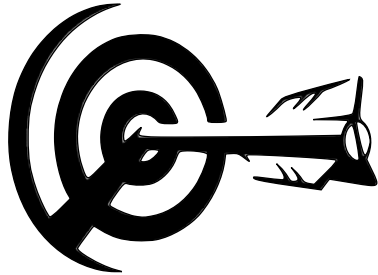
Tip Summary



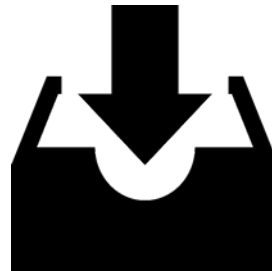
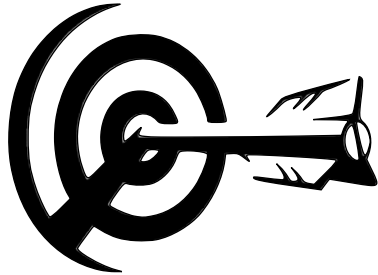
Worst case:
Commonly omitted
activities



Tip Summary



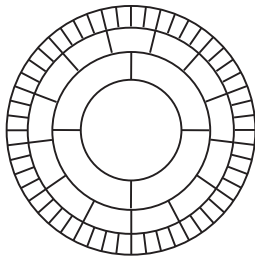
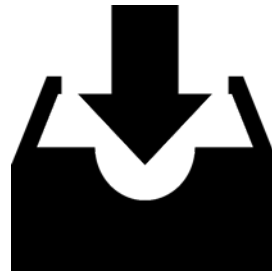
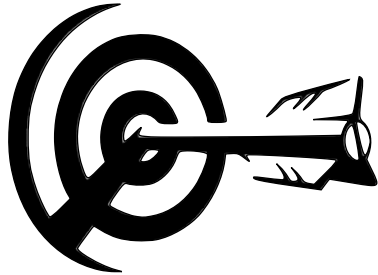
Tip Summary



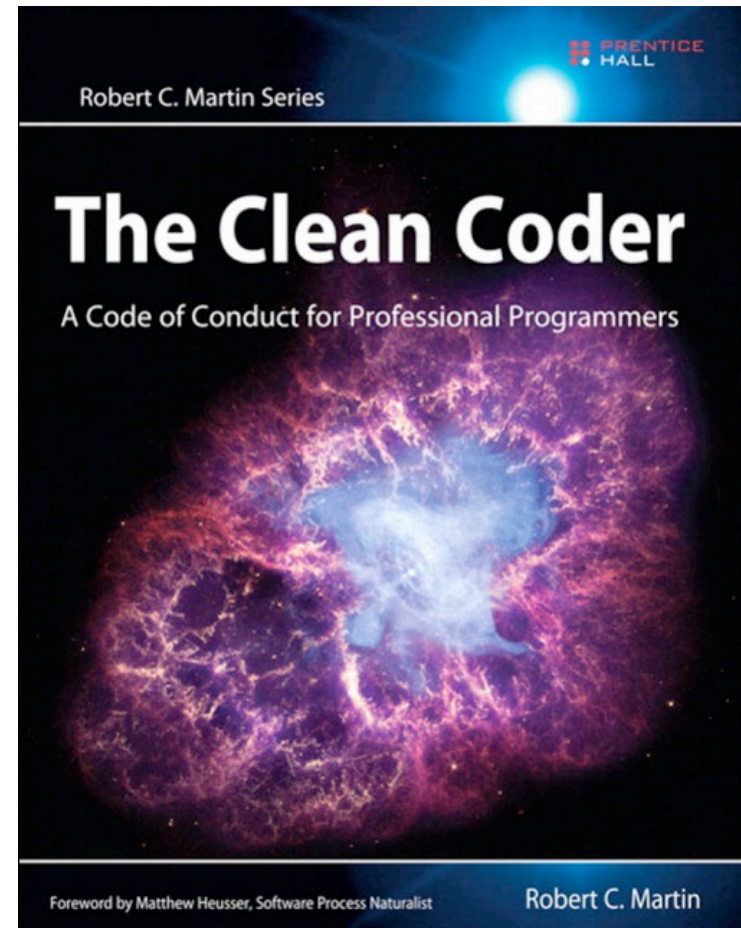
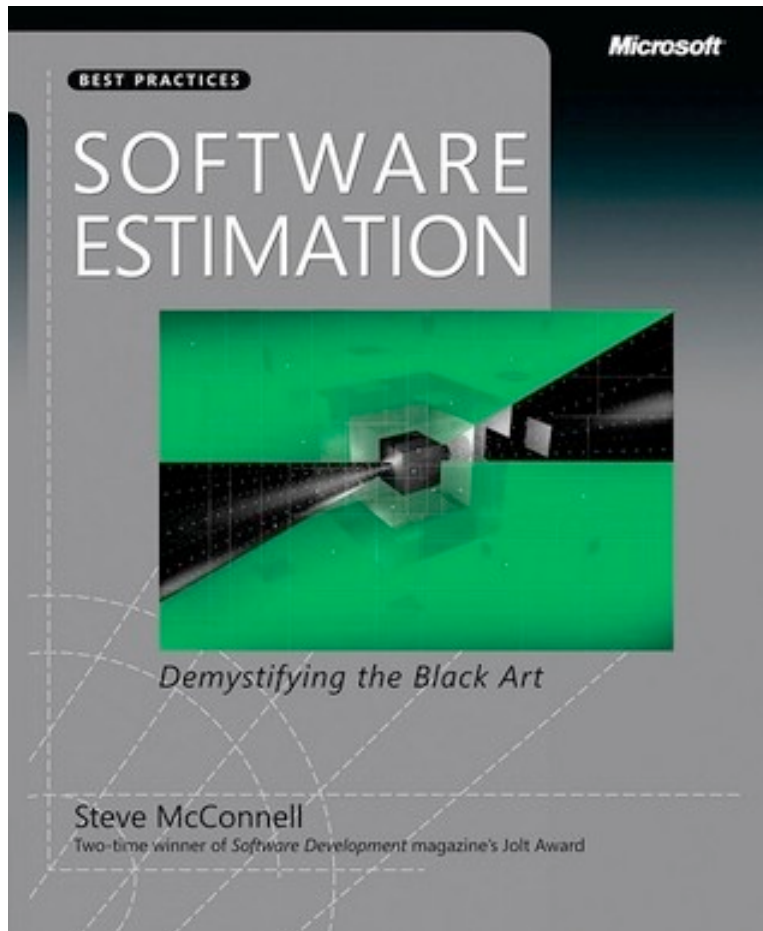
Do or do not,
there is no try



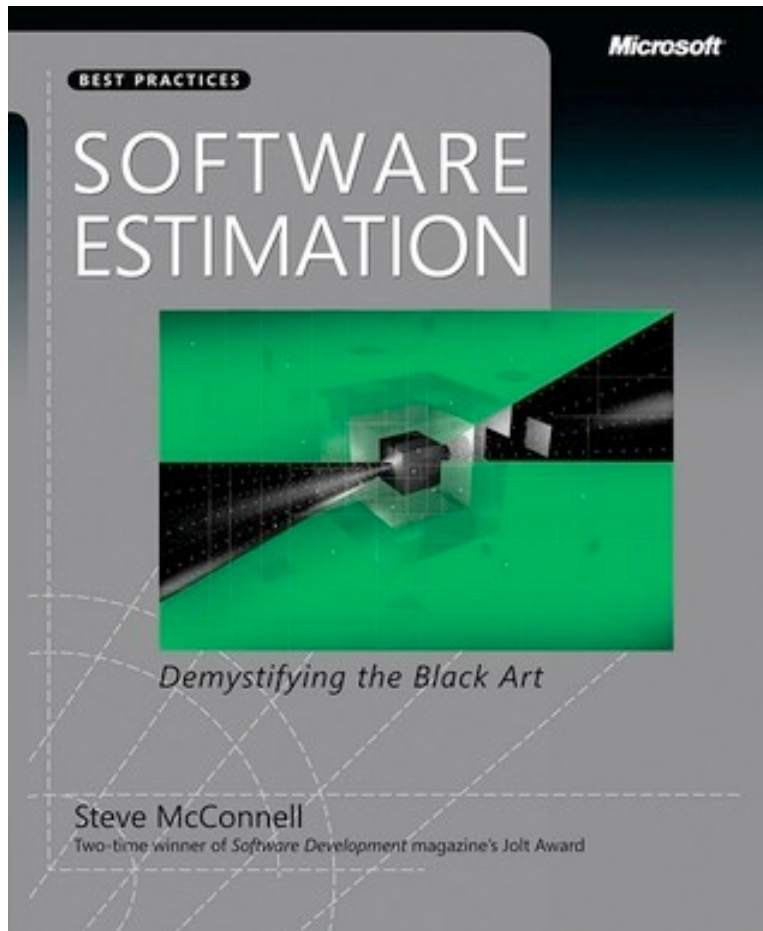
Tip Summary



Tip: Read these Books



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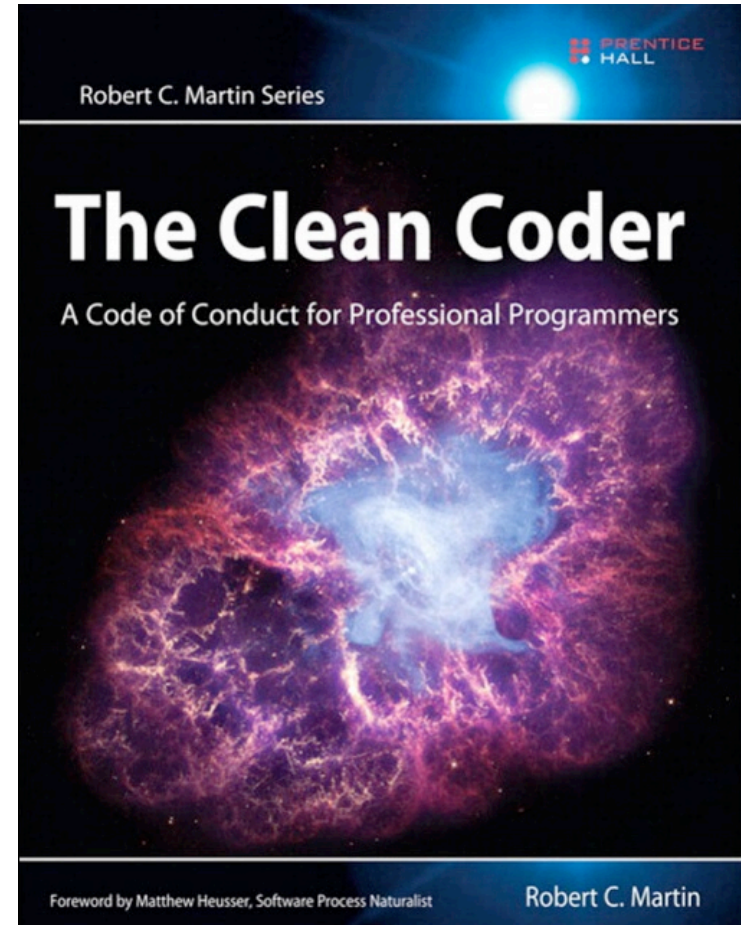


- ~120 Estimating tips / techniques
- Tips are categorized by:
 - What is estimated
 - Size
 - Effort
 - Schedule
 - Features
 - Size of Project
 - S, M, L
 - Stage that estimate applies
 - Early, Middle, Late
 - Iterative or Sequential
 - Accuracy possible
 - Medium - High

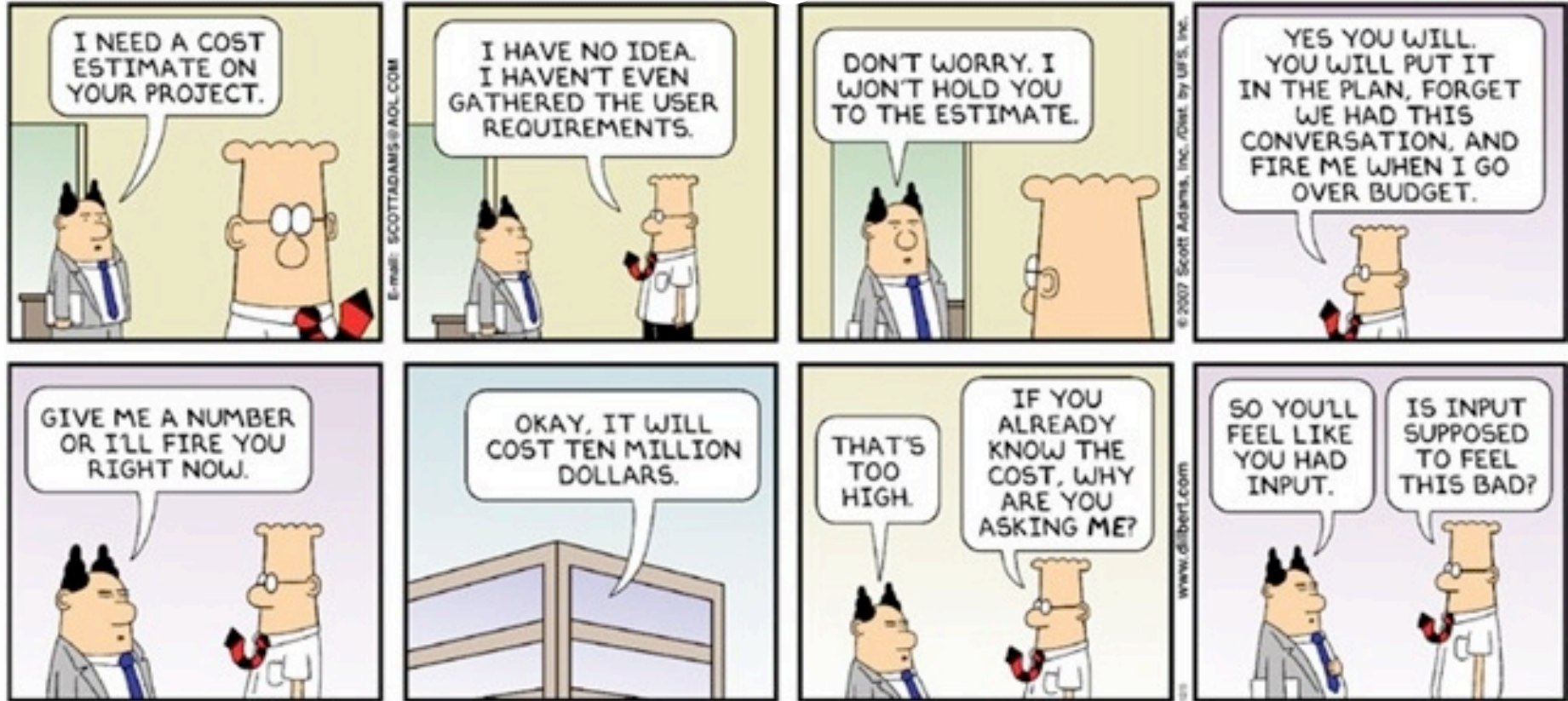
Tip: Read these Books



- 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



Q&A



Slides and more info at:
<http://squaredi.blogspot.com>



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Feedback:
bit.ly/estimatingPreso

Thank You



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