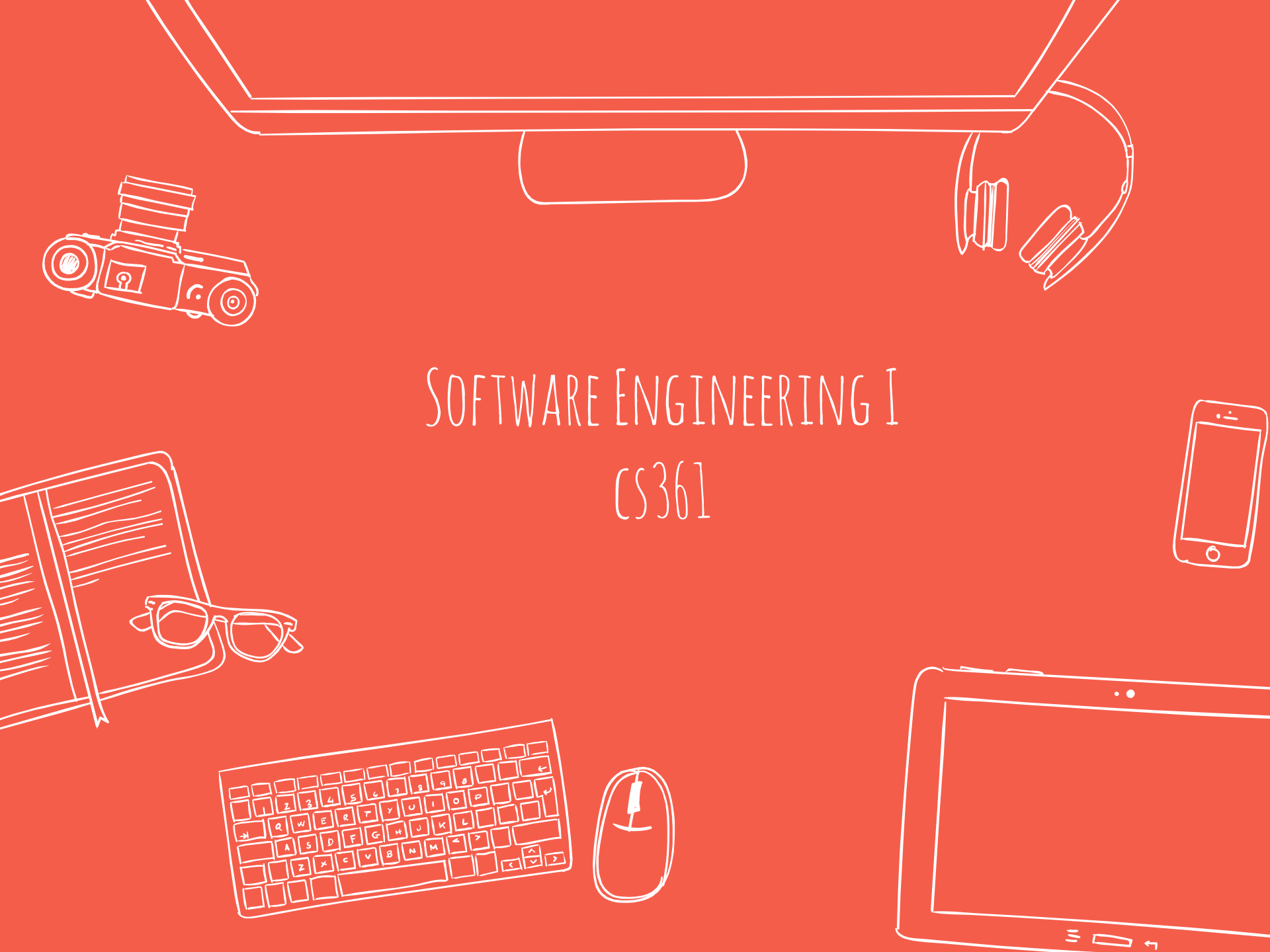
Software Engineering I

CS361



Wat

@garybernhardt

Announcements

- Writing assignment (peer review) posted tomorrow
- I will post another class participation opportunity to Piazza, Due Monday Night
- Grading meetings Monday and Tuesday. Time slots will be posted on Piazza
- http://web.engr.oregonstate.edu/~hiltonm/classes/cs361/assignment1.html

Project Management

Project Manager

Done by “Managers”

Typical Tasks

- Project Management
- Scheduling
- Risk Management
- Measurement

Managers can Control

- ✖Resources
- ✖Time
- ✖Product
- ✖Risk

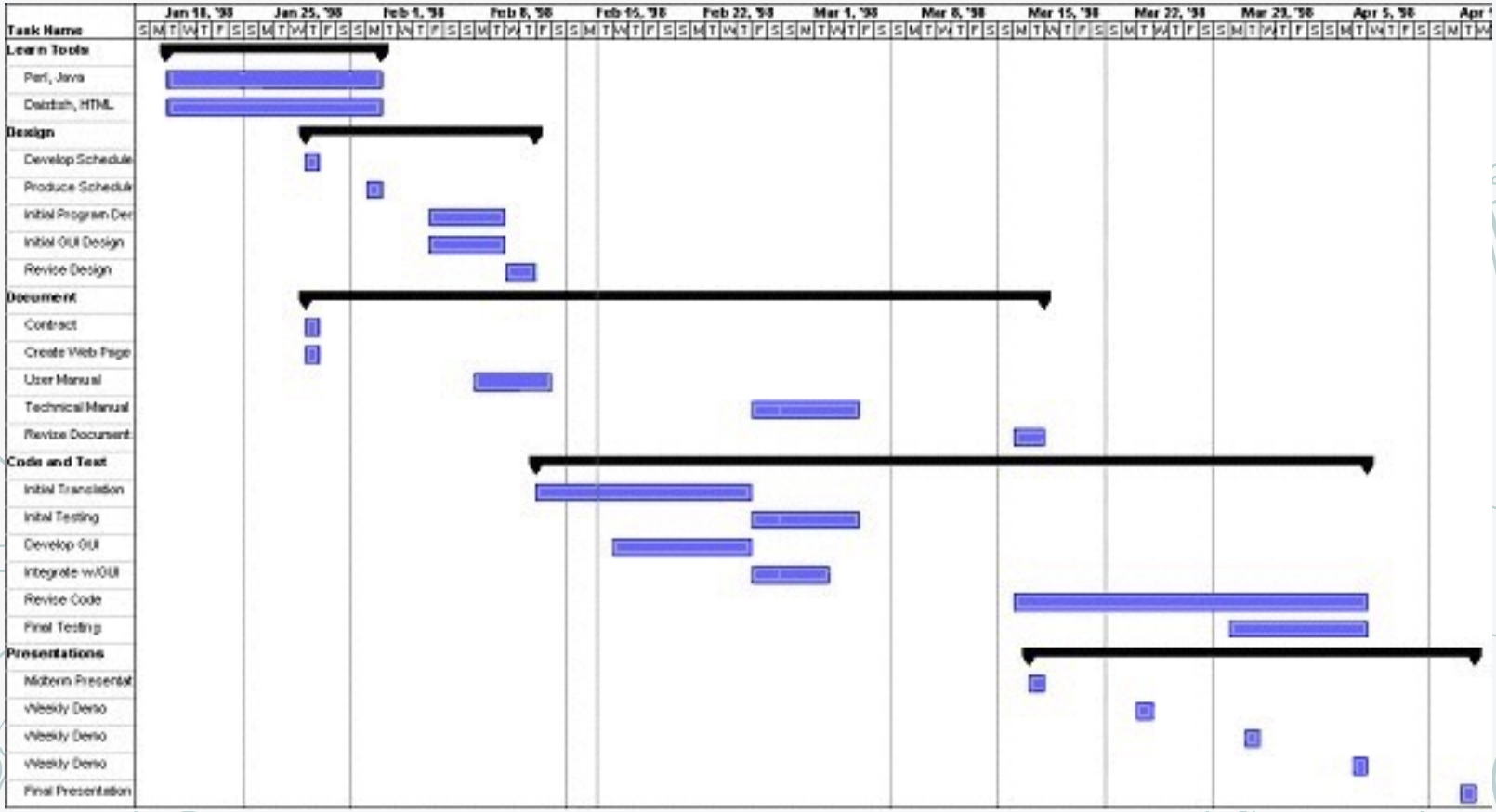
Managers can Control

- ✖Resources ?
- ✖Time ???
- ✖Product
- ✖Risk ??

Management Terms - WBS: Work Breakdown Schedule

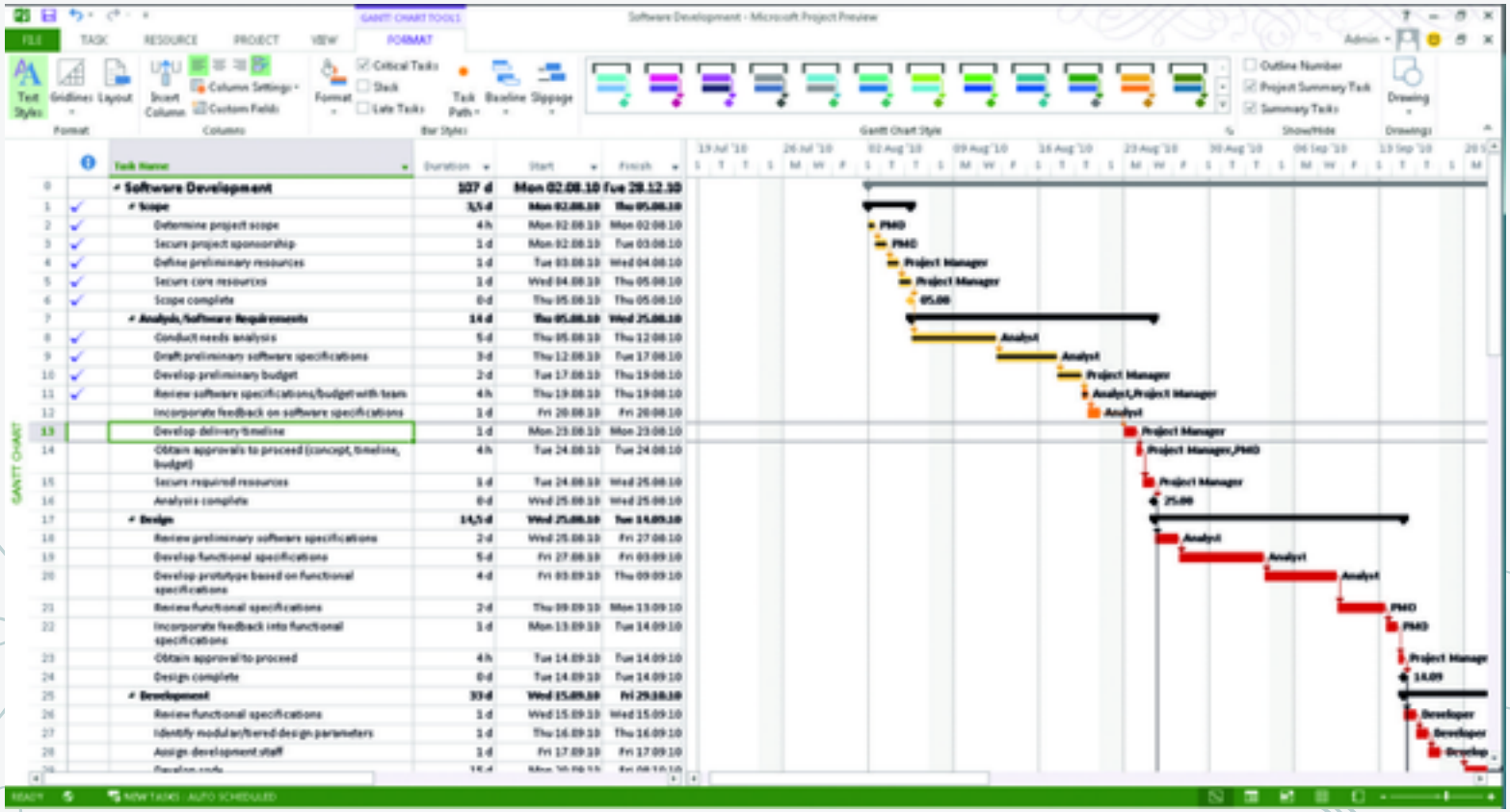
	Task Mode	WBS	Task Name	Duration	Start	Finish	Predec
1		**1**	**Landscape Job at New Home**	**40 days?**	**Mon 4/7/14**	**Mon 6/2/14**	
2		1.1	**Design home landscape**	5 days	Mon 4/7/14	Fri 4/11/14	
3		**1.2**	**Put in Lawn**	**2 days**	**Mon 4/14/14**	**Tue 4/15/14**	
4		1.2.1	Acquire lawn materials	2 days	Mon 4/14/14	Tue 4/15/14	2
5		**1.3**	**Install sprinklers**	**7 days**	**Wed 4/16/14**	**Thu 4/24/14**	
6		1.3.1	Identify locations	1 day	Wed 4/16/14	Wed 4/16/14	4
7		1.3.2	Dig trenches	2 days	Thu 4/17/14	Fri 4/18/14	6
8		1.3.3	Install Pipe & HW	3 days	Mon 4/21/14	Wed 4/23/14	7
9		1.3.4	Cover prinkler lines	1 day	Thu 4/24/14	Thu 4/24/14	8
10		1.3.5	Sprinklers complete	0 days	Thu 4/24/14	Thu 4/24/14	9
11		**1.4**	**Plant Grass & Shrubs**	**15 days?**	**Fri 4/25/14**	**Thu 5/15/14**	
12		1.4.1	Remove construction debris	4 days	Fri 4/25/14	Wed 4/30/14	9
13		1.4.2	Prepare soil	4 days	Thu 5/1/14	Tue 5/6/14	12
14		1.4.3	Plant shrubs	6 days	Wed 5/7/14	Wed 5/14/14	13
15		1.4.4	Plant lawn seed	1 day?	Thu 5/15/14	Thu 5/15/14	14
16		1.4.5	Lawn & shrubs complete	0 days	Thu 5/15/14	Thu 5/15/14	15
17		**1.5**	**Build Fence**	**11 days?**	**Fri 5/16/14**	**Mon 6/2/14**	
18		1.5.1	Acquire fence materials	1 day?	Fri 5/16/14	Fri 5/16/14	16
19		**1.5.2**	**Install fence**	**10 days?**	**Mon 5/19/14**	**Mon 6/2/14**	
20		1.5.2.1	Mark fence line	1 day?	Mon 5/19/14	Mon 5/19/14	18
21		1.5.2.2	Install posts	5 days	Tue 5/20/14	Mon 5/26/14	20
22		1.5.2.3	Install fence & gates	1 day?	Tue 5/27/14	Tue 5/27/14	21
23		1.5.2.4	Paint/stain fence & gates	3 days	Wed 5/28/14	Fri 5/30/14	22
24		1.5.2.5	Fence complete	0 days	Mon 6/2/14	Mon 6/2/14	23
25		1.6	**Landscape complete**	0 days	Mon 6/2/14	Mon 6/2/14	24

Management Terms - Gantt Chart



http://www.examplesof.com/business/gantt_charts.html

Microsoft Project



Management Buzzwords

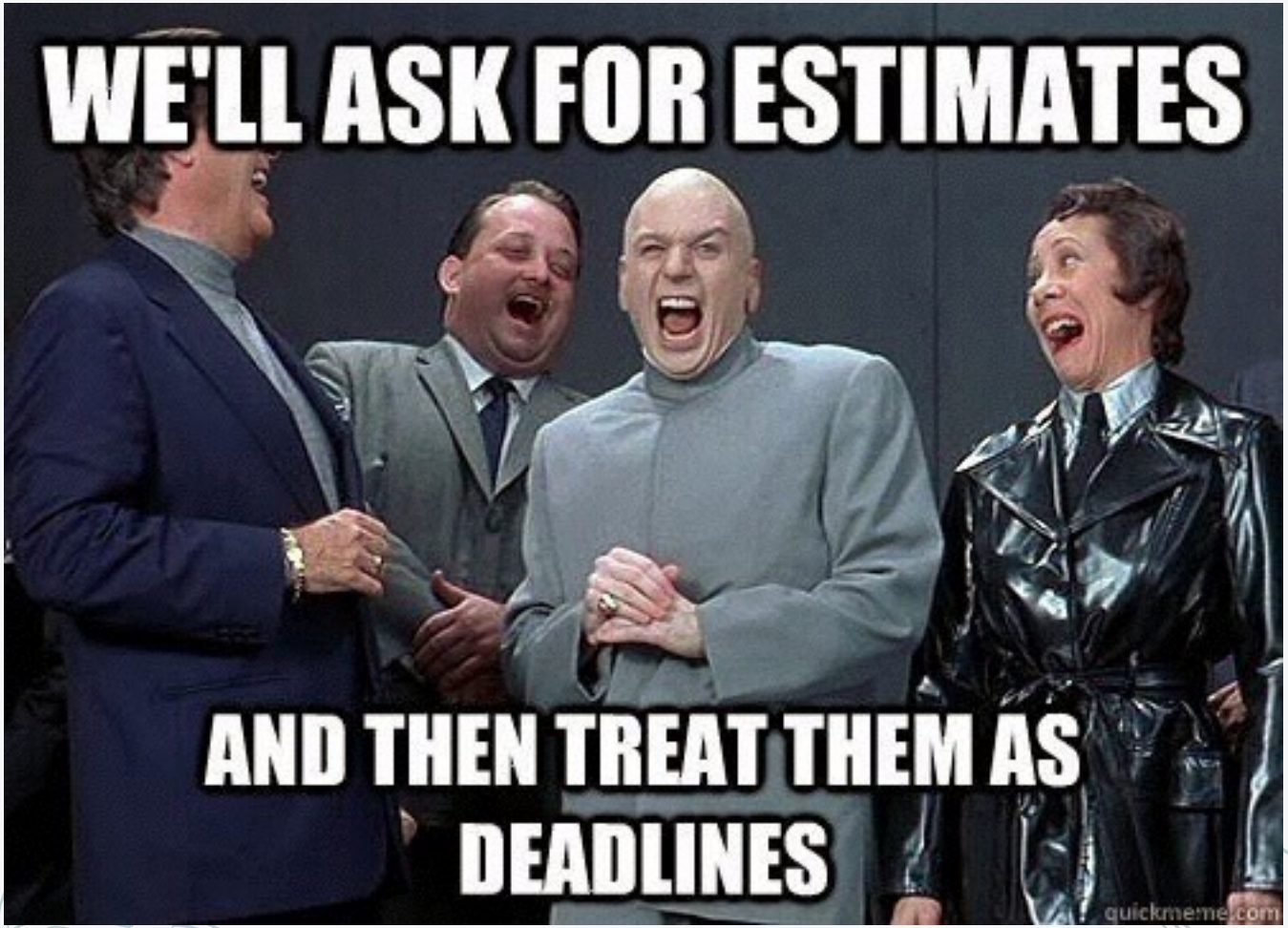
- ✖ Burndown
- ✖ Critical Path
- ✖ Milestones
- ✖ Slippage
- ✖ Mission Critical
- ✖ 10,000-foot view aka “Big Picture”
- ✖ Deliverable
- ✖ SME
- ✖ Silos

Task Estimation

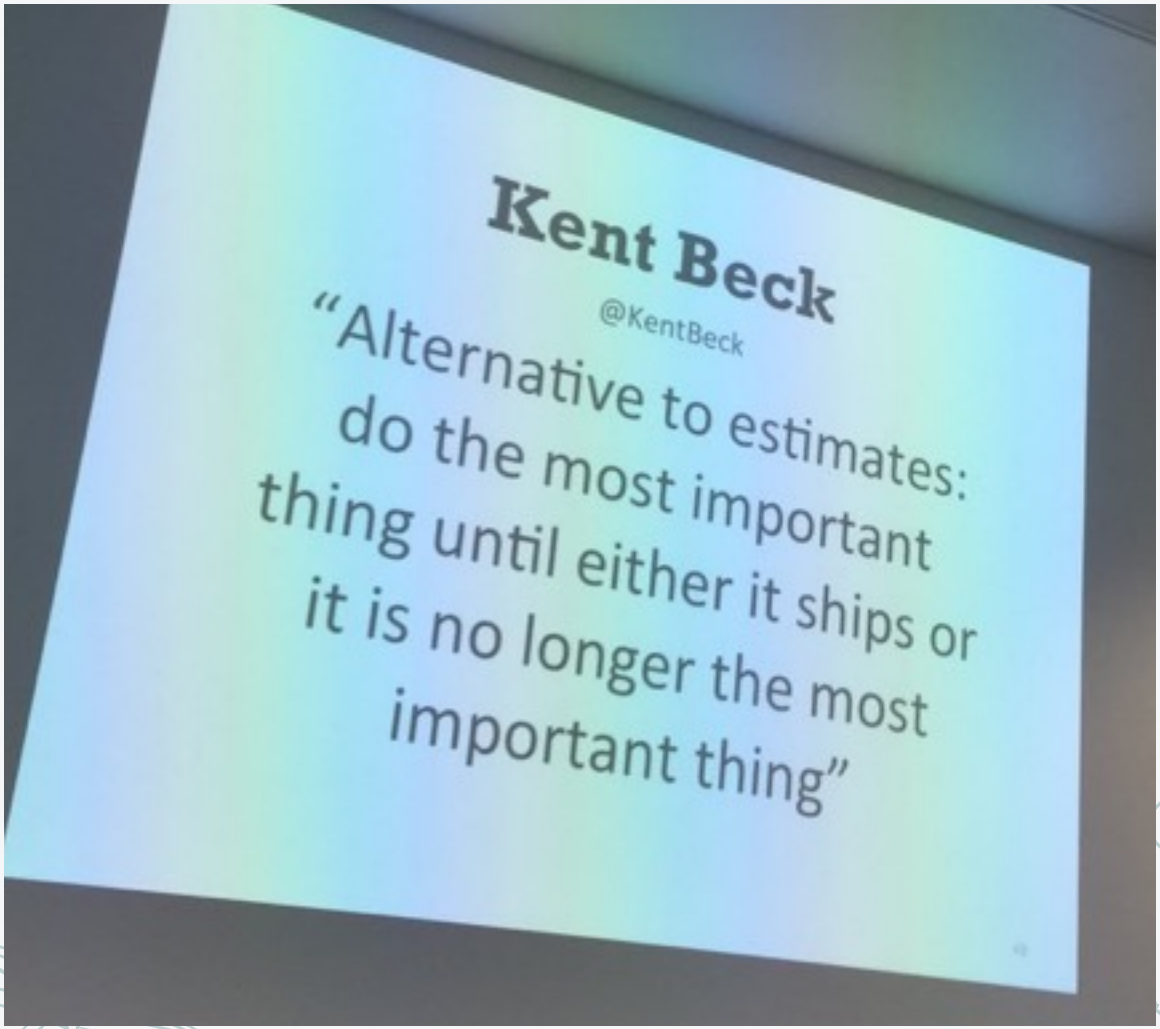
Estimation approach	Category	Examples of support of implementation of estimation approach
Analogy-based estimation	Formal estimation model	ANGEL, Weighted Micro Function Points
WBS-based (bottom up) estimation	Expert estimation	Project management software, company specific activity templates
Parametric models	Formal estimation model	COCOMO, SLIM, SEER-SEM, TruePlanning for Software
Size-based estimation models[13]	Formal estimation model	Function Point Analysis,[14] Use Case Analysis, SSU (Software Size Unit), Story points-based estimation in Agile software development
Group estimation	Expert estimation	Planning poker, Wideband Delphi
Mechanical combination	Combination-based estimation	Average of an analogy-based and a Work breakdown structure-based effort estimate
Judgmental combination	Combination-based estimation	Expert judgment based on estimates from a parametric model and group estimation

https://en.wikipedia.org/wiki/Software_development_effort_estimation

#NoEstimates



#NoEstimates



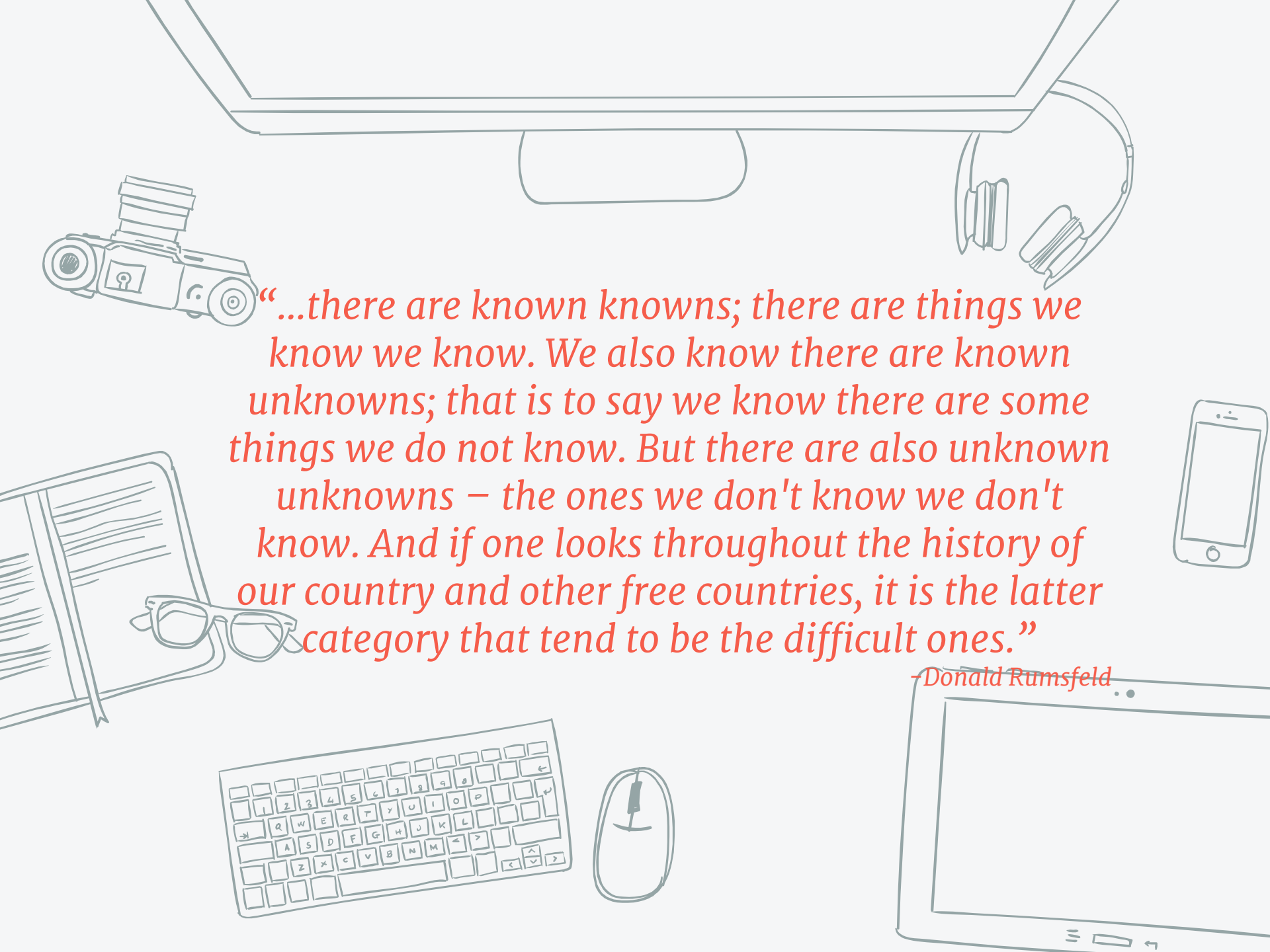
#NoEstimates

- ✖Software estimation is difficult.
- ✖Many teams fail to accurately make estimates.
- ✖Trying to meet unrealistic estimates can destroy a team's morale.
- ✖Failing to meet an estimate hurts a team's credibility.

#NoEstimates

- ✖ Estimates are so often wrong lets not do them
- ✖ Find the most important thing and do it
- ✖ Many small course corrections are easier setting initial course correctly
- ✖ Embrace the “agility” of agile

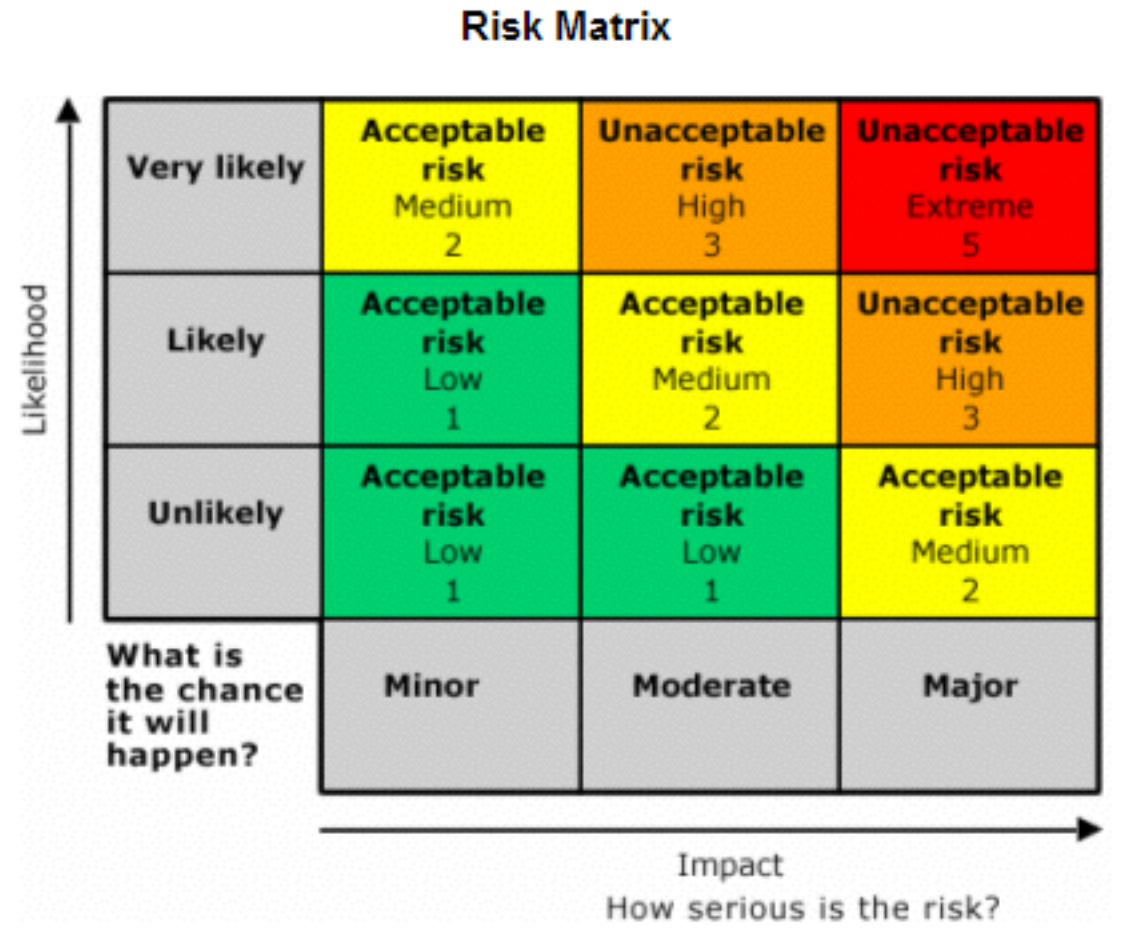
Risk Management



"...there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns – the ones we don't know we don't know. And if one looks throughout the history of our country and other free countries, it is the latter category that tend to be the difficult ones."

-Donald Rumsfeld

Risk Matrix



http://www.streetbuild.com/services/whs-risk-management/

Risk Management

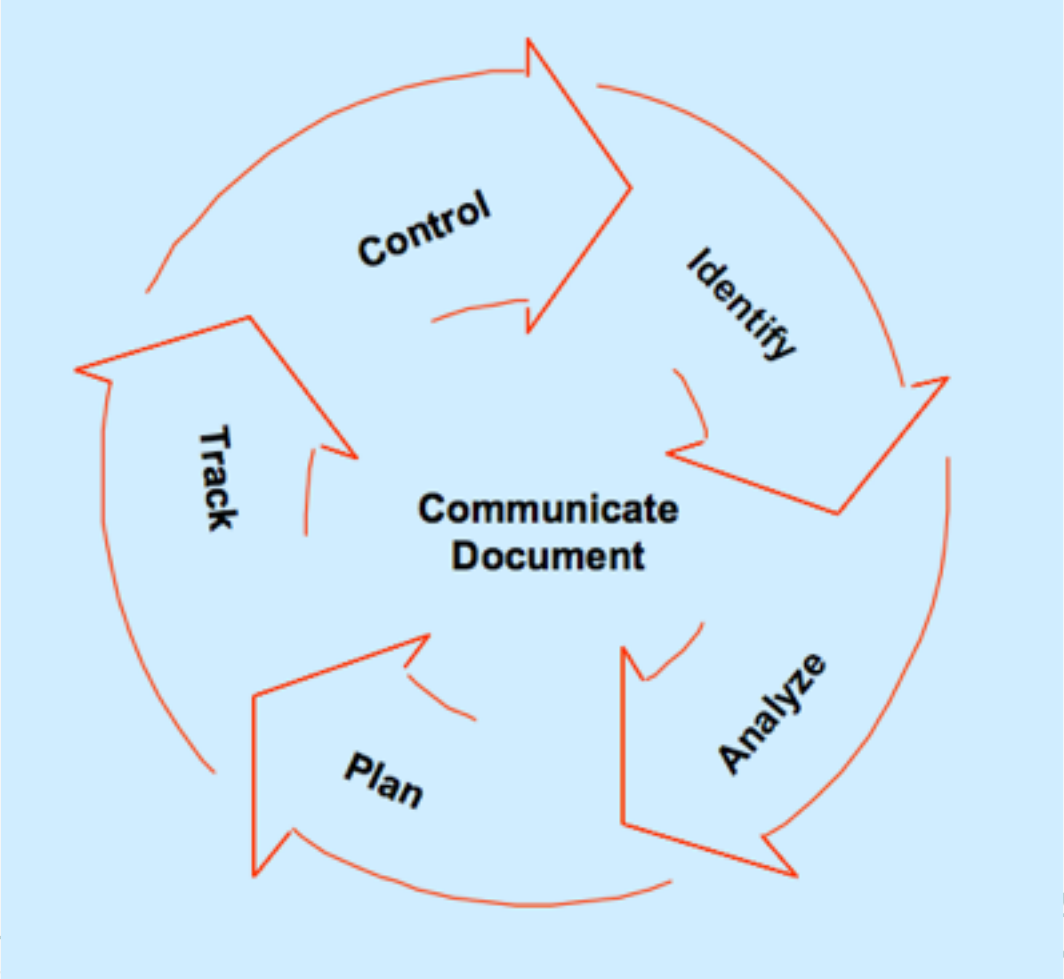
We can Learn a lot from other forms of Engineering

- ✖ CRM – Crew Resource Management (FAA)
- ✖ CRM – Continuous Risk Management (NASA)

Crew Resource Management

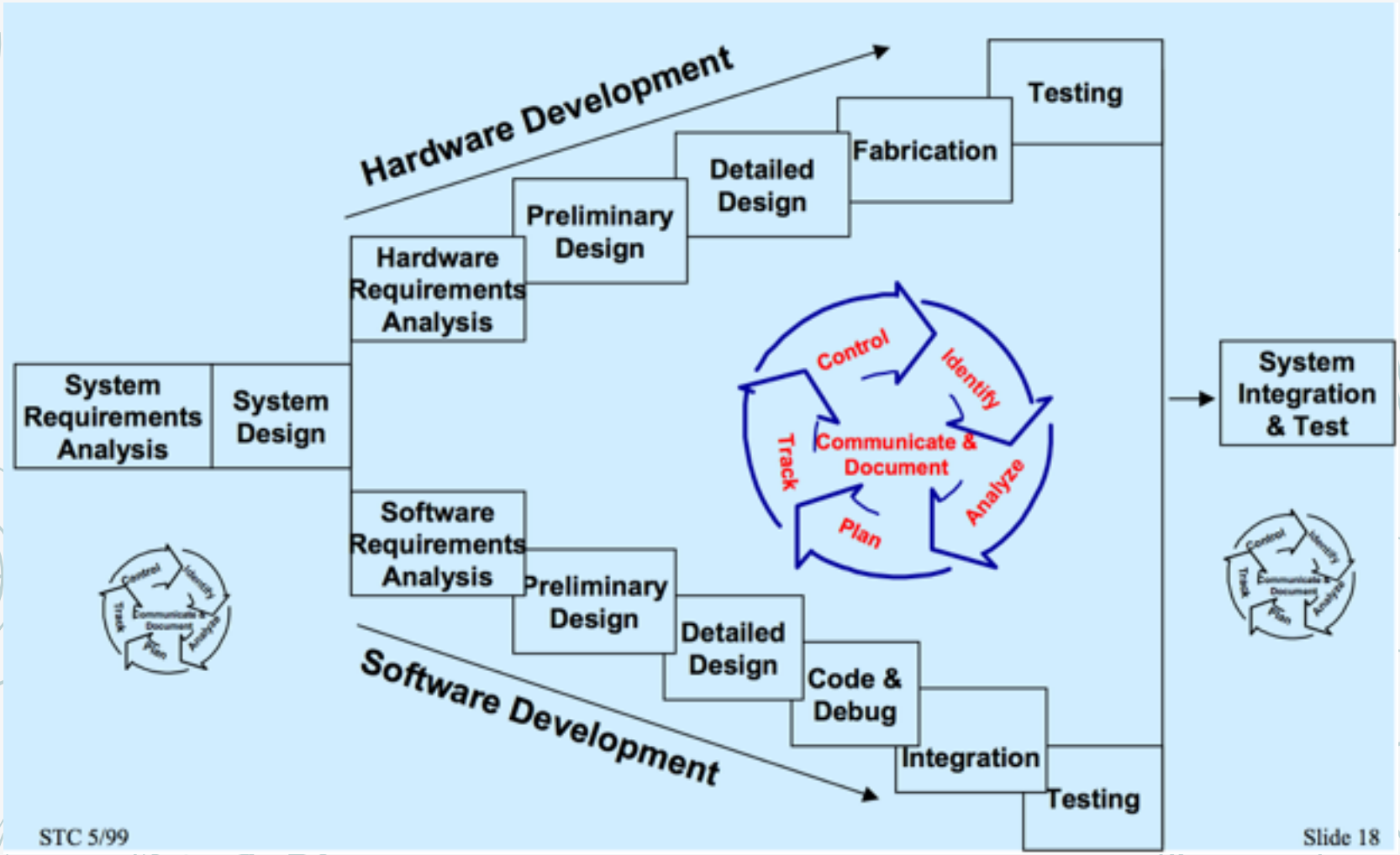
- ✖ Get there right persons attention
- ✖ State your concern
- ✖ State the problem as you see it
- ✖ State a solution
- ✖ Obtain agreement

Continuous Risk Management



http://www.lomag-man.org/gestiondurisque/riskmanagement/ContRsk1nasa.pdf

Continuous Risk Management



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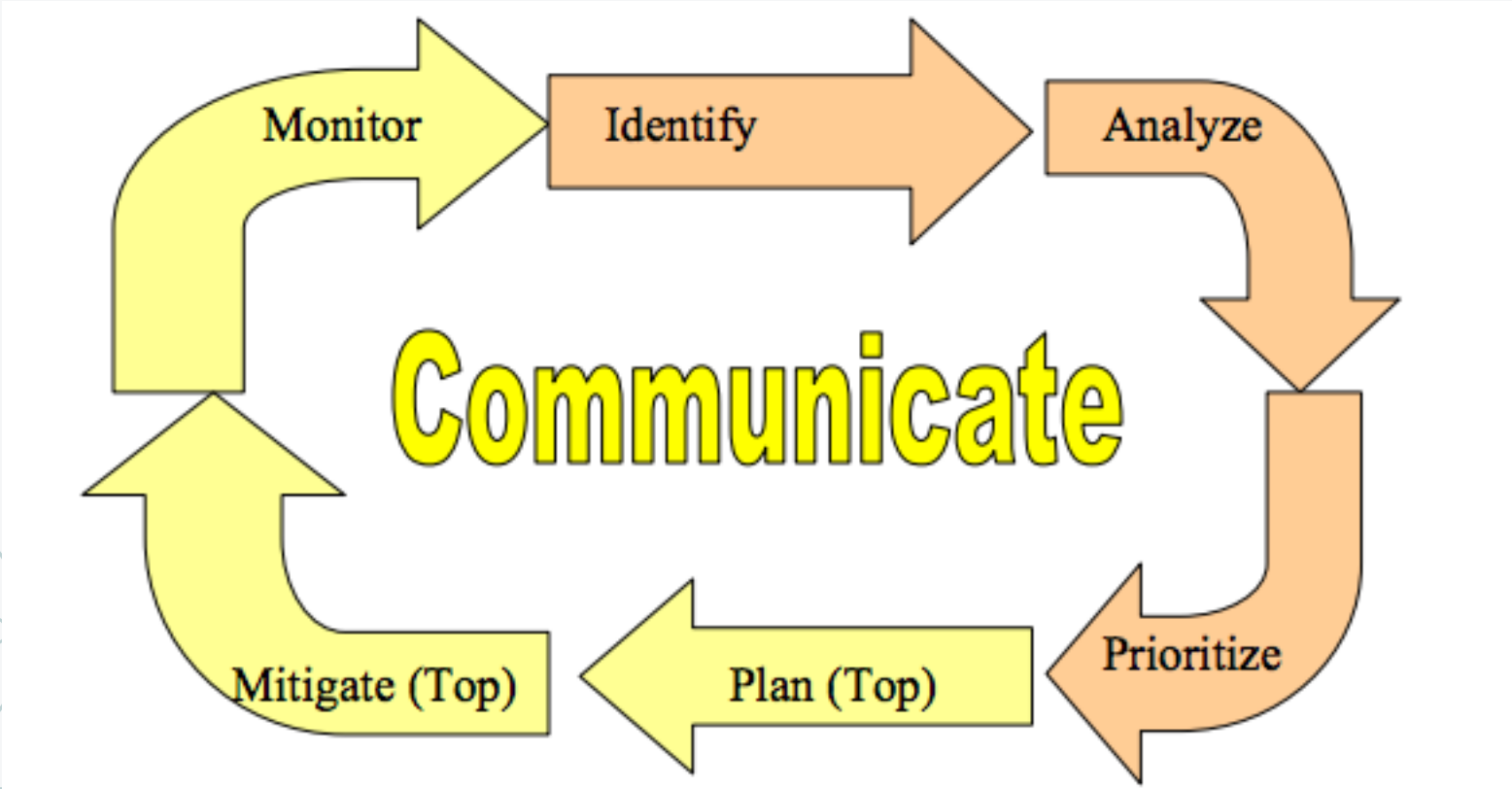
Risk Management Framework



Identify

Identify Risks by Type:

- Generic
- Product Specific
  - People, Size, Process, Technology, Tools, Organizational, Material, Customer, Estimation, Sales, Support

Given that <condition>
then there is a concern that
(possibly) <transition>
<consequence>.

Analyze

- For each risk identify, we must define a probability and an impact
- Probability: Categorical, 0-100%
- Impact: Categorical, Time, Money,

Prioritize

- ✖ Decide which risks to take actions on
- ✖ Some risks may be out of our control
- ✖ Some risks may not be worth preventing

Plan

Each risk that we identified as needing action, we should come up with a plan to mitigate

Possible Strategies:

- Get more information
- Develop Contingency Plan
- Risk Reduction
- Risk Acceptance

MITIGATE

Example Mitigation Strategies

- Risk Avoidance
- Risk Protection

Monitor

- ✖ Ongoing activity
- ✖ Keep track of state of risk
- ✖ Some risks go away with time, others get worse

Communicate

✖ Everyone should be aware of the current risks being monitored.

✖There are very few things worse then having a failure which was not anticipated.

Credits

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by SlidesCarnival
- Photographs by Unsplash