



# Software Architecture Decision Making Techniques

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# Overview

- Context
- Philosophies
- Actions
- Psychologies
- Summary

# Course Objectives

- Goal of course: Familiarize yourself with philosophies, actions, and psychologies of decision making techniques.
- After taking the course participants will be able to
  - Identify several philosophies of decision making
  - Identify several actions to make better decisions
  - Identify several psychologies you need to manage to make better decisions

# Definition

## **Decision-making**

*Verb*

Decision-making is the study of identifying and choosing alternatives based on the values and preferences of the decision maker

synonyms:

Execution, cognitive process

# Statistics

According to studies, the average human makes about 612 decisions a day. This equals to 4,900 decisions in a week and 254,800 in a year

SOURCE

# Why you need to take this course

- Why should I bother with this?
  - “Building software falls into an interesting case of problems known as wicked problems”.
  - This means basically that there are many possible solutions and that no solution is really "right" or "wrong" only "better" or "worse" given your current understanding of the problem.
  - Further each problem is essentially unique, there isn't an explicit stopping rule, and as the designer you will be held liable for consequences of your solution.“
  - Michael Keeling – Architect at IBM

# Context

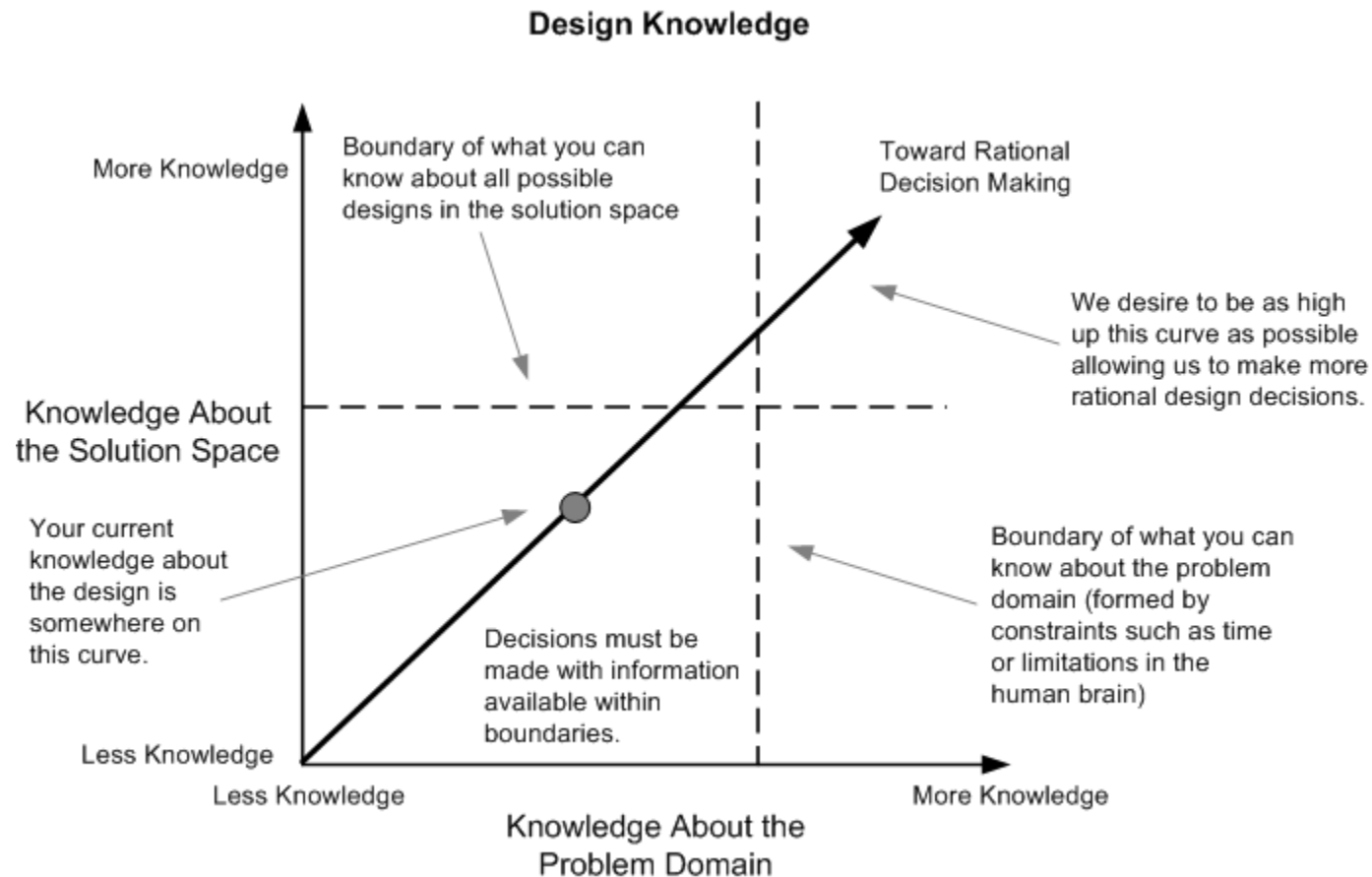
- What context are we dealing with today?

Enterprise Architecture Decisions

System Level Architecture Decisions

Interface level Decisions between systems

# Design Knowledge





# Philosophies

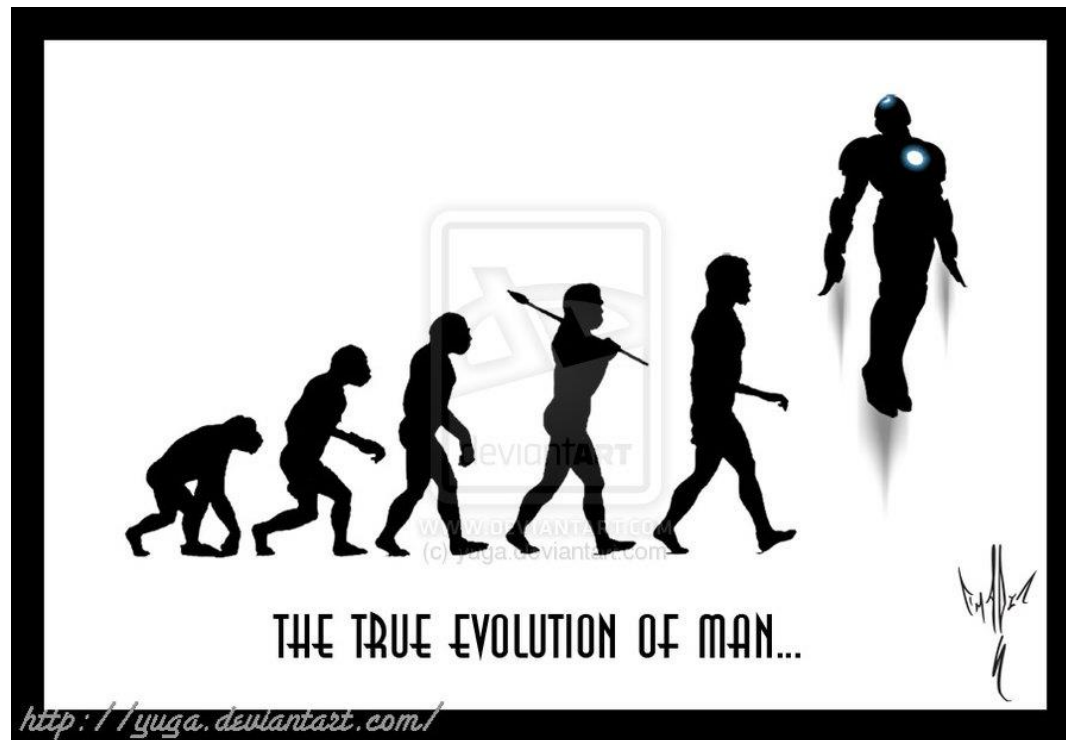
# Philosophy

- Extreme programming: Design your system for the requirements we have NOW.



# Philosophy

- Systems evolve and each version builds on the previous



# Philosophy

- Agile/Lean: make big hard decisions as late as possible

“Abolish the idea that it is a good idea to start development with a complete specification.”  
– Mary P

# Philosophy

- Conclusion: make decisions that reduce the cost of making change later

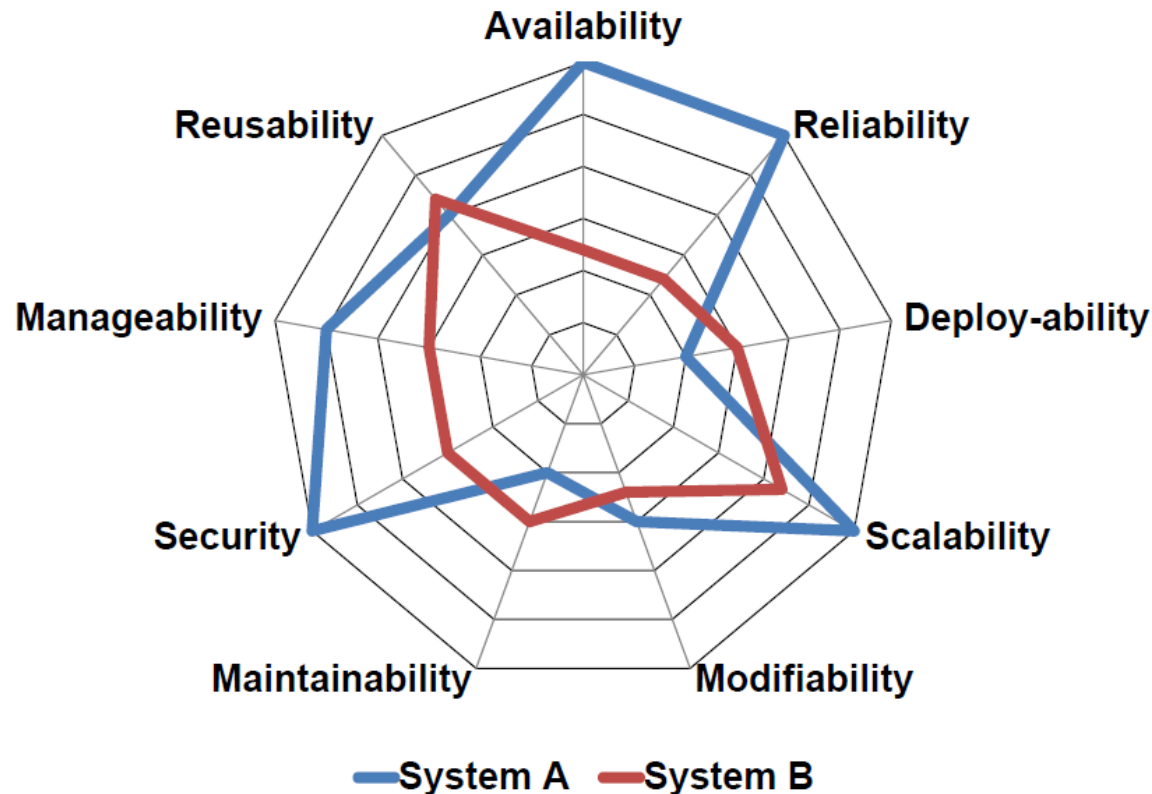


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# Actions

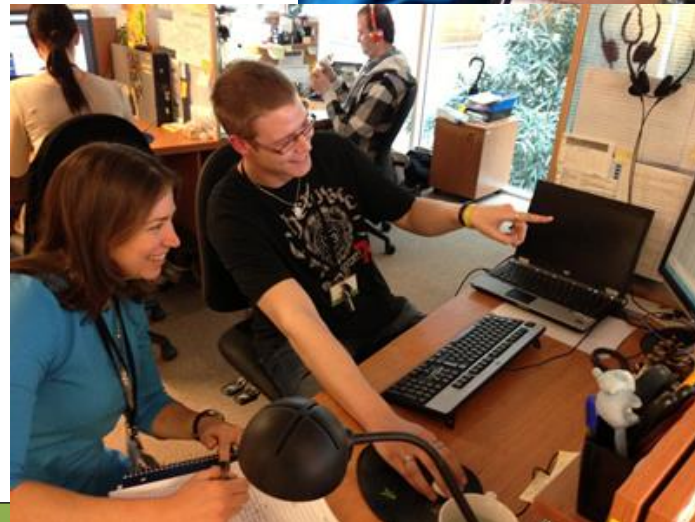
# Actions: Reduce the Unknown

- Find out what is important:
- Run a quality attributes workshop with all stakeholders including users System SMEs, product owners, QA, architects



# Actions: Reduce the Unknown

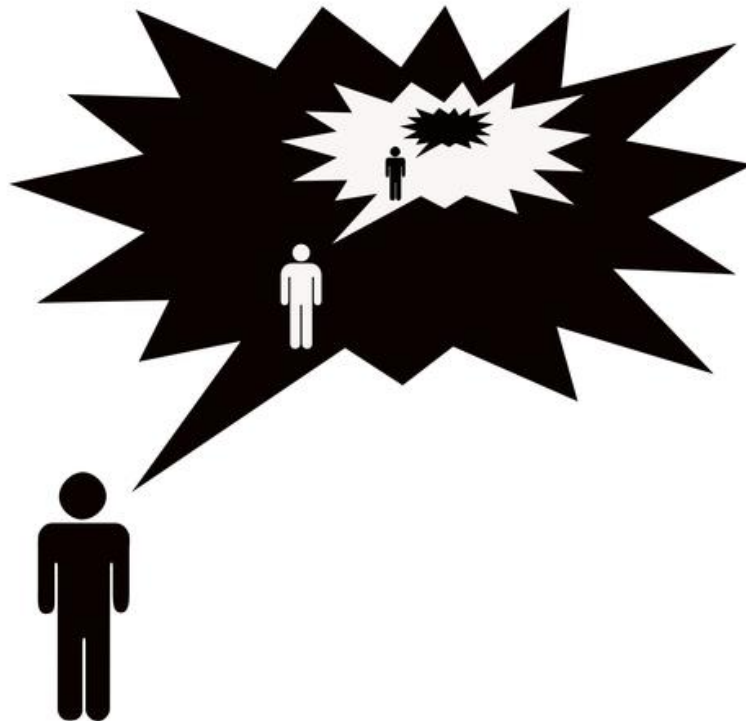
- Uncover hidden requirements by using contextual design.
- Contextual Design engages the people doing the work and studies their intents and problems to ensure the software system developed is more in tune with the user's actual needs.
- It provides a powerful tool for software engineers to use as input into their requirements and architecture





# Actions: Get the Evidence

- Don't rely on hearsay, go to the source
- If the right people are not on in the meeting, end the meeting



# Actions: Find a Solution

- Write out the pros and cons for the customer for each solution and review with stakeholders.



# Actions: Find a Solution

- Do a Pre-Mortem on your possible solutions
  - Imagine the project is over and talk about what went wrong using each solution



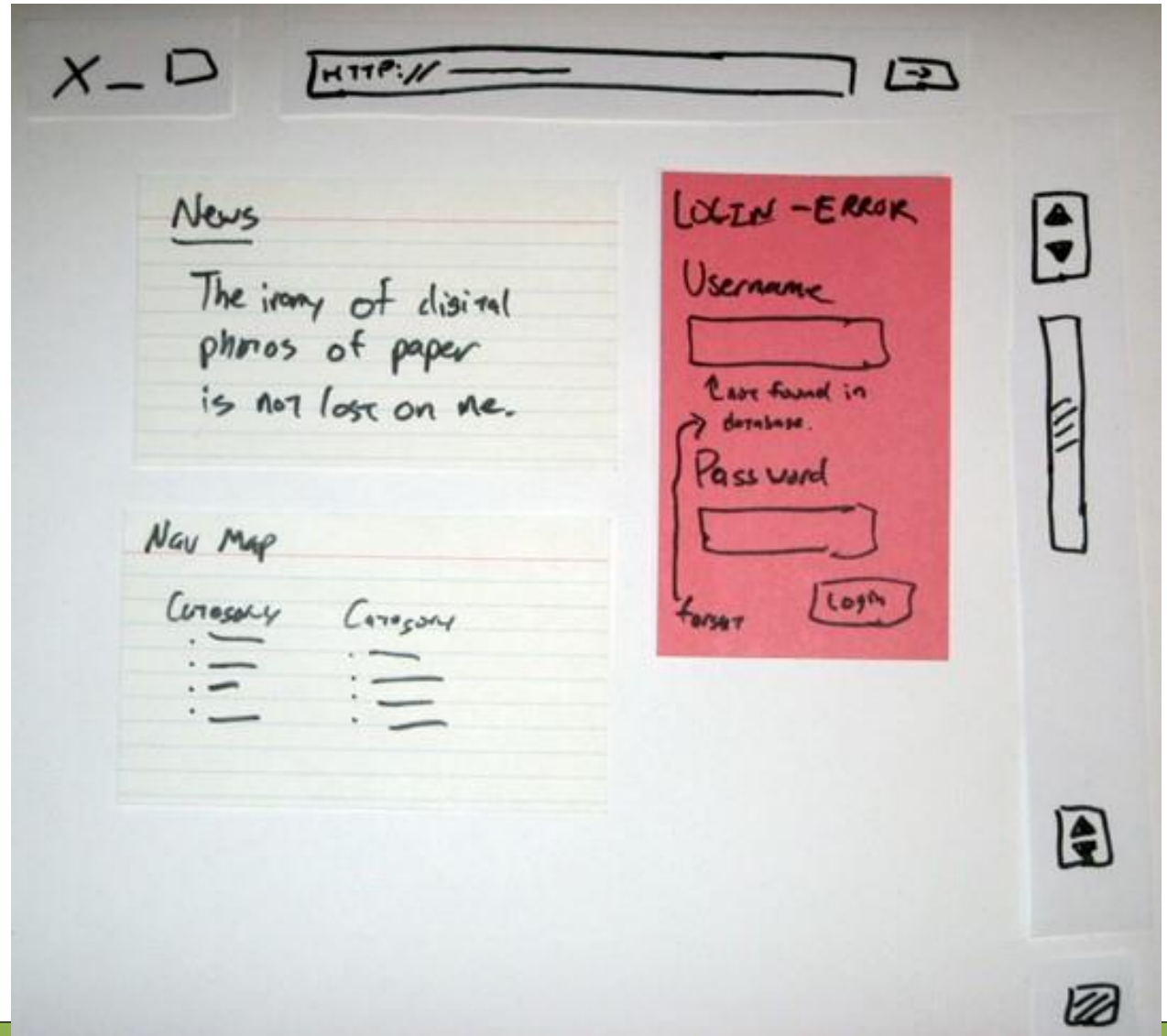
# Actions: Find a Solution

- Talk your solutions over with experts from other areas



# Actions: Reduce the Unknown

Prototype  
and show it  
to the users!



# Actions: Reduce the Unknown

- Conclusion from Actions: identify issues early and change direction quickly

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# Psychologies

# Psychology

- Realize that most blocks to decisions aren't technical:  
They are political



Political means Psychology

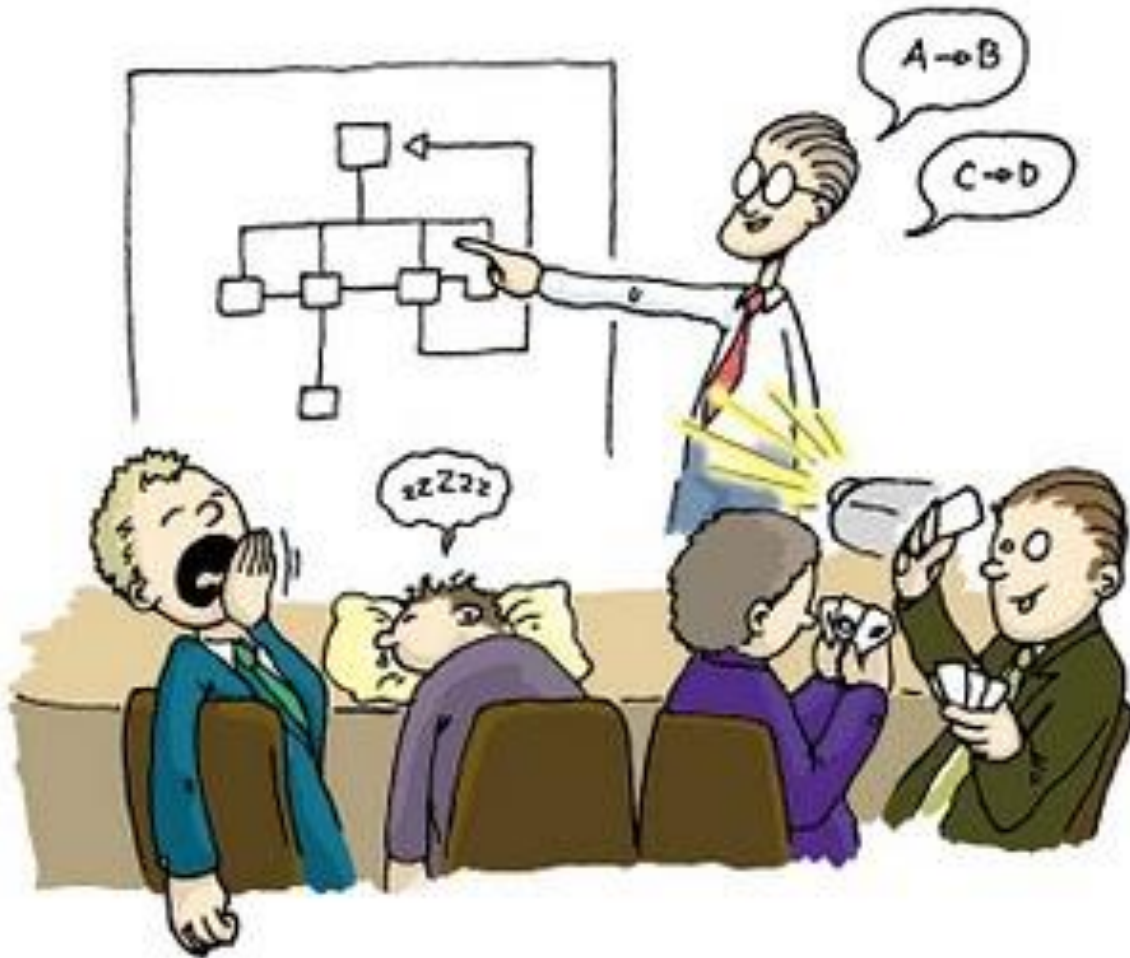


# Character

- Trustworthy
- Helpful
- Reciprocation

**CHARACTER  
COUNTS!®**

# Know thy Audience



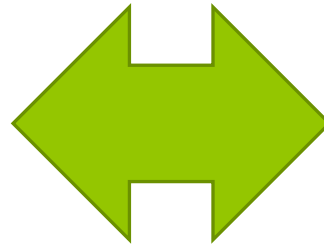
# Know your Objective



# Connect the two



Robert Durell / Special to the Chronicle

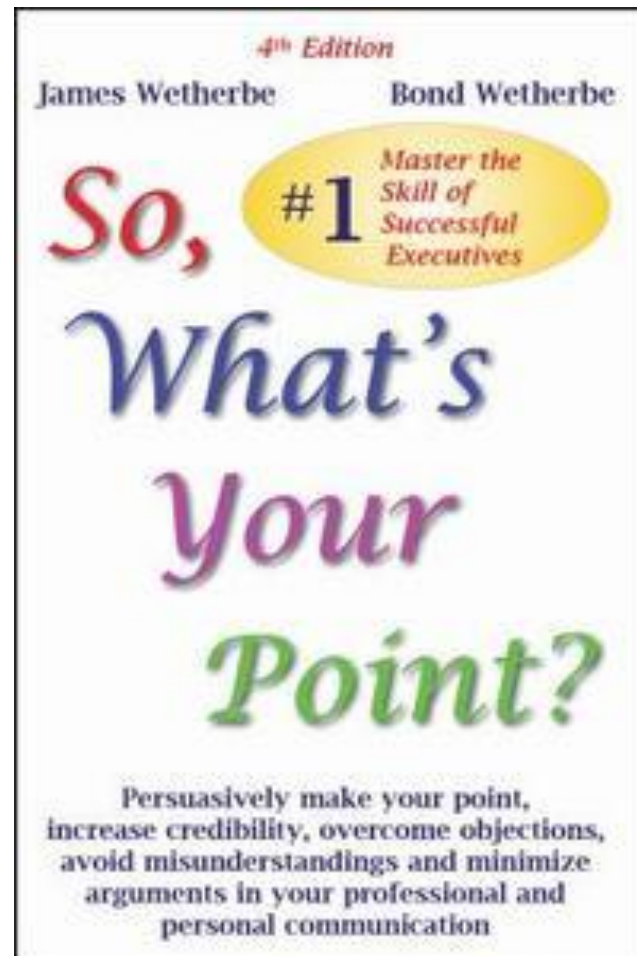


# Presentation

- Explain the problem completely
- Answer any questions to ensure they understand the real problem
- Only then once they understand the problem, give them the solution.

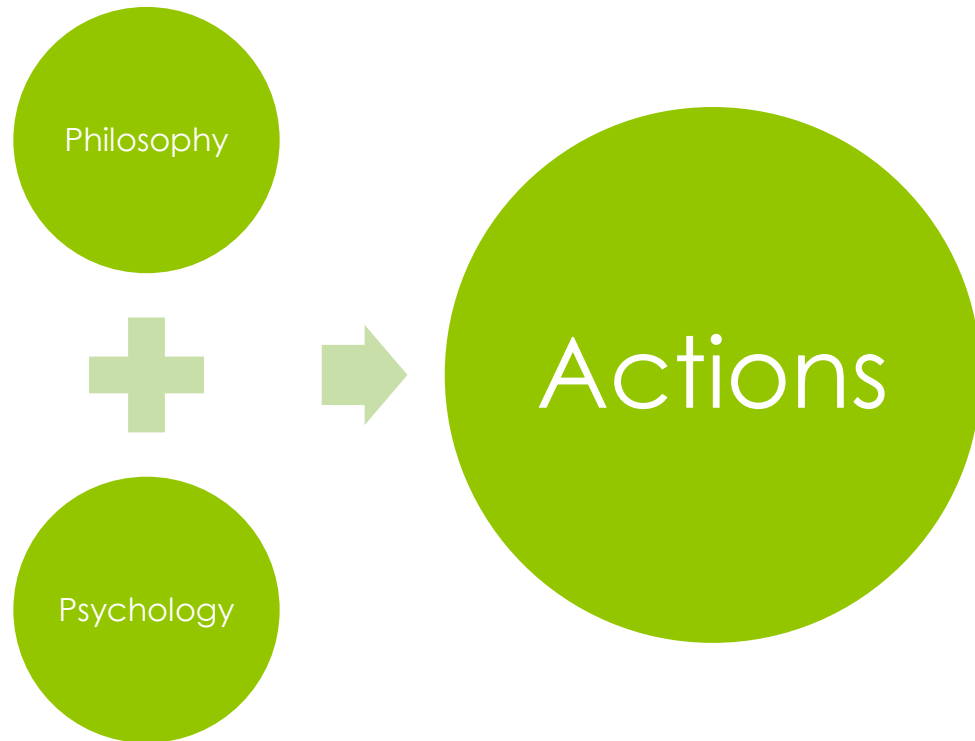
# Conversation Models

- So What's Your Point?



# Summary / Review

## Decision Making Toolkit



# Resources

- General Decision Making Resource:
  - <http://hbr.org/web/management-tip/tips-on-decision-making>
- Agile Resources:
  - *Lean Startup* – Eric Ries
  - <http://johnnycoder.com/blog/2010/06/18/introduction-to-lean-software-development-and-kanban-systems-defer-commitment-and-decide-as-late-as-possible/>
  - Design Strategies: <http://www.neverletdown.net/2010/08/choosing-a-software-design-strategy.html>
- *Quality Attributes Workshop resource*:
  - *SATURN 2014 Presentation*  
[http://resources.sei.cmu.edu/asset\\_files/Presentation/2014\\_017\\_101\\_89563.pdf](http://resources.sei.cmu.edu/asset_files/Presentation/2014_017_101_89563.pdf)
- *Politics resource*:
  - *So What's your Point?* by James C. Wetherbe and Bond Wetherbe
  - *Speed of Trust* by Stephen M.R. Covey
  - *Secrets of Closing the Sale* by Zig Zigler
  - *Just in Time Architecture* by George Fairbanks



# Questions?

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