ISP 2019
Negotiation Games
Day 2: Coordination
Oil and Beer

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Culture of Skoltech

- Speak English
  - Use every opportunity to become fluent
  - Please speak English and remind your peers to do it
- CAP: Courteous, Actionable (non-descriptive), Positive
  - Rephrase and practice
- Emails
  - Reply
  - Copy to stakeholders

If you have any question, immediately raise your hand at any time: there are no stupid or inappropriate questions

Any digital activity in most classes (unless explicitly stated otherwise) is an illegal addition that:

- **destroys your and your classmates learning experience**
- **harms your leadership and innovation potential**
- **leads to stress and possibly failure**

POSITIONAL HAGGLING

- In positional negotiations (aka bargaining or haggling) **the one who proposes the first, mostly looses**
  - **If you is forced to propose first, anchor the beneficial result – start high**
- **The best predictor of negotiation success is preparation**
- If you have no chance to validate your counteragent words, you only have EQ
- Work on validation and mercy:
  - active listening-empathy-rapport

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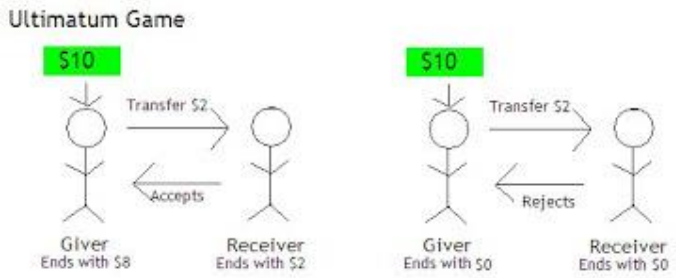
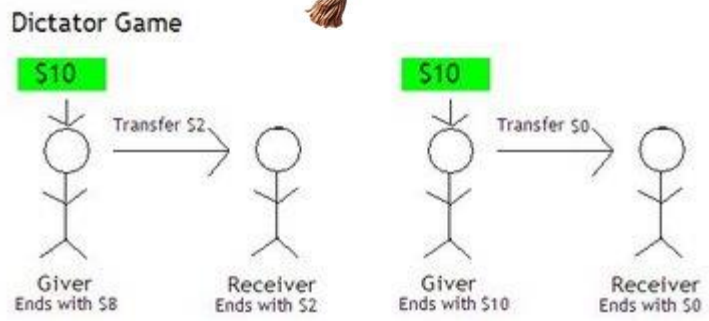
Where are we are

- **Ultimatum**
  - Extreme positional war of wills
    - Emotional disappointment
- **Bargaining** for an item of unclear value
  - Ultimate manipulation
    - Social disappointment
- **Dictator**
  - Disorientation
    - Intellectual disappointment





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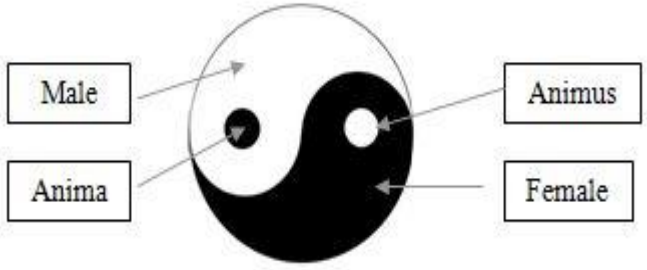
From position to coordination

- Positional bargaining is ugly
  - Animus said 30, Animus fights for 30
  - Fighting means deception, manipulation and all other killers of relationship
- **Coordination**
  - Anima says lets talk about it and find mutually acceptable solution
  - Listening to Anima is helpful, but tough

Thanks to compromise they were moving closer.



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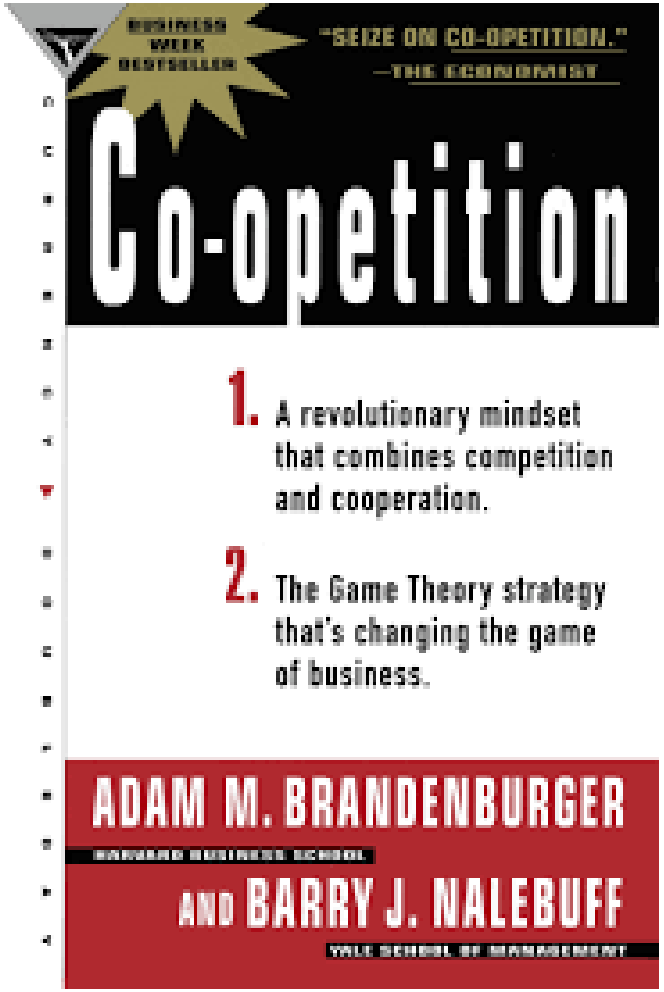
Coordination is not exactly Cooperation



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HINT

- Today morning is special:
  - **you finally need computer**

- **After lunch you do not need it again**

Social Services

- The outcome is your names and cos and shares

Lastname 1	Lastname 2	Lastname 3
A	B	C
10,11%	20,22%	69,67%

Social Services Solution in Math

- Three types of constraints are imposed on the set of possible outcomes
  - Individual Rationality
    $X_A \geq 0$, $X_B \geq 0$, $X_C \geq 0$
  - Coalitional Rationality
    $X_A + X_B \geq 118$
    $X_A + X_C \geq 84$
    $X_B + X_C \geq 50$
  - Pareto Optimality
    $X_A + X_B + X_C = 121$
    The solution to the game is in the core if it satisfies the above set of constraints.
- In the Social Services case the core is empty
  If we add up the coalitional rationality constraints we get:
  $2 (X_A + X_B + X_C) \geq 118 + 84 + 50$
  $(X_A + X_B + X_C) \geq 126$
  Hence, we violate the Pareto efficiency constraint.
  - Suppose we raise 121 to 126, this allows us to get a unique solution:
    $(X_A^*, X_B^*, X_C^*) = (76, 42, 8)$
  - Now **we adjust this solution to satisfy the original constraint:**
    $p (76 + 42 + 8) = 121$
    if, $p = 121/126$
    then, $(X_A^*, X_B^*, X_C^*) = (72.96, 40.32, 7.68)$
  - Alternatively,
    $(76 – y) + (42 – y) + (8 – y) = 121$
    if $y = 5/3$

then, $(X_A^*, X_B^*, X_C^*) = ($**74.33, 40.33, 6.33**$)$

Social Services Solution in Game theory

(People do not accept Ultimatum of 10 !)

- **The Shapley Value**

Under the Shapley Value each party's take is the average of their incremental contribution to the game, where we average over all the ways in which the grand coalition can form.

The Shapley Value for the Social Services game.

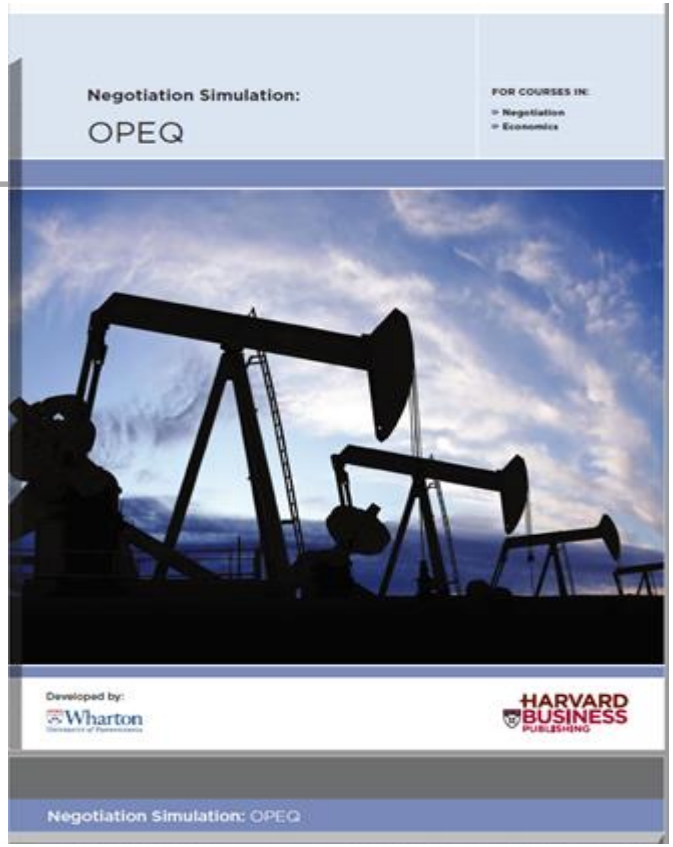
Order of players forming the coalition	Incremental value added			
	A	B	C	Total
ABC	0	118	3	121
ACB	0	37	84	121
BAC	118	0	3	121
BCA	71	0	50	121
CAB	84	37	0	121
CBA	71	50	0	121
Average	**57.33**	**40.33**	**23.33**	121

OIL GAME

- Three worlds
  - Three teams per world: A,B,C
- Each team is remote from the other: three A teams in class, others in the corridor
- You have 5 minutes to make decision and put it into your report
- Follow the messages that you receive
- Fill your numbers in your sheet:
  - TOTAL
  - PRICE
  - YOUR PROFIT
  - WORLD PROFIT

Famous oil game

- This is a so-called **“social trap”** exercise, in which **long-term maximization requires unenforced mutual trust** where **significant short-term gains are possible by breaking that trust. The exercise highlights the frequency with which we make imprecise and inadequately supported assumptions**
  - **make and keep assumptions explicit - test them periodically !**
- The danger of self-fulfilling assumptions is also illustrated
  - **pre-emptive ruthlessness results in collapse**



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Famous oil game known globally

Famous oil game 2

- The difference between **reacting** to the other side's moves (or **one's perception** of what those moves mean or will be), and **acting purposefully** to influence the other side to act constructively, is easily illustrated by comparing the experience of different teams.

- The monetary variation tends to be dramatic between cooperative and competitive games, and **analysis usually suggests that to establish the former, some teams have to take a risk.** Players face the tension between seeking high short-term gains and low short-term risk inherent in a competitive strategy, and lower but more stable long-term gains inherent in a cooperative strategy.

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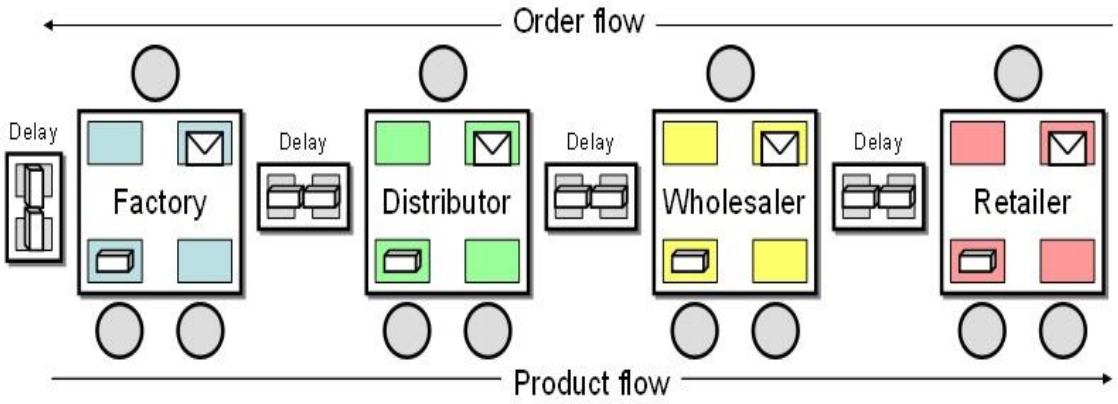
BEER GAME SETUP



- In 5 ppl teams there are two factories:
  - Brewer
  - Bottler
- There is a two-step info flow process between Distributor and wholesaler because they do not trust each other

BEER GAME

- **Step 1 (3 min):** Try to satisfy the incoming order in your sheet by moving the sticks from your inventory to the point midway to the player to your left. If you do not have enough sticks, this is your back order. **Record in your sheet your ending inventory (if any) or your backordered demand (if any).** You cannot have both inventory left over, and back order.
- **Step 2 (30 sec):** Put your sheet to the midpoint left of you so that your neighbor from the left puts her order there. Write your order in the sheet of your neighbor to the right: how many units of beer you want to replenish your inventory, and place it at a point midway to the player to your right. **Record your order in your sheet.**
- **Step 3 (10 sec):** Reach to your left and put your hand on the order coming to you, and simultaneously reach to your right and put your hand on the sticks coming to you. Then, at the same time, pull both hands back to you, putting the new order face up in front of you (above the sticks) and adding the new sticks to your inventory.
- **YOUR GOAL** is to minimize Inventory and back order. **The latter is dramatically more important and penalized 4x in comparison**
  - **The process in the middle isle is**
    - **the same for sheet and**
    - **two-step for sticks**

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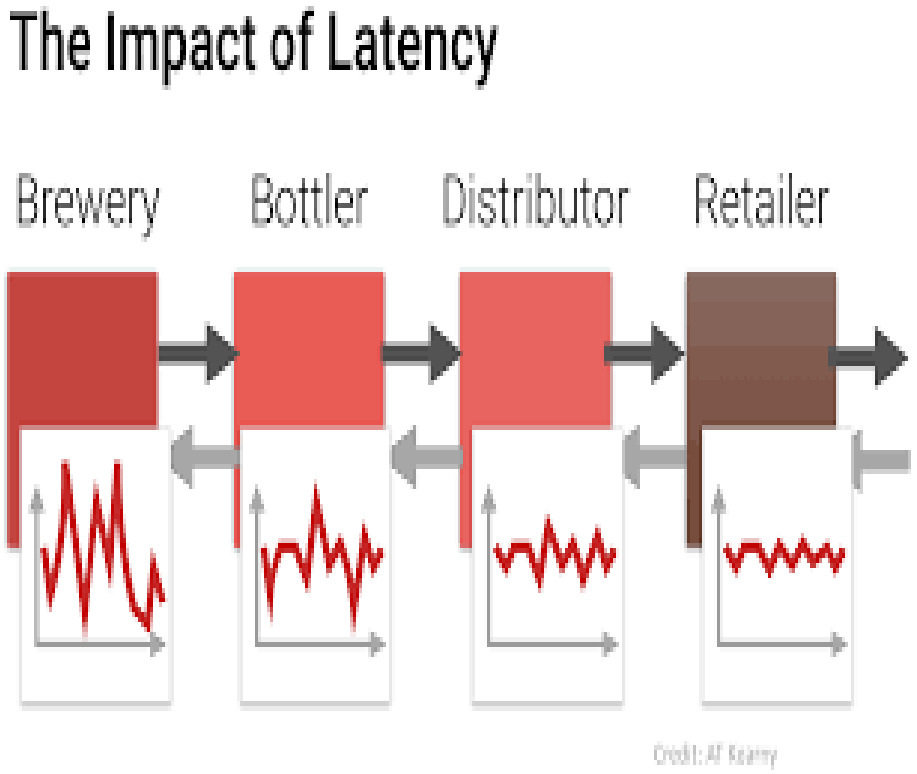
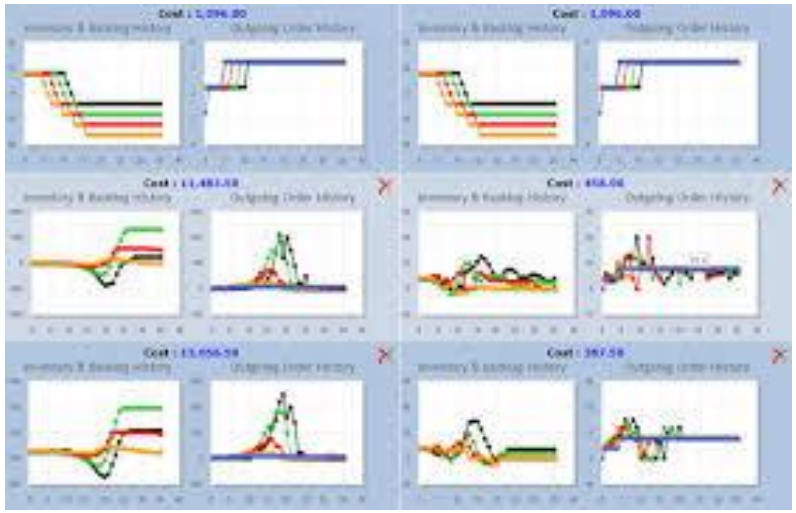
BILLWHIP EFFECT

- The only source is the same human psychology as in the oil game





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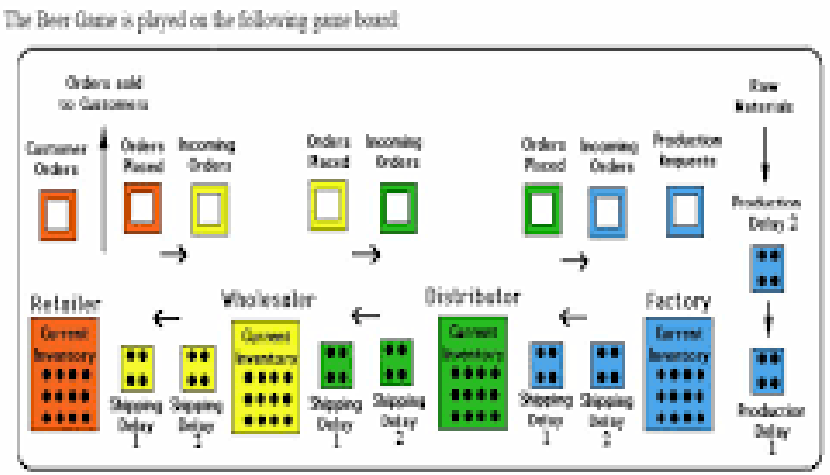
50 yr old legacy

The MIT Beer Game

- Players
  - Retailer, Wholesaler, Distributor and Manufacturer.
- Goal
  - Minimize system-wide (chain) long-run average cost.
- Information sharing: Mail.
- Demand: Deterministic.
- Costs
  - Holding cost: $1.00/case/week.
  - Penalty cost: $2.00/case/week.
- Leadtime: 2 weeks physical delay

Game Board



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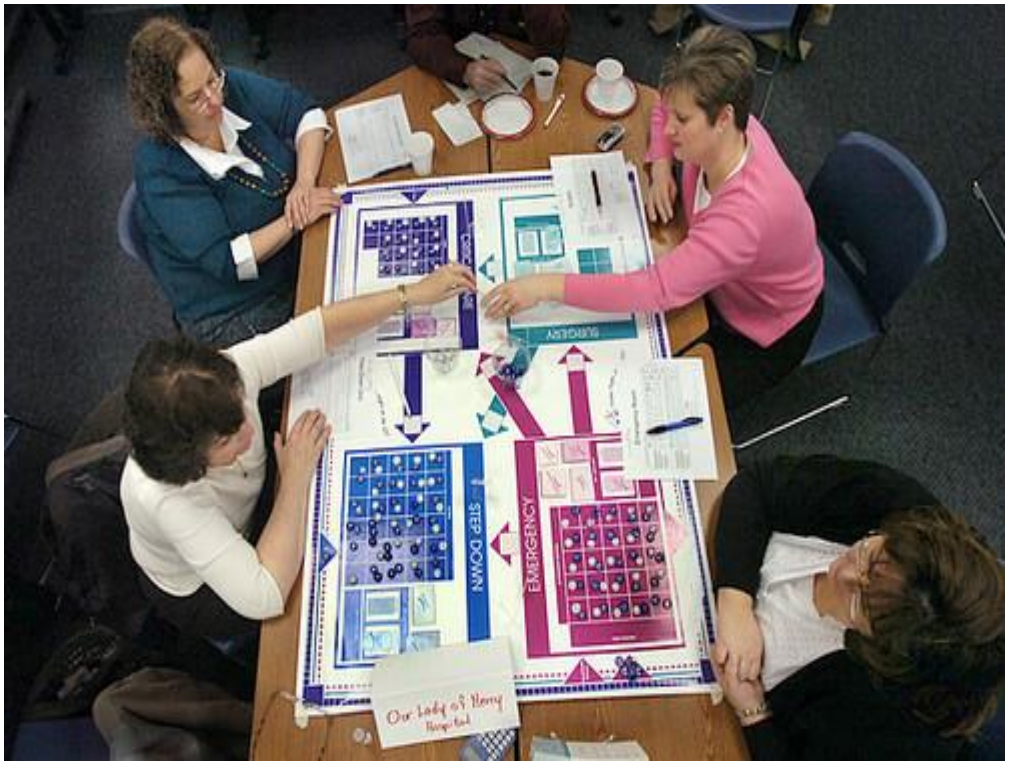
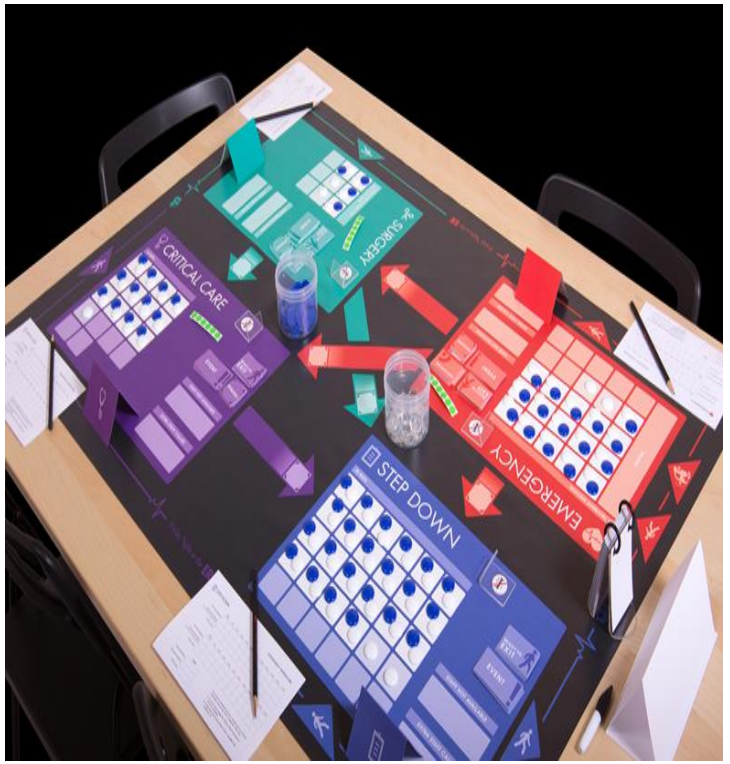
Friday Night at the ER

- Currently played all around the world
  - Team work through negotiation
  - Communication
  - Innovation





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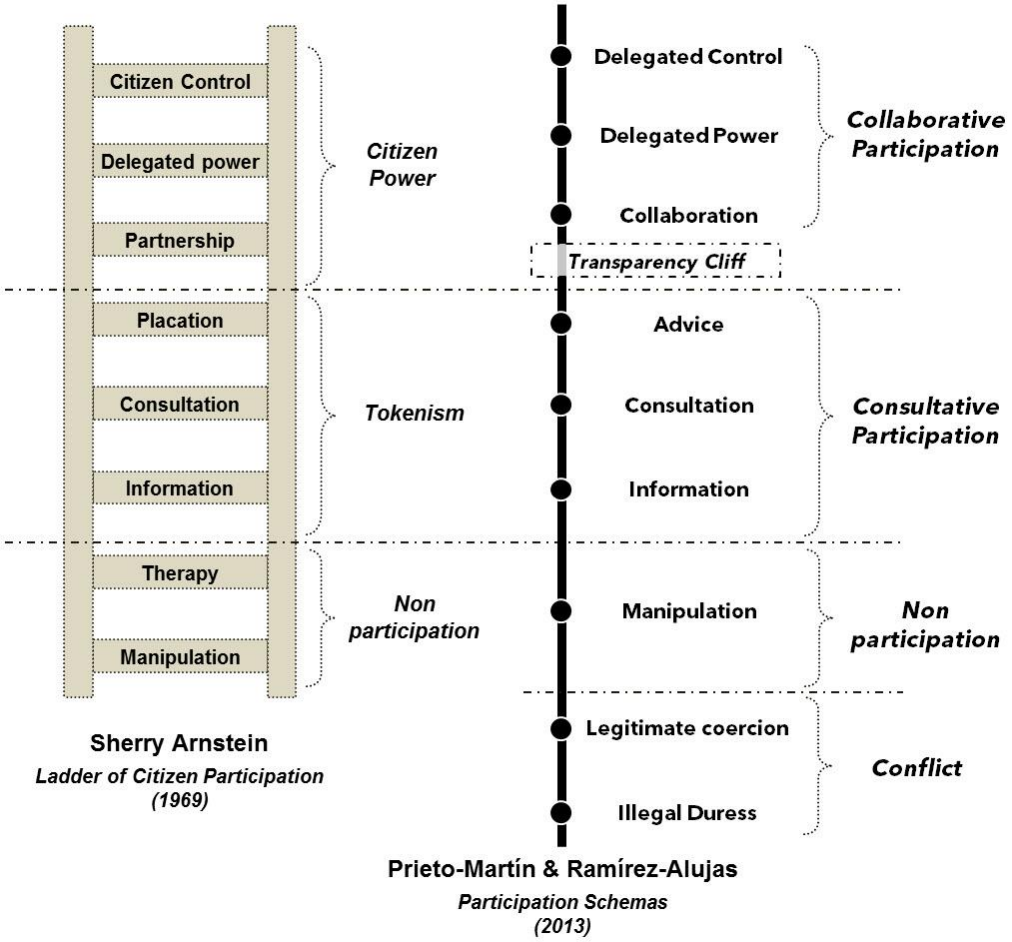
Systems Thinking

- Sharing sense of responsibility for system performance. The parts of a system are Interdependent.The more one focuses on departmental focus, the worse system is likely to perform.
  - Protecting your department from calling in staff results in better financial performance, but causes backlogs and excessive patient waiting time.

- High level collaboration is required. Who in the game is responsible for Emergency patient waiting?
  - Everyone. The market will judge your performance as an organization, not as a department. The “parts” must share an understanding of system goals and what is necessary to make this happen. Work across functional boundaries to achieve them.
    - **Most people do not want you to mess up with their business. Apply EQ.**

Collaboration Ladder

- Share Responsibility
- Jointly Plan
- Treat Peers as Customers
- Communicate Needed Information
- Minimal Communication



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TRUE INNOVATION IS BREAKING OUT AND ADAPTING

- To excel, individuals must consistently collaborate: See they are interdependent contributors to a system and share responsibility for system performance.

- To excel, individuals must consistently innovate: **break out of conventional thinking boundaries to adapt the processes of the system to meet end user needs.**
  - Collaboration without innovation can reinforce the status quo
  - Innovation without collaboration can be harmful to the other parts
  - Collaboration and innovation are only meaningful when driven by performance data