

WHAT IS IT?

What makes employees adopt a particular innovation, practice, or idea? And what makes it more likely for adoption to spread wide in an organization? This paper presents an agent-based model that simulates interactions among employees to analyze the spread of bandwagons. Agents are subject to conformity and peer pressure as well as to a two-level organizational hierarchy. In the model, perceptions of the surrounding environment depend on individual cognitive attitudes (or 'tolerance' to bandwagons), the level of ambiguity attached to social relationships, and organization size. Findings show that the probability of widespread diffusion (i.e., bandwagon) is dependent more on organizational size, conformity, and interactions than ambiguity and individual attitudes.

The simulation models individual adoption based on threshold levels, i.e. the extent to which an individual is willing to jump on a bandwagon.

HOW IT WORKS

The model is set to explore bandwagons as they emerge and evolve within organizations. Agents simulate employees in an organizations and the links represent their working relationships. Red agents have adopted the idea, project, thought, or behavior, hence they are considered to be in the bandwagon. Links to an agent that is part of the bandwagon also turn red, to make this relation visually clearer in the 3D space.

Here is a list of parameters and other aspects that can be manipulated from the control panel.

Switches

managers

If the switch is on then 10% of the agents turn into managers and exercise more influence on the other agents (employees). The agent-manager is noticeable in the 3D space because it has an larger size.

randomize

When this is on then thresholds are randomly attributed to agents. If it is turned off then thresholds equal the agent who number and the model follows a rather deterministic path (this is less interesting).

link-workers

This command allows agents to establish links with each other, depending on the number set in the slider vicinity (see below).

imit.enabler

When this is turned off then agent thresholds change (adjust or evolve) in relation to the parameter K (i.e., cultural conformity), the other agents in range vicinity, and to their original threshold level. If imitation enabler is turned on then a parameter called 'imitation' is part of the equation for the update of agent thresholds. This parameter is attributed randomly to agents and it ranges between zero and one.

Sliders

individuals

This is simply the number of simulated employees in the organization. It ranges from zero to one thousand.

vicinity (proximity)

This is the range that individuals use to look for others to see, observe, and/or imitate.

K

The letter 'K' identifies the extent to which there is cultural conformity in the organization. The number is the same for agents---meaning that they use it the same way (the equation is the same)---but, of course, it has different impacts on agent behaviors depending on their characteristics. The number of the slider is the average conformity that the organization experiences.

Put differently, conformity as an aspect of organizational culture; values close to 0 indicate poor conformity whereas values close to 1 indicate high levels of conformity for agents in the organization.

Starting commands

1. Setup

This button has to be clicked first, to start the simulation.

2. Layout (ambiguity)

This button allows the agents to move smoothly on the 3D space. The simulation would work without clicking it, providing the ground for low ambiguity. When switched on, ambiguity is modeled as random movement of all agents, with (socially) 'close' ones moving together.

3. Go

There are two buttons to start the simulation. One shows you what happens one step at a time while the other gets you automatically through the steps (ticks).

Other relevant variables

docility (k)

Docility attitudes of the agent that is allocated to each agent at time $T = 0$; it leads the process of adaptation for individual thresholds due to internal and external conditions (i.e., position, peers, individual threshold level). All values below 0 and above 1 are respectively 0 and 1.

alpha

Threshold constant used to allocate individual characteristics as initial conditions.

t_a

Threshold of agents; μ is given by the total number of employees in a given organization, N , times the threshold constant, α , and σ is defined as $N \times 0.6 \times \alpha$.

THINGS TO NOTICE

Findings show that bandwagons do not depend strictly on the distribution of thresholds in as much as they are affected by strong organizational culture and management-employee relations. Impact of organizational variables also vary with size.

THINGS TO TRY

I suggest the following with the existing parameters. See differences between 100, 200, 500, and 1000 agents active in the simulation. Also, the most interesting results appear for vicinity/proximity taking values between 4 and 6.

You can see what cultural conformity, K , shows interesting differences when it is 0.1, 0.5, 1, and when it is turned completely off (from the switch).

The impact of management is easily observable by using the switch. It is usually different depending on whether it is exercised in small, medium, or large organizations (defined by the number of agents).

Finally, the layout button can be turned off, and this represents an organization where ambiguity is relatively low.

EXTENDING THE MODEL

Moving forward, this model can be extended with the following:

- additional hierarchical levels
- departments (teams or groups)
- de-escalation of bandwagons

RELATED MODELS

A model replicating what Granovetter describes in his 1978 article:
<http://ccl.northwestern.edu/netlogo/models/community/Bandwagon%202D>

CREDITS AND REFERENCES

Secchi, D. & Gullekson, N. (2015). Individual and organizational conditions for the emergence and evolution of bandwagons. Computational and Mathematical Organization Theory, (pp. forthcoming), accepted Sep 2015