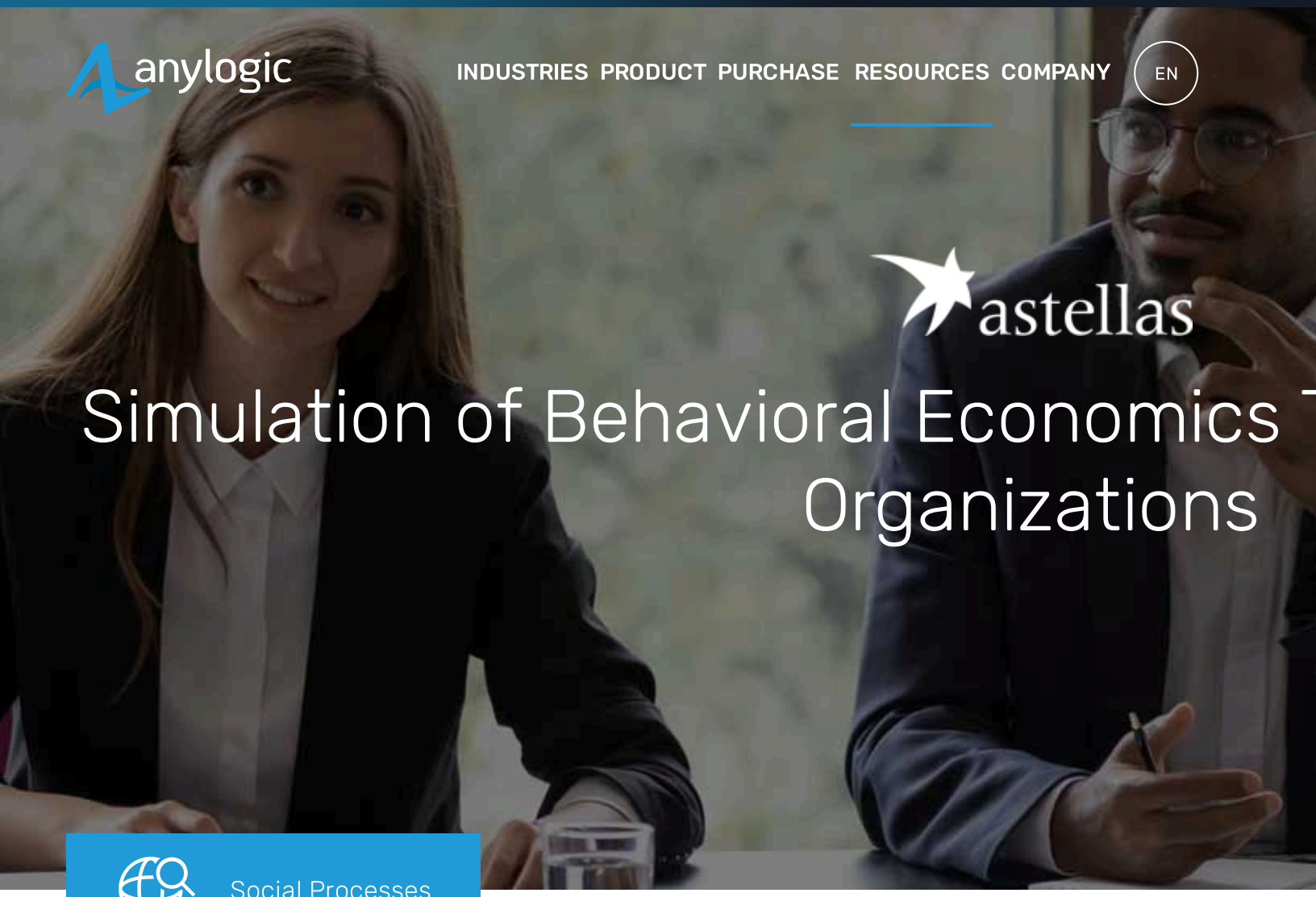


Simulation of Behavioral Economics T Organizations

Social Processes

Classical economic models assumed that people were rational and predictable with well-defined preferences, which enabled them to make decisions. In contrast, behavioral economics is a new method of economic analysis that combines elements of economics and psychology to better understand people's behavior in the real world.

Within this new field, theories such as “Prospect Theory” have emerged. This theory shows that human

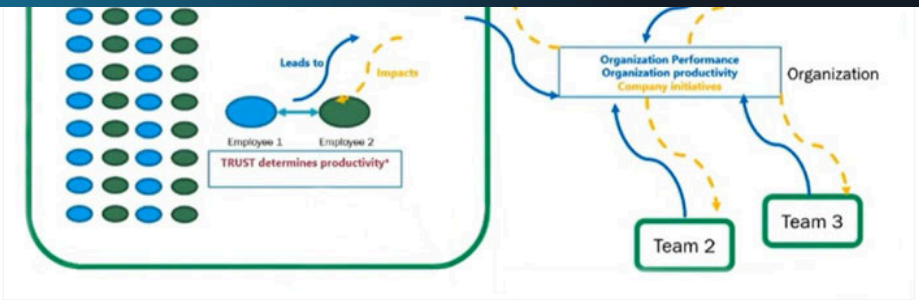
Problem

Organizations consist of people who make decisions which impact the performance of the company. People's rational and irrational decisions create both long-term and short-term effects. In reality an organization is also composed of systems and subsystems. This is where Astellas Pharma used AnyLogic simulation software to combine behavioral economics with system science to generate simulations. These could then help identify what impact people's decision making has on the company's performance.

Solution

In this case study, the researchers applied agent-based modeling to simulate employees. At first, the researchers utilized behavioral economics to determine how the agents (employees) made decisions. After that, they used system dynamics approach to identify any unintended consequences, along with the emerging behavior of the organization.

The model was initially built as a project to help learn to ask the right questions. A large number of these questions related to building trust within teams and the role of psychological safety, along with team productivity and organizational performance. This model looked at the interaction between different teams, how those teams worked within themselves and how they worked in collaboration between different teams.



Agent-based model to evaluate organization's performance

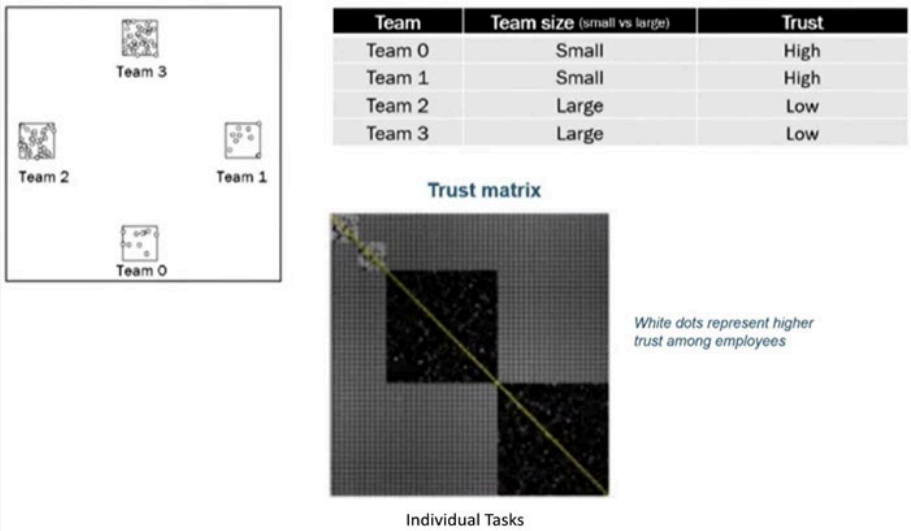
In the model, the researchers could control the size and the number of the teams. With various team sizes, the dynamics of trust developed differently over time. In addition, the nature of the questions asked varied. Some teams worked on research-based approaches where the uncertainty is quite high and the level of success is fairly low, while in other teams, the success was a little bit more predictable. Finally, the researchers of this model looked at how established teams vs new teams played a role in the development of trust over time.

Findings

Initially, the researchers changed the penalty of interacting with people (negative result penalty), applying the behavioral economics model. So, in this first finding, the model showed variation in the productivity of the team, which illustrated that the experiment was working as expected. Following this, more findings could be verified.

changes

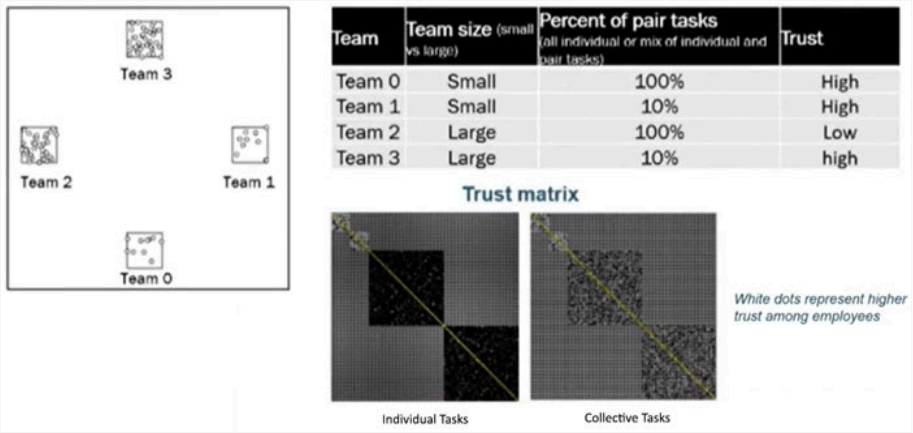
In the second finding, the model sought to answer questions related to team size. If there is a variation in team size, does the trust or productivity change. The results showed that with small teams, trust is extremely high, but as the teams increase in size (for example 50 or 100), the trust drops relatively. Productivity follows the same trend.



Variations in team size can affect the trust between employees (click to enlarge)

The third set of findings dealt with how the type of tasks could affect the interactions amongst the employees. The questions asked were:

- What happens if the teams receive tasks that are either collaborative or individual?
- Does a collaborative task require a lot of trust or do the types of tasks have an impact on trust or productivity?



Percentage of collaborative vs individual tasks affect trust between employees and overall productivity of the team (click to enlarge)

Essentially, paired tasks and larger teams revealed that the trust would be lower and in order to improve productivity, team sizes or the types of tasks should be varied.

Next Steps

This model helped to identify which targets could be changed and if nudges could be created or not. Overall, the model showed some important findings, but as it is still in development there are a number of results that could be shown in the future. Such results include determining optimal team sizes, simulating the impact of bad employees, simulating changes in strategic directions, and even interdepartmental collaborations and cross-communications.

Finally, the model will be able to see any unintended consequences of changes an organization makes as well as improving strategies, structures, and processes

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