Innovation is a team activity

Successful innovation projects include team members who can collaborate across multiple functional areas. How is your supply chain team performing?

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Supply chain management is a team endeavor, and developing an effective operational team is a challenge for any organization. But including innovation in the mix compounds that challenge.

A study conducted last January by the MIT Supply Chain Strategy Lab sheds light on the dynamics of supply chain teams, and the factors that impact their performance. The study indicates that to successfully tackle innovation projects, a supply chain team should be composed of members with the knowledge, visibility, commitment and competence necessary to collaborate across multiple functional areas in the pursuit of shared objectives.

Simulation exercise

The sample for the study was a group of 112 master's students from the MIT Global SCALE Network, an international alliance of supply chain education and research centers, which at the time had four centers in the United States, Europe, Asia and Latin America (the Network has since added two centers in China and Luxembourg). Over a period of three weeks that these students spent at MIT's campus in Cambridge, Mass., they took part in a supply chain simulation known as The Fresh Connection. Students were grouped in teams of four members, chosen by a third party to maximize the diversity of centers represented in each team. The typical team was composed of students from four different centers who had never met each other.

The Fresh Connection simulation revolves around a fictitious company based in the Netherlands that manufactures and sells orange juice. At the beginning of the game the company is operating at a loss, and the mission of the team is to rescue it by making it profitable again. In the simulation, there are four functional positions in the company, focusing respectively on purchasing, operations, logistics and sales.

Each function is helmed by a different student. Although they do have visibility into each other's decisions, each one of these four positions controls only the decisions that correspond to their respective functions. Because there is no fifth position overseeing and coordinating the efforts of the previous four, the members have to find a way to work as a team—as opposed to operating as independent functions—in order to achieve the common goal of maximizing the company's return on investment (ROI).

A total of 28 teams took place in the simulation, each one starting with an identical ROI of negative 8.5%. The teams competed against each other over six rounds—each round more complex than the previous one—to bring their companies back into the black and push their ROIs as high as possible. The simulation was set so that over the first four rounds, separate teams could not affect each other's results: Each company's performance was based on their own decisions. (So, for example, when by the end of the fourth round a given team had actually worsened their company's ROI from -8.5% all the way down to -23.3%, they had nobody to blame but themselves.) The level of realism, however, was increased in the last two rounds, by allowing more successful teams to steal market share from less successful ones.

Research opportunity

In theory, it would have been possible for all teams to end the game with positive ROIs; in practice, only half of the teams managed to bring their companies into the black. By the end of the six rounds, companies in our simulation had ROIs as high as 10.7% and as low as -19.7%, giving us a wide spectrum of performances and the perfect opportunity to test some ideas about what features were common to the better performing teams. Before the last round, the students participating in the exercise were asked to complete (individually) a survey with two dozen questions about the internal dynamics of their team.

The preparation of the survey administered to students in January 2016 actually started four years before. Back in January 2013, the first time The Fresh Connection was used with MIT SCALE Network students, one of the teams went on to manage their supply chain exceptionally well. In-depth interviews were conducted with the members, which suggested some traits that could be behind their success as a team. This preliminary list of traits was expanded during the second time the simulation was run in January 2014 by conversations with members from some of the best performing and worst performing teams of that year's cohort. In January 2015, during the third simulation, a pilot survey including over two dozen questions derived from the insights gleaned from the last two years was administered to that year's cohort. Before administering the survey again in January 2016, the least relevant questions were removed, and a few were added or reworded for clarity. A total of 103 students (out of 112) completed the survey; a response rate above 90%.

Performance ranking

The findings are very interesting. Out of 17 hypothesized relationships between reported traits of the teams and the reported performance of their supply chains, 10 were found to be statistically significant predictors of good performance, at the p=5% level. These are shown in Table 1 below, ranked according to the statistical significance of the relationship between that trait and the performance.

Whereas the amount of time that the team members dedicated to making decisions was found not to be a good predictor of superior performance, the amount of effort that the students gave to the simulation

was strongly correlated with good performance. The study found that having common goals and a figure of leadership were also predictors of superior performance in the supply chains of The Fresh Connection, as were good communication and a team spirit.

However, the five strongest predictors of good performance in the supply chain teams, all of them significant at the p=1% level, were: having an agreed-upon strategy, a good enough understanding by each team member of the challenges of their own function, giving high enough priority to the decision making, having a good capacity for analyzing the problems faced and having a good knowledge of the challenges facing the other functions. This last trait was the single best predictor.

These findings may be especially relevant to those undertaking innovation projects. A clear strategy, sufficient priority, analytical competence and good knowledge of both one's own function and those of others: These are the traits that allowed the student teams in our study to perform better than their peers. They may also be the key factors for making supply chain teams better at facing the challenges of innovation. ⚙️

TABLE 1

Statistically significant predictors of good performance

Rank	Predictor	p-value
10	**Effort:** The team members put a good amount of effort into making each round's decisions.	3.40%
9	**Leadership:** In the team, there was one member that played the role of a leader for decision-making in the round.	3.10%
8	**Common goals:** The team had a set of common goals that were pursued jointly across roles as a team.	2.40%
7	**Team spirit:** In my team, we have a sense of belonging to something.	2.20%
6	**Communication:** The team members communicated well with each other in this round.	1.10%
5	**Strategy:** The team members agreed on a strategy that would be pursued in each round's decisions.	.54%
4	**Own knowledge:** The team members understood the challenges of their own function rather well.	.49%
3	**Priority:** The team members gave high enough priority to making each round's decisions.	.35%
2	**Analytical capacity:** The team members showed a good capacity for analyzing problems.	.05%
1	**Knowledge of others:** The team members understood the challenges of other functions rather well.	.01%

Source: MIT Supply Chain Strategy Lab