

How Swarm Intelligence Integrate Global and Local Insight

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DESCRIPTION

Swarm intelligence is a form of artificial intelligence (AI) inspired by the insect kingdom. In nature, it describes how honeybees migrate, how ants form perfect trails, and the way birds flock. In the world of AI, swarm systems draw input from individual people or machine sensors and then use algorithms to optimize the overall performance of the group or system in real time.

Consider Waze, the favored road navigation app that uses swarm intelligence to make and modify maps. Starting with limited digital maps, it began making tweaks supported its users' GPS data alongside manual map modifications by registered users. Entire cities are mapped using this method, as was the case in Costa Rica's capital, San José. And just as ants signal danger to their counterparts, so too do Waze users contribute live information from accident locations and traffic jams.

Swarm intelligence is now getting used to predict everything from the result of the Super Bowl to fashion trends to major political events. Using swarm intelligence, investors can better predict market movements, and retailers can more accurately forecast sales.

While the swarm intelligence concept isn't new, the advent of edge computing has renewed its impetus. This technology enables greater processing and data storage on local devices rather than big data centers or the cloud. Advances in internet of things (IoT) technologies, machine learning, and 5G also make swarm systems faster and more efficient.

FOLLOWING THE ANT TRAIL TO GROWTH

Ants have a very particular approach to finding a trail to food: Constantly releasing pheromones, they signal their progress to the rest of the collective. Each ant learns from all the opposite ants' experiences, and as a result, each gets closer to a food source. Eventually, the colony identifies the simplest trail supported the feedback of individual ants.

This approach presents a valuable lesson for businesses looking to spot new growth opportunities. Finance is one industry where spotting new growth opportunities before the remainder of the market is crucial. While algorithms can forecast market trends, investment decisions are made in boardrooms, where overpowering personalities and company hierarchies can preclude investors from identifying or pursuing the proper opportunities.

To mitigate such effects, large financial institutions, like hedge funds and investment banks, have employed Unanimous AI's Swarm platform to predict potential market growth areas. Here's how it works: A team of finance experts uses the platform to answer a series of questions on their perceptions of market trends. The key's to watch how other participants, represented by anonymous dots on the screen, answer the questions in real time. Instead of picking the solution supported an easy majority vote, the experts converge on the asset class or market that they believe is probably going to perform best in the next year.

SUCCESS FACTORS OF A SWARM ORGANIZATION

AI swarms need certain conditions to operate successfully: specific goals, the right resources, and a supportive infrastructure, to name a few. For successful swarming:

- A swarm of ants can locate food over a huge area because they're individually focused on one goal. For a corporation, the goal is probably going to be a big area of business performance. Guided by a transparent goal of improving flight turn around, Gatwick was ready to optimize its performance within limited capacity.
- Worker bees can assume different roles counting on the requirements of the hive: collecting pollen, feeding larvae, or making wax. Similarly, swarm systems can help organizations respond flexibly to spikes or dips in demand. In the case of a buildup of passengers, for instance, a swarm system can help airports identify where and when to open up new passenger channels or security lanes.
- Beehives and ant colonies don't exist in silos. They share their knowledge with the remainder of the swarm so it can quickly

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adapt and respond at scale. Similarly, a corporation implementing swarm solutions has got to confirm that it benefits from the various parts of the organization and its ecosystem. For example, in an airport, retail brands, airlines, and government officers all got to operationally support the swarm system.

- While swarm technology are often complex, individual agents act best on simple instructions. A swarm system has got to be simple to know and use. Whether it's choosing the

simplest sweater or predicting flight delays, each member of the swarm needs an easy and clear blueprint to influence.

- Swarm AI should be seen as an aid to worker productivity. As Chacko said, "We want the system to reinforce human judgment, not replace it." An algorithm might tell us that on Friday evenings, an airport is probably going to be crowded with revelers with more potential for disruption, but it's humans who can come up with the creative solutions to manage such risks.