COMPANIES TURN TO INTERNAL CROWDSOURCING TO PICK BEST NEW IDEAS

By Henry Williams

Many companies rely on their senior executives and research-and-development teams to drive decisions around innovation. But now, some organizations are trying a different approach: They are giving rank-and-file employees a bigger say in which projects the companies pursue.

Under the typical R&D model, a team of designers is responsible for developing new products and processes, or improving existing ones. Senior staff may provide direction, but individual employees are often left out of the process—a situation that some say doesn't always deliver the best results.

"Companies began to realize that the R&D department might not be the best predictor of what is a good idea," says Ann Majchrzak, a chaired professor at the University of Southern California's Marshall School of Business.

So some companies are experimenting with internal crowdsourcing, which is modeled after websites like Kickstarter, where inventors and artists pitch their creative projects in the hopes people will fund them. With internal crowdsourcing, employees get to pitch their ideas to managers and colleagues—and collectively decide which projects the company should pursue. Some organizations accomplish this by giving employees virtual money to "invest" in the projects they think are worthy. The projects that attract the most interest are then funded with real money.

The goal is to tap into the pool of unused knowledge from internal innovators, whose ideas can get lost or diluted during a traditional R&D process.

"I have a limited set of knowledge, and yet there are 150 other people in the group that aren't being asked [the] questions," says Adam Siegel, the co-founder and chief executive of Cultivate Labs, a Chicago-based company that offers a platform for internal crowdsourcing. Those employees, he says, may have an innovative idea, which crowdsourcing can help find.

Canadian Nuclear Laboratories, an Ontario, Canada-based nuclear science and technology organization, is among those experimenting with crowdsourcing.

"We wanted a simple way to inspire people" and engage with them about their ideas, says Dana Hewit, CNL's chief R&D operations officer. CNL worked with Cultivate Labs last year to set up a platform through which employees could submit ideas. Each project was limited to a request of $100,000 in funding. Within three weeks, CNL received 38 proposals.

The projects included proposed solutions to technical problems, inventions and workflow improvements. One idea was to create a 3-minute "elevator pitch" for researchers who struggle to describe their work to nontechnical audiences. The project was named "3-minutes to impact"—dry humor for a nuclear-research organization.

Once the ideas were vetted, CNL sought input from employees across the company, giving each eligible staff member $5,000 in virtual money to "invest" in the projects they liked best. The projects that received the most bids and met their investment targets were allocated a real budget and developed further. Some at CNL were initially skeptical of the program, says Ms. Hewit, but when the winning projects were actually funded it generated enthusiasm for this year's program.

"Twenty of [the projects] were fully funded," says Ms. Hewit. CNL just launched the seed for this year, she says, and received 25 to 30 ideas by the fourth day.

Some companies, such as U.K.-based drug company **Astra-Zeneca**, are using internal crowdsourcing to develop small projects, while keeping their main R&D process intact.

"It's good to do both," says Cristina Duran, vice president of transformation in AstraZeneca's R&D department, adding that crowdsourcing helps engage people within the organization on change.

AstraZeneca recently solicited ideas from employees around various themes.

One idea centered on a very mundane but time-consuming problem—the distribution of safety letters to drug-trial participants. The company sends 70,000 such letters a year and needs to get acknowledgments from recipients for every single one. The project digitized the process, helping to create an automated audit trail.

"It's quite simple to automate," says Ms. Duran. "But it was something that hadn't come up."

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A Clearer Crystal Ball

By Paul J. Davies

With agent-based modeling, companies can better predict how consumers and investors interact with each other

E.W. Scripps Co. had a big year in 2018 for political advertising on its network of local TV stations. Its new approach to political-ad sales helped to nearly double its revenue in the sector versus the previous midterm elections in 2014.

Behind these gains was a form of market analysis called agent-based modeling, which can show how all sorts of different people or companies or investors interact with each other and might react to things that happen to them. It helped E.W. Scripps advise political-campaign managers on how to get the best bang for their buck, and it's helping a growing number of other companies understand their markets.

"We aim to simulate how consumers make decisions," says Dejan Duzevik, chief product officer at Concentric Inc., a Cambridge, Mass.-based modeling company that helped E.W. Scripps. "Lots of companies are doing this to see if they can bring new consumers into their market." Concentric's clients have included **Microsoft** Corp., Toyota Motor Corp. and Whirlpool Corp., as well as advertising companies like **Havas**.

Agent-based modeling also has a growing role in finance and regulation, particularly as a way of understanding how crises and panics cascade through markets—things that are missed by traditional, simplified economic models.

Traditional economics and market analysis average out the differences among individuals to arrive at a representative of the group, who is typically expected to act rationally. This creates elegant models that can produce simple answers for researchers—and simple predictions of what people will do. However, like a map drawn crudely, traditional models are useful for some purposes but fail to match reality at a finer resolution. In contrast, agent-based models can represent many different kinds of individuals with a wide variety of desires and needs at the same time, and offer a wide range of possibilities of how they will act, which is much more realistic. But with realism comes complexity and predictions that are often less specific.

Crisis testing

Financial regulators are running these sorts of models to see how crises spread—how quickly and how far a shock in one market or asset class can spread to other parts of the financial system. They try to identify weak points in the financial system—for example, in banks, clearing houses or money-market funds—and then test regulations or policies that could bolster those weak points and make the financial system more resilient.

Richard Bookstaber, a financial-risk manager, academic and author who built such a model for the U.S. Treasury after the 2008 global financial crisis, says agent-based modeling works well for financial crises because at those times investors and traders become more risk averse, which compels them to follow rules of behavior that are easier to discern.

These models aren't new, but in the past their use was limited by the extremely high number of calculations they perform. The computing power needed to quickly perform those calculations has only become accessible inexpensively in recent years through cloud computing. The growing amount of data collected also has helped make agent-based modeling a much more commercially viable tool.

All this is possible because enormous computing power has become widely available with the growth of cloud computing in recent years. Andrew Skates, founder of Sandtable, a London-based modeling company, says that when he started in 2009, he would run models on a series of laptops linked together. "Over a weekend, we would get 50 hours of computer time on 10 cores [processors], which is 500 computer hours," he says. In a recent week, "we did a run that was 50,000 computer hours, and that's not even large for us."

Political choices

Michael O'Brien, vice president of distribution at E.W. Scripps, says agent-based modeling allows the company to test the impact on voters of events like news stories, political rallies, security scares or even the weather. The model is built on multiple sets of data such as audience ratings for TV shows, social-media volumes, public and private polling and other information to build a picture of attitudes among the voters in a particular race.

Mr. O'Brien says the agent-based model produces much better predictions than traditional polling alone about the most effective ways to encourage voters to back a candidate. "Campaign managers tell us who they want to target, and we can say where are the best opportunities to target those voters and how to get the best conversion rates," he says.

Beyond politics, agent-based models are being more widely used by advertising and consumer-products companies to generate predictions about what certain advertising messages or pricing strategies will push a company's rivals to do, as well as how they will affect opinions and choices among consumers.

One of the strengths of this modeling is that it produces a range of probabilities rather than a simple prescription for how to proceed. David Teague, portfolio head for data analysis and products at British Broadcasting Corp., says agent-based models don't exactly forecast the future, but they do let you explore what could happen in a complex system that keeps changing.

The BBC, Britain's taxpayer-funded broadcaster, is developing a model to test how different mixes of TV programs will appeal to different segments of the audience. Because the company is publicly funded, it has public-service duties—and has to ensure taxpayers' money is spent to the widest possible benefit.

Like all models, Mr. Teague says, agent-based ones can only ever be something that helps inform decision making rather than making decisions for you. "It's a balance of 'This is going to help me' versus 'This is going to answer everything for me,' " he says. "With anything, once you think it will answer everything for you, that's when you come unstuck."

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Cloud computing has increased the power of agent-based modeling, which has a growing role in finance and regulation.