How Emotion-Sensing Technology Can Reshape the Workplace
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become comfortable with the gathering and analysis of physiological, behavioral, and emotional data. Although this won't happen overnight, several trends suggest that trust can be built over time. Millions of individuals already use smart watches and fitness devices like Apple Watches and Fitbits, and many people share their workout and nutrition data openly on social media. Social media itself has conditioned us to accept and even embrace new levels of personal transparency. The challenge will be to introduce new devices and measures into workplaces in a way that empowers performance, mitigates privacy concerns, and generally reassures employees that the benefits are mutual.

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[SOCIAL MEDIA]

The Secret to Successful Knowledge Seeding

A sophisticated online user community will relieve companies of huge support burdens. Building such a network begins with a smart approach to seeding it with expert knowledge.

BY PENG HUANG, ALI TAFTI, AND SUNIL MITHAS

Online user communities can help harness the knowledge and collective wisdom of a company's customers and complementors around the globe. These networks can gather input for new product development, reduce the cost of customer support, and facilitate the sharing of platform-related knowledge and practices. But how should companies best establish and manage them?

SAP SE, a leading enterprise software company with headquarters in Walldorf, Germany, was among the earliest companies to unlock the potential of social media to address the need for customer engagement and support. Realizing that it could not keep up with the demand for customer support through its traditional in-house channels, it established the SAP Community Network in 2003 to let partners, customers, and solution providers help one another. This virtual community includes a network of well-defined online forums in which users can post questions on a wide range

of topics related to the implementation, customization, and use of SAP's software; peer members can respond by providing potential solutions. The network also offers expert blogs, a technical library, a code-sharing gallery, e-learning catalogs, wikis, and other tools that support open communication between active members of the community.

Getting a peer-to-peer knowledge-sharing platform off the ground is not easy, however. Online support forums have two distinct segments of community members: those who seek product support and those who provide it. Knowledge seekers are hesitant to ask questions if knowledge contributors are few and far between, and knowledge contributors will not sign up if there are not enough problems to solve. It is a classic chicken-or-egg challenge. To address this, SAP adopted a strategy that involves what we call "knowledge seeding" — in which a company asks employees to provide free technical support by answering questions posted in discussion forums. The high-quality content provided by SAP employees gave the forum the jump-start it needed, attracting more users seeking solutions, which, in turn, enticed more knowledge contributors to get involved.

Our study of SAP's virtual community has helped to answer several critical questions that almost all platform businesses face. What is the payoff from the knowledge-seeding strategy in terms of engaging ecosystem members and nurturing a knowledge platform? More importantly, how should companies allocate their limited seeding efforts over time and across geographies for optimal outcomes? Our analysis of the history of the forum discussions in the SAP Community Network over a period of seven years generated several key insights. (See "Related Research.") While our research focused on platform ecosystems specifically, our findings are also applicable to online user communities more broadly.

RELATED RESEARCH

▶ P. Huang, A. Tafti, and S. Mithas, "Platform Sponsor Investments and User Contributions in Knowledge Communities: The Role of Knowledge Seeding," MIS Quarterly 42, no. 1 (March 2018): 213-240.

The Payoff From Knowledge Seeding

SAP committed significant human resources to seeding knowledge in its forums. More than 9,000 SAP employees participated directly in forum discussions, and about 11% of all the resolved questions were answered by SAP employees.

SAP's knowledge-seeding strategy worked well. We found a high correlation between its knowledge seeding and the growth of its community user base. More importantly, we found that every question solved by SAP employees leads to an additional 0.66 questions solved by community users beyond their usual peer-to-peer support activities.

We attribute these positive effects of knowledge seeding to two factors. First, knowledge seeding helps to build trust between community members and the community sponsor, and therefore increases community users' inclination to contribute knowledge. By committing to free technical support, the company shows that it genuinely cares about the well-being of its community members. For their part, community members view this commitment as a signal of the company's integrity and are therefore encouraged to contribute knowledge to the virtual community.

Second, knowledge seeding leads to an increase in community members' capacity to contribute knowledge. Generating new knowledge, particularly in a community context, is an incremental and cumulative process that hinges on users' domain expertise and their ability to discover existing knowledge, recombine ideas shared by peer members, conduct independent investigations and experiments, and find novel solutions. When the community sponsor makes knowledge investments to seed the community, users can relate that information to their own experiences and recombine it with their existing knowledge to generate new ideas, increasing their capacity to make their own knowledge contributions to the community.

Returns on Knowledge Seeding Vary Over Time

Knowledge seeding is valuable, but not all such efforts are equally valuable. One key variable is timing. We find the amount of user knowledge contribution stimulated by knowledge seeding decreases as the community matures. (See "The Effect of Knowledge Seeding Over Time.") The returns on the seeding of one SAP-solved question fell dramatically from 1.32 user-contributed solutions in 2004, the year the community network was launched, to about 0.68 in 2007, and to nearly zero by 2010. This suggests that platforms and other companies are better off making large investments up-front to kick-start the community, and gradually reduce their investments as the community gains traction.

THE EFFECT OF KNOWLEDGE SEEDING OVER TIME

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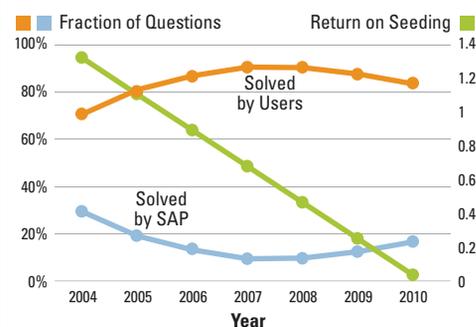
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We attribute the variations in returns over time to the role played by the lead users in the knowledge community. Lead users distinguish themselves in several respects: They tend to be early adopters of a product or service; they are more likely to innovate; and they experience needs ahead of the mass market. They usually have up-to-date knowledge related to the practice in question and thus are more likely and able to contribute knowledge.

In its early stages, a knowledge community attracts a disproportionately large fraction of lead users. Knowledge seeding is thus likely to stimulate stronger responses from them and generate a higher rate of return. However, when the community reaches a more mature phase, it contains a smaller fraction of lead users and a larger fraction of late adopters, who have lower contribution capacities. This leads to reduced average user knowledge contribution in response to knowledge seeding. The value of knowledge seeding in the mature phase may also be lower because many answers already have been provided in the earlier phases.

Returns on Knowledge Seeding Vary by Geography

Just as timing is a key factor in gaining the highest returns on knowledge seeding, so is location: The value of knowledge seeding is not uniform across geographies. For example, although Singapore is a small country that didn't receive a huge amount of SAP attention in its knowledge seeding, users from Singapore contributed a great deal of knowledge themselves (Singapore ranked No. 9 among all the countries for its user knowledge contribution).

Upon further investigation, we found that SAP's knowledge seeding yielded higher returns in countries with higher levels of information technology (IT)

infrastructure, as measured by the number of secure internet servers per million people. (See "The Return on Knowledge Seeding Across Countries.") Returns on seeding varied dramatically, ranging from a low of 0.28 user-contributed solutions in countries with the lowest level of IT infrastructure to 1.29 in countries with the most sophisticated IT infrastructure.

We argue this geographic difference is driven by variations in IT-enabled absorptive capacity: the ability to identify, assimilate,

THE RETURN ON KNOWLEDGE SEEDING ACROSS COUNTRIES

Knowledge seeding yields higher returns in countries with higher levels of IT infrastructure.

Return on Seeding

Percentile Ranking of Country IT Infrastructure
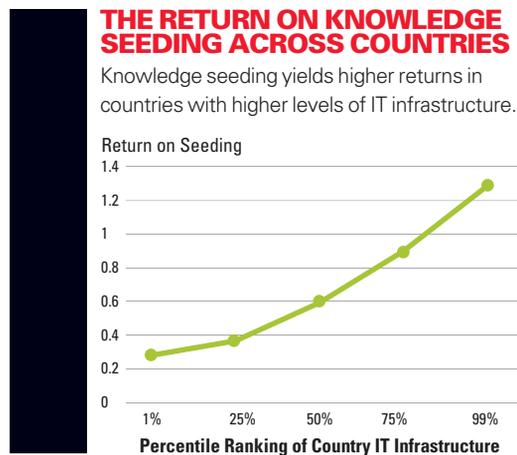
transform, and apply external knowledge. A country's IT infrastructure is an important determinant of the collective absorptive capacity of its community user population; the user population from a country with a higher level of IT infrastructure is better at recognizing the value of new knowledge seeding by SAP employees and then assimilating it and putting it to productive use. Singapore's IT infrastructure ranks above 88%. The knowledge bases of countries with higher levels of IT infrastructure grow at a faster rate when new knowledge is injected, resulting in a higher knowledge contribution capacity of community users from those countries.

Managing Value Cocreation Through Knowledge Seeding

Our research highlights at least three important lessons for companies developing

virtual communities: Seed knowledge strategically, focus on lead users, and consider IT infrastructure limitations.

1. Seed content to ignite creativity among users. Knowledge seeding is particularly effective when companies are introducing new products or technologies that have significant learning curves. By providing free early support, companies help users overcome learning hurdles and accelerate community engagement in building a knowledge repository. While we focused here on free technical support, other resources are equally important, particularly when the underlying technology requires high levels of customization and adaptation. For example, in the case of software platforms, providing detailed documentation on the application programming interfaces (APIs) in the form of tutorials or sharing source code of sample programs can help ignite creativity among users. Such knowledge seeding encourages the user community to share its experience and knowledge by enhancing members' willingness and capacity to contribute knowledge.

2. Implement a contribution recognition program to identify lead users. Companies should pay primary attention to lead users, who tend to have up-to-date knowledge about the products and are the most active contributors. Implementing a contribution recognition program can quantify community members' knowledge contributions and help identify lead users. A company can then target lead users strategically by addressing their most pressing questions and issues, and it can rely on their support to help the larger community. While SAP adopted a program that rewards contributions with virtual points, badges, and medals, other platforms have used monetary rewards: For example, technology company Google Inc. used a seeding strategy by giving $10 million in prizes to developers of the best apps in several categories in the early stages of its Android platform.

3. Consider IT infrastructure across geographies. When expanding internationally, especially in less-developed countries, companies should be aware of IT infrastructure limitations that might hinder the ability of user groups in some countries to absorb the related knowledge. Companies should also realize that providing free technical support to users in these countries is more costly because it stimulates less user cocreated value. In some cases, there may be opportunities to work with local policymakers to increase public-sector investments in country-level IT infrastructure. This would enable better capitalization on knowledge investments by platforms, which in turn can produce positive spillover benefits in these economies. The launch of Google Station — a project to develop free public Wi-Fi hotspots in emerging markets such as Indonesia through partnerships with local railway authorities — is an excellent example of such initiatives.

Details of particular initiatives aside, successful knowledge-seeding strategies share several traits in common in spurring the development of virtuous two-sided markets for problem-solving and customer engagement. Companies are better off making seeding investments aligned to the launch of new products and services by focusing on lead users and — initially — by focusing on geographies with better IT infrastructures.

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