



By C.K. Prahalad and Venkat Ramaswamy

CONTENTS

The Future of Competition *Pages 2, 3*

Escaping the Past Page 3

A New Frame Of Reference For Value Creation Pages 3, 4, 5

The Call Center Opportunity Page 5

The Experience Environment *Pages 5, 6, 7*

Co-Shaping Expectations *Page 7*

The New Theory Of Strategic Capital *Pages 7, 8*

Co-Creating Unique Value With Customers

THE FUTURE OF COMPETITION

THE SUMMARY IN BRIEF

In a world of infinite choice, instant gratification, and unbounded opportunities for innovation, why, ask University of Michigan Business School professors C.K. Prahalad and Venkat Ramaswamy, are companies still unable to satisfy customers or sustain growth and profitability?

The answer lies in the evolving role of the customer — from passive recipient to active co-creator — in the value creation process. No longer do customers receive value through the purchase of products and services alone. Instead, individual customers are interacting with a network of firms and consumer communities in order to satisfy their unique preferences — and the value they obtain comes from the sum total of those personal experiences.

To compete in this developing marketplace, companies must fundamentally alter their value creation infrastructures. They make information and operations transparent and accessible to all collaborators, and transform their interactions with customers from transactions to meaningful dialogues. For their part, customers must be able to understand and assess all the risks, as well as the rewards, of the choices they make.

Exploring the issues that will shape strategy for years to come, the authors reveal what organizations must do to co-create value in the future.

What You'll Learn In This Summary

The consumer and the firm are intimately involved in jointly creating value that is unique to the individual consumer and sustainable to the firm. This summary's purpose is to help your company:

 \checkmark Break out of its old entrenched ways and discover new methods for creating strategic capital.

 \checkmark To recognize the limitations of what it knows — its *zones of comfort* — and identify and occupy new *zones of opportunity*.

 \checkmark To understand how today's industrial system is morphing and evolving and how it will change the way it will compete in the future.

 \checkmark To understand the new value paradigm, in which the firm and the consumer co-create value at points of interaction and can no longer act unilaterally.

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THE FUTURE OF COMPETITION

by C.K. Prahalad and Venkat Ramaswamy

- THE COMPLETE SUMMARY

The Future of Competition

In 1999 and again in 2000, one of us taught an M.B.A. course called "Emerging Issues in Strategy." Its basic premise was straightforward: The old, established corporations (let's call them "A-type" firms) would not disappear. The new, energetic dot-coms ("B-type" firms) would not necessarily survive. A new class of firms ("C-type") would emerge, signifying a morphing and evolving of both the A-type incumbents and B-type startups.

In the conventional realm of A-type and B-type firms, almost all of the work has centered on the firm. But, what if the individual consumer (whether in an enterprise or a household) were at the center, and not the firm? What if we spoke of "consumer-to-business-toconsumer" (C2B2C) patterns of economic activity?

We challenge the traditional notion of value and its creation, namely that firms create and exchange value with consumers. We believe that, increasingly, the joint efforts of the consumer and the firm — the firm's extended network and consumer communities together — are co-creating value through personalized experiences that are unique to each individual consumer.

The Changing Role of the Consumer

The emerging reality is forcing us to reexamine the traditional system of company-centric value creation that has served us so well over the past hundred years. We now need a new frame of reference for value creation. The answer, we believe, lies in a different premise centered on co-creation of value. It begins with the changing role of the consumer in the industrial system — from isolated to connected, from unaware to informed, from passive to active. The impact of this new consumer role is manifest in many ways:

Information Access: With access to unprecedented amounts of information, knowledgeable consumers can make more informed decisions.

Global View: Consumers can also access information on firms, products, technologies, performance, prices and consumer actions and reactions from around the world.

Networking: "Thematic consumer communities," in which individuals share ideas and feelings without regard for geographic or social barriers, are revolution-

izing emerging markets and transforming established ones. The power of consumer communities comes from their independence from the firm. Thus, consumer networking inverts the traditional top-down patterns of marketing communications.

Experimentation: Consumers can also use the Internet to experiment with and develop products, especially digital ones.

Activism: As people learn, they can better discriminate when making choices; as they network, they embolden each other to act and speak out.

What is the net result of the changing role of consumers? Companies can no longer act autonomously, designing products, developing production processes, crafting marketing messages, and controlling sales channels with little or no interference from consumers. The use of interaction as a basis for co-creation is at the crux of our emerging reality.

The Emerging Reality of Value Creation

Let us examine the changing dynamics of interaction between a consumer and the firms that participate in the wellness space. Twenty years ago, doctors thought they knew how to treat me, and since I wasn't a physician myself, I probably agreed. Similarly, most businesses figured they knew how to create customer value — and most customers agreed.

(continued on page 3)

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The Future of Competition

(continued from page 2)

Now the health care process is far more complex. I can investigate alternative treatments for my condition and develop an opinion about what might and might not work for me. Ultimately, I can cut my own path through the wellness space, thereby constructing a personal wellness portfolio. As a health care consumer, I can more actively determine the "value bundle" that is appropriate for me, cutting across customary industry boundaries.

Let's move beyond doctors and patients. What if consumers inappropriately use or modify your products and then hold you responsible for any resulting damage? Increasingly, consumers seem to want power without accountability. They want to choose for themselves but not be liable for the consequences of their choices. But no matter how the future unfolds in terms of the roles, rights and responsibilities of companies and consumers, companies *will* have to engage consumers in co-creation of value.

Thus, when we amplify the weak signals reverberating in the wellness space and scrutinize consumer-company interactions, we glimpse the emerging reality of the active involvement of consumers, whether as thematic communities or as informed individuals. This fundamentally challenges two deeply embedded, traditional business assumptions: (1) that any given company or industry can create value unilaterally; and (2) that value resides exclusively in the company's or industry's products and services.

Co-Creation of Value

The new value creation space is a competitive space centered on personalized co-creation experiences developed through purposeful interactions between the consumer and a network of companies and consumer com-

The 21st-Century Paradox

Our industrial system is generating more goods and services than at any point in history, delivered through an ever-growing number of channels. Supermarkets, boutiques, online retailers and discount stores proliferate, offering thousands of distinct products and services. The burgeoning complexity of offerings, as well as the associated risks and rewards, confounds and frustrates most timestarved consumers. Product variety has not necessarily resulted in better consumer experiences. For managers, the situation is no better. Thus, the paradox of the 21st-century economy: Consumers have more choices that yield less satisfaction; managers have more strategic options that yield less value.

Escaping the Past

Traditional business thinking starts with the premise that the firm creates value. Employees focus on the quality of the firm's products and processes, potentially enhanced through internal disciplines, such as Six Sigma and Total Quality Management. Innovation involves technology, products and processes. Matching supply and demand has long been the bedrock of the value creation process.

The co-creation experience depends highly on individuals. Each person's uniqueness affects the cocreation process as well as the co-creation experience. A firm cannot create anything of value without the engagement of individuals. Co-creation supplants the exchange process.

munities. In this space, value lies in the co-creation experience of a specific consumer, at a specific point in time, in a specific location, in the context of a specific event.

In the conventional value creation process, companies and consumers had distinct roles of production and consumption. Products and services contained value, and markets exchanged this value, from the producer to the consumer. Value creation occurred outside the markets. But as we move toward co-creation, this distinction disappears. Increasingly, consumers engage in the processes of both defining and creating value. The co-creation experience of the consumer becomes the basis of value.

In the emerging reality, the patterns of interaction between the consumer and the firm will shape the value creation process, challenging existing ways of doing business and creating value. Simultaneously, they create tremendous new opportunities. The future of competition lies in an altogether new approach to value creation, based on an individual-centered co-creation of value between consumers and companies. To see this future, we must escape the past. ■

A New Frame of Reference For Value Creation

If the new starting premise is that the consumer and the firm co-create value and the co-creation experience is the very basis of value, managers must attend to the quality of co-creation experiences, not just to the quality of the firm's products and processes. Quality depends on the infrastructure for interaction between companies and consumers, oriented around the capacity to create a variety of experiences. Eventually, the roles of the company and the consumer converge toward a unique cocreation experience, or an "experience of one."

(continued on page 4)

A New Frame of Reference For Value Creation

(continued from page 3)

Notice what co-creation is not. It is neither the transfer nor outsourcing of activities to customers nor a marginal customization of products and services. Nor is it a scripting or staging of customer events around the firm's various offerings. The change we are describing is far more fundamental. It involves the co-creation of value through personalized interactions that are meaningful and sensitive to a specific consumer. The co-creation experience, not the offering, is the basis of unique value for each individual. The market begins to resemble a forum organized around individuals and their co-creation experiences rather than around passive pockets of demand for the firm's offerings.

In the emergent economy, competition will center on personalized co-creation experiences, resulting in value that is truly unique to each individual.

DART — The Building Blocks of Co-Creation

The four building blocks of co-creation are dialogue, access, risk assessment, and transparency.

• *Dialogue* encourages not just knowledge sharing but even more important, qualitatively new levels of understanding between companies and consumers. It also allows consumers to interject their views of value into the value creation process.

• *Access* challenges the notion that consumers can experience value only through ownership. By focusing on access to experiences at multiple points of interaction, as opposed to simply ownership of products, companies can broaden their business opportunities.

• *Risk assessment* assumes that if consumers become co-creators of value with companies, then they will demand more information about potential risks of goods and services — but they may also bear more responsibility for dealing with those risks.

• *Transparency* of information is necessary to create trust between institutions and individuals. Companies have traditionally benefited from an information advantage in the marketplace, but that asymmetry between the firm and the consumer is rapidly disappearing.

Creating New Capabilities With DART

Combining the building blocks of transparency, risk assessment, access and dialogue enables companies to better engage customers as collaborators. Transparency facilitates collaborative dialogue with consumers. Constant experimentation, coupled with access and risk assessment on both sides, can lead to new business models and functionalities designed to enable compelling co-creation experiences. Even conventional companies, such as Sony, now engage in collaborative dialogues with consumers, who helped co-develop Sony's PlayStation 2. From Intel to Microsoft to Nokia, companies are enlisting consumers in the shaping of new technologies that range from Web-enabled devices and networking software to cellular phones. Consumers contribute to the debate, both technically and in terms of their expectations and views of value. In doing so, they are co-shaping the future. When companies combine the four building blocks in different ways, they create new and important capabilities.

Beware the Zones of Comfort

Most managers are reluctant to let go of familiar practices and tools — their zones of comfort. The result is an emerging tension between the traditional "company think" and the emerging "consumer think."

Like all humans, business managers are socialized into a dominant logic — that is, they are shaped by the attitudes, behaviors and assumptions they learn in their business environments. Unfortunately, most managers seem to forget that they are also consumers. Their thinking is conditioned by managerial routines, systems, processes, budgets and incentives created under the traditional framework of value creation. They focus on technology road maps, plant scheduling, product quality, cost reduction, cycle time, and efficiency. Unsurprisingly, opportunities for interaction with consumers are approached in a similar fashion.

Simply understanding the framework of co-creation does not suffice in the effort to escape our zones of comfort. We must explicitly recognize how deeply etched ways of thinking limit our ability to shift into cocreation mode.

Most managers implicitly assume that their physical product — the digital camera, for example — is the vessel of value. They rarely consider the aspirations, frustrations and wishes of the heterogeneous group of consumers who experience their product or service. Instead, they focus on the efficiency of production and logistical systems or on advanced technology for its own sake. Misled by company think, they clutter the marketplace with products that are feature rich but experience poor. Meanwhile for the consumer, "technology convergence" can often create "experience divergence."

The disconnect between consumer think and company think is not new. However, as we move toward co-creation, this disconnect becomes more pronounced at *points of interaction*, those intersections where choice is exercised and the consumer interacts with the firm to create an experience.

(continued on page 5)

For Additional Information on examples of DART in action, go to: <u>http://my.summary.com</u>

A New Frame of Reference For Value Creation

(continued from page 4)

Dimensions of Choice

Dialogue, access, risk assessment and transparency — DART — form the foundation for co-creation of value, but these factors alone may not produce compelling experiences in co-creation. We also must pay close attention to the *dimensions of choice* in consumer-company interaction. These condition the co-creation experience. We have identified four such dimensions:

• Consumers want the freedom of choice to interact with the firm through a range of experience gateways. Therefore, the firm must focus on the co-creation experience across *multiple channels*.

• Consumers want to define choices in a manner that reflects their view of value. Therefore, the firm must provide experience-centric *options* that reflect consumer desires.

• Consumers want to interact and transact in their preferred language and style. They want quick, easy, convenient and safe access to experiences. Therefore, in consummating individual choices, the firm must focus on the co-creation experience through *transactions*.

• Consumers want to associate choice with the experiences they are willing to pay for. They want the price of these experiences to be fair. Therefore, the firm must focus on the totality of the *price-experience relationship* in the co-creation.

The Price-Experience Relationship in Co-Creation

The over-arching dimension of choice in co-creation experiences is the price-experience relationship. This is the critical intersection of price and the co-creation experience, where consumers judge economic value.

Witness how Federal Express enhanced the priceexperience relationship. Its customers, both shippers and receivers, can log on and check the progress of packages in real time, viewing the same information that FedEx employees have. While this system has reduced the burden on FedEx call centers and trimmed costs, it simultaneously allows for an individual-centric view of interactions. Just knowing a package's whereabouts can reduce customer anxiety. The transparency of the system gives individuals choices otherwise unavailable and thereby enhances the co-creation experience and the totality of the price-experience relationship.

Businesses have typically associated price with cost and often set prices based on the company's cost structure. This traditional methodology is becoming increasingly problematic, because it has little meaning to the consumer. The experience associated with a product or

The Call Center Opportunity

The ubiquitous call center is an excellent example of "company think" vs. "consumer think." The company call center represents a unique opportunity for interacting with the consumer. A well-run call center can transform a consumer's experience from negative to positive, not only by solving problems and answering questions but by offering entirely new ways to enjoy the product or service. Yet most firms squander the opportunity by establishing automated call centers, manned by inexperienced, narrowly focused operators whose productivity is measured in terms of calls handled per hour - not the quality of the consumer experience. The managers who develop these systems mean well. They are simply applying the customary management techniques. But most consumer experiences with call centers are unpleasant, irritating — and potentially disastrous.

service, and therefore its associated value, varies from one consumer to another. A gadget-loving techie may buy a digital camera just to experiment with new technology. A parent may buy it to capture her child's first steps, a different experience. A small business owner may buy it to record images of inventory for insurance coverage, still another experience. The cost of producing the cameras may be the same, but each camera's value varies from consumer to consumer.

When determining a consumer's "willingness to pay," managers conventionally focus on what they can offer customers in isolation from the experiences they desire. A pricing system that recognizes the existence of experience-based value begins to reflect the nature and quality of heterogeneous consumer experiences.

For Additional Information on how the brokerage industry has been transformed by co-creation across multiple channels, go to: <u>http://my.summary.com</u>

The Experience Environment

We need a generalizable view of the co-creation process that can accommodate large numbers of consumers of varying interests, skill levels, needs and desires. To accomplish this, we need an *experience environment* — a framework that allows the firm to facilitate a variety of co-creation experiences with millions of consumers.

We need to understand that when an experience environment is sufficiently compelling, consumer communities can evolve beyond the firm's control and potentially without the firm's knowledge. Suddenly, whole communities of individuals can directly co-create value.

The Experience Environment

(continued from page 5)

On the positive side, these consumer communities can serve as multipliers for in-house R&D efforts. Managers whose firms have met the preconditions for effective cocreation can use them to augment their creative resource base. On the negative side, enthusiastic, but untrained and unrestrained, consumers can unwittingly ruin other customers' experiences without liability for quality or safety, thereby tainting the company's reputation.

Regardless of a manager's preference, consumer communities will form whenever an experience environment lets them, and they will influence consumer experiences in unpredictable ways. More fundamentally, the role of consumer communities evolves and cannot be predicted *a priori*. As a result, the firm is forced to concentrate on innovating experience environments with consumer communities — environments within which consumers, individually as well as collectively, can co-construct their own experiences. We call this new challenge *experience innovation*.

Experience Personalization

To co-create unique value with customers, we must appreciate what constitutes a *personalized* co-creation experience. The co-creation experience springs from the interaction between a single consumer and an experience environment. Our goal is to create an experience environment that accommodates not just the individual, but *how the individual changes in relation to space, time and events.* Designing an experience environment in which many heterogeneous consumers can enjoy truly personalized co-creation experiences is by no means trivial.

Delta Air Lines, for example, has rolled out information systems that let passengers access information previously available only to gate agents, such as the realtime progress of flights, seating status, and upgrade and standby lists. This transparency can reduce passenger anxiety and gate agent job stress. This example conveys the basic dimensions of an experience and its personalization: events, context, individual involvement and personal meaning.

Events form the basis for experiences. An event is a change of state in space and time that affects one or more individuals. Context is the space and time in which an event occurred. Individual involvement is the form and level of the individual's participation in the event. Personal meaning is the knowledge, insights, enjoyment, satisfaction and excitement that the individual derives from the event. These four dimensions — events, context of events, individual involvement and derivation of personal meaning — put the individual at the heart of a co-creation experience.

Designing Experience Environments

We can develop a broad specification for designing an experience environment. At a minimum, the experience environment must:

✓ Offer opportunities for consumers to coconstruct their own experiences on demand, in a specific context of space and time.

✓ Accommodate a heterogeneous group of consumers, from the very sophisticated and active to the very unsophisticated and passive.

Recognize that every consumer (including the active, smart consumer) does not always want to co-create; sometimes he or she just wants to consume.

✓ Facilitate new opportunities afforded by the evolution of emerging technologies.

✓ Accommodate the involvement of consumer communities.

 \checkmark Engage the consumer emotionally and intellectually.

Explicitly recognize both the social and the technical aspects of co-creation experiences.

Migrating to Experience Networks

The following are some of the key points and organizational challenges in building an *experience network* — the infrastructure for effectively co-creating value through personalized experiences:

• The company must facilitate the continuous cocreation of experiences at points of interaction. We must view products, distribution channels, technologies and employees as experience gateways.

• The experience environment should be oriented around the experience space, allowing consumers to initiate experiences on demand.

• Accommodating consumer heterogeneity is crucial. The company must understand its various sources and forms as well as its implications for co-creating unique experiences.

• The experience network should provide consumers with various levels and forms of access, mechanisms for dialogue with the company and other customers, and ways to manage risk.

• The logistics infrastructure should link closely to the experience environment, balancing the customer's desire for access with the company's desire for control. To win the customer's trust, a significant level of transparency in the company's information infrastructure is required.

• Managers need the capacity to react quickly and

The Experience Environment

(continued from page 6)

continuously based on events, along with the capacity to reconfigure resources flexibly and quickly.

• All infrastructures have both a technical and a social side. An effective experience network requires both technical and social enablers of experiences.

The strategic architecture of the experience network is a creative combination of the appropriate technical and social experience enablers, along with selective activation of the competence base to facilitate heterogeneous, individual-centric experiences.

The Market as a Forum

The traditional concept of a market was companycentric. In the emerging concept of a market, the focus is on consumer-company interaction — the roles of the company and the consumer converge. The firm and the consumer are both collaborators and competitors — collaborators in co-creating value and competitors for the extraction of economic value. The market as a whole becomes inseparable from the value creation process.

Co-creation converts the market into a place where dialogue among the consumer, the firm, consumer communities, and networks of firms can take place. We must view the market as a space of potential co-creation experiences in which the constraints and choices of individuals define their willingness to pay for experiences. In short, the market resembles a forum for cocreation experiences.

The Experience Is the Brand

The brand has traditionally been the centerpiece of a firm's communication with customers. Today, the rise of the active consumer has shattered the old companycentric model of brand creation. Advertising has been supplanted as the chief shaper of consumer attitudes by word-of-mouth, which today's Web-linked consumer communities have put on overdrive. Consumers now have access to the information they need to make informed choices, assess value on their own terms, influence the expectations of other consumers, and decide for themselves how they want to transact with the company. As a result, the power of advertising to create or sustain a product or company image is steadily shrinking.

At one time, brands could be created by companies through advertising and other communications. No more. Now, brands evolve through experiences. Consider some of the major survivors of the dot-com decade: Yahoo!, AOL, Amazon and eBay. All are brands that evolved through the personalized experiences of an increasing number of individuals within a social fabric. Individuals legitimized these brands and gave them meaning.

Co-Shaping Expectations

Let's take as an example the movie *Lord of the Rings: The Fellowship of the Ring.* No film in history was released to a larger audience of pre-primed, passionate fans: the tens of millions of readers around the world who had been enthralled by the epic novels of J.R.R. Tolkien. These fans were thrilled by the news that a major film was in the works. They were also ready to denounce the movie en masse if it violated their vision of the fantasy realm of Middle Earth.

Wisely, rather than try to shut down or drown out the vast worldwide network of Tolkien fans, New Line Cinema worked to co-opt them. As Gordon Paddison, senior vice president for worldwide interactive marketing, notes, "It would have been arrogant to say, 'We are Lord of the Rings, come to us." Instead, Paddison treated the most rabid Tolkien followers as early influencers, whose response could make or break the movie. He reached out to the more than 400 unofficial Tolkien Web sites, aiving them insider tips, seeking their feedback on the details of the movie, and offering them access to the production team. With the help of director Peter Jackson, the Web site www.LordoftheRings.net was created, including rough sketches of costume designs, handwritten production notes, and other exclusive content. Millions of fans have visited the Web site. Although Tolkien fans still debate the merits of the movie, nearly all appreciate the respect with which the filmmakers have treated the material — and them.

Thus, as companies transition toward the new opportunity space, the co-creation experience and the brand become embedded in each other. In the end, the cocreation experience is the brand. The new focus must be on fostering a consistent quality of co-creation experience. The challenge to managers is one of ensuring a consistent quality of experience across multiple channels, while simultaneously enabling a personalized co-creation experience for each individual. ■

For Additional Information on how to use consumers as a source of competence, go to: <u>http://my.summary.com</u>

The New Theory of Strategic Capital

Managers must build new strategic capital — a new theory of how to compete on experiences and how to build new capabilities consistent with that theory. New strategic capital is about challenging the traditional

The New Theory of Strategic Capital

(continued from page 7)

approach to competition and value creation. It entails new ways to consider and analyze opportunities, access competence, leverage and reconfigure resources, engage the organization, and compete to co-create value based on experiences.

The current capabilities of companies reflect an implicit theory of how to compete, based on the traditional system of value creation. The ideas in this summary collectively embody an emerging theory of the meaning of value and the value creation process.

Bridging the Manager-Consumer Gap

Managing the co-creation of unique value demands a new capability: the ability for managers to relate to consumer interactions with the experience network. Managers must increasingly experience and understand the business as consumers do, and not merely as an abstraction of numbers and charts.

To co-create value effectively, managers must also have the capacity for agility. Agility is the ability to act fast — to improve the cycle time for managerial action. We believe that agility depends above all on the readiness of the line managers to respond quickly to changes on demand. And it is important to recognize that line managers, like consumers, are a heterogeneous lot. No two managers react the same way to similar events. Business agility is largely a function of the capacity of the managerial environment to respond to the needs of heterogeneous line managers.

Rapid Knowledge Creation

To co-create value continually, we must continually co-create new knowledge. To make this happen, we must create knowledge environments that facilitate discovery and action in the new competitive space.

Consider Buckman Laboratories, a \$300 million specialty chemicals company based in Memphis, Tennessee, with around 1,300 employees in over 100 countries. Buckman produces more than 1,000 different specialty chemicals in eight factories around the world. Like most multinational corporations (MNC), Buckman operates in many countries, with many businesses from paper processing and water treatment to personal care, leather and agriculture. Unlike a typical MNC, it is small, enjoying a competitive edge due to its ability to apply the power of all its employees to every customer experience. Central to this capability is its global knowledge-sharing network called K'Netix, which is integral to Buckman's information infrastructure.

An Example of Rapid Knowledge Creation

This story illustrates a typical application of K'Netix.

Managers As Consumers

Three basic requirements must be met if managers are to share the experiences of consumers and others who play an important role in co-creation:

✓ Managers must get as much real-time eventcentric data as possible regarding consumer experiences.

✓ Managers must understand and intervene selectively in individual consumer events even as they manage the overall operation. "How did we do with Hilda Schmidt today?" is just as important as "How did we do around the world this week?"

✓ Managers must be able to respond quickly by mobilizing and reconfiguring resources as needed.

A managing director for Buckman in Singapore — let's call her Mary — must propose a pitch-control program to an Indonesian pulp mill. Pitch is a chemical released from wood that affects paper quality and can cause problems in paper mill operations. Thus, developing an effective pitch-control program is an important and complex aspect of paper mill management.

Mary logs into K'Netix and asks for an update on recent pitch-control approaches around the world. Three hours later, she gets a response from Memphis that refers to a master's thesis by an Indonesian student in the United States on pitch control of tropical hardwoods, and offers some specific suggestions on Buckman chemicals that might be appropriate for this application. About an hour later, a Canadian manager sends a note about his experience in solving the pitch problem in British Columbia. Still later, Mary receives data from Sweden, New Zealand, Spain and France, followed by an offer of technical expertise and scientific advice from the company's central R&D group. In all, Mary receives 11 postings from six countries, forming several conversational threads that enable each participant to learn something new.

The contextual knowledge that was created helps Mary secure a \$6 million order from the Indonesian mill.

Lastly, remember that while knowledge creation must be rapid, knowledge environments evolve over time. We must create and nurture mechanisms that enable the emergence of knowledge threads and facilitate the rapid creation of new knowledge. Such mechanisms, or "knowledge catalysts," are critical for integrating the information infrastructure, which is typically designed for managing explicit information (structured and unstructured data), into an effective environment for rapid knowledge creation.