

# Visualizing Organizations

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**Research Note**

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Not far into the future, we will see as well as manage organizations very differently. Today, we rely on two-dimensional, static (and notoriously outdated) organization charts to depict what a company is or does. Soon, however, we will be able to represent organizations the way they really are: active, in motion, growing, shrinking, reacting to stimuli, flowing in the direction of opportunities and pulsating with life. In the foreseeable future, the org chart is likely to be a visual representation — a movie — that enhances decision making.<sup>1</sup>

The implications of visualization for management are significant. For example, suppose a rapidly growing company wants to know whether its acquisitions are being integrated into the culture and the operations of the existing firm. Are the key people talking to one another? Are newcomers quickly connected to the organization? Will the benefits they bring be eroded or amplified? Questions like these are difficult to address today; it can take weeks or even months to find and interpret the answers. By the time an answer is found, seeds of problems may already have blossomed into real trouble.

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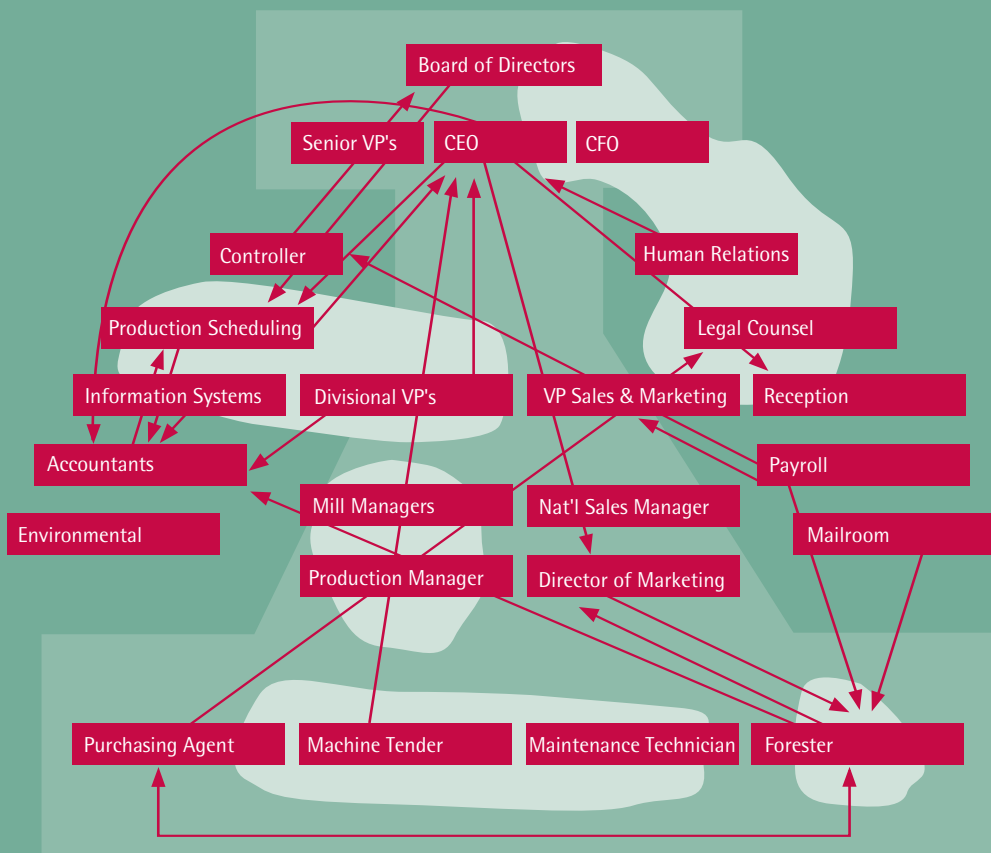
Suppose, by contrast, an animated rendering, based on data supplied by the organization's own IT system, revealed that key people in some of the acquired units were drifting toward the margins of the organization, exchanging e-mails only with each other and appearing for all the world to be on their way out. Suppose the same tool showed that newcomers who worked for company veterans of similar age and functional background were much more actively involved in exchanges with peers and counterparts, obviously integrated into the daily life of the enterprise. The cues provided by a dynamic visualization – quite literally, a movie of who was talking to whom – would most likely focus energy on getting the marginalized people better connected.

In this research note, we explain how developments in theory and methods are making it possible to represent organizational phenomena in new and potentially very productive ways, and we discuss several emergent managerial applications, particularly in areas such as post-merger integration and cross-functional management, which up to now have proven difficult to observe directly. Finally, we describe our efforts to develop a proof of concept that will serve as a vehicle for potential commercialization of visual management approaches. It will also help us to more effectively demonstrate how performance anatomy, one of the building blocks of high-performance business, enables some organizations to out-execute their competitors.

### Toward a visual paradigm

Organization charts, as Accenture colleague Jane Linder and others have pointed out, are a necessary evil.<sup>2</sup> Newcomers find them valuable when trying to get the lay of the land. But most charts tell very little about where important people or resources are located or how or where work gets done. Worse yet, they are usually out of date by the time they are published. Mintzberg's overlapping maps of functional responsibility, decision-making authority, communication and power (depicted in exhibit 1 below) remind us just how difficult it is to represent an organization meaningfully in only two dimensions. Still, in the absence of a better alternative, charts are what we pull out of the desk drawer when people ask how we're organized.

Exhibit 1. Typical organization chart



Adapted from Henry Mintzberg, Structure in Fives: Designing Effective Organizations (Prentice Hall, 1992) 28.

In recent years, however, analysts and practicing managers alike have begun using new tools and language to replace static and mechanistic analogies for explaining organizational behavior. For example, process reengineering introduced the idea that flows of activity should determine organization design rather than discrete transactions.<sup>3</sup> Social network analyses suggest that interaction patterns among individuals can describe an enterprise more accurately and effectively than an organization chart ever could.<sup>4</sup> Similar approaches have been used to depict industries in transition, especially those (such as media, entertainment and telecommunications) in

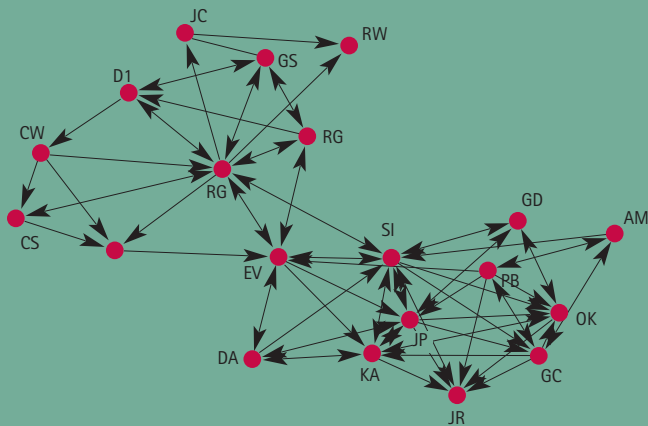
which temporary alliances and joint ventures abound.<sup>5</sup> More recently, observers such as Thomas Friedman and Kenichi Ohmae have suggested that network-based organizations are rewriting the rules of political, economic and culture interaction on a global scale.<sup>6</sup>

The promise of network analysis, in particular, is evident in an example from Rob Cross's work with a large professional-services organization.<sup>7</sup> Executives suspected that collaboration across different regional units in one of the company's most important businesses wasn't what it needed to be to achieve growth targets. Outcome measures revealed a flat growth curve in cross-unit sales, but the executives had no insight as to the causes of the

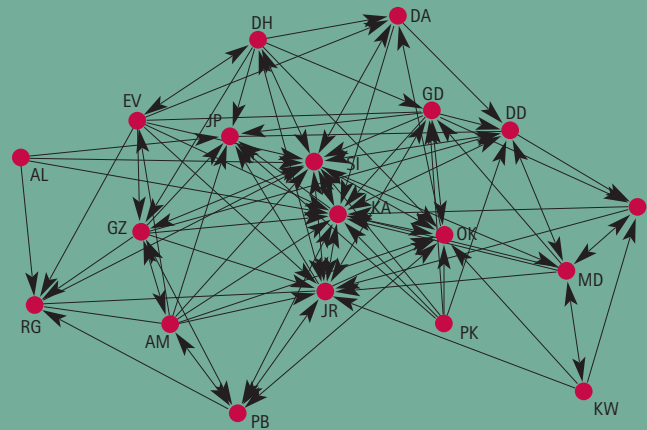
problem other than anecdotal stories. However, social network analysis (see exhibit 2) confirmed management's suspicions: groups representing different geographies were isolated from one another; what little communication did take place occurred only between unit leaders. Management intervened, organizing cross-boundary meetings and introducing a new incentive system that rewarded information sharing. Several months later, a new social network analysis revealed dramatic changes in patterns of communication.

Exhibit 2. Network diagrams reveal the impact of reorganization on patterns of communication

Before social network analysis



After social network analysis



Network diagrams enable us to see into an organization much as a simple X-ray lets doctors see inside a human body, but the subtleties of the “soft tissue” of the organization elude capture. For that level of insight, we need a tool more like an organizational MRI.

Fortunately, our ability to portray organizations as they live and breathe is improving. For example, software now enables us to track in real time the exchanges and interactions (orders and payments, phone calls and e-mails, arrivals and departures of products and people, etc.) that represent the circulatory system of an organization.<sup>8</sup> New algorithms can detect patterns of communication and information exchange. A relatively inexpensive microprocessor can string together network “snapshots” to form a motion picture. Motion pictures, in turn, can be accelerated to show organizations and even industries evolving over time, in much the same way that time-lapse photography has made it possible to see a seed germinate and flower in a matter of seconds.

## Potential applications

Based on initial interviews with line executives, we have identified four areas in which a visual approach to the organization could produce value for management.

**1. Monitoring and enhancing alignment.** Managers often wonder if the initiatives they launch are actually taking root. Although a conventional survey might reveal whether employees have heard about a strategic plan or

understand what a major IT initiative is intended to accomplish, it will not tell managers whether behaviors are changing in line with expectations. Similarly, when events occur that have the potential to divert an organization from its goals or to dissipate a vital initiative’s energy, managers need a way to track reactions and respond.

Some key questions that a visual approach can address:

Are people changing their behaviors in response to strategic initiatives?

Are supervisors (at all levels) providing timely information and feedback to the people who report to them?

Do people see and feel how their behavior impacts customers, profits and their own performance?

Are internal initiatives or external events changing patterns of communication and interaction?

Is it possible to detect events at the boundaries of an organization before they impact the core?

**2. Working across functions and organizations.** Increasingly, executives expect their organizations to behave in a boundaryless fashion. Rapid shifts in consumer demands, technology and competitor behavior make it essential for organizations to communicate horizontally as well as vertically. Joint ventures and alliances between companies put a premium on the quick and seamless movement of ideas, products and people. However, managers often are unable to see the relationships between networks. For example, a company may believe that co-locating R&D and marketing ought to result in products that embody the latest

technology and incorporate a better understanding of consumer preferences – in theory, co-location should result in increased interactions and communication between the two groups. But unless they look at communications data in real time, the managers will not know for sure if practice lives up to theory. By following that data, managers would be able to see what types of behavior between networks produce what results and could make appropriate decisions.

Some key questions that a visual approach can address:

Are efforts to enhance cross-functional communication actually working?

When and how are people working across boundaries?

What distinct patterns of communication are linked to good results? To poor ones?

## 3. Stimulating innovation and learning.

For organizations dependent upon innovation for growth, the biggest challenges have to do with stimulating idea creation and smoothing the path to commercialization. New visual network tools would illuminate areas of innovation within an organization and allow managers to reward diffusion of learning. Managers would come to recognize the patterns of communication or interaction that characterized energetic and creative teams and could apply that knowledge to other areas of the organization as appropriate. Additionally, they would be able to see how effective the channels for innovation sharing and learning are across the organization and between the organization, its allies and its competitors.

Some key questions that a visual approach can address:

Where are the hotbeds of innovation and experimentation in the company?

What are the patterns of communication and interaction that characterize energetic and creative units or teams?

How effective are the channels for innovation sharing and learning across the organization? Between the organization, its allies (current and potential) and its competitors?

**4. Designing organizations.** A visual approach to management that draws heavily on animated representations of networks could change the principles of organizational design dramatically. New organizations would grow organically through the seeding of new networks or the grafting together of existing ones rather than through the mechanical replication of known but inappropriate structures. They would build on now-visible relationships between key members of a network. The process would avoid excess cost and disruption because it would create more effective horizontal, temporary and/or virtual connections within organizations, instead of reorganizing. A visual approach would make possible more effective design and evaluation of alternative models of value creation, such as the value shops and networks described by Accenture's Jeanne Harris and AssetEconomics' Roland Burgman.<sup>9</sup> Decision making could also be expedited through the identification of bottlenecks and disconnects. Finally, a longer-term benefit of real-time motion pictures would be the ability to see networks evolve, making possible extended scenario-based planning.<sup>10</sup>

## Conclusions and next steps

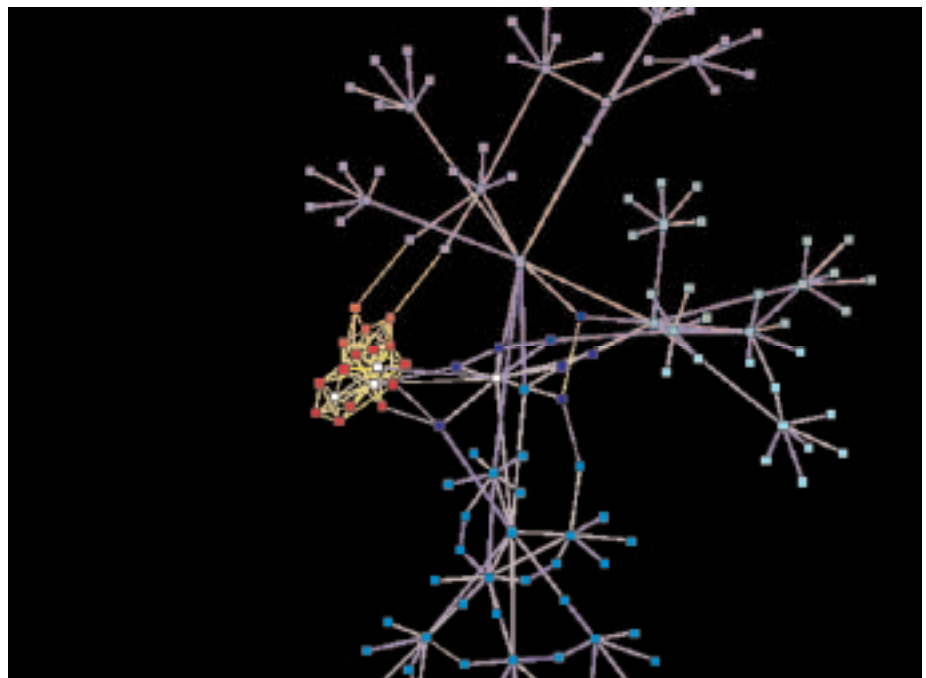
Visual approaches to organizations offer a new management paradigm — one in which enterprises and industries are viewed as active networks evolving in patterned ways. In the immediate future, the challenge is to devise robust tools that allow managers to capture and react to network-based data. We believe that a visual approach has significant potential as a management aid.

To that end, we have undertaken a proof-of-concept initiative. Specifically, we are developing a math-based tool for converting real-time interaction data into a time-lapse representation — a network movie. This tool is being used to model a case of unsuccessful post-merger integration (see exhibit 3). We have two concrete objectives: first, to test whether a network movie can

effectively portray events as dynamic as post-merger integration, and second, to garner responses from a wide variety of managerial and professional audiences as to the potential applicability of a visual approach to other aspects of organization, including those listed earlier: monitoring enhanced alignment, working across functions and organizations, stimulating innovation and learning, and designing organizations. The network movie will take the form of a CD-ROM; viewers will have the opportunity to see a simulation of the use of real time visualization to support timely interventions and to assess the consequences of those interventions.

In an upcoming research note, we will describe the tool and the demonstration in detail and will provide a URL that will allow readers to become viewers.

**Exhibit 3. Screenshot from prototype of network visualization software**



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## Notes

- 1 The irony is that even in this research note we use words and still images to describe objects in motion – not unlike the music reviewer who must describe and critique an orchestral performance without the benefit of sound or visual cues.
- 2 See her recent article "How Do Things Really Work Around Here?" Accenture Research Note, April 7, 2005, as well as other classic statements on the topic such as Henry Mintzberg, **Structure in Fives: Designing Effective Organizations** (Prentice Hall, 1992); Henry Mintzberg and Ludo Van der Heyden, "Organigraphs: Drawing How Companies Really Work," **Harvard Business Review**, September–October 1999; and James Thompson, **Organizations in Action: Social Science Bases of Administrative Theory** (McGraw–Hill, 1967). See also the recent article by James Moody, Daniel McFarland and Skye Bender–deMoll "Dynamic Network Visualization," **American Journal of Sociology**, January 2005.
- 3 See Thomas Davenport, **Process Innovation: Reengineering Work Through Information Technology** (Harvard Business School Press, 1993); Shona Brown and Kathleen Eisenhardt, **Competing on the Edge: Strategy as Structured Chaos** (Harvard Business School Press, 1998); Richard Pascale, Mark Milleman and Linda Gioja, **Surfing the Edge of Chaos: The Laws of Nature and the New Laws of Business** (Three Rivers Press, 2001); Arun Maira and Robert Thomas, **Organizing on the Edge: Meeting the Demand for Innovation and Efficiency** (Arthur D. Little, 1998).
- 4 Rob Cross, **Hidden Power of Social Networks: Understanding How Work Really Gets Done in Organizations** (Harvard Business School Press, 2004); Don Cohen and Laurence Prusak, **In Good Company: How Social Capital Makes Organizations Work** (Harvard Business School Press, 2001).
- 5 See, for example, Walter Powell, Douglas White and Kenneth Koput, "Network Dynamics and Field Evolution: The Growth of Interorganizational Collaboration in the Life Sciences," **American Journal of Sociology**, January 2005; Joel Podolny, "Networks as Pipes and Prisms of the Market," **American Journal of Sociology**, July 2001; David Dreyfus, Bala Iyer, Chi-Hyon Lee and N. Venkatraman, "Dual Networks of Knowledge Flows: An Empirical Test of Complementarity in the Prepackaged Software Industry," paper presented at the International Conference on Information Systems, 2005.
- 6 Thomas Friedman, **The World is Flat: A Brief History of the Twenty-first Century** (Farrar, Straus and Giroux, 2005); Kenichi Ohmae, **The Next Global Stage: Challenges and Opportunities in Our Borderless World** (Wharton School Publishing, 2005).
- 7 Rob Cross and Laurence Prusak, "The People Who Make Organizations Go—Or Stop," **Harvard Business Review**, June 2002.
- 8 Data can be captured through (a) active observation, i.e., through network analyses that openly survey who is talking to whom, who gets or gives information and who creates and consumes energy; (b) passive observation, or sophisticated tracking of incoming and outgoing communications, as well as tracking of transactions with customers, suppliers and partners; (c) real-time surveys of employees, customers and other key stakeholders on topics such as satisfaction, engagement and the like – all fed into the visual representation of the organization.
- 9 See Jeanne G. Harris and Roland J. Burgman, **Chains, Shops and Networks: The Logic of Organizational Value**, Accenture Institute for High Performance Business Research Report, April 2005.
- 10 Richard Pascale, Stuart Kauffman, and the Santa Fe Institute have speculated about the business applications of some core principles of adaptive systems. However, they have failed to get traction in management practice because they have not been able to demonstrate the behaviors they hypothesize or the results they predict, and they have not been able to simplify their principles to enable management action. New approaches to monitoring and visualization may make it possible to assemble the data needed to test hypotheses about the ecology of adaptive systems and, therefore, may extend managers' ability to design organizations that embody lessons from evolutionary biology, such as population dynamics.

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