

A new approach to information promises business benefits that few managers could conceive of when focusing strictly on technology.

Saving IT's Soul: Human-Centered Information Management

by Thomas H. Davenport

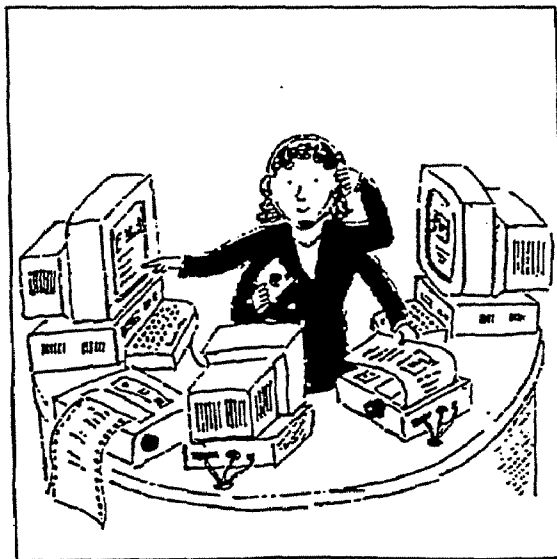
Information technology has a polarizing effect on managers; it either bedazzles or frightens. Those who are afraid of it shun it, while bedazzled IT departments frequently become prisoners of their own fascination, constructing elaborate technology architectures and enterprise information models to guide systems development. Senior executives who buy into this view promote technology as the key catalyst of business change. But such technocratic solutions often specify the minutiae of machinery while disregarding how people in organizations actually go about acquiring, sharing, and making use of information. In short, they glorify information technology and ignore human psychology.

It shouldn't surprise anyone that human nature, good and bad, can throw a wrench into the best-laid IT plans, yet technocrats are constantly

caught off guard by the "irrational" behavior of "end users." In fact, people who are afraid of information technology may have good reason to feel that way. Companies that ballyhoo their latest management information systems or groupware usually spend little time training employees to use

them. Even those who like computers can find themselves hobbled by the rigid structure and rules of many IT shops.

Obviously, people handle information in any number of ways, from basic data processing to gen-



People handle information in myriad ways—from data processing to exchanging E-mail worldwide.

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erating sophisticated accounting documents to exchanging informal E-mail messages around the world. For the many diverse information users in large organizations, only one thing is certain: effective information management must begin by thinking about how people use information—not with how people use machines. While it's impossible to account for all the unforeseen consequences of information expansion and use in today's companies, the following three observations exemplify how a human-centered approach to information management contrasts with the standard IT view:

- *Information evolves in many directions, taking*

Too many managers still believe that once the right technology is in place, appropriate information sharing will follow.

on multiple meanings. While IT specialists are drawn to common definitions of terms like customer or product, most information doesn't conform to such strict boundaries. Forcing employees to come to one common definition, as some technologies require, only truncates the very conversations and sharing of perspectives that the technology is supposed to ensure. Rather than forcing employees to simplify information so that it will fit into a computer, a human-centered approach to information calls for preserving the rich complexity we prefer in our information diets.

- *People don't share information easily.* Assuming that different departments, professionals, or line workers will want to use technology to share information is one of the biggest mistakes executives make. Yet it is one of the fundamental assumptions made in planning any IT system. That is, if you build it, people will use it.

- *Changing an IT system won't change a company's information culture.* The presence of technology, in and of itself, cannot wholly transform a corporation. Changing a company's information culture requires altering the basic behaviors, attitudes, values, management expectations, and incentives that relate to information. Changing the technology only reinforces the behaviors that already exist. Yet in most companies, many managers still believe that once the right technology is in place, the appropriate information-sharing behavior will inevitably follow.

At one large pharmaceutical company, for example, IT managers tried to implement shared databases and other new technologies to speed up R&D, only to have their efforts foiled by significant cultural barriers. In this case, managers assumed that researchers involved in the development of a drug would pass along all information about it to the people conducting its clinical trial; if researchers had found early on that, say, the drug's effect diminished when taken with certain foods, then patients in the clinical trial could be instructed not to take the drug at meals. Such early release of data, however, rarely happens at this pharmaceutical company. Clinical studies therefore often have to be redone, delaying the drug-approval process sometimes for years.

In this company, management pushed the new databases and software, but researchers were either hostile or apathetic. The IT department was so focused on the technology that they had failed to understand the rigid rules of scientific exploration that govern how scientists think about information. Different departments couldn't agree on what constituted a "drug" or a "clinical trial"—or even what font they should use for research reports. In this case, the rate of technological change far outstripped the pace of change in the culture as a whole. Instead of instituting new technologies, executives should have instituted a program of cultural change to convince highly competitive scientists that they wouldn't be penalized for sharing early and perhaps incomplete results.

Technology, after all, is neither the savior nor archdemon of the information age. At its worst, it distracts and misleads us. But at its best, new systems can support the kind of information use that results in real business change.

What's Wrong with the View from IT?

Since the first business applications of computers in the mid-1950s, planning and control have dominated systems development in large companies. In particular, the concept of "information architecture" has overshadowed a human-centered view of information. IBM created the first structured approach in the 1960s and has defined the field ever since. Originally named "business systems planning" (BSP), later versions came to be called "strategic data planning" and "information architecture."

The analogy to an architectural blueprint, in which the location and uses of different rooms are

The Information Facts of Life

1. Most of the information in organizations—and most of the information people really care about—isn't on computers.

2. Managers prefer to get information from people rather than computers; people add value to raw information by interpreting it and adding context.

3. The more complex and detailed an information management approach, the less likely it is to change anyone's behavior.

4. All information doesn't have to be common; an element of flexibility and disorder is desirable.

5. The more a company knows and cares about its core business area, the less likely employees will be to agree on a common definition of it.

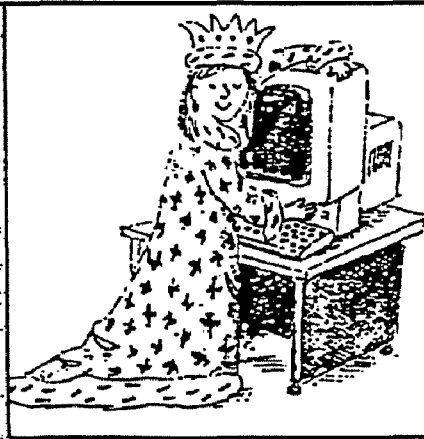
6. If information is power and money, people won't share it easily.

7. The willingness of individuals to use a specified information format is directly proportional to how much they have participated in defining it or trust others who did.

8. To make the most of electronic communications, employees must first learn to communicate face-to-face.

9. Since people are important sources and integrators of information, any maps or models of information should include people.

10. There's no such thing as information overload; if information is really useful, our appetite for it is insatiable.



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important, they make the unrealistic assumption that most of a company's information can be organized according to a few common terms.

A Natural Mess: Multiple Information Meanings

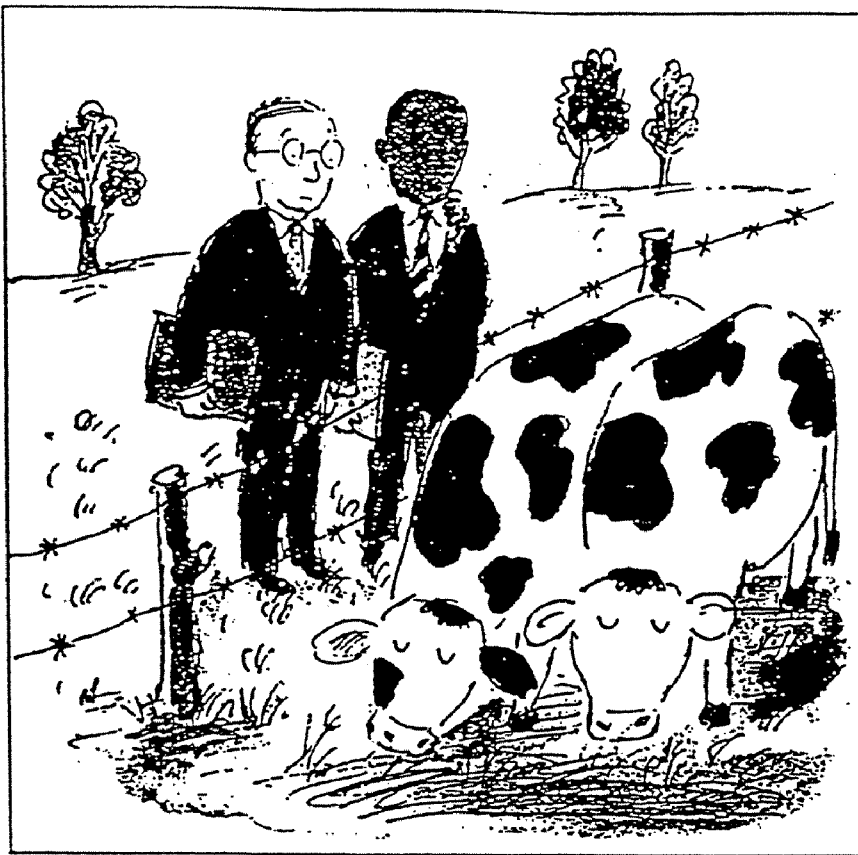
While information architecture can't capture the reality of human behavior, the alternative is hard for traditional managers to grasp. That's because a human-centered approach assumes information is complex, ever-expanding, and impossible to control completely. The natural world is a more apt metaphor for the information age than architecture. From this holistic perspective, all information doesn't have to be common; some disorder and even redundancy may be desirable. (See the chart, "Human-Centered IT Managers Focus on How People Use Information Rather than Machines.")

No matter how simple or basic a unit of information may seem, there can be valid disagreements about its meaning. At Digital Equipment Corporation, for example, a "sale" to the indirect marketing organization happened when a distributor or reseller ordered a computer; but to direct marketing, the sale occurred only when the end customer took delivery. Even within direct marketing, there were

differences of opinion: salespeople recorded a sale when the order was placed, manufacturing and logistics when the product was delivered, and finance when it was paid for.

At American Airlines, there are several perspectives on what an "airport" is. Some managers argue that an airport is any location to which American has scheduled service; others count any airport granted that status by the international standards body. At Union Pacific Railroad, there's little consensus on what a "train" is. Is it a locomotive, all cars actually pulled from an origin to a destination, or an abstract scheduling entity? Even U.S. Department of Agriculture officials can't agree on the meaning of "farm."

These multiple meanings make the job of information management treacherous at best. At one oil exploration company, for example, information architects worked for years on ineffective models because people assigned different meanings to "oil location." Some users defined it as the original geographic coordinates in the ground; others thought it was the well from which oil sprang; still others used the term to refer to the oil's current location in a tank farm or pipeline. Each definition found its way into computer databases. As a result, it was difficult to share even the most basic infor-



No unit of information is too basic to prevent disagreement about its meaning: USDA officials can't even agree on what a farm is.

gether. But while dual information streams are messy and hard to control, they seem realistic for this diverse company.

A larger managerial barrier, however, remains: operating with multiple meanings also requires basic changes in behavior—not only for information providers, who categorize and collect the information, but also for users. The CEO who is annoyed when told there's no quick answer to how many customers (or employees or products) the company has is just as guilty of oversimplifying information as the database designer who insists on one definition of customer.

And when it is necessary to define common meanings, the process requires much more management participation and time than many assume or want to allot. For instance, Xerox did data modeling and administration for 20 years, but in the words of the director of information management, "We got nowhere." These initiatives were driven by IT rather than by senior business managers; they were always abandoned in favor of specific development projects like the new order-processing or billing system, which yielded obvious benefits.

Finally, Xerox's IT department asked senior executives to identify the key pieces of information on

which the entire business should be run. The executives debated the issue on several occasions but weren't able to reach a consensus. They did agree, however, that their main priorities were customer, financial, and product information—in that order.

Xerox's IT department then took another tack. From around the world, 15 marketing and sales managers, accompanied by their IT counterparts, met to agree on the set of common customer information the company would use. As usual, people disagreed about what "customer" meant. But these managers eventually agreed to define customers as corporations that had already purchased products or services from Xerox and to refer to them with a common worldwide number; they also reached consensus on 11 other customer-oriented terms, including customer-satisfaction measures. This coordinated approach allowed country managers to then create customer information

that the IT department has now combined into a global data warehouse.

The Trouble with Information Sharing

In today's competitive business environment, it makes sense to give information particularism its due; but as Xerox's experience with customer information illustrates, executives must also decide which aspects of a company's information are global. More to the point, executives must determine how such information is to be shared effectively—one of the trickiest management issues for today's companies. While information architecture can specify who controls information, such rigid models don't account for the unpredictable growth of information or human nature.

Some managers are quick to point out the obvious difficulties with information sharing, especially when it's driven by new technologies like electronic mail. If sharing makes it easier for a company's employees to get at critical information, it also opens the way for any interested external parties—competitors, attorneys, even computer hackers. Given the many recent and highly visible

information technologies don't inevitably lead to flattened hierarchies and empowered employees. Working out information issues in a company with a monolithic culture—instead of wrestling with two competing information cultures that result from a merger—often involves digging out entrenched attitudes toward organizational control.

In such companies, technologies that promote information sharing can end up controlling employees rather than empowering them. When lower level workers are ordered to "share" information with those higher up the corporate ladder, a cutthroat information culture of meddling micro-management can result. At the refining and marketing division of a large oil company, for example, the division president delighted in being able to use his computer to peer electronically over the shoulders of oil traders—and occasionally to override or initiate a deal.

On the other hand, Xerox's executive support system has been limited to accessing data two levels below the user—precisely to avoid this type of excessive control. Such human-centered technology implementations are still rare, but they indicate the way managers must think about the issues that information sharing brings to the surface.

Populist exhortations to the contrary, unlimited information sharing doesn't work. In fact, increased information sharing can either improve or actively harm company morale. Sharing information about actual corporate performance is usually good for morale—even when performance is poor, since uninformed employees often assume that it's worse than it really is. Sharing rumors, however, can be demoralizing.

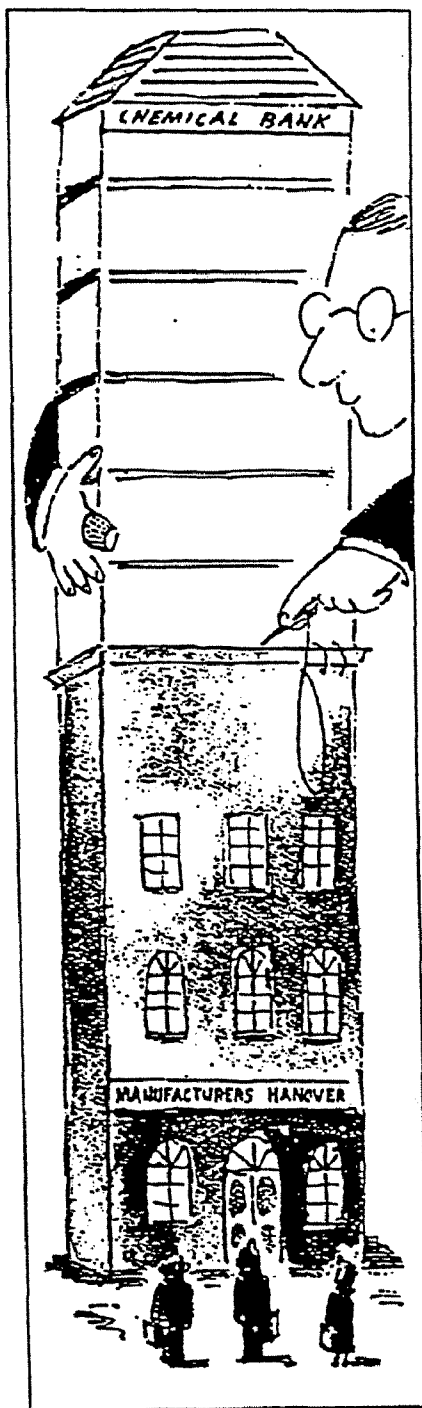
An information systems manager at a New York bank, for example, created a Lotus Notes bulletin board that he called the "Rumor Mill." The system allowed employees in his department to share rumors easily; the

manager could then quash false ones on-line. This experiment worked just fine—until rumors were posted about the manager's own departure from the bank. When he refused to comment, employees correctly surmised it was true. They became cynical about this attempt to share information through technology, since the manager hadn't communicated with them on this particular piece of information. Needless to say, Rumor Mill was not continued by his successor.

Sharing rumors in this fashion underscores the distinction between information and *noninformation*. Many people suffer from far too much noninformation—which companies seem to generate with ease and at the expense of useful information—rather than the "information overload" they complain about. Any heavy E-mail user can testify to the junk mail problem. Right now I have more than 160 messages in my electronic mailbox, some of which inform me that one colleague lost his appointment book or that another wanted to be included in last Thursday's pizza run. I should never have received them, and now I don't have the time to delete them.

Technologists are working on personalized filters or "agents" that can separate real information from junk. But it's likely that good marketers of electronic information will find ways to circumvent filters—just as direct mail now looks like a tax refund or personal check. In fact, some communication technologies just exacerbate this problem.

At Tandem Computers, for example, a combination E-mail/bulletin board allows field-service personnel to send a "has anyone seen this problem?" message to all technical people in the company. The service technician may get an answer, but is it really necessary for everyone to read this message? As in so many other cases, simply implementing an electronic-mail system—without any guidelines



When Chemical Bank and Manufacturers Hanover merged, two information cultures clashed.

IBM's Catalog of Information

Hands On Network Environment (HONE)

Overview

HONE is an on-line system that provides access to a variety of applications, tools, and information databases designed to increase the productivity of the field. These applications are organized into the following categories:

- IBM product information
- IBM Services information
- marketing information and tools
- technical information
- configurators and tools
- financial topics
- performance information and tools
- administrative information and tools
- publications
- education topics
- customer registration/support tools
- about HONE information

Seven components of HONE represent major sources of market information and are described in detail later in this section:

1. Competitive On-Line Marketing Perspective (COMP)
2. EXPERTMENU
3. Market Studies Document Database (MDOC)
4. National Solution Center (NSC)
5. Published Document Database (PDOC)
6. Selected International Account Support (SIASUPP)
7. SERVICES

For further information on any HONE application while using HONE, enter on the command line:

WHATIS application name

Key Contact

HONE Customer Support
External 800-555-6789
Hours 6 a.m.- 6 p.m. Mountain Time
Contact the electronic delivery specialist or HONE coordinator at a local site.

Availability

5 a.m.-1 a.m. Monday-Friday Eastern Time
5 a.m.-3 a.m. Saturday
8 a.m.-1 a.m. Sunday

Responsible Organization

IBM US Services - Electronic Delivery

User Interface/Query

Menu-Driven and/or STAIRS Query Tools

Educational Offerings

For HONE productivity tips and news, subscribe to HONEINFO Bulletin Board on NATBOARD.
The following educational tools are available on HONE:

- HONE Reference Card - Key HONEREF.
- HONE User Guide - Key GUIDE from the HONE main menu.
- HONEDEMO - On-line demonstrations of selected applications or functions.
- HONE News - On the HONE main menu.
- Applications Guides - A number of applications contain User Guides, which may be viewed by keying GUIDE on the application menu.

were afraid that answering questions about information would be too time-consuming. In practice, however, the extra time involved hasn't really interfered with anyone's job. Many of these information owners now say they learn from the questions and comments of others. More important, IBM has saved millions by avoiding duplication in the purchase of external market information.

Information Guides. Along with maps, information users need people to guide them to the right kind of information in the first place. Librarians have often performed this role in the past. But while information owners at IBM can answer specific questions, few companies have general guides to the vast information resources available throughout an organization. Once again, including new kinds of human support for technology can help change a company's information culture.

In 1991, Hallmark Cards's MIS managers realized that the company's information users were confused about how to access necessary data. The problem was both technical and behavioral. Financial, customer, supplier, product, and other data were buried in many different databases. In addition, existing applications were hard to use and provided no information about how the data were created.

Hallmark's MIS managers therefore established in each business unit a new full-time position: the "information guide." These individuals are the primary point of contact for anyone at Hallmark seeking computer-based information. They translate between user information requests and the IT staff who can query databases and get the computerized information that users need. Hallmark's information guides have helped improve data access so much that there are now 10 guides around the company. They have substantially reduced the time it takes for employees to find the right information and to compare information across business units.

Business Documents. The form in which information is presented is also critical to its understanding and use. After all, raw data is not information; and accumulating data is not the same as interpreting it and putting it in a usable form. Company B's emphasis on documentation and presentation, demonstrates how such an attitude shapes the overall information culture. In that case, promotions and other financial incentives were tied to the kinds of documents professionals produced.

In general, business documents provide organization and context, and they exclude enough informa-

tion so that what remains is digestible. Focusing on which documents an organization needs often leads to a more fruitful discussion than looking at broad information requirements or trying to pin down a term like "customer."

Several companies have begun to identify critical information needs in the form of documents. At Dean Witter, for instance, information managers, particularly those in the central library, were frustrated by their inability to address brokers' information needs efficiently. They advocated hiring more librarians, but financial executives were reluctant to take on additional workers.

With the help of a consultant, finance managers talked to brokers about what information they needed. Instead of phrasing their questions in terms of information and systems, they asked which key documents brokers required. As it turned out, almost all used the same documents over and over. Their needs were categorized into a set of "core documents," most of which were regulatory and reporting documents from U.S. companies.

By separating the documents into three or four industry groups, 90% of the information needed by a typical broker fit on one CD-ROM disk. Dean Witter then created a "perfect information platter," which was updated monthly and kept on a local area network server. By defining common informa-

Hallmark has established "information guides"— translators between information users and the IT staff.

tional needs and implementing technology to support what brokers were already doing, Dean Witter was able to reduce its library staff—rather than increasing it as originally suggested—while greatly facilitating information use.

Groupware. Groupware like Lotus Notes, NCR's Cooperation, and Digital Equipment's TeamLinks are excellent examples of less structured information-sharing technologies. This new technology allows teams in different locations to share documents electronically, to discuss issues on-line, and to capture and distribute key information easily.

Even so, companies will fail to take advantage of groupware if they don't also provide adequate training and human support. Indeed, groupware implementation stands or falls on a company's informa-

