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SURVEY: THE REAL-TIME ECONOMY

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How about now?

Jan 31st 2002
From The Economist print edition

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Information technology is increasingly taking the lags out of doing business, in effect creating a real-time economy, says Ludwig Siegele

YOU can't accuse Gary Reiner of being verbose and inefficient. Ask General Electric's chief information officer a question, and you get a three-sentence answer that is right to the point. He prefers show-and-tell to lengthy explanations and intellectual tangents. And he regularly checks whether his interlocutor is still following: "Are you getting what you need?"

Anything else would be a disappointment from someone in his position. After all, America's GE is known for its almost obsessive quest for perfection. And Mr Reiner heads the company's most important initiative: "digitising" as much of its business as possible. That not only means buying and selling most things online but, more importantly, setting up a digital nervous system that connects anything and everything involved in the company's business: IT systems, factories and employees, as well as suppliers, customers and products.

GE's aim is to monitor everything in real time, Mr Reiner explains, calling up a special web page on his PC: a "digital dashboard". From a distance it looks like a Mondrian canvas in green, yellow and red. A closer look reveals that the colours signal the status of software applications critical to GE's business. If one of the programs stays red or even yellow for too long, Mr Reiner gets the system to e-mail the people in charge. He can also see when he had to intervene the last time, or how individual applications—such as programs to manage book-keeping or orders—have performed.

As chief information officer, Mr Reiner was the first in the firm to get a dashboard, in early 2001. Now most of GE's senior managers have such a constantly updated view of their enterprise. Their screens differ according to their particular business, but the principle is the same: the dashboard compares how certain measurements, such as response times or sales or margins, perform against goals, and alerts managers if the deviation becomes large enough for them to have to take action.

GE has a record of keeping ahead of the pack. In years to come, experts predict, many companies will use information technology to become a "real-time enterprise"—an organisation that is able to react instantaneously to changes in its business. And as firms wire themselves up and connect to their business partners, they make the entire economy more and more real-time, slowly but surely creating not so much a "new" but a "now" economy.

Companies will use information technology to react instantaneously to changes in their business

The next big thing

Small wonder that the Silicon Valley hype machine has already appropriated the concept of real time. Venture-capital firms, and above all the most prominent among them, Kleiner Perkins Caufield & Byers, are promoting it. Software and networking start-ups are peppering their marketing materials with the term. There is even a new newsletter called

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- [Gary Reiner is in charge of GE's plans to digitise its operations.](#) *Real-Time Report*, a newsletter, focuses on the latest developments in the field. Venture-capital firm Kleiner Perkins Caufield & Byers is championing the "now" economy. See also the [Digital Technology Centre](#).

Real-Time Report.

Wonderful, one is tempted to say: another buzzword out of Silicon Valley—just what we need in these difficult times. But real time is more real than it appears. The start-ups in this field are leading the counter-revolution to the dotcom mania. They are not about all-too-clever business models and breathless “Internet time” (for which read going public as quickly as possible), but about highly complex enterprise software, often based on serious mathematics, that can yield real savings if deployed and used correctly.

That is why these firms might actually grow up to become successful companies. What is more, the current recession will probably speed up the adoption of new real-time products and services. Many of these do not require big investments. Instead, they make existing computer systems more effective, promising a quick return. GE estimates that its digitisation efforts saved it \$1.6 billion last year. Firms that have spent billions on IT without any guarantee that their bottom line would benefit are desperate for such savings.

Most important, perhaps, the concept of real time is more useful than the somewhat artificial distinction between the “old” and the “new” economy. Real time describes the full potential of what information technologies could ultimately do, according to Andrew Odlyzko, director of the Digital Technology Centre at the University of Minnesota: drive the lags and latencies out of the economy and make it much more efficient.

Real-time technology might even prove as important for speeding up the information flow in business as the telegraph, invented in 1837.

The economic effect of that technology was substantial. Before the telegraph, Australian companies had to carry large stocks because the only way to order from England was to send a letter by sea. But once the first telegraph connection between Australia and England opened, businesses such as Prince, Ogg and Co, a soft-goods firm in Sydney, were able to cut their stocks by more than half.

Yet “real time” is also something of a misnomer. It was originally a term of art in data processing, meaning that data are processed the moment they enter a computer, rather than in “batch mode”, in which information is stored and worked on later. A classic example of batch mode is the early mainframe computer: data were first encoded on punch cards which were then fed through the machine.

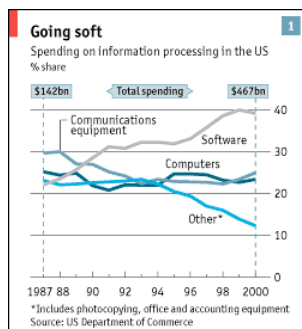
In contrast, modern spreadsheet software is as real-time as it gets. To a layman these programs look like tables with many rows and columns of “cells”. But their most important feature—how these cells are related to each other—is invisible. Often they are connected by simple operations such as addition or multiplication. Investment banks in particular, however, use more sophisticated spreadsheets in which the cells are linked by dozens of “macros”, sometimes quite elaborate sub-programs. If a user changes the data in one cell, many others are automatically recalculated.

Instant gratification

To advocates of the concept, the real-time enterprise is a giant spreadsheet of sorts, in which new information, such as an order, is automatically processed and percolates through a firm's computer systems and those of its suppliers. Thus a simple inquiry such as, “When is my order being shipped?” can be answered immediately, and not six phone calls and three days later, explains Vinod Khosla, a partner with Kleiner Perkins Caufield & Byers and one of the most notable advocates of the real-time concept. Many consumers have already encountered real-time business without realising it, for instance when they order a Dell computer. The firm's website allows customers to check the status of their order at any time.

But the real-time enterprise is not simply about speeding up information flow. It is also, as GE's example shows, about being able to monitor a business continuously and react when conditions change. Today, businesses “are mostly shooting in the dark”,

says Michael Maoz, a research director at Gartner, an IT consultancy, and one of the pioneers of the concept. Real-time technology, he predicts, will give firms a window into their



Real-time enterprise is not simply about speeding up information flow

business they never had before.

Mr Maoz also emphasizes the third main benefit of a real-time enterprise: using newly available information to offer new products and services. For instance, in 2000 GE's consumer-appliance business installed online kiosks in selected branches of Home Depot, a fast-growing American home-improvement chain. Customers can order an appliance, select a delivery date and time, and be told instantly whether their request can be met.

The following articles will describe in detail how the real-time economy works. First, there is the underlying technology. In the past, firms have faced a trade-off between being integrated and being flexible. New software technology promises to ease that trade-off, or even do away with it altogether.

At the same time, new hardware, such as wireless sensors, makes it possible to gather ever more information about the physical world and feed it into a company's computer systems. Turbines made by GE are equipped with sensors that allow the firm to tell its customers online how efficiently their machinery is operating. Similarly, companies can now collect more data about people, even tracking their location.



By themselves, these data would just contribute to the increasing information overload. But they present a new business opportunity: to develop software that analyses them and suggests ways of optimising the supply chain, or even automates the response to certain kinds of new information. This has already happened in the financial markets, where the availability of real-time data has produced a plethora of firms selling programs to automate trading and make it more efficient.

How will all this change the company and the economy as we know it? For reasons that will become clear later on in this survey, IT will probably not spell the death of big firms, as is often forecast. But real-time technology will have a huge impact on the inner workings of companies. It is also likely to make economies more fluid, and perhaps more volatile, as last year's abrupt American downturn suggests. The financial markets have already shown that putting even parts of the economy on autopilot can lead to accidents. A crash in 1987 was caused in large part by automated program trading. Perhaps, one day, the "now economy" will have to have circuit breakers installed.

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