CHAPTER 1

The Promise of the Real-Time Enterprise

We are in the stage of our economy where the fusing together of information technology and business operations is creating what has come to be called the *real-time enterprise*. Computers have been widely used in business for the last four decades, but what is happening now is something new. A wide array of information technology is being custom tailored and fine-tuned to fit people's precise needs. The real-time enterprise is an organization in which specific and relevant information—not just an indiscriminant flood of data—flows continuously to individual people throughout the organization. They use this information hour by hour, day to day, and week to week to perform their jobs at levels of efficiency and responsiveness not possible before.

Every well-rounded executive is expected to understand the essentials of finance, operations, marketing, and sales. Now every well-rounded executive also needs to understand the essentials of applying information technology (IT) to address common business problems. The rise of the real-time enterprise makes the use of IT central to a company's survival and success.

Executives can no longer allow themselves to be bewildered by technical discussions about information systems. They must be able to apply a basic understanding of how to use IT in business so that they can make their own assessments of existing and proposed information systems. They can no longer rely entirely on the advice of outside experts in this area.

There are technical specialists who build and operate computer systems just as there are accountants who keep a company's books, factory managers

who run a company's factories, and salespeople who find customers for a company's products. The executive does not need to know all the details involved in each of these activities. What is necessary is that the executive understands enough about all of them to see how they work together and provide the company with its ability to profitably deliver products and services to its customers.

This book lays out the key concepts needed to effectively use information technology to create and sustain a real-time enterprise. The concepts are presented in the form of a business briefing. This chapter and the next one provide an overview of the main business issues and scientific foundations that underpin the real-time enterprise. The next four chapters then discuss how company structures and ways of doing business are changing as the full impact of IT is now being felt. The remaining chapters talk specifically about how an effective executive can identify the need for and oversee the development of the systems required to move their company into the real-time world.

Definition of the Real-Time Enterprise

A useful analogy is to think about the spread of electric power in the first decades of the twentieth century. Electricity was wired into factories, offices, and homes. The buildings themselves and the activities that could occur within those buildings changed profoundly as this happened. At first, the use of electricity for lighting, heating, and driving elevators, machines, and appliances was wondrous and amazing. Then it became the norm. We now expect buildings to be wired for electric power and most of us would hardly know how to operate in a building that did not have electricity.

A similar thing is happening with the spread of real-time IT. The nearly instantaneous delivery of information that this technology makes possible is changing the way organizations operate. Companies are leveraging and adding to their existing systems infrastructure to create real-time systems. Existing systems provide a foundation of basic business functionality, and this is being combined with new information technology to create systems that enable companies to sense and respond immediately to important events in their environments. This may seem wondrous and amazing but it will soon enough be the norm.

Gartner, a prominent research firm that focuses on business and technology, defines the idea of the real-time enterprise as an organization that "achieves competitive advantage by using up-to-date information to progressively remove delays in the management and execution of its critical business processes."[1] Gartner goes on to point out that their definition has no explicit reference to technology. The reason for this is that the central concept of the real-time enterprise is not about technology, even though IT is the enabler that allows a company to become real-time. Instead, the central concept is about continuously improving key business processes and adapting them to changing circumstances so that they deliver better value to customers and more profit to the company.

The Pace of Change Continues to Accelerate

Let's take a quick look at the sequence of events that has brought about the real-time business world that is growing up around us. Since the start of the Industrial Revolution, the pace of change in business and the global economy has been steadily increasing. During the twentieth century several waves of innovation propelled the pace of change to move even faster. The introduction of the assembly line by Henry Ford and others in the early 1900s gave rise to the modern consumer society by delivering huge quantities of mass-produced items at prices that most people could afford.

As people became used to the availability of basic products such as cars, appliances, and clothes, they developed a demand for more specialized products with particular features that more closely met their needs and desires. Companies responded to this by defining market segments and developing a corporate structure in which separate divisions were created to focus on producing and selling products to each market segment. General Motors is a classic example of this. Instead of one company selling cars to a mass market, it became a collection of businesses selling different kinds of cars to different groups of customers. This structure became the model for business organizations everywhere.

Operations research techniques and continuing improvements in technology fueled a steady competitive race between companies during the 1950s, 1960s, and 1970s. In the 1980s, Japanese companies like Toyota employed the techniques of lean manufacturing and changed the way

manufacturing is organized and performed around the world. The production process got faster, more efficient, and more responsive.

During the 1990s, computer and communications technology developed to the point where the real-time organization started to move from theory to reality. Just as lean manufacturing changed the way manufacturing is done, the principles and practices of the real-time enterprise are starting to change the way companies are organized and how they operate.

In the last 20 years we have seen long-established manufacturing companies fade away because they were unable to successfully adopt lean manufacturing techniques and thus could no longer compete. In the next 20 years we will see other organizations fade away because they cannot make the transition to real time. Those organizations that do succeed in becoming real-time enterprises will need to change dramatically in the process.

This is a genuine wave of change, not just another IT fad. The real-time enterprise comes about through the use of IT but it is not about IT. The wealth-generation capabilities inherent in real-time operations are the major force that is driving this change. The switch over to real-time operations and the building of systems infrastructures to support this will be a major economic driver for the next several decades. This process has just begun and will accelerate as companies that become adept at real-time operations demonstrate the results that are possible from this way of operating.

What Does a Real-Time Enterprise Do?

A real-time organization is a company that has learned to operate in a continuously changing and coordinated manner with its suppliers and customers. A real-time organization receives, analyzes, and acts on a steady stream of information that describes its market environment and its internal operations. It is both constantly fine-tuning the efficiency of its internal operations and watching for and responding to new opportunities in the markets it serves.

Real-time enterprises are replacing the traditional Industrial Age organization that works on a monthly, quarterly, or yearly management cycle. Reaction times are too slow in those organizations. They follow management practices that arose from a time when most information traveled on

paper, a cup of coffee cost a nickel, and the business world moved at a much slower pace.

The competitive playing field now requires that companies are more aware of their performance and their markets on a daily or even hourly basis so that they are able to maximize their internal operating efficiencies, spot new opportunities, and respond to them quickly. Real-time organizations enjoy significant competitive benefits such as:

- *Higher profits through better customer service.* Many customers are busy and pressed for time and will pay a higher price to get faster and more convenient service. Companies that can deliver products quickly and introduce new or improved products in a timely manner will have an advantage.
- *Increased customer satisfaction.* Faster and more responsive customer service creates more satisfied customers. Companies can be more attentive to the needs of their customers and respond with more relevant product and service offerings.
- *Reduced waste and inefficiency.* Business processes in most companies can be run faster and more efficiently if they are reengineered to take advantage of new IT. These improvements can produce significant cost savings.
- *Improved management decisions.* Managers with more timely and accurate information make better decisions. Companies can reduce their risks and get better operating results with real-time data.[2]

It's All About Coordination

Those companies that are able to react quickly because of their real-time systems will have a competitive advantage. But merely reacting quickly to events is not enough. A company must also act in an appropriate and controlled manner. The proper combination of speed and control is what generates the coordination companies need. Speed without control is like stepping on the gas without being able to steer. That will only result in a crash.

Companies need to be careful not to speed up some processes without assessing the impact on other related operations. Speeding up one task only

to throw other activities into confusion is counterproductive. Increased speed must be weighed against the increased costs involved. There is no point in taking speed to the level where the stability of a business process is degraded or a company's ability to control its risk is undermined.

Different areas of a company often have conflicting objectives. Inventory managers are motivated to reduce inventory. Salespeople are motivated to sell everything they can to customers. Credit people are motivated to prevent sales that could result in hard-to-collect or impossible-to-collect customer invoices. Senior management has to create complementary incentive plans for all these groups, and each group needs to understand enough about the others to effectively coordinate their interactions. This takes real effort to achieve.

Organizations need to keep several things in mind as they move into the real-time world. They should make sure that sound business strategy is what drives their efforts and not just the availability of new technology. They should redesign entire business processes before they begin applying IT. And they should set priorities so that they focus first on improving those processes that will deliver the most value to them and their customers.

A Day in the Life of an Agile Real-Time Company

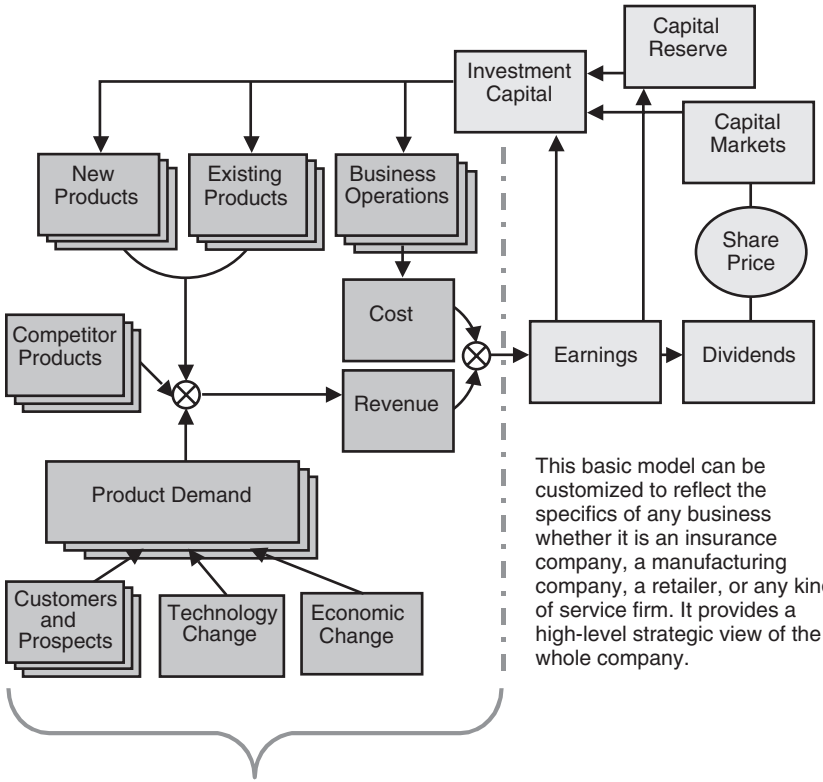
To get a feel for what it is like to work in a real-time organization, let's imagine what a day in your life would be like. Last year you were promoted to Senior Vice President–North America for a large insurance company that sells insurance to businesses to cover their operating risks and related liabilities. You have put in place an ambitious plan to increase your market share in three targeted market segments. You have rolled out the plan to all your regional managers and the field sales force. People know what the big picture is and they know what their individual performance targets are within the plan. You are starting to see results that indicate the plan is working. But now is not the time to get complacent. You need to stay alert and respond effectively to events as they unfold.

The first thing you do each morning when you get to the office is open a window on the flat-screen display on your desk. The window shows a schematic diagram of operations in North America. Boxes in the diagram correspond to different parts of the business such as product sales, business

operations, expenses, and revenue (see Exhibit 1.1).You call this window your dashboard because it shows you at a glance the status in key areas of your organization. The data that drives this display is updated continuously throughout the day so you can see what is happening as it occurs. This isn't a static report that is issued every month or every quarter.

This morning most of the boxes show up on the dashboard in green, indicating that actual results are tracking close to the plan. But you notice that

EXHIBIT 1.1 A SAMPLE CORPORATE DASHBOARD



This portion of the model can be repeated at lower and lower levels of detail for the divisional and regional organizations within a company. It provides a tactical view for division and region managers. Operating staff within these organizations have dashboards that display detail about one or more of the components of the model that relate to their jobs.

Source: Stafford Beer, *Brain of the Firm*, 2nd ed. (New York: John Wiley & Sons, Inc., 1996), p.188.

one box—revenue—is glowing yellow. "Let's see what is going on here," you think as you click on this box. It opens up to show you the key indicators you have defined to monitor activity there. Two of the indicators you defined are showing in green, but the third indicator is yellow. This indicator is the new business win ratio and you think to yourself, "We aren't selling enough new business and the trend line is not getting better. If this keeps up for another couple of months, we will never make our annual sales target."

You click on the button for the new business win ratio and up comes a geographic display of the United States and Canada and their states and provinces. Five of the regions show up in green, but one region, the North Central, shows in yellow, and another, the Northeast, shows in red. "That's Carolyn's region," you think, "I need to give her a call."

Carolyn had gotten in early that morning. She poured herself a cup of coffee and opened the dashboard window on her display screen. Carolyn's dashboard has the same layout as your dashboard, but the data it displays is only for the Northeast region. While the product sales box on your dashboard for all of North American showed up as yellow, on Carolyn's dashboard, this box glowed red. That got her attention instantly.

Clicking on the product sales box, she saw that the new business win ratio was in red. Clicking on the win ratio button, she pulled up a list showing the quotes put out last month. The list shows whether they got the business or not, and if not, the name of the company that did. What caught Carolyn's eye was the number of times a certain competitor's name showed up on that list. A company called Eat Your Lunch, Inc. was starting to win an alarming amount of new business. "I need to watch this competitor more closely," thought Carolyn. "I'm going to add an alert to my dashboard to let me know whenever Eat Your Lunch wins a bid." Carolyn then picked up the phone and began calling some of her salespeople.

Carolyn has talked to four of her top salespeople and has gotten some interesting information and a good assessment of the situation by the time you call. "I've been looking into the new business win ratio," says Carolyn. "Remember Eat Your Lunch, Inc.? We thought they were a joke. Well, it seems they have added some new features to their insurance products. They don't seem to be beating us on price, but customers love the new features. I'm going to dig into this further in the next few days. Here's what I know so far about those new features . . ."

As you hang up, you are already formulating ideas for how to counter Eat Your Lunch's moves. You've been working with a group at headquarters to add some new features of your own to the company's policies. You thought you had more time to work out some details, but now you think, "Maybe its time to get going and roll out those new features sooner rather than later." You turn and ask your assistant to set up a session this afternoon with the task force from marketing and product development. "Tell them to run the 36-month simulations of those new features and bring the results to the meeting. Tell them to come prepared with recommendations—analysis is over. We'll be making some decisions today."

A week later, Craig, a salesman in the Northeast region, receives a set of product alerts on his dashboard. He reviews the new features that he can mix and match with existing policies to better fit customers' needs. "These are going to let me offer some very customized policies," thinks Craig. Craig taps into the client and prospect database for his territory and pulls up a list of the key people at these companies and their preferences and concerns. "I can see a number of companies whose concerns will be addressed by these new features. I'm going to contact them right away."

Along with the new feature alerts came updated pricing models. So Craig can create proposals and prices by feeding in relevant parameters like the claims history of his target companies, their operating results, and other factors. He iterates through the models several times making different assumptions and arrives at a set of proposals that he is sure his customers will find interesting.

The next morning Craig is in the office of the controller of Acme Services Company. The controller tells him that just last week a person from a company named Eat Your Lunch, Inc. was out and showed him some very innovative new insurance options. Craig showed him the updated policy he had put together and the new features that would better fit Acme's needs. Then the controller leaned forward and asked, "So what is this going to cost?"

Craig opened up his tablet PC. Through a wireless connection, he connected with his company's Web site and called up one of the new pricing models. He reviewed his assumptions with the controller to make sure he understood his needs correctly and typed some numbers into the model. Then he pressed the *calculate* button and out came a cost schedule that he handed to the controller. The controller sat back and nodded his head as

he read the numbers. "We move fast," thought Craig, "We see the competition starting to make a move, and a week later the company comes out with a set of new features that are just what I need to win new business and sell more to the customers I already have."

EXECUTIVE INSIGHT

LIVING IN THE REAL-TIME WORLD

Tom Hammond is the vice president of trading operations at the Chicago Board of Trade (CBOT). Prior to this, he was the chief operating officer for the Board of Trade Clearing Corporation, and he has over 20 years of financial market experience ranging from trading to operations. Trading in stocks, commodities, and financial futures is a real-time business. Tom is an experienced executive who already operates in the kind of world that the rest of us are just now entering.

"If you look at the financial markets today," said Tom, "you see a shift in what people perceive as valuable. Execution resources [making and clearing trades] used to be what people paid for and valued. Now that's seen as a utility, and the value is in the after-market sector. It's risk management, capital management—people take these skills and apply them across many markets to do things they couldn't do before. Instead of a guy focusing on a single market like treasury bonds, he now uses his knowledge and applies it across a range of markets that interest him.

"Execution and clearing of trades used to be a mounting overhead—the more trades, the more people we needed to handle them. And at some point it becomes humanly impossible to push more volume through a trading pit even if you do add more people. Now we've made the investment to automate those activities so the more trades we handle, the better the return on our investment.

"Your highest activity levels in the past will be dwarfed by the activity to be handled in the future. If you are going to go real time, you need to make a big investment in automation, but then you have eliminated the bottlenecks and now you can handle practically unlimited volume," Tom explained. "The paradigm shift today in electronic trading hasn't been fully realized yet. Everything is automating. It is a game

of distribution now. If you own the distribution, you own the world." By distribution he is referring to the number of ways CBOT can bring its trading services to customers. The more customers that use the CBOT for their trading activities, the greater are the economies of scale.

Tom's focus is shifting away from the actual execution of trades and is moving toward the issues related to building greater trading volume at the CBOT. "We've built this great automated trading system and now we are looking at ways to bring in transaction volume. I deal with questions like whether we should build our own program interfaces to customers' trading systems or whether we should just publicize the specifications for our interface and let others do that. We have decided to form partnerships with the trading system vendors and let them provide the interfaces between their systems and our trading and clearing systems. Now our distribution is not gated on what we can deliver ourselves, but instead it is gated on what our software partners can do to deliver an ever-increasing number of new customers."

Tom observed that even though they drop their trading fees to attract more volume, the trade-off is still very favorable. "Your fees drop by 50%, but your volume grows by 400%. You capture market share and you keep it because, once they are connected to your system, the switching costs are so high that customers won't leave unless you really screw up." He went on to explain that it is too costly to continue to build infrastructure to support more and more manual trading, but they can cover the cost of building systems to support automated trading as long as they keep growing their market share.

The CBOT is investing in systems to automate the bulk of its routine transactions and focusing its people on handling the nonroutine transactions or the exceptions. "The exceptions and the complex situations, that's where we want to focus our people because that is where the margins are. People will no longer pay very much for execution of routine trades," said Tom, "but there are still markets suited to face-to-face trading, what we call open-outcry trading. There are people who want a premium service and will pay a higher price to get it. You can build more complexity and subtlety into trading strategies in these markets. There is a feel that an experienced trader can develop there, and that market feel doesn't come through electronically—you have to be there in the trading pit.

"And, you know, we are also finding that the more complex the situation, the less the complexity I want in the systems I use to deal with that situation. Simple systems give me maneuverability, and in complex

situations maneuverability is what I want." He pointed out that simple systems used well by experienced people are a lot more effective than complex systems that are hard to use.

When asked about things that worry him, Tom thought for a moment and then said, "It's the things you can't control, things in your distribution channels that can have a great impact on you but that are external to your company." Tom continued, "As things speed up, so does potential risk. If I can now trade 30 times a second, how many times an hour do I need to assess my risk?" Tom described how customer-facing systems are the ones that go real-time first, but they are supported by back-office systems that are not real-time. "Downstream operations after trade execution are often still batch—you can get really out of sync," he said. "You still have back-office systems that only run once a day when markets now run 22 hours a day."

"Another thing is that as you start to offer price competition, margins get very thin and you need a lot of market share to make money. I don't think there is enough market share to support 20 to 30 competitors anymore. For us, that means that our distribution becomes more and more concentrated and our risk gets more concentrated, too. You need to make sure that you and your distribution partners are strategically going in the same direction."

There is also a lot of excitement and opportunity that comes with living in a real-time world. Investments in real-time systems make it easier to enter new markets. "You can offer new products quickly and cheaply. The barriers to entering new markets are greatly reduced from even five years ago. You can sell what you are offering to an even broader range of participants. The next 10 years of my career are going to be the most exciting ones yet."

Tom has some thoughts to share with executives in other industries about operating in a real-time business world. "Regardless of where you are, don't be so satisfied or think that others using rising new technology can't unseat you. There is always someone out there willing to leverage new technology to get into a market that is too rich or to find margins that are too wide.

"The bandwidth of the Internet is going to expand dramatically," he said. "This will drive all sorts of new opportunities and launch lots of new projects to apply technology to business. These projects should be based on business need. If you can't justify a project based on clear business opportunity and good return on investment, then don't do it.

It is new, uncharted territory. Watch out that you don't forget where you are going. Use specific business needs as your compass or you will get drawn into things that become expensive research projects and deliver very little return to your business."

Endnotes

1. Walter Janowski, "Management Update: The Real-Time Enterprise at the Customer Front Line," *InSide Gartner:* Note Number IGG-05282003-01, 2003.
2. Ibid.