

Availability of Information, Data, and Services on a  
24-7 Basis is Critical For Business Success

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## Abstract

The information age touches the lives of almost everyone, and knowledge in all areas of human interest is expanding with unsurpassed rapidity. The benefits of using the Internet are wide-ranging, and it has ushered in a new age of global communication, discourse, and information access. As companies broaden their interests to incorporate a global focus, it becomes increasingly important that information is available 24 hours a day, seven days a week (24-7). Since consumers are on the Internet 24 hours a day sending e-mail, checking world news, researching travel destinations, etc., it is important that many businesses are also available continuously. Data that is stored in data warehouses will need to be accessed continually as businesses expand their operations globally. For some businesses, not having information that is instantly available at all times of the day can mean a loss of a competitive edge. A 24-7 concept for businesses is not only important for attracting new customers and maintaining existing customers, but also for improved customer service.

## Availability of Information, Data, and Services on a 24-7 Basis is Critical For Business Success

The World Wide Web is actually a collection or *web* of pages linked together around the globe to form a worldwide information web. The Web is truly global, and access to sites across the world can be forthcoming in just a few seconds. From using simple e-mail to sophisticated back-end services, the ability of users to communicate with others and complete business on the Internet 24 hours a day is truly astonishing. As both customers and employees of businesses have become more used to the 24-7 availability of information, the *need to have* that information available for them also increases in importance. Companies that have created data warehouses have realized that both current and historical data can have value, and the ability for individuals to access that data at all times to assist in the decision-making process becomes of paramount importance. Delays in getting data to individuals who need that data can result in production delays or in inferior customer service.

From a consumer's point of view, 24 hour shopping can be very convenient. Businesses who offer Internet commerce can figure out, down to the individual, who is buying what and how much (Greenspun, 1999). This specificity of information gathering allows them to more accurately cater to customers, resulting in improved service. The concept of a lifetime customer value management system (Greenspun, 1999) indicates that a business will track the *lifetime* of transactions that the customer has made. As soon as Customer X shows up on a company's Web site to "shop" again, the company can know how many times the person has ordered before, returned a product for a refund, or

come to the site and not ordered. The value of a data warehouse becomes more apparent when you can see that data from the warehouse can be translated not only into decision-making tools to assist in strategic planning and other long-term plans, but also for identification of core customer data, traits, and trends.

New software that is on the market (Mahoney, 2000) makes it easier for businesses to gather valuable data about customers. For instance, WebTaggers, Inc. created software that tracks consumers' interests, notes comparison shopping practices, and matches that data with merchants' databases. Real-time personalization that caters to customers who are shopping online is a large and growing market. In addition, the technology offers companies immediate feedback on how well promotions, displays, and products are being received.

New customer rules may need to be developed as a result of what is learned from customer data from the data warehouse. For instance, if a customer has ordered 11 times before, and the company is running low on inventory, his/her order may be pushed to the front of the list and quoted a 48-hour delivery time. A customer that has only ordered once within the past 18 months may be quoted a longer delivery time of two or three weeks. These "rules" can be developed as a result of studying the transaction trends of customers from the data warehouse. Since the customer can be transacting at almost any time of day, the business would be smart to learn as much as it can about a customer and create policies and rules that will keep customers satisfied.

According to Furlong and Lipson (1999), the concept of "service" seems different on the Web than in ordinary store shopping. Businesses must make certain that customers feel confident that information required (e.g., name, phone number, credit card

number) for the transaction is safe. The important thing for businesses is to help customers get comfortable with the basics of Web shopping.

Service is a concept that is taking on new meaning for consumers and for businesses. Not just the quality, but also the availability of service is important for both businesses and customers, and it benefits both in different ways. Residents of the Australian city of Hurstville can now get personal attention on a range of city council services 24 hours a day, seven days a week (Anonymous, 2000). The “customer” (i.e., local citizen) benefits by getting attention from a *live* employee at any time of day. The local city council benefits by getting more ideas and feedback from citizens due to the increased hours of availability, thereby allowing them to stay current with issues that citizens deem important.

Edward (2000) stated that “The nature of our business is such that customers will access our Web site in the evenings. We owe it to them to be available, and to have the data current.” As an apartment leasing company that also specializes in relocation, it is understandable that Edward’s company information needs to be available at all hours. Individuals planning a move to one of the 21 cities where Edward’s leasing offices are located will often do their research at night, after they have come home from work. While the actual leasing agents at Superior Views Real Estate may not be in the office 24 hours a day, the potential customer exploring the data available on their Web site is offered at least two reliable ways (i.e. e-mail, and voice mail) to make contact with a leasing office. The customer can finish their investigation of available properties for lease and can feel confident that their communication will be followed up on the next business day. Edward remarked that because of the fact that potential customers may make contact with the

company at any time of day, customer service (viz. a prompt reply to the customer) becomes a top priority. “Otherwise, we could lose the potential customer to a competitor.”

Edward also mentioned the benefits of the company’s data warehouse for office managers. With over 60 real estate leasing offices nationwide, managers have a valuable tool with which to sharpen their marketing focus. For instance, if a particular office seems to get increasingly more customers from a particular zip code area or subdivision, they may decide to expand advertising in that area to maximize productivity. “It’s not always apparent,” states Edward, “where business comes from, and the ability of the information that can be gleaned from the data warehouse has saved us dozens of hours in research, and has allowed us to maintain and manage information in-house, rather than hiring a professional demographics analysis company.”

One other advantage of the data warehouse of Edward’s company is that the ability of leasing agents at each office to be able to make permanent changes to the data in the data warehouse will minimize the data entry duties of the IT staff. If one agent at one office gets news of a price change at a particular apartment community, he or she can directly update that price information into their workstation, and that data goes directly to the data warehouse nightly. The transfer of information between offices and to the data warehouse is facilitated by the company’s nationwide network system.

The 24-7 availability of the Internet reinforces the fact that we live in a world with a global economy. The reality of being a business with a Web presence “is that as soon as you go on the Web, you are irrevocably global” (Yorgey, 2000). The very nature of the Web is that it instantly gives a company the potential for global exposure. As

companies expand their business interests worldwide and create data warehouses to manage their increasing volumes of data, they position themselves to use data and information in a very “global” way, especially when they have used that data in the decision-making process.

The concept of 24-7 availability actually changes the way management must operate in the world of commerce and services. Managers must have a much broader perspective in terms of availability of information and services and with regards to customer service. Their need to focus on real time, all the time, is a phenomenon that is a result of four trends (Stewart, 2000). The first trend is that corporations are becoming increasingly global in nature. Having business operations around the world effectively means having availability around the clock.

The second trend that has led towards a 24-7 business world is that regular business hours have steadily lengthened. Their physical doors may not always be open to the public, but many businesses provide service beyond usual business hours. For instance, many high tech companies offer live technical support 24 hours a day. Also, credit card companies offer 24-hour customer service. Consider a traveler who loses a wallet. He should not have to wait until the next business day to cancel his credit cards, and he doesn't. Credit card companies have 1-800 numbers and customer service representatives on duty at all times.

The third trend that has led to the phenomenon of 24-7 availability is the enrichment provided by the Internet and World Wide Web. On the Web, individuals can both interact and transact. They can also comparison shop when gathering information about a product to purchase.

The fourth trend leading companies to a 24-7 business structure is the increasing advancement of computer technology. As computers increase in speed and processing power, everything they are used for, including business processes and update cycles to data warehouses, operates on a quicker time schedule.

Stewart stated (2000) that when the four “trends (mentioned above) intersect, you are closing in on real time.” The more that companies feel the realities of the four trends, the more they are pulled along with the trends and their inevitable consequences, and the more they must operate within the 24-7 paradigm to be competitive.

While customer service, tech support, and production can operate on a 24-7 schedule, some business functions (e.g. purchasing, distribution, working-capital management) are slower to reach that timetable, but they are getting closer. One can recognize when the whole business has reached the 24-7 structure when it can pass three tests (Stewart, 2000). The first test is that the company produces in response to derived (i.e., actual) demand. Dell’s business model is based on actual demand in that a computer that a customer orders gets custom made for the customer. Dell doesn’t produce “extra” computers to sit on the shelves of retail stores. Dell deals directly with the customer and responds precisely to the customer’s needs.

The second way one can recognize that a whole business is a 24-7 organization is that a real-time business completely depends on absolute reliability. If a business offers its services in a 24-7 framework, then they had better be up to the task to *provide* that availability.

The third way to recognize that a business as a whole is a 24-7 organization is when it is determined that a real-time business connects in a 24-7 manner with the



outside world. In other words, a business should have real-time audit and feedback structures including financial, customer satisfaction, and news about what is happening within the organization. It also means responding to the world with both decisions and resources with a decidedly 24-7 mentality.

As Internet technologies increase customers' ability to transact with organizations offering goods and services, e-mail and the Internet are helping create higher expectations among customers. Customers are becoming more accustomed to having continual access to businesses and services on the Internet (Fairley, 2000), and they are getting used to extended hours by other businesses that are not quite at the 24-7 availability. They are also *expecting* better customer service from businesses. Inadequate customer service leads some to shift their business to competitors. Managers must realize this so that they will keep up with customer expectations and not become a victim of lost business.

Union Planters Corporation, a bank in Tennessee, is not yet at 24-7 availability (Fairley, 2000). While they feel that they operate successfully with the current level of 12-6 availability, they did increase their availability to the current level as a result of observations made about customer expectations and the need for increased hours. They even have a dedicated staff that they call their Internet Response Team, that responds to e-mail messages and makes as-needed follow-up phone calls to customers. Regular updates of customer suggestions and/or complaints to a data warehouse increase the likelihood of improved future customer service.

Investors in the stock market are also realizing that decisions can be made at almost any time of day. Although the stock market is only open six and one-half hours

every weekday, online investors are trading as if the exchanges were open 24 hours a day, seven days a week (Futrelle, 2000). Many companies release important news once trading has stopped, so investors see on-line trading as a way to capitalize on that news. Data warehouses that house historical trading data can be accessed by institutional investors for researching trends during and after trading hours.

Increased information flow as a result of the expansiveness of Internet technology indicates that information itself requires a new perspective. Businesses are going to have to perceive information differently in order to deliver the new paradigm. The key to improvement lies in new and different ways of thinking about immediacy, thinking about ways to use data more effectively, and thinking about methods to respond through multiple channels. In the banking industry, for example, multiple channels means that a customer may visit a branch office to make a transaction, may send an e-mail to get an answer on a non-urgent issue, may phone the branch, or may view the branch's Web site. According to Fairley (2000), it may be best to blend the Internet into the fabric of the bank as opposed to setting it off as a separate operating entity. Customers should be able to choose the best channel for accomplishing the task they deem important at the time.

Bank managers can use their data warehouses as tools to improve customer service or to create new services. For instance, because of data that has been studied from the data warehouse, managers may decide to implement a new type of account to attract a growing target market. One bank in Austin actually remodeled the entry area of one branch location so that it would lend itself to a more "friendly" atmosphere. The information they used to make the remodeling decision came from their review of customer service questionnaires, which indicated that the bank seemed too "formal" in

atmosphere. Data placed into their data warehouse enabled them to recognize a concern of customers that could be effectively addressed.

Customer groups that have grown accustomed to data that is available on a 24-7 basis may eventually *require* that the data be available, and may specify that objective in service agreements. “In the future, the way people are going to do business with their customer is any way the customer wants to do business with them (Baldwin, 2000).” The end-users that expect 24-7 availability will often *need* that information on a 24-7 basis, and the only way to ensure that it will be provided as expected is by having a written agreement that provides for such.

Not only are customers expecting service at any time of day, but information technology (IT) employees also anticipate that longer work hours may be needed. A poll in January 2000 found that 46 percent of women who are married or living with someone see their significant other only in passing because they work different hours (Solomon, 2000). The two main reasons that explain why they need to work different hours are the management of childcare, and the need for our society to offer 24-hour service. Someone has to work those late hours in order to service customers, or in order to maintain systems (e.g. servers, data warehouses) that provide 24 hour on-line availability.

Another survey mentioned by Solomon (2000) indicates that many IT jobs are very flexible, often allowing workers to perform some or all of their jobs from home. With e-mail, personal digital assistants, and notebook computers, it is easier now to work from home than it was in the past, and non-traditional working hours are more easily accommodated.

Flexibility may be one incentive to hiring IT professionals for the late shifts. The other incentive may be a pay differential (Kontzer, 2000) as remuneration for their acceptance of the late shift. Chris Huff, chief information officer of Arthur Andersen's business process outsourcing unit, suggests (Kontzer, 2000) the following round-the-clock staffing strategies:

- Make sure a potential employee understands the company culture and is comfortable with it.
- Whenever possible, keep employees on the same shift. Rotating shifts can be stressful and can increase turnover.
- Implement the best practices for retention, such as performance bonuses, extensive training and opportunities for advancement.
- Measure the client load frequently, so that IT staff can be deployed when needed.
- Let the dynamics of the business drive the approach to attracting and keeping IT staff.

Business-to-business transactions have also increased as a result of 24/7 availability. While business-to-consumer sales on the Internet for last year were around \$18 billion, business-to-business sales were at an estimated \$100 billion (Waters, 2000), and are being driven by investment financing, information technology spending, start-up money, and new "brick-and-mortar" projects. According to Waters, 42 percent of Web sites that catered to businesses for at least three years are now considered profitable businesses, and 27 percent of new sites that went active in 1999 are profitable.

The availability of data in data warehouses makes it easier to make decisions with greater accuracy than in previous years. The volume of data that can be stored on a data warehouse is immense, and proper utilization of that data for decision-making can help businesses improve both business-to-business and business-to-customer sales and service.

Delivering information to knowledge workers leads to better business practices and customer satisfaction. Understanding customer transaction patterns allows businesses

to build better products and services that lead to a competitive advantage (Bischoff & Alexander, 1999). New approaches to the design and use of data warehouses, such as a virtual data warehouses approach, focus on understanding the end user's requirements and enabling immediate access whenever possible. The more immediate the access by the end user to pertinent data, the better for the end user, and the better for the business as a whole.

Technology is here that can *allow* businesses to be open 24-7 with the public, and with their own employee base. Global customers expect on online business to be up and running at all times to meet their needs. "Keeping an online business open 24-7 is crucial," according to Traubitz (2000). Unexpected losses from downtime can be disastrous. Hardware must be in place to make certain that the 24-7 availability is reliable for those businesses that need it. Businesses with the 24-7 mentality must be able to back up their innovation and enthusiasm with solid solutions that ensure the continuous availability of their systems. By combining cluster-aware database servers with current hardware and operating system solutions, a business-class Web-based database can deliver the continuous availability that is needed. Such database systems must incorporate the following key elements (Traubitz, 2000):

- Automatic synchronization of backup systems
- Automatic failover to backup systems
- Automatic and transparent client migration between systems if a failure occurs on the main system

While a data warehouse project may start at a departmental level, it is prudent to plan for ongoing enhancements to the system. Companies may merge, split into two or

more parts, or have upgraded technology. The data warehouse system must be capable of being modified as needed.

The Internet and Web-based technology represents a dramatic example of how businesses can offer 24-7 availability to end-users. As the public becomes more and more used to being able to access the offerings of businesses at all times, what is certain is that there is a clear indication that companies must be prepared for the continual presentation of their product offerings and services. The function of the data warehouse becomes increasingly important as businesses realize the need to keep up with a rapidly changing world with rapidly improving technological sophistication. The data warehouse is a tool that managers can use to improve the strategic and tactical maneuvering of the global enterprise. For many companies, the ability and willingness of the consumer to be ready and willing to transact at any time of day means that the business *must* be ready at all times of day. Decision-making is not just limited to daylight hours or to the hours of a traditional workday. To use the data warehouse as a tool for the decision-making process means that it must be up and running at all times of day for those who need it. While the data in the data warehouse may not necessarily be updated in real time, it *is* updated as often as the business needs it to be updated. The important concern is that it be available *when needed* so that companies can operate at their most efficient in a highly competitive marketplace. The very fact that a business is available 24-7 indicates that all enterprise processes of that business, from customer service to the maintenance of a successful data warehouse, should also be available whenever necessary.

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