

Zero Time™: A Conceptual Architecture for 21st Century Enterprises

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Introduction

“Speed is the essence of military strategy.”

Sun Tze , *The Art of War*

The digital economy has changed the ground rules; now the norm is change and winning is achieved through speed. We used to think that satisfying customers meant simply providing the best product or service at the best price. But the game has changed. Computing and communication technologies continue to shrink time and space. The new generation of customers has come to expect instant gratification. And unless companies respond with product, price and speed, customers are not satisfied.

Elite companies already know this and are restructuring themselves to compete in the 21st century world of speed and constant change. When CitiBank first offered its “Power Loan,” the industry’s average time for mortgage approval was between 30 and 45 days. In the program’s first year, power loan guaranteed 15-day approval; in the second year, it reduced approval time to 15 minutes. Customers responded by providing CitiBank with a significant increase in market share. When customers of Progressive Insurance are involved in an accident, frequently the Progressive agent is there, even before the police, because of an intelligence device installed in the customer’s car. In addition to taking care of Progressive’s customers, agents have the authority to make an “instant settlement” by immediately writing a check to the customer. This has become a source of competitive advantage for Progressive. Michael Dell of Dell computers is pushing for zero inventory, and Intel’s ex-CEO Andy Grove projected that microprocessor power would double machine performance at every price point every year. Massachusetts General Hospital offers instant telemedicine to customers in Saudi Arabia. Continental airline was the first to offer E-ticket, self-service electronic ticketing at the airports, and Toyota was the first to introduce just-in-time inventory. NEC’s spider manufacturing line was designed to reduce time to zero. These leading edge companies have figured out how to manage **time** as a valuable resource, which helps them gain competitive advantages.

Stalk and Hout in their book *Competing Against Time*¹ suggest that time-based companies have gained distinct advantages over their competitors. They were able to respond to customers at least 66 percent faster, grow three to four times faster, and have at least double the profit advantage of their average competitors. These companies demonstrate some of the characteristics of the Zero Time organization that we see as critical for the digital economy of the 21st century:

- Zero-resistance – The information needed was available when it was needed.
- Total empowerment – People in these organizations are leaders capable of making the right decisions.

- Zero learning gaps – Knowledge is managed throughout its life cycle, from basic learning and creation of knowledge to the conversion of knowledge to customer value.

In this paper, we discuss the concept of Zero Time from several perspectives. First, we describe Zero Time thinking and the disciplines of a Zero Time organization. We then describe how this concept is similar to and different from current popular management theories. Examples of near-Zero Time companies we find in existence today are offered as a glimpse to the future. We then describe how to become a Zero Time organization, and conclude with a section on actually being a Zero Time organization.

Zero Time Philosophy

“First, the taking in of scattered particulars under one idea, so that everyone understands what is being talked about... Second, the separation of the idea into parts, by dividing it at the joints, as nature directs, not breaking any limb in half as a bad carver might.”

Plato, *Phaedrus*

We have learned from very early times to divide large problems into smaller pieces to make complex tasks more manageable. For the past two hundred years, ever since the industrial revolution, we have built organizations and enterprises based on Adam Smith’s thesis that work should be divided into its simplest and most basic tasks. Smith’s principles and practices, their refinement by Frederick W. Taylor, and their enhancements by Henry Ford and Alfred P. Sloan transformed American industry from craftsmanship to mass production. This transformation brought about an impressive gain in overall productivity. However, entering the 21st century of a postindustrial, global business age, we have come to realize the deficiencies of this way of thinking.

The enormous, hidden price that we paid for rational thinking is that we lost our intrinsic sense of the connection to a larger whole. This loss is not limited to the business arena, but permeates our society’s science and sociology domains as well. For example, despite the brilliant discoveries in physics principles, we were not able to explain the formation of clouds until about 25 years ago. This fact and other similar phenomenon in biology, genetics, etc. led to the formation of chaos theory, which advocates looking at a problem as a whole rather than by examining only its parts. This section will describe the philosophy of Zero Time: a holistic way of thinking about change.

Many enterprises today understand the importance of time from a multitude of viewpoints. FedEx understood that customers would pay premiums for getting the right information at the right time; Dell understood that a “build to order” manufacturing process would guarantee its product delivery in five days from order. Progressive Insurance understood the value of an instant settlement. And Intel and 3M, among others, understood the value of “time pacing”² to rapidly turn over their product lines. The stellar performances of these leaders demonstrate how time can be an effective competitive weapon.

While the goal of shrinking time to zero is common, Zero Time thinking is not. The difference is similar to the difference between quality management and zero defects. Both seek to produce a quality product but do so from different fundamental philosophies. The former assumes that there are defects, and hence there is a need to manage defects to ensure only an acceptable level. This means that attention is spent on building processes to inspect and rework output. The latter, on the other hand, assumes that there will be *no* defects. Hence attention is focused on the design and production processes so defects do not occur. While the goal of both approaches is to realize no defects, their methods to achieve that goal will be entirely different. Zero Time is like zero defects in that the challenge is to design instantly executable business processes, rather than to incrementally “fix” existing processes by reducing cycle times. In fact, for many organizations, incremental improvements may never lead the organization to the so-called “promised land.”

Normally we think of time as sequential, or “horizontal,” in that time flows linearly. Given this, we try to ‘slice’ our time in order to gain efficiency when dealing with the multitude of situations we encounter daily. As we tackle problems in different time slices, we bring a part of our knowledge, energy and emotion to determine solutions. Zero Time thinking is like taking a view from a “vertical” perspective³ in that *all* of our knowledge, energy and emotions are brought to bear on the problem. As such, each problem can be solved instantly because we are able to *see* differently. This may sound strange, but a consideration of the experiences of people in a state of meditation or hypnosis suggests that in such a deep state, one can instantly grasp any problem because the notion of time does not exist; time stands still, and the mind is clear. Many world-class scientists are able to see through the complexity of a problem to reach the essential result. “*I think, therefore, I am*” embodies the philosophy of Zero Time. This statement challenges managers to take a new look at how an organization or individual must function. It suggests that once an idea or order or output is identified and desired, it is instantly produced from existing people, processes and technology in combination. The following table provides a summary of how we view Zero Time thinking, in contrast to conventional wisdom (See Figure 1).

<***Figure 1 about here***>

To summarize, the Zero Time philosophy describes how organizations have the ability to *see* differently, and have the capability to *act instantly* on what they see.

Disciplines of a Zero Time Organization

“Speed is Everything. It is the indispensable ingredient in competitiveness. Speed keeps business – and people – young. It’s addictive, and it’s a profoundly American taste we need to cultivate.”

Jack Welch, CEO of GE

A Zero Time organization can be characterized by five disciplines: *zero-value-gaps*, *zero-learning-gaps*, *zero-management-gaps*, *zero-process-gaps*, and *zero-inclusion-gaps*. These disciplines are briefly introduced, then further refined in examples and a description of how to become a Zero Time organization.

Zero-value-gaps

Zero-value-gaps means to custom fit your products or services for each of your customers, one at a time, to maximize the value each receives. Values are of course different for different customers. For example, Swatch's customers desire fashion; Harley Davidson's want lifestyle; Sony's look for innovation; Compaq's demand quality; Wal-Mart's go for low price; 3M's solicit innovation; and IBM's seek premium service. But beyond these generic values, customers want more. They want the product or services tailored exactly to their needs, delivered at the exact time frame, and at a price point that renders the deal satisfactory.

The idea of zero-value-gaps is a totally different way of looking at the market. Since customer and brand loyalty is earned at **each** transaction, long-term market share is no longer meaningful. Customers can be lured away by a more clever, more responsive competitor the next time a transaction is about to happen. Instead, we suggest "customer share" is the new goal. Will each customer continue to buy your products or services instead of using other brands? Can you get 80 percent of each customer's lifetime value? This is certainly contrary to the conventional marketing approach where "market share" is the measuring stick for success. And attaining customer share means understanding what is of value to the customer now and in the future. It means understanding what the customer's customer wants, and providing a product or service that adds value to both your link and the next link of the supply chain. Application of the concept of zero-value gap forces enterprises to adopt each customer's point of view. Often, helping the customer satisfy his or her customer is a function of the value of time.

One way these elite companies deliver more is to incorporate the value of time into their processes and services. For example, Wal-Mart and Proctor and Gamble linked their databases in a way that pioneered virtual integration to drastically reduce costs and shorten the cycle time for shelf replenishment. Compaq uses Just-In-Time inventory management and build-to-order manufacturing to improve its cycle time to market, and ultimately to reduce costs while maintaining quality. Compaq's CEO, Eckhard Pfeiffer, launched a new business model, the Optimized Distribution Model (ODM), which exemplifies this perspective. "ODM sees our entire business from the customer's point of view. Compaq believes that ODM will create a new customer-value revolution," according to Pfeiffer⁴. Sony utilizes the concept of "product families"⁵ to reduce cycle time and prepare its customers for new products.

Zero Time organizations take a broad view of who the "customer" is with whom to share values. Customers include the standard external customer, the one who directly buys goods and services from the organization. But in addition, Zero Time companies often include internal customers, or other departments who need outputs from one another to meet their goals. In some cases, companies include other stakeholders as "customers" and seek to design processes that meet the shared values of the broader collective. Dell Computers is one such company that takes this broader view, as described later in this article.

Zero learning gaps

Zero learning gaps is the capacity to continuously learn and create knowledge, then convert it into customer value. In other words, by Zero learning gaps we mean the management of the entire life cycle of knowledge – from creation to dissemination. We consider knowledge to be any information collected by the organization and then assimilated and processed in some manner in

order to make it useful to those who need it. Pure information, on the other hand, is a static arrangement of data, without any assimilation or processing to make it more easily used. There are several components necessary to build Zero learning gaps into an organization: an environment for learning; management of the knowledge in chunks that are useful to people; and an infrastructure supporting seamless integration of computing, communication, and content technologies. For example, 3M's 15-percent rule provides an environment in which an employee can request that 15 percent of his or her time be allocated to pursue potential interests to the corporation in order to continue to create knowledge and convert it into customer value. The ubiquitous "post-it" sticker is a product of the 15-percent rule. Another example is the widely used concept of distance learning, where on-demand training is used to distribute knowledge efficiently and effectively.

Through Zero learning gaps, it becomes possible to embed intelligence into products and services GM's *OnBoard* system facilitates the integration of computing, communications and content to each individual car⁶. Some of Otis Elevator's products include embedded processors and communications systems to allow self-diagnosing and to alert remotely the service and maintenance organization of impending failures⁷. Similarly, utility and telephone companies are beginning to offer automatic diagnosis and repair services. Zero learning gaps is the core competency for a Zero Time organization because it is the basis for ensuring the other disciplines can be achieved.

Zero-management-gaps

Zero-management-gaps is based on the concept of holonic management⁸ where every part of the organization is in and of itself a whole, complete entity, or a whole within a whole. The concept of *holon*—a whole within a whole—is in fact visible in such naturally occurring entities as the genetic code. Zero-management-gaps means that every person in the Zero Time organization has the ability and the permission to do whatever needs to be done *in order to produce value for customers*. Every person is totally empowered with both the knowledge and the capability to complete whatever tasks he or she is asked to perform. Likewise, teams of workers are also complete and have the tools, ability and capability to complete whatever work they are asked to do. A zero-management-gaps model implies that each whole is aligned with the corporate whole, and all parts are empowered to do what needs to be done. NEC, the computer giant of Japan, highlights the way a holonic organization works. NEC's mobile division's manufacturing line near Tokyo was reduced from 105 meters to 8.5 meters by incorporating the concept of holonics. Each line worker is part of a "spider," or cell, and each worker has a storage box containing one day's supply of parts. The workers in the spider have everything they need to do the job they need to do. If they need assistance, they know to whom to go, and are empowered to seek out whatever is necessary to complete their day's work.

NEC has obtained outstanding results by incorporating a holonic design into the manufacturing process. Manufacturing at NEC is based on the orders received – a pull strategy, rather than on the level of inventory – a push strategy. And the workers report increased satisfaction with the manufacturing process, thus reducing costs associated with high employee turnover and low satisfaction.

The concept of whole within a whole is not new. Wal-Mart used the concept "a store within a store" to give department managers the authority and freedom to run each department as if it were

their own business. Fast food franchises such as McDonalds also exhibit holonic thinking. Another example is the concept of a “micro-enterprises unit” of Xerox. This unit is one person who represents Xerox with the ability at his or her disposal to satisfy customers’ needs, no matter what they might be.

Zero-process-gaps

A zero-resistant process is one in which there are no obstacles to performing whatever tasks are required. Total and immediate availability of all resources needed to complete a task is crucial to zero-process-gaps. Like a superconductor through which current can flow without producing heat, in a Zero Time organization the process can occur without interruption, wait time, or downtime. Zero-process-gaps requires that individuals have achieved personal mastery of tasks and that they are empowered to follow them through. Many organizations today use virtualization: that is, trading virtual space with physical space, to achieve near-zero-process-gaps. For example, Massachusetts General Hospital is using telemedicine to provide patients in Saudi Arabia immediate access to top medical experts. The virtual bookstore, amazon.com, is another such example, since a customer seeking a book can locate, order, pay, and receive it without encountering any impediments or complications. Manufacturers such as Dell and Compaq have replaced inventory with information that reduces resistance. Medtronic has increased its adaptability to market changes through a multigenerational strategy for new product development of cardiac rhythm management devices.. As a consequence of this approach, Medtronic’s worldwide share of the pacing business has increased from 30 percent in 1985 to 50 percent in 1997, and over 70 percent of its revenues come from products introduced in the past 12 months⁹. Zero-process-gaps is a critical characteristic of a Zero Time organization.

Zero-inclusion-gaps

Zero-inclusion-gaps means that all people and organizations who need to be involved are included – automatically – with neither physical nor technological boundaries to limit accessibility. The Zero Time organization is a proactive organization that anticipates, senses and responds to the environmental changes influencing completion of the corporation’s mission and goals. For example, Toyota, Ford, and Intel, for years, have been including both customers and suppliers in the design of their next-generation products.

This concept is best illustrated through value-added partnerships (VAP) where each partner has a stake in the other partner’s successes and failures. The VAP builds on the potential economies of scale and scope of each partner to reduce costs, increase expertise, and leverage knowledge. Figure 2 illustrates the VAP of farm products.

<***Figure 2 about here***>

Information technology provides the basic infrastructure for zero-inclusion-gaps. One pioneer of the VAP concept is McKesson Corporation, the pharmaceutical products distributor. In the 1970s, McKesson considered selling its pharmaceutical wholesale and distribution business because of the fierce competition from chains. Instead, McKesson created VAPs with insurance companies, drug stores, and consumers using information technology. Another classic example of zero-inclusion-gaps is the Boeing 777 design team. The airlines planning to purchase the new airplane, United, Cathay Pacific, Japan Airlines, and All Nippon Airlines, were involved in the design,

production and introduction of the product. The paperless system extended beyond Boeing's boundaries to include their customers who influenced final design criteria such as width of the fuselage, reliability and maintenance, size of operating buttons and configuration of compartments¹⁰

<***Figure 3 about here***>

The Goal: Instant Customerization

These five disciplines (see Figure 3) result in *instant customerization*, which means that the needs of any customer are fulfilled as soon as the needs are expressed. Instantaneous fulfillment of customer needs is achieved by converting knowledge into something valued by the customer. Among the models for how to do this is the emergency room, an organization that provides virtually unlimited resources (access to experts, databases, processing time, products, etc.) to the individual servicing the patient. Like an emergency room, where the doctors, nurses, and equipment needed to treat emergency patients are all present or near by and easily accessible, this model suggests that organizations can achieve instant customerization by keeping all resources close to the customer service representative or other employee who needs to complete tasks. An example of company that uses this model are Amazon.com, whose large virtual inventory makes it possible to order just about any book in print and have it delivered directly to the customer. Another example is luxury hotels, which pamper customers by providing anything needed, such as business centers, health clubs, a variety of restaurants, etc. to make their stay satisfactory.

In the other model, the Disneyland model, an organization provides the customers with a set of choices and allows the customer to effectively provide self-service. By providing the environment and a choice of rides and attractions, Disneyland enables every guest to experience a unique vacation within the boundaries of the park¹¹. Elite manufacturers such as Dell, Compaq, GM and fast food chains like McDonalds are in this category; customers have a wide range of choices of products to buy, but these choices are bounded by what the company offers.

A third model, which we call the Hybrid model, is a mix of the Emergency Room and Disneyland Models. Mega-retailers such as Wal-Mart and Home Depot fall into this category because, similar to the Disneyland model, they have enormous inventories that provide a wealth of selections. However, they go beyond the Disneyland Model to offer customers services that enable them to customize their selections. The result is a supply of almost endless possibilities, like the Emergency Room model. The book store chain Barnes and Noble, is also a hybrid in that it provides a rich selection of books coupled with an ability to custom order any book in print. These 3 models are summarized in Figure 4.

<***Figure 4 about here***>

How is this New and Different from Existing Theories?

“All men can see these tactics whereby I conquer, but what none can see is the strategy out of which victory is evolved.”

Sun Tzu, *The Art of War*

Many of the concepts embedded in the discussion of Zero Time are also part of other management theories. Zero Time is new and different because it describes the integration of many of these theories into a unifying set of concepts targeted at a specific organizational goal of instant customerization. Further, Zero Time describes a basic philosophy that is fundamental to achieving the goals of organizations in the digital economy. Finally, Zero Time includes a set of disciplines and a prescription that describes an organization ideal type, whereas many of the management theories today include either a process, or a goal, or a vision, but not all three. We briefly review several of the more popular management concepts in Figure 5, and then identify how Zero Time differs from each of them individually.

<***Figure 5 about here***>

The theories listed in Figure 5 have significant overlap with the concept of Zero Time. Figure 6 maps these theories onto the discipline of Zero Time. Notice, in Figure 6, that while each of the disciplines of Zero Time overlaps with one or more popular theories, none of the popular theories include all of the disciplines embodied in Zero Time.

Our point is that while the concepts of Zero Time are individually discussed in great detail by other popular management theories, Zero Time is an integrative theory, linking the concepts together in a coherent manner. Further, Zero Time is both a way of thinking and a set of disciplines to guide action. When one thinks Zero Time, one begins to make decisions that look different than decisions made without Zero Time thinking. This, we believe, differentiates Zero Time from the other theories and ideas previously articulated by the authors of the theories described here.

<***Figure 6 about here***>

Examples of Near-Zero Time Organizations

“I have always concentrated all along on building the finest retailing company that we possibly could. Period.”

Sam Walton

While no one organization exhibits a full complement of the disciplines listed above for a Zero Time organization, there are many companies that have components we consider excellent examples of the Zero Time concept. In addition to Disneyland and the emergency-room model, many other organizations have built Zero Time components into their current strategy. The concept of Zero Time should emerge through the following description of two global companies: Dell Computers and FedEx.

Dell Computers is best known for its pioneering use of the direct marketing channel for selling and distributing personal computer systems. Its now-famous strategy of manufacturing a system for a customer, or build-to-order, has provided Dell with a cascading series of advantages over its competition – including low inventory costs, no dealer costs, and current technology in every system manufactured. Conventional wisdom said that it was necessary to have inventories of systems in order to provide customers with many choices, and it was necessary to have those systems sold through dealers who could explain the complexities of the systems and give customers a chance to “kick the tires.” Instead, Dell gave the customer a chance to pick whatever features he or she wanted from those available. In addition, Dell manufactured systems only after they were ordered by a customer, which conventional wisdom would say was either too costly or took too long. But Dell was able to guarantee delivery within five days of order. Finally, Dell saw that personal computers were becoming a commodity and realized that sales people would not be needed to explain the systems in the conventional, physical way.

The result is a win/win situation for both Dell and its customers. Factory inventory levels are typically only three days, supported by tight alliances with suppliers who deliver frequent but smaller loads. Finished goods inventory is near zero since the shipper is waiting at the end of the production line to receive and deliver completed orders. No one in the “stream” is sitting with a

significant inventory, whereas traditional supply chains hold up to 60 days of inventory of parts and 30 days of inventory of systems for dealers. Figure 7 summarizes the evolution of business models of Dell, from direct model to virtual integration as it continues to enlarge the distance between Dell and its competitor a more traditional value chain model.

<***Figure 7 about here***>

There are several Zero Time characteristics in the Dell example. First, we discuss the values that drive Dell's culture, that map directly on the zero-value-gap discipline of Zero Time. The Dell Direct Model, shown in Figure 8 highlights how the build-to-order philosophy is central to the Dell culture. And this philosophy is a good example of understanding the needs of the customer and meeting those needs through not only quality product, but speed and customization, which is called "instant customerization" in Zero Time.

<***Figure 8 about here***>

Dell incorporates Zero learning gaps into its process after the customer gives the order. This order triggers the credit checking process and then the manufacturing process, with human intervention only for exceptions. This is an example of a Zero Time process. The manufacturing process begins as soon as the order is known to Dell. This process involves ordering the parts to include in the system, and preparing the software to be downloaded into the system. When Dell accepts the order, the information system sets all necessary components in motion. The information, entered by a customer or Dell's salesperson, contains all the information manufacturing needs to begin building the product. This is an example of Zero Time learning because all the information needed by manufacturing is ready and available to manufacturing when it needs it. There is instant transmission of the information from the customer's order to the systems that will need to complete that order.

Dell also illustrates the concept of Zero Time zero-inclusion-gaps. Relationships with suppliers are critical to make the "build-to-order" concept work. Suppliers are able to know what parts are needed when the order is taken – messages are sent to them if supplies are needed that were previously unanticipated. Short cycle times are possible because the suppliers are included in the process. Similarly, the delivery vendors are part of the process. Their shipper provides logistics services that go beyond simply picking up the package and delivering it to the customer, and actually stocks components such as monitors. When a system is ordered, their shipper is sent a message to begin the process of transporting the required components to customers. This results in delivery of all needed system components at the same time. Finally, even the customer is part of the process; new web technology has enabled Dell to offer its customers access to the systems that help them configure their desired purchase. Customer orders over the web have added significantly to sales, further pushing the direct marketing model.

Zero-process-gaps is clearly illustrated through the build-to-order strategy. There is neither downtime nor wait time in the process. It is possible to begin to fill orders as soon as they are received. Suppliers get the order when Dell gets the order; there is no resistance to transmitting the orders. Since manufacturing has all the parts needed to build the order, there is no resistance to making it happen. Dell's information system takes the lead role in advancing the order through the order fulfillment process.

Where does Dell go from here? To further its path towards a Zero Time organization, it would continue to reduce time in its process. The future could bring a complete computer on a chip, where the hardware is all manufactured the same way, and the software is the differentiating factor. For example, a customer would be shipped a system within one day (or hour) of ordering, and when it was received, it would be turned on and immediately connected to a network that would download all the software the customer desires. The system would then automatically configure itself for the customer, based on the software loaded. Customers would receive systems in a very short time, but at the same time Dell would not incur the costs of inventory typically necessary to respond this quickly.

A second company that illustrates concepts of Zero Time is FedEx¹², the package-delivery company. FedEx has created a successful business by helping companies reduce time in their processes by shipping packages overnight. To do this, its internal operations revolve around Zero Time. For example, when a customer wants to ship a package, he or she enters information into the FedEx computer either through a terminal located in the customer's shipping room or over the Internet. An airbill is automatically printed out and a FedEx service person is dispatched to pick up the package. Once the package is picked up, the information systems track where the package is until it is delivered to the recipient. The "shared values" culture is well documented in the company's sales tag line, "(Customers use FedEx) If it absolutely, positively has to get there on time." Implied in this vision is that the company will do whatever is necessary to satisfy the customer. FedEx sells "time" so customers have more time to work before sending something to their customers. There is no question that time is the most valuable resource FedEx seeks to help customers manage. The results are consistent innovations that further allow FedEx to provide increasingly outstanding services.

FedEx illustrates Zero learning gaps through its extensive information infrastructure. Web access allows any individual to instantly locate information about his or her packages while they are under the auspices of the FedEx transportation system. As a package moves through the FedEx logistics system, its location is automatically updated in the database, which is accessible to FedEx's external customers. The success FedEx has in managing the extensive truck and airline fleet exemplifies the benefits achieved when Zero learning gaps is tightly coupled with a logistics system.

Zero-inclusion-gaps is also clearly incorporated in the FedEx business strategy. Customers can do some of the work of tracking and managing the packages sent. Customers needing assistance can contact the FedEx service agent, who has access to all the information available related to a customer's shipment.

Zero-process-gaps is also made manifest by the FedEx tracking system. As a package moves through the system, the updated information is available immediately to customers and service agents who query the system. There are no waits, delays, or impediments to this information.

FedEx, however, does not completely exemplify the Zero Time organization, in that the hub-and-spoke architecture used to process packages is, by definition, not a holonic concept. A holonic view would say that every location has been empowered to send a package to whatever location is necessary to ensure on-time delivery. Using a hub-and-spoke architecture means every package must go through the hub in order to reach a new spoke. This has been a highly successful and

original concept for package delivery. While we do not advocate changing the architecture to a point-to-point design, we do wish to note that this limitation exists – and at some cost to FedEx.

Had FedEx been an actual Zero Time organization, its experiment with Zap Mail, a service that used fax machines to send documents immediately to their destination, might have evolved differently. In fact, we suggest that FedEx could have “owned” the fax industry. A Zero Time organization would have given all customers a fax machine as part of their service, in the way FedEx gave its largest customers computers equipped to track packages and print air bills. Customers would have looked to FedEx for their fax services. We believe had FedEx been a truly Zero Time organization, it would have conceived of the idea of Zap Mail much earlier and would have been the supplier of fax machines to virtually every business.

We find these examples have several design characteristics in common. First, having an explicit “time-driven” culture from the beginning can be a big benefit to an organization. Michael Dell expresses this culture as “ the biggest change from business as usual is changing the focus from how much inventory there is to how fast it’s moving.”¹³ *Inventory velocity* is thus a key performance measure that Dell watches closely. As a consequence, Dell built an extensive information infrastructure to manage velocity, which it sees as managing information. FedEx uses time as a key factor to define its business. “By 10:30 a.m. next day” became an industry standard that its competitors had no choice but to follow. Fred Smith expressed his vision as “the consequence of failure to deliver within a specified period of time would far outweigh any consideration of reasonable rate comparisons.”¹⁴ This thinking became the foundation of the FedEx engine. Time is considered of paramount importance, with a goal to drive it to zero. Intel is another company that possessed the time-driven culture from the beginning. Its cofounder, Gordon Moore, stated that he expected the performance of the integrated circuit to double every 18 months. This became the famous Moore’s law that set the standard for the industry. By designing a Zero Time organization from a green field, opportunities emerge that are unimaginable at the conception of an organization. As environments change, Zero Time organizations will be better equipped to sense, respond to, and capitalize on those changes.

Second, both of these companies of shifting work from internal employees to customers through automation. In the case of Dell, the customer is able to initiate, configure and place an order, through an operator or the company’s web site, which starts the manufacturing process. And in the case of FedEx, customers can both initiate a pick up and track packages for themselves, eliminating the need for interaction with customer service agents for routine tasks.

Third, both of these companies are virtually integrated with their partners (suppliers, distributors, service providers, etc.) in such a fashion that these partners are treated as if they are inside the company. Dell expresses his view of integration as, “When we launch a new product, our suppliers’ engineers are right in our plants. If a customer has a problem, we can fix it in real time.”¹⁵ Intel has been practicing this for years, as customers and suppliers participate jointly in the design of new products. FedEx, on the other hand, owns its own logistic operation and hence is tightly integrated with its information tracking system. In this way, it can partner with its customers to provide logistics services that go beyond simply moving packages. Zero Time organizations exploit the value of information sharing in order to maximize the time value of information.

Becoming a Zero Time Organization

*“If you can dream it, you can do it.
Always remember that this whole thing was started by a mouse.”*
Walt Disney

“To my imagination it is far more satisfactory to look at (well-adapted species) not as specially endowed or created instincts, but as small consequences of one general law leading to advancement of all organic beings—namely, multiply, vary. Let the strongest live and the weakest die.”

Charles Darwin

We have described the concept of Zero Time and the disciplines needed for a Zero Time organization. We have also illustrated these concepts with examples of near Zero Time organizations from well-known businesses. In this section, we describe a methodology¹⁶ for an organization to follow to evolve holistically into a Zero Time organization. The methodology consists of two concurrent phases: *strategic evolution* and *operational excellence*. These two phases are like the two sides of a coin and must go hand in hand for the methodology to be effective. Strategic evolution is concerned with doing the **right thing** (core value, vision and strategy) whereas operational excellence is concerned with **doing things right** (making operations work). Jack Welch of GE successfully implemented this approach via the management concept of “planful opportunism” by setting a few clear, overarching goals and then empowering his people to seize any opportunities to implement these goals. A Zero Time organization is able to rapidly cycle through these two phases, while learning and adapting. Below we elaborate on these two phases.

Strategic Evolution

The vision of a Zero Time organization is simply instant customerization. The compression of time creates value for stakeholders, such as reduction of costs and inventories, while leading to increased quality. When NEC's Samitomo factory was redesigning the manufacturing line, they set a goal of reducing the time to zero. Likewise, Intel mandates the doubling of performance of its processor products every 18 months; SONY and Medtronic use the concept of multigenerational product families to continually compress time-to-market; Dell follows their vision of build-to-order.

Customerization leads to long term relationship with each customer by truly understand their needs through collaboration and economy of scope. This leads to constant search for discontinuous technologies that will enable the development of next generation products and services that customer will need. Hence, to achieve instant customerization, it is necessary to develop a strategy for evolution.

Unlike evolution in nature, which appears to be random and unintentional, strategic evolution of the human organization is intentional and purposeful. Natural evolution is gradual with very small increments of change, whereas strategic evolution builds on an accumulating critical mass of knowledge with an eye towards the end goal. For example, natural selection took a few million

years to develop the first flying mammal, the bat. By contrast, man flew to the moon and back only 75 years after the first manned flight by the Wright brothers. In fact, it took a mere 30 years after the Wright brothers' proof that flight was possible for Douglas Aircraft to introduce the DC-3 jet engine, in 1935. This was followed by President Kennedy's compelling vision to "put a man on the moon and bring him home within this decade", which drove the nation to invest heavily in NASA to achieve the goal. Strategic evolution provides dramatic potential for time compression compared to natural evolution.

The business world is full of examples of rapid evolution based on brilliant strategies. For example, GM attacked Ford in the Model T era with a flanking strategy of segmentation, embodied in the famous quote, "a car for each income strata". But later, GM was flanked by the VW, which used the "small is beautiful" slogan. Wal-Mart attacked Sears with a guerilla strategy by building their stores in small towns before Sears could respond with their own stores. The "cola wars" between Coca Cola and Pepsi are well known examples of defense and frontal attack strategies.

Another set of examples of strategic evolution is the paradigm shift caused by the next generation products. For example, Intel strategically introduces next generation processors which force evolution of the entire PC industry. Not only do competitors seek to evolve quicker or more effectively than Intel, but PC manufacturers are dependent on the strategic evolution plans of Intel. New PCs must include the newest microchip in order to keep up with competition and satisfy user demands. And each product generation introduces a new era of computing due to the large increase in processing power possible. For example, current PCs are capable of processing in real time what took three to four times as long in the past. And this new processing speed allows new applications of the PC, such as desktop videoconferencing, video on demand, and voice communications over the Internet. This shifts the art of the possible uses of a PC in a dramatic way.

While strategic evolution suggests constant change, there is an aspect of any enterprise that should not be subject to constant change: the core values of the organization. Strategic evolution must take into consideration of the deep-rooted core value system. Core values implicitly and explicitly describe the purpose of any business. They highlight why the organization exists. They are the common bond among people in any organization and they guide the behavior and decisions of each person. A well-aligned organization is one where its core values are deeply rooted and well understood. A deep-rooted core value system helps to render an organization more transparent and consequently more zero resistant. For example, under the guidance of its credo, Johnson & Johnson immediately removed all Tylenol capsules from the entire US market when the deaths of seven people in Chicago area led to the discovery that someone had tampered with Tylenol bottles and cyanide. On the other hand, without a deep-rooted core value system, Exxon dragged its feet for nearly a month before responding to its oil-transport spill off of the Alaskan coast.

How does an organization position itself to achieve their vision, while keeping an eye on general trends and their specific competition? The organization must develop an integrated strategy for evolution that consists of 1.) a focus on specific goals, 2.) a critical mass of knowledge including competitive intelligence and market trends 3.) an understanding of critical technologies needed to achieve these goals, 4.) a tactical plan of how to move ahead, and 5.) a coordinated investment of resources. Figure 9 summarizes the strategic visioning phase.

<***Figure 9 about here***>

Operational Excellence

Operational Excellence consists of three concurrent phases: build an infrastructure for instant action, establish a Zero Time culture, and make all processes zero resistant.

Build an infrastructure for instant action

An organization's infrastructure consists of four primary entities: people, technology, organizational structure, and management system. These are integrated together through a series of infrastructures: the Information Technology Infrastructure, the Organizational Infrastructure, the Learning Infrastructure, and the Management System Infrastructure. We will briefly elaborate these below.

Information Technology Infrastructure (ITI)

This is the seamless integration of computing, communication, and content technologies. The integration of computing and communication, as envisioned by Kongo Kobayashi of NEC more than twenty years ago, is conventional wisdom today. In order to empower each individual within the organization, information/knowledge must be at each individual's fingertips whenever, wherever he or she needs it. Furthermore, it must be available in a user-friendly fashion, in the form that the user would want to see and use the information. By content technology, we mean not only the knowledge nugget the user gets, but also the medium by which that information is delivered and the ease of accessing the information.

A good ITI will help an organization be closer to its customers by making the information directly accessible to customers. For example, by making its tracking system available to its customers, FedEx's customers can instantly find out where their packages are. At the same time, the system relieves FedEx personnel from handling many routine customer calls. Through ITI, an organization can trade off physical space with virtual space and provide transparency. The benefit is the opportunity to provide customized services and rapid response to customers' needs.

Other benefits of a good ITI include shrinking overhead, inventory, and working capital. For example, Dell's build-to-order manufacturing guarantees five-day delivery, and requires only three days of factory inventory. Furthermore, its down-line capital commitment is nearly zero versus tens of thousands of dollars of inventory required by those who use dealer channels. Another example is the fight for dominance in the film industry between HP and Kodak. The HP vision is to use digital camera to capture the image, edit it with the home PC, and e-mail the image to grandma, for example, who then prints out the picture in her home HP printer. Such a scenario would eliminate film and processing, which comprise much of Kodak's revenue. Should HP be successful, the use of information technology would radically change the photography industry. Similarly, General Motors' OnBoard system provides content to passengers while they are traveling in a GM car. However, we believe that this system used to deliver the content to the GM cars will also provide an infrastructure for expanded business opportunities, which will transform the automotive business¹⁷. In the case of eyeglasses, Lenscrafter is already practicing manufacturing at point of delivery as compared to the old mode in which eyeglass lenses are ground, molded, stored in a central location, then distributed to retail outlets weeks later. Point-of-delivery manufacturing has radically changed the eyeglass industry.

ITI provides interorganizational connections, such as the database linkages between retailers/manufacturers and their suppliers. It also is the basis for global connections. For example, information content is often stripped from the original product and transported globally through a sophisticated information system. A key example is found in the newspaper/magazine publishing industry, where information is passed to different locations digitally, and local suppliers then customize the publication for the local market.

Organizational Infrastructure

An organization must be reshaped with molecules, or clusters of individuals coupled with technology and process components, as the basis of organization activities. In other words, a Zero Time organization must be component based in terms of people, technology, process, and organizational structure so that it can dynamically organize these components into teams that deliver necessary value to the customers. Diamond Technology Partners, a relatively new consulting firm headquarters in Chicago, provides a good example of this concept. Diamond Technology Partners has built an organization model that allows it to instantly assemble a team of consultants from a diverse, geographically spread out set of employees. It has instant customerization in that new business is instantly serviced by the best available set of individuals. The team is empowered to do what needs to be done to satisfy the client engagement. The team is backed up by a powerful knowledge management system that takes the client engagement notes and stores them as knowledge not only for the current team, but for any other teams that may be faced with similar problems in future engagements.

The virtual organization concept is another example of an infrastructure combining an ITI and an organizational infrastructure to support Zero Time work. Individuals who work in a remote work setting, such as telecommuting or hotelling, do so with the support of an ITI that provides them with the information they need at the time they need it¹⁸. Likewise, a well-managed mobile work environment has an organization infrastructure which empowers workers to work within a Zero-management-gaps arrangement. Since managers cannot be everywhere the virtual worker is, zero-management-gaps is a key discipline for the virtual organization.

Learning Infrastructure

Learning implies that the organization will provide an infrastructure for continued gathering and digesting of information. The digital economy is a knowledge-based economy, which means more and more people working in any organizations will be knowledge workers. It is estimated that at the current rate, knowledge is growing at a rate of doubling every seven years. Science and engineer college graduates will become obsolete four years after graduation. At the same time, it is no longer feasible for corporations to send their people back to the universities for a substantial length of time to update their knowledge. We believe that in order to survive in the 21st century, every enterprise must be a "learning organization."¹⁹ A good example of this learning infrastructure is the previously mentioned 15-percent rule of 3M, which facilitates experimentation and learning.

Management System Infrastructure

Such a system is needed to monitor, reward, and improve Zero Time practices. Some examples of measures include:

- Product development—time from idea to concept; rate of new product introduction; percent of first competitor to market; percentage of new products in the last x years.

- Decision making—decision cycle time; time lost waiting for decision.
- Customer service—response time; quoted lead time.
- Percent delivery on time.
- Time from customer's recognition of need to delivery.
- Processing and production – value added as percent of total elapsed time; inventory velocity; first-pass yield.

Establish a Zero Time Culture

Culture defines major parts of the relationships among entities in an organization. A Zero Time culture is one that facilitates the realization of instant customerization of the organization. We believe that a Zero Time culture must, at its core, be based on trust. There are three kinds of trust: trust in oneself, trust of other people in a team, and trust of the enterprise one is working. These different kinds of trust are developed with sub-disciplines: personal mastery, total empowerment, and alignment (See Figure 10).

<***Figure 10 about here***>

Personal mastery

This discipline helps each person to have the ability to master his or her work. Such ability helps to establish self-worthiness and consequently enhances the organization's ability to be zero resistant. A Zero Time organization must foster a climate in which personal mastery is practiced in daily life as is done by master artists. This means that the culture must be safe for people to create personal vision and challenge the status quo. For example, when Jack Welch took over as CEO of GE, he pushed to consolidate the infrastructure with cost cutting efforts. However, he also recognized that focusing on the bottom line alone had limitations. Therefore in an effort to foster a culture which encouraged personal mastery, Welch made a commitment to his workers of "life time employability" to replace the traditional "life time employment" and the result was an increase in average productivity from below 2% to above 5%, which for an employment force of 300,000 people is a very significant increase.

Total empowerment

This is the consequence of zero-process gaps, and zero-management-gaps. The relationship between any individual or team and its coordinating person must be such that the individual or team can act alone with full power. Otherwise, an organization cannot achieve Zero Time. In fact, when each link within the organization is empowered, the organization has indeed achieved customer empowerment. In effect, the entire value chain becomes Zero Time. Sports are a good analogy of this discipline in that each player in a team during competition is totally empowered. The coach is powerless during the actual act when a quarterback passes to a wild receiver, demonstrating total empowerment of the quarterback. In different enterprises, these players represent front-line personnel, front desk clerk in hotels, sales representatives, or customer service personnel on call to customer sites. For example, at the hotel chain the Ritz Carlton, employees are trained to understand the goals and values of the organization, and to remind them, each employee carries a small card with these important ideas. When a customer asks any employee for something, that employee is empowered to do what is needed to satisfy the request. Likewise,

at Disneyland, when a guest is unsatisfied or in need of something, any Disneyland employee is empowered to do what is needed to improve the customers visit, as any visitor-in-need can attest.

Alignment

The ability to align, or instantly form teams that consist of members from geographically dispersed locations in order to meet customers' needs, must be part of the core competency of any organization that thinks in Zero Time . Underlying a culture of alignment is trust. Members within an enterprise, and among closely linked enterprises (the zero-inclusion-gaps discipline), must trust one another for the new team to have high performance. Diamond Technology Partners is an example of an organization that is based on mutual trust, and consequently, is able to effectively align when the need arises to configure a new team of geographically dispersed individuals for a work project.

Mutual trust in this case means that all managers, employees, and closely linked partners understand the direction in which they are headed and can expect everyone else to have the same understanding. Further, each individual can expect all other individuals to make every effort to move in the right direction. Finally, each individual can expect that the organization will not suddenly change it's goals.

In order for an organization to be zero resistant, each individual or team/business unit in the organization must have its goals align with the organization's goals. In this case, the shared vision of the organization becomes an extension of each individual's vision. Such an aligned organization is one that enjoys both the modularization and interconnectedness. Jazz musicians understand alignment when they play without scripts and can follow the flow.

A Zero Time culture is one in which each individual and team is a "whole", and therefore is empowered and able to make decisions that may result in honest mistakes. These mistakes are tolerated as part of the learning experience. For example, in most of the automobile manufacturing plants today, any assembly line worker can stop the entire line if process errors are discovered. This demonstrates a situation where employees are empowered and have the ability to make major decisions. In this type of organization, the goal of every organizational subunit is in alignment with that of the organization. Thus, by satisfying the goal of the organization, each employee also meets his or her own personal goal.

Make all Processes Zero Resistant

A process represents how work is structured and performed within an organization. The processes of a Zero Time organization must be zero resistant. This means that all resources are available when needed, and that people, technology, and knowledge modules are seamlessly integrated to support process execution. Finally, knowledge is automatically created as processes proceed along. Clever and innovative uses of information systems make zero resistant processes possible. The kiosks at Disney World from which tourists can make reservations, and in some cases order food and drinks to pick up at the restaurant are an early example of zero-resistant process. Of course, ATMs provide banking services to customers at locations convenient to the customers, airlines such as Continental sell tickets through remote kiosks²⁰, Dell Computers sell systems

virtually anywhere using the Internet, and tourists can get information on almost any destination in the world using the World Wide Web. Virtual kiosks are becoming commonplace.

An important distinction is needed between two types of processes: physical and virtual. A classic physical process is the manufacturing assembly line, where parts flow through the process and are assembled into systems. On the other hand, virtual processes are information based, and often supplement physical processes. The physical processes turn raw materials into products, whereas virtual processes turn raw information into new services. Clearly these new information products can be delivered through information-based media such as the Internet, satellite, and telephony, adding value by delivering information and knowledge to destinations convenient to customers. An additional difference between physical and virtual processes is in the construction of the process steps. Physical processes are typically linear, with a sequence of steps to be followed. Virtual processes are typically non-linear, consisting of a matrix of potential inputs, transformations, and outputs depending on the needs of the customer of the process.

Thus, Zero Time organizations are the ones who have traded physical processes for virtual processes. Zero resistant processes typically have a large component of information, and are likely candidates for automation and time compression. Of course, the more virtual processes included in the value chain of an organization, the higher the effect of Zero Time, due to the multiplication factor in calculating value.

Zero resistant virtual processes provide numerous benefits for organizations. First, virtual processes are used to redefine economies of scale. There is little, if any, distinction between a virtual process of a big and small company. For example, it is impossible to tell the size of a company simply by their processes offered over the Internet. The Post Office provides us with another example. FedEx was able to effectively create a virtual post office in every individual customer's business, which was inconceivable to the Post Office, which operates in physical space alone. Second, virtual processes redefine economies of scope. Organizations with virtual processes have an easier time reusing the digital assets for different situations. It is much simpler to replicate a virtual process than a physical process. This leads to the third benefit: decreased transaction costs. The cost of a virtual process is typically orders of magnitude less than a physical process. For example, the cost of processing a withdrawal from a teller at a bank is much more expensive than the cost of processing a withdrawal from an ATM.

In summary, an organization with zero resistant virtual processes will be able to get much closer to customers. The organization will be able to project their business into the space of the customers over communications media. The processes can provide instant feedback to the organizations, giving them an advantage of understanding customer needs before organizations operating physical processes. And therefore opportunities are more easily identified which create value for customers. It is our opinion that any enterprise can become a Zero Time organization using the methodology outlined above. Figure 11 summarizes the phases of operational excellence of a Zero Time organization.

<***Figure 11 about here***>

To summarize our concept of Zero Time, we borrow from the earlier quote by Darwin, and reframe it using the terms and concepts described in this paper.

Zero Time enterprises are those well-adapted organizations primarily as a consequence of strategic

evolution, namely within the context of its core value system, they use time as the paramount driver to experiment, select, and act through rapid learning cycles in order to achieve its vision of instant customerization.

Being a Zero Time Organization

“To boldly go where no one has gone before...”

Star Trek

In their book *Discipline of Market Leaders*,²¹ Treacy and Wiersema discuss the cultures of the three kinds of market leaders: operational excellence, customer intimacy, and product leadership. They conclude that the operating model for each market leader is sufficiently different to the degree that people who are comfortable in one usually do not fit effectively with a different operating model. However, Geoffrey Moore, in his best seller *Inside the Tornado*,²² considers that these three models fit well into the life cycle of a high-tech organization. He believes that it is imperative for an organization to change its operating model before it can pass to the next state of growth. We believe that the phenomenon observed by Moore is not restricted to high tech companies only. In our opinion, a Zero Time organization diffuses the cultural boundaries among these three different models, and transcends their differences by focussing on the unifying principle of time. By considering time as the most important independent variable, we believe there is a unifying culture that will automatically lead to the evolution of the operating model in its life cycle.

One of the key characteristics of a Zero Time organization is that the entire organization can reside in each of its employees, each of its products, and each of its services. In other words, essential knowledge of the entire organization can be embedded into each of its components, which is also “whole.”

The most important differentiation of a Zero Time organization from others is that of a shift from mechanical to a holistic mindset. ***A Zero Time organization has the ability to see differently and has the ability to act instantly.*** It is this combination of abilities that, in our opinion, provides the capability to instantly convert knowledge into customer value. And this will be the key competitive edge for businesses in the 21st century.

In sum, the organization model for the 21st century is the Zero Time organization. This organization is one that embodies the five disciplines of Zero Time, and effectively provides instant customerization. It is our belief that Zero Time organizations will own their customers as customers come to realize the value provided by the Zero Time organization—resolved problems, reduced costs, etc. Speed and variety, tools for non-Zero Time organizations, are actually embedded into the processes and activities of the Zero Time organization. Managers who begin to build a Zero Time organization will be the leaders in the next wave of business change. These managers will be the ones who understand the importance of a value-driven organization. They will be imbued with a series of beliefs and values that support Zero Time as it is conceived for their specific industries. These managers will be the ones who are not afraid to empower their

employees, teams, and subunits. They will be the ones who cultivate a culture where power is gained from not only knowledge, but the sharing of knowledge. And these managers will be the ones who understand that the only certain fact about their industrial environment is that it will change. Zero Time organizations are the ones that can quickly and effectively adapt to rapid, continuous change.

“I have tried to paint the picture of what such an organization would be like and how it might be built – so that people can see the choice that exists. The choice, as is always the case, is yours.”

Peter Senge, *The Fifth Discipline*

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Figure 1. Conventional Wisdom versus Zero Time Thinking

Conventional Wisdom	Zero Time Thinking
Remedial Medicine	Preventative Medicine
Quality Management	Zero Defects
Mechanistic	Holistic
Either/Or	Simultaneity
Do	Being
Control	Letting Go

Figure 2. Supply-Chain for Agricultural Goods



Figure 3. Disciplines of Zero Time Organizations

Discipline	Description
Zero-value-gap	Core values of company are based on customers' values and these values are shared across entities.
Zero-learning-gaps	Capacity to continuously learn and create knowledge, then convert it into customer value instantly.
Zero-management-gaps	Every part of the organization is in itself a whole, complete entity with the ability and authority to function independently.
Zero-process-gaps	The property in which there are no obstacles to completing any required tasks, processes, or activities.
Zero-inclusion-gaps	All individuals and groups who need to be involved are automatically included when the process takes place.

Figure 4. Models of Instant Customerization

Model	Description
Emergency Room Model	Everything necessary to satisfy the customers' needs and choices is waiting, accessible whenever needed.
Disneyland Model	A bounded set of choices is available, from which each customer selects whatever he or she wants.
Hybrid Model	Reasonable set of choices is available coupled with a way to customize these choices to meet whatever need customer has.

Figure 5: Comparison of Popular Theories and Zero Time

Theory	Brief Summary	Comparison with Zero Time
Reengineering ²³	Business process redesign using discontinuous change.	Zero-process-gaps is the process-focused aspect of Zero Time. But Zero Time is more broadly focused than reengineering.
Real Time ²⁴	Shrink existing process cycle time as small as possible.	The goal is similar – short process cycle time – but the Real Time approach is one of incremental change and the focus is on the end customer, not the multiple stakeholders identified by Zero Time.
One-to-One ²⁵	Deal with each customer individually.	Zero-value gap embodies this concept in the Zero Time disciplines. But Zero Time also includes process and human resource aspects absent in One-on-One.
Blur ²⁶	The rate of change is so fast, lines between buyer and sellers, product and services, and employee and entrepreneurs are no longer clear	Blur includes aspects of zero-inclusion-gaps, zero-value-gap, Zero learning gaps and zero-process-gaps. But focus is on the organization and economy levels, not the individual or group levels, which is the holonics aspect of Zero Time.
Virtual Integration ²⁷	The concept of using information systems to integrate geographically distant entities.	Zero Time also includes this concept, but integrates it with process goals, organizational characteristics, and customer values.
Corporate Kinetics ²⁸	Organizations must operate in unpredictable environments and must sense and respond immediately.	This is the closest theory to Zero Time. But Zero Time has a significant focus on organizational trust and holonic thinking that is missing in Corporate Kinetics.
Knowledge Management	Processes and structures to make an organization's information useful and of value.	One of the dimensions of Zero Time directly correlates to Knowledge Management. But Zero Time integrates it with organizational design considerations.
Empowerment	Individuals in the organization must have responsibility to make decisions and authority to ensure they are carried out.	Zero Time requires individual and group empowerment. But Zero Time also describes process and organization goals that in addition, require trust, which is necessary for successful empowerment
Learning Organization ²⁹	Organizations are learning organisms which involves empowerment, alignment and trust.	Zero Time requires the organization to be a learning organization, but takes the concept further to relate it to time and process design.

Figure 6: Overlap of Popular Theories with Zero Time Disciplines

(Note: XX indicates major overlap, X indicates minor overlap)

Theory	Zero-value-gap	Zero learning gaps	Zero-management-gaps	Zero-process-gaps	Zero-inclusion-gaps
Zero Time	XX	XX	XX	XX	XX
Reengineering			X	XX	
Real Time	X			XX	
One-to-One	XX				X
Blur	X	X		XX	XX
Virtual Integration				XX	XX
Corporate Kinetics	X	XX		XX	
Knowledge Management		XX			
Empowerment				XX	
Learning Organization		XX	XX		X

Figure 7. Three Models of Personal Computer Industry Value Chains³⁰

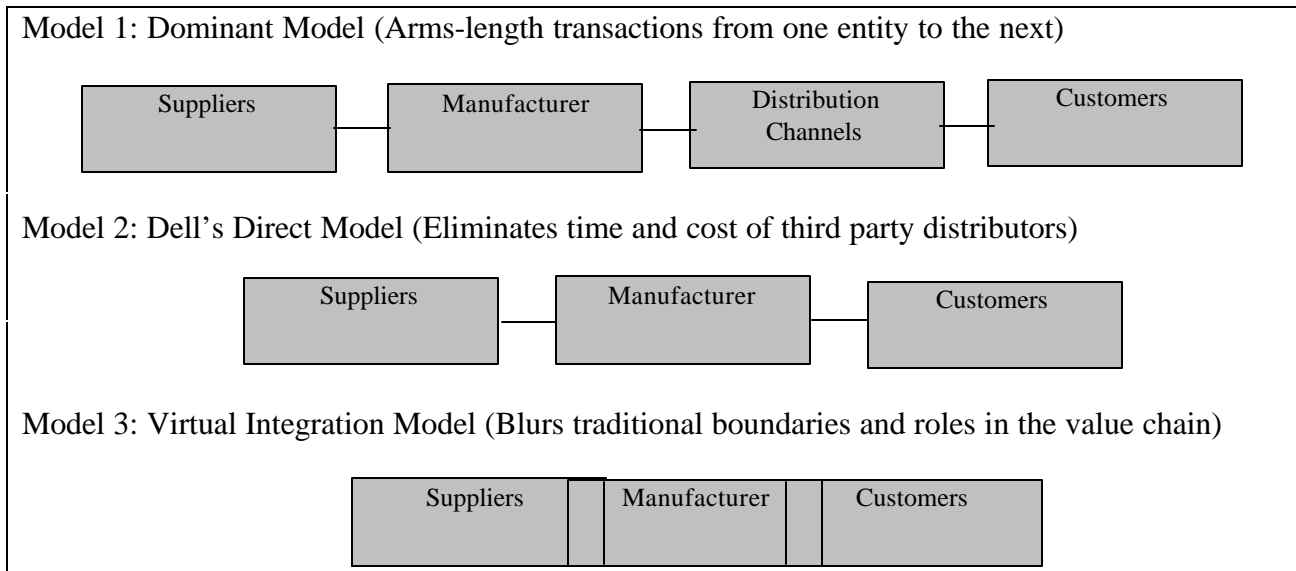


Figure 8: The Dell Direct Model (Source: Dell Corporate Web site, May 1998)

Dell's award-winning customer service, industry-leading growth and financial performance continue to differentiate the company from competitors. At the heart of that performance is Dell's unique direct-to-customer business model. "Direct" refers to the company's relationships with its customers, from home-PC users to the world's largest corporations. There are no retailers or other resellers adding unnecessary time and cost, or diminishing Dell's understanding of customer expectations. Why are computer-systems customers and investors increasingly turning to Dell and its unique direct model? There are several reasons:

- Price for Performance. By eliminating resellers, retailers and other costly intermediary steps together with the industry's most efficient procurement, manufacturing and distribution process Dell offers its customers more powerful, more richly configured systems for the money than competitors.
- Customization. Every Dell system is built to order. Customers get exactly, and only, what they want.
- Service and Support. Dell uses knowledge gained from direct contact before and after the sale to provide award-winning, tailored customer service.
- Latest Technology. Dell's efficient model means the latest relevant technology is introduced in its product lines much more quickly than through slow-moving indirect distribution channels. Inventory is turned over every 10 or fewer days, on average, keeping related costs low.
- Superior Shareholder Value. During the last fiscal year, the value of Dell common stock more than doubled. In 1996 and 1997, Dell was the top-performing stock among the Standard & Poor's 500 and Nasdaq 100, and represented the top-performing U.S. stock on the Dow Jones World Stock Index.

Figure 9: Summary of Strategic Visioning Phases

Phase	Description
Establish a Deep Rooted Core Value System	Values are the common bond among people in the organization
Define a Strategic Zero Time Vision	The vision is a customer-focus, value-added goal which drives process time to zero
Establish Strategy for Evolution	Strategic evolution is the purposeful and intentional change and adaptation made to achieve the vision. Strategies include flanking, guerilla, and frontal attack.

Figure 10. Zero Time Culture Disciplines

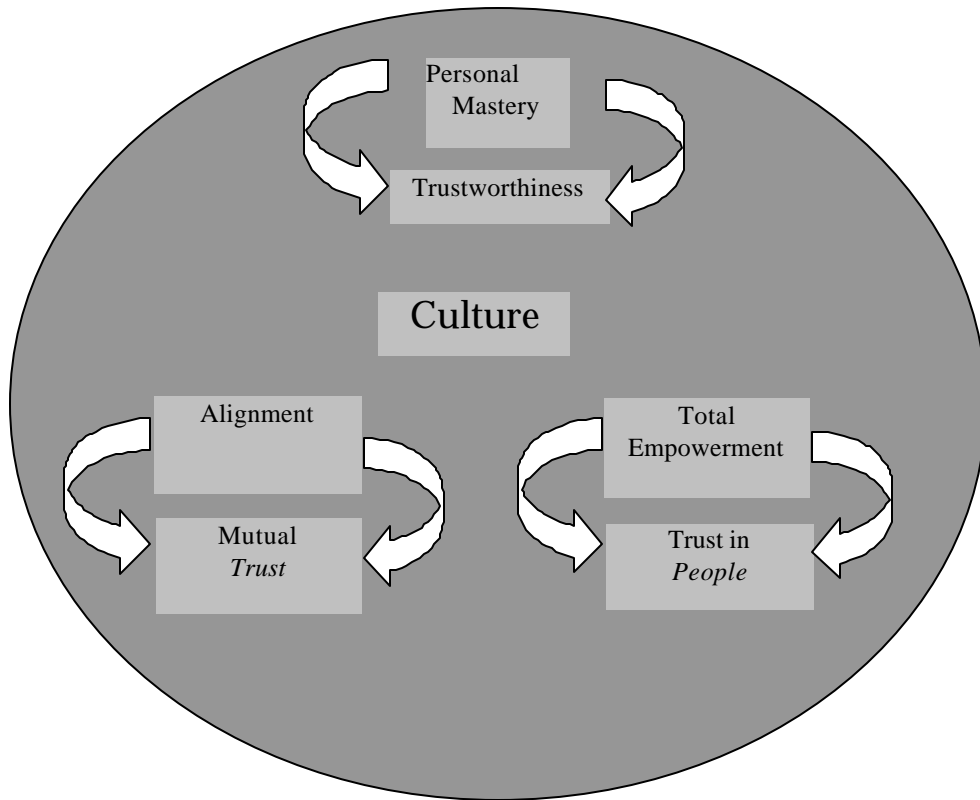


Figure 11: Concurrent phases of Operational Excellence

Phase	Description
Build a Zero learning gaps infrastructure	Relationships between people, technology and organization which are based on informationalization, molecularization, learning and time-based management.
Establish a Zero Time culture	Disciplines of Personal mastery, total empowerment, and alignment that lead to trustworthiness, trust in people and mutual trust.
Make all processes zero resistant	All resources are available when needed, and people, technology and knowledge are seamlessly integrated to support process execution.

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- ¹ G. Stalk Jr. and T. Hout, *Competing Against Time* (New York: McGraw Hill, 1990).
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- ⁷ J. I. Cash, K. E. Ostrofsky, and J. O'Neill, "Otis Elevators: Managing The Service Force." (Boston, Massachusetts : Harvard Business School Case Study number 191-213, 1991).
- ⁸ This phrase was invented by Dr. Yukio Mizuno of NEC.
- ⁹ T. Stevens, "Heart and Soul, " *Industry Week*, May 4, 1998, Vol. 247(9), pp. 44-49.
- ¹⁰ D. Tapscott, *Digital Economy*, (New York: McGraw Hill, 1996).
- ¹¹ These models are similar to those described by Regis McKenna in his book *Real Time*. The difference is that Zero Time organizations, while customer focused, are not entirely marketing driven. Real-time organizations exhibit similar characteristics, but are primarily concerned with responding to needs of external customers. Zero Time organizations focus on the employee mindset and the organization culture as a means of satisfying external customers
- ¹² A more detailed case study on FedEx see K.E. Pearlson and D. Paul, "Federal Express: The Role of Information Technology in Customer Service," (Austin, Texas: University of Texas at Austin Graduate School of Business case study, 1995).
- ¹³ J. Magreta, 1998, pg. 75.
- ¹⁴ S. Davis, 1996, pg. 213.
- ¹⁵ J. Magreta, 1998, pg. 81.
- ¹⁶ See R. T. Yeh, et al., "A Common Sense Management Model", *IEEE Software*, Nov. 1991, pp. 23-33. And R. T. Yeh, "Designing Holistic Enterprise Evolution", *Journal of Integrated Design and Process Science*, Sept. 1997, pp. 17-23.
- ¹⁷ See K. E. Pearlson, 1998.
- ¹⁸ For a perspective of problems and benefits of mobile workers see T. Davenport and K. Pearlson, "Two Cheers for the Virtual Office" *Sloan Management Review*, Vol. 40, Summer 1998, pg. 51-65.
- ¹⁹ P. Senge, 1990.
- ²⁰ See K.E. Pearlson and N. Christensen, "Continental Airlines: Outsourcing IT to Support Business Transformation", (Austin, Texas: University of Texas at Austin Graduate School of Business case study, October 1996).
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