

WHAT IS ERP?

Process improvement and the need for it move fast in today's competitive markets. To stay on top of the latest implementation successes and techniques, it would seem that one must read continuously. New "buzzwords" are invented every week by some organization trying to sell its wares. Some new acronyms stick and some do not. I am in the business of sorting this stuff out and have come to believe that *implementation and success* is the final test for validity. I have been in the implementation business since the mid-1980s, and in that time I have determined that some of these process methodologies are actually legitimate. Three specifically are (1) Class A ERP, (2) lean, and (3) Six Sigma.

I have also observed through working at manufacturing and distribution facilities all over the world that there are some specific high-value factors embedded in each of these approaches. After several years of involvement, observation, and even, admittedly, some trial and error, I have come to the conclusion that there is definitely a sequence of events and an approach that work best for successfully harvesting the goodness with the least amount of disruption and best competitive advantage. That is what this book will focus

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on — how the improvement processes integrate and the best approaches to implement them. In reality, the method is not the goal; the goal is implementing improvement and sustainable good habits.

Some readers of this book will have a burning desire to get right to the integration discussion — how to best integrate enterprise resource planning (ERP) with lean and Six Sigma. Be assured we will do that with plenty of detail

and real-life examples as this book progresses, but right now the foundation we must start with is a common understanding of ERP: what it is and why organizations would want to do it.

There is a lot of confusion about the topic of ERP. This confusion is often credited to the aggressiveness of business system software peddlers. Not that ERP tools do not offer a lot of value-add, because they clearly do. Tiger Woods would have had a difficult time maintaining a top ranking in the world of golf if he did not have quality, straight, and true golf clubs and perfectly balanced golf balls to limit the process variation. The rest of the story is meaningful as well, however. Without his skillful and disciplined execution, the tools alone would not get the job done to a high-performance standard.

Like a professional-level game of golf, high-performance manufacturing requires discipline and execution with the highest process repeatability and predictability. ERP is a business model that involves all levels of the organization — hence the word “enterprise.” ERP process disciplines allow organizations to link customers and top-management decisions all the way through to

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execution in the supply chain and the factory floor. Well-executed ERP not only starts with top management, it is totally *dependent* on top management.

At this point, I should admit to you that I have been involved with a few Class A ERP implementation *failures* as well as successes. It needs to be said that the common denominator in the failure of any of these improvement process approaches is always the same thing — lack of top-management involvement and prioritization of activity. That is a very well-known fact. Let us look at how high-performance organizations handle top-management planning.

TOP-MANAGEMENT PLANNING

Top-management planning is clearly the most important process within ERP. As illustrated in Figure 1.1, it is clear that many decisions must be made to guide the organization’s vision correctly. While the “strategic” element of top-management planning may be the single most effective component of ERP, the rules and *spirit* of ERP do not dictate strategic policy, but instead insist on strategic linkage to the rest of the organizational practices and execution, especially the demand-side and supply-side rules of engagement. More simply stated, the top-management ideas must actually drive activity in the organization. There needs to be a direct connection.

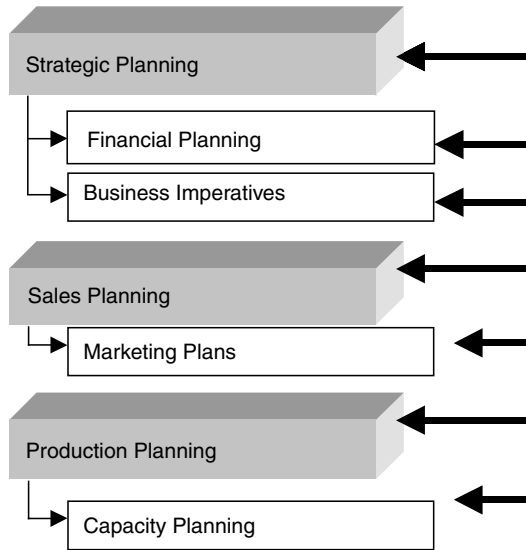


Figure 1.1. Top-Management Planning.

ERP is the spinal cord and information flow that link top-management thinking and planning with marketing, sales, capacity planning, procurement, manufacturing, and customer service.

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I remember a lesson from a management book I read many years ago.

I found the lesson amusing and it has

stuck with me all these years. The saying went something to the effect of “Business planning in many companies is too often like a rain dance. Managers get together and ceremoniously dance and make a lot of noise, but at the end of the day, it doesn’t have much to do with the weather.” I can relate to this humorous story directly from my observations and travels to many companies. I go into a lot of businesses where top-management teams do exactly that — have a lot of fun and make a lot of noise about strategic plans, but at the end of the day, this activity does not have much to do with the execution of plans. When executed in its proper form, ERP connects these processes. It creates the linkage and management systems to ensure proper execution of marketing plans, sales policy, supply chain partnerships, and capital spending. When executed

properly, ERP does this through a formal management system and, to some degree, supporting tools.

In a manufacturing business, management systems are planned and executed accountability infrastructures that create predictable opportunities for follow-up on decisions and goals. Examples would include infrastructure events such as daily performance reviews, weekly project management reviews, top-management monthly planning performance reviews (often referred to as sales and operations planning [S&OP]), and events directly related to master scheduling, such as a “clear-to-build” process. All of these events and processes such as master scheduling and the clear-to-build infrastructure will be described in detail in the coming pages.

Class A ERP, which we will talk about in the next chapter, *dictates* many elements of performance review. Along with agreed-to and documented “rules of engagement,” these result in increased predictable performance. In Chapter 6, the details of how this top-management planning process works in high-performance businesses will be described.

MASTER PRODUCTION SCHEDULING AND MATERIALS MANAGEMENT

The outputs from top-management planning feed directly into the master production scheduling (MPS) and materials management when executing correctly. Figure 1.2 illustrates the subsequent activities.

While master scheduling in many businesses is a clerical process of documenting the promises made by order management, when done properly it is

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much more. Master scheduling is anything but a simple process. Master scheduling done correctly is a science *and* an art.

The truth is, if you want to be influential in any manufacturing facility, the position you want is either plant manager or master scheduler. In Chapter 7, the rules of master scheduling and the roles of the master scheduler will be reviewed in detail. To spike your interest, here are some introductory thoughts on the function and responsibilities of good master scheduling within ERP.

The short story on a high-performance MPS process starts with the idea that top-management planning (known as S&OP) drives product family demand and operations expectations in both supply-side and demand-side requirements. S&OP has been growing in popularity for the last several years and has become a key and critical component of both ERP and good management process in general.

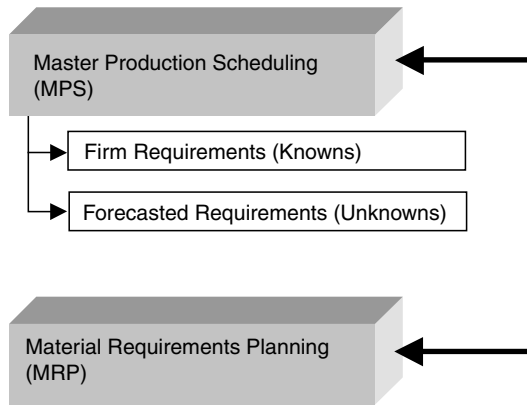


Figure 1.2. Master Scheduling.

The S&OP process outputs are made up of “product family” requirements. It is at this level of detail where the MPS starts to add some real value. In most environments, “product families” without any more detail than that cannot be manufactured without more specific information. These product family signals are translated directly into detailed, firm, and forecasted signals by the MPS through planning techniques. When the ERP process works efficiently and effectively, scheduling becomes the linkage rod or transmission connecting the top-management planning engine with the execution wing of the business, normally operations.

When the ERP process is *not* working properly, the linkage does not exist. The scheduling process becomes a stand-alone process reacting to daily demand with short planning horizons. The results can range from ineffectiveness to devastation, and this rarely results in long-term success. In today’s best-managed businesses, few choose not to hold the S&OP process as a valuable component of their top-level management system. As Tim Frank, CEO of Grafcop PET Packaging Corporation, said to me, “Why wouldn’t any top manager want to do this?”

Master scheduling takes the signals from top management and translates them into usable requirements for production planning. It is the master scheduler’s job to determine the mix within product families and other unknowns such as lot size and priority of order requirements. Without these important communi-

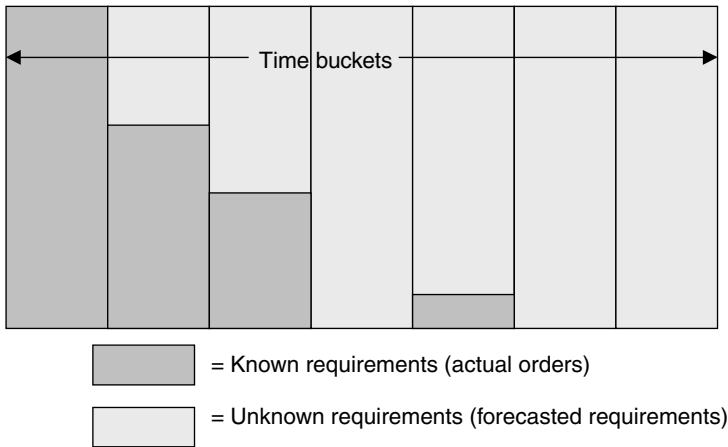


Figure 1.3. Scheduling “Knowns” and “Unknowns.”

cations, the planning engine, material requirements planning (MRP), would not have anything to plan, or if it did, there would probably not be many accurate requirements posted other than actual orders. That is due to the fact that much of what the master schedule sequences in the schedule are “unknowns” (see Figure 1.3).

Unknowns are often the drivers of unnecessary inventory buffer, so it is critically important to take this scheduling process seriously. The best master schedulers work with their organizations’ supply chain managers to minimize lead time and increase flexibility within the supply base and, at the same time, work with the order management team to establish responsive rules of engagement that put everybody on common ground in terms of both goals and expectations. The master scheduler’s job is much like the conductor of an orchestra. The musical score is customer need, and the master scheduler interprets customer need and translates it into the schedule. There are several players in manufacturing and supply chain management, just as there are in an orchestra, and they all need to be coordinated. The baton’s drumbeat is the master schedule itself broadcasted to the team. When everybody is exactly in sync at the end of the song, there is no extra unplanned inventory buffer and the music was done exactly to the composer’s liking.

There are several inputs to the MPS, and the more accurate these data are, the more likely the process will be successful and value-add. For this reason, Class A ERP performance also includes data accuracy as a specific area of focus.

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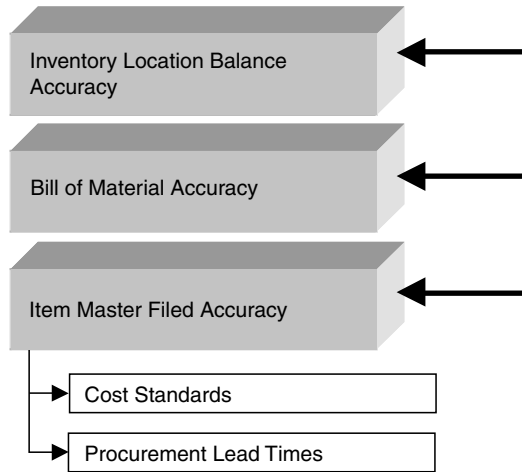


Figure 1.4. Database Accuracy.

DATA ACCURACY

ERP inputs play an important role in the effectiveness of the overall ERP process. Data accuracy of these inputs obviously plays a critical role, and data integrity is a historically proven prerequisite to high performance. Accuracy of data is an asset for process improvement as well as process predictability in all high-performance organizations. Data accuracy elements in an ERP focus always include inventory balance accuracy, bill of material (BOM) accuracy, and other item master file field data accuracy elements, such as lead time and cost standards (Figure 1.4). Since the ERP process focuses on data and process linkage, it becomes extremely important for the data elements to have high integrity. When inputs to the ERP process such as inventory balances (which directly affect MRP) are accurate, the user has a significantly improved chance of producing valuable and accurate outputs such as supply chain signals and shop floor orders. Examples of these accuracy-dependent processes include not only requirements planning but also cost planning and inventory management.

BILL OF MATERIAL ACCURACY

The discussion on BOM accuracy is quite possibly of even more importance than the inventory balance integrity. BOMs are the recipe that is used by many organizational functions. This would include kits in distribution and assemblies,

If BOM information is not absolutely right, it becomes difficult to deliver a cost-effective, quality product to the customer.

informal process to get the correct materials in place, specifications are wrong, or it is reworked before it leaves the building. Regardless, it is unnecessary process variation. All high-performance organizations realize the importance of these data and treat them accordingly. Few would argue against the value-add characteristic of accuracy in the building of requirements for engineering design, material requirements, quality standards, and cost planning. It is important not only that the BOM record within the ERP business system meet the engineering specification, but also that these records match what the factory floor actually does!

batch mixes, weldments, and kits in manufacturing. If BOM information is not absolutely right, it becomes difficult to deliver a cost-effective, quality product to the customer. The product either has wrong components and in-

INVENTORY BALANCE ACCURACY

Inventory accuracy is another key element of ERP data management. Inventory records are the jewels of the planning process and affect both requirements planning and costs. In the planning process, there are two types of inventory records: on hand and on order. Both need to be accurate for the planning process to work properly. Like all topics covered in this first overview chapter, this too will be given ample attention later in the book as each element of ERP is detailed. Figure 1.5 illustrates the interaction of data records with the planning engine of ERP, master scheduling, and MRP.

The execution processes of ERP are also outputs of the planning process and are literally the end of the trail where ERP outputs from plans at all levels are executed (see Figure 1.6). These include procurement, shop floor controls, product delivery, and service execution. Supply chain management is controlled from this vantage point. Without these signals, the supply chain cannot be linked solidly to the manufacturer's vision and drumbeat. In many manufacturing organizations, purchasing functions under confident but less informed management act quite independently and do not have tight linkage to the MPS process. In high-performance ERP organizations, procurement processes are tied directly to the ERP planning processes just as tightly as other ERP outputs. The benefits of this linkage discipline become obvious.

Inventory is a direct result of purchases. Buying the wrong inventory means wasted energy and money on several levels. Buying too much inventory is

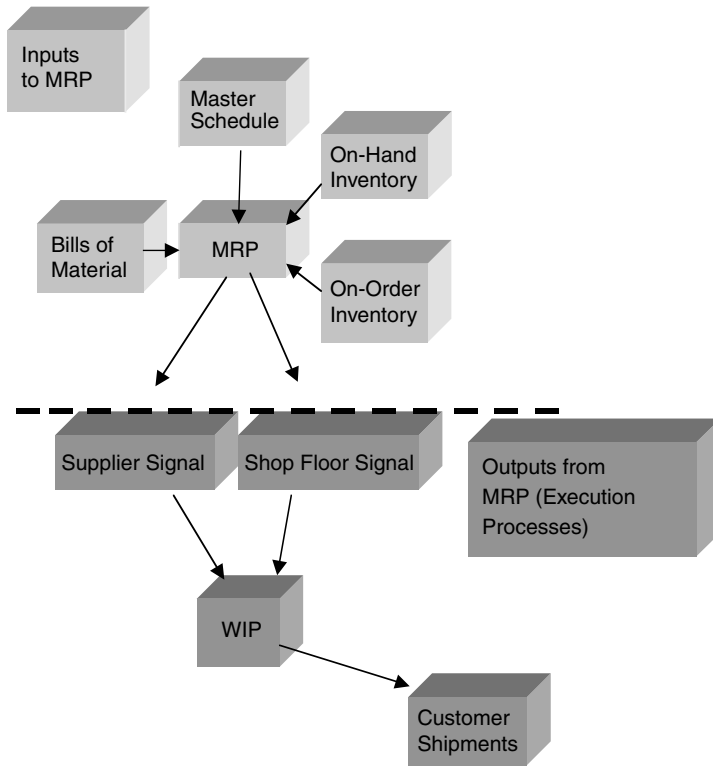


Figure 1.5. Schedule Execution Processes.

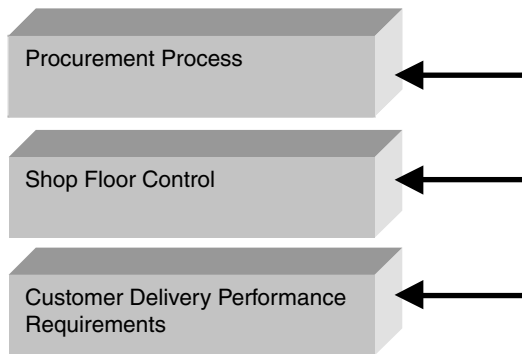


Figure 1.6. ERP Execution Processes.

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especially wasteful in a cost-conscious competitive world. Only disciplined process linkages within the information flow initiated by the top-management planning process and scheduled through the master scheduling process can allow maximum efficiency and accuracy of inventory-buy commitments. Without the direct information linkage, inventory is driven from best pricing or truckload quantities only and not necessarily strategic amounts. This *can* result

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in additional obsolescence, stranded inventory, and other unnecessary cost drivers. Inventory is often referred to as an evil, but it is quite the contrary.

Inventory is the best asset you can have at the time the customer comes to buy it! ERP allows the opportunity for this synchronization to happen. As we will find throughout this book, discipline is the necessary glue to keep the processes linkage intact.

You have now been introduced to the entire ERP business model, but only in its pieces. The entire ERP business model in high-performance organizations usually resembles Figure 1.7.

In the model, one can see the importance of information flow and process linkage from top-management planning through to plan execution and, ultimately, customer service and satisfaction. In Chapter 2, the discussion around specific performance requirements prescribed in Class A ERP certification will begin. Certification offers some value when shifting culture within the entire organization as it creates a specific performance target and celebration point.

INTEGRATION WITH LEAN AND SIX SIGMA

In this book, we will first dissect the ERP business model, convert the process elements into Class A ERP understanding, and then follow up by showing the integration to lean and Six Sigma. At this point, ERP has been described with enough detail to begin the discussion of integration.

Many organizations have *started* on journeys to excellence, yet a high percentage fail. I have an understanding of this from not only clients, practitioners I meet, and personal experiences, but also other consultants I meet. Although these consultants often have their own methodologies, inevitably we find that we are all doing the same thing, but simply calling it by a different name.

After all, we are all after the same result — manufacturing excellence and competitive advantage — but the reality is that most of us are simply trying to avoid the wrong way. It is the big mistakes that add unnecessary time and cost. From my experience, there *is* a way to implement a high-performance or world-class process that works effectively and efficiently every time. To do so,

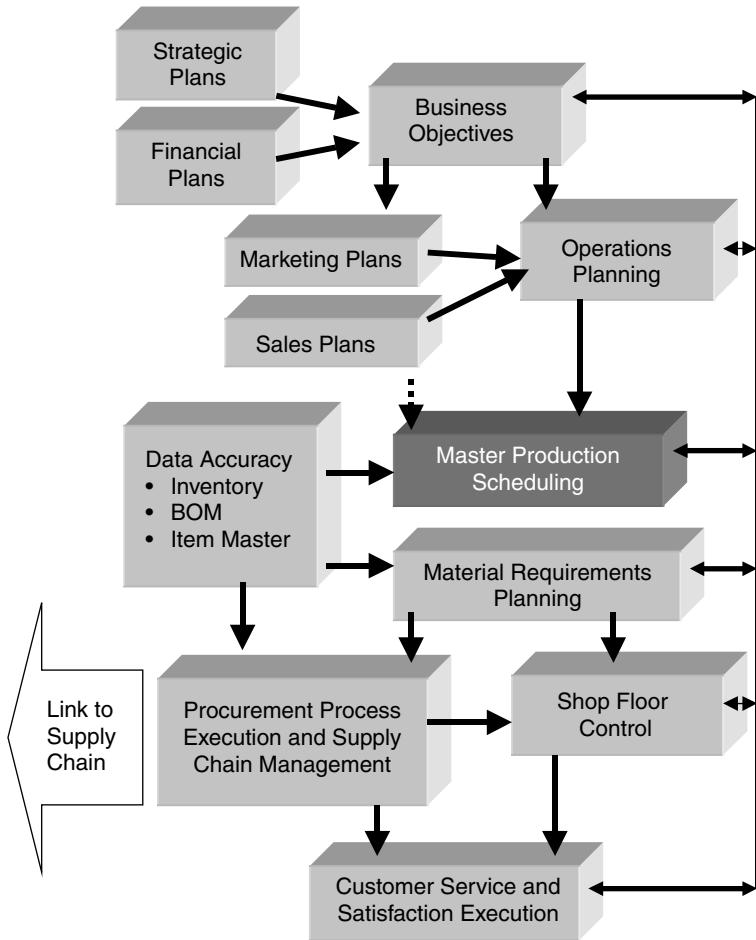


Figure 1.7. ERP Business System Model.

it is best to understand this journey for its pieces. This book’s goal is to define and separate the components of the journey most referred to as ERP, lean, and Six Sigma. No other initiatives (for the foreseeable future) are necessary, and it will be more understandable by the time you get to the last chapter of this book. It all comes back to the discussion of improvement implementation methodology and what we choose to call it. ERP, lean, and Six Sigma are the names we will call the segments of our journey to world-class performance. You can probably think of other names that some of the elements we are going to discuss have been called.

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ERP AS THE STARTING POINT

As I have briefly explained in this chapter, ERP is the overall business model defining information flow and accountability. In the simplest form, high-performance applications of ERP processes are repeatable and predictable. The focus is generally on data and schedule accuracy. That does not mean that processes are necessarily wasteful or low quality; they just are not normally the main emphasis from ERP itself.

As a separate improvement focus topic, lean normally would not reference a business model such as we would with an ERP discussion. Lean is from a

Whereas ERP is a process, lean is more of an approach within a process.

different space. Whereas ERP is a process, lean is more of an approach within a process. For that reason, it lends itself well to be a completely separate focus on the journey to excellence.

Lean refers to an approach focused on waste elimination. Lean thinking within a business is about looking at all processes, even repeatable processes, as opportunities for cost reduction and customer service improvement. This is normally done through rigorous process evaluations using mapping and other problem-solving tools.

At this point in the discussion, we have an ERP emphasis on process and information flow predictability, followed by a lean focus on improving these processes through the elimination of waste. Nothing new here for most readers, but you may begin to get a sense for the efficiency gained through the sequence of focus. That is exactly the same sense I have developed by helping hundreds of businesses all over the world. The issues are all the same in the businesses I have visited. Get the processes to work quickly and then come back to improve them through a new focus. Shigeo Shingo, the famous Toyota improvement wizard, used this approach to improvement — plan levels of improvement from the beginning, improve by 50 percent, and then come back to improve by 50 percent again!

At what point does Six Sigma come into this discussion? Many managers have had these thoughts when reading about Six Sigma and relating back to their statistical process control experiences of the 1980s. “How the heck are complex statistics with a goal of zero defects going to help real-world problems on the shop floor? Those Six Sigma guys live in a dream world.” The sad truth is that many organizations start their serious improvement effort with Six Sigma after the CEO reads an article on an airplane. His or her epiphany is then followed by education and six to twelve months of floundering and making projects (that were already in process pre-Six Sigma) fit the new Six Sigma requirements. Six Sigma as a quality goal can be reached through tinkering as

well, if that label alone is the goal. After all, defects *are* defined by where the lines are drawn around customer requirements. Anyone who concentrates on describing the requirements to your capabilities can achieve Six Sigma — well, sort of — in name only, certainly not the spirit of Six Sigma. Many of these companies end up seeking additional help. Having *been that help* in some of these organizations, I have found that the best approach starts with understanding the basics. Call them what you want, but these basics are back to the ERP discussion. Six Sigma is a sophisticated vision and organization of problem-

Once an organization is ready for this level of cultural focus for tenacious improvement, Six Sigma is the right methodology.

solving and process-improving teams and tools. Once an organization is ready for this level of cultural focus for tenacious improvement, Six Sigma is the right methodology. The reality is that it takes organizational maturity for this to work. Many *successful* organizations

have taken the improvement process in progressive steps.

Six Sigma is a powerful set of tools and a methodology that can empower a disciplined and trained organization to go from good performance to great. Six Sigma is literally a designation of quality as defined by standard deviations. That is as far as we are going in this chapter. There will be much more to come in following chapters.

As illustrated in Figure 1.8, when you look at each of these improvement methods for its specialty and strength, you find that they complement each other quite well. In every company I have been involved with, I have found this to be applicable and a valuable understanding to start with. Having a good set of ERP standard practices that predictably result in promises met is a great foundation on which to build a culture of continuous improvement. The logical next

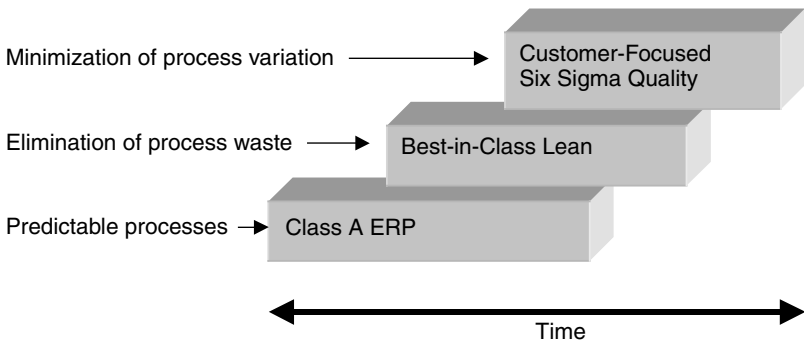


Figure 1.8. Sequence of Focus.

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step in many organizations is not to jump into complex statistical tools and deal with all of the complexities of hours and hours of in-depth training required to establish Six Sigma green belts and black belts. While there is a time and place, I have found it to be more efficient to keep the process focused on significant yet incremental improvements with a clear vision of where you are headed, including the expectation of Six Sigma levels of quality and process reliability. Be acutely aware that I am not downplaying the importance of Six Sigma process methodology. Quite the contrary; I found it to be a very powerful tool, and when organizations, including management, are ready for this level of focus, it is the right step to take.

The final step in this vision is world-class performance (Figure 1.9). I am sure there are more steps to come and I hope I live long enough to see them, but it is difficult to see beyond world-class performance. Most would agree that it is a little foggy on that level. World-class performance is not yet clearly defined. This performance level also changes every day, and to make matters even more confusing, it is not defined by the same market week to week or process to process; new product introduction may be defined by the electronics consumer goods market, lean flow may be defined by the automobile industry, quality may be defined by the aerospace market. This last step is not defined in this book because it just is not thought through enough in the marketplace and there are too few organizations that have reached that level to prove the theories.

I can only imagine that technology will continue to play an expanding role in business. Who knows? RFID (radio frequency identification device) is al-

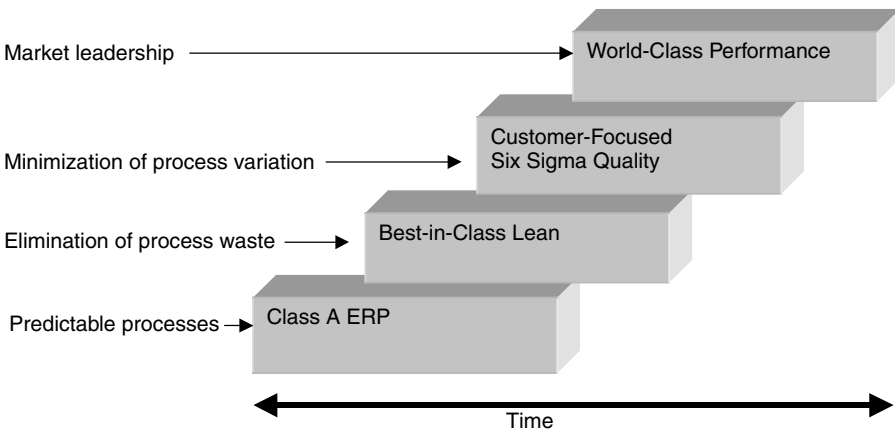


Figure 1.9. Journey to World-Class Performance.

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ready starting to change the manufacturing and distribution landscape, and I can only imagine the world in twenty years. World-class manufacturing and a *real* definition for it — that is a good topic for a future book!

At this point, I hope that you are starting to understand the interdependencies in the prerequisite steps to world-class performance. Class A ERP performance is a major step in the right direction in every business that focuses on it. The management system requirements from Class A ERP greatly help the organization mature in terms of both accountability and discipline. It is time to take a more in-depth look at Class A ERP.



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