CHAPTER ONE

1

The Law of Unintended Consequences

"Long-term commitment to new learning and new philosophy is required of any management that seeks transformation. The timid and the faint-hearted, and people that expect quick results, are doomed to disappointment."

—*W. Edwards Deming,* Out of the Crisis

INTRODUCTION

Going far back into history, philosophers have commented on the phenomenon of unintended consequences, both for good and for bad. Various references go back to Locke or Burke as talking about this principle in general terms, and it was a primary element of Adam Smith's "invisible hand" as one of the guiding principles of modern economics, albeit in Smith's case the unintended consequences were the positive effects of the "invisible hand." For the purpose of this book, we refer to this law as a primary reason that well-intentioned actions taken in a functionally organized world create unforeseen negative consequences across

an enterprise and define how the conversion to ERP programs contributes to the illumination of the logical relationships that cause these to occur. With this illumination comes the opportunity to design and implement changes within an organization that will more closely produce intended results.[1]

WHAT IS THE LAW OF UNINTENDED CONSEQUENCES?

Everyone has heard the expression "It is what it is." Although obviously tautological (inherently true), the statement still begs a couple of questions:

- Exactly what is it and is what we perceive it to be what it actually is?
- If we really understand what it is, wouldn't it be nice to know how it got this way so that we could figure out how to either change the current state or use it more effectively?

We are not suggesting that large efforts be expended to rehash history or agonize over past decisions, which may be perceived as errors, in hindsight. Instead, a few examples follow of how business approaches evolve over time into situations that were never intended and that present significant obstacles to improvement. Furthermore, regardless of whether the intent is to drive improvements (our view is that it always should), changes necessitated by the explosion of IT business applications technology are unavoidable as we adopt an integrated view of business. This is the product of integrated systems exposing the logical relationships between functions that were not fully understood or supported in the past. Far from criticizing past organizational development, we believe that these approaches evolved as natural constructs developed to model past practices and understanding. All that being said, however, in order to effectively use current Enterprise Resource Planning (ERP) platforms to improve business results, business leaders must make organizational changes from functional alignment to truly integrated business processes.

Let's start with integrated business systems themselves. The integrated business applications platform in an enterprise has several roles, including

1. Execute transactions.
2. Record and store transaction records.
3. Provide "real-time" view.
4. Manage designed business processes.

5. Establish internal controls.
6. Provide an analysis of business performance.

Furthermore, the integrated business applications platform

1. Provides a way to execute and record transactions. In this regard, it is different only in presentation and organization from traditional systems of the past.
2. Offers a means to record and store the results of transactions over time, for the purpose of organizing, collating, and reporting on them.
3. Allows a "real-time" view of the physical and financial condition of the enterprise. (This is almost always true of business components such as sales orders to date, inventory levels, and so on. It is somewhat less true at a higher level, where functions such as consolidations and reconciliation accounts are not processed in real time.)
4. Manages business processes that have been designed to both meet commercial needs of the business and produce optimal business results (regardless of whether this has been done correctly). This is a key point because a business process, in our terms, is cross-functional and must be designed and implemented across all of the affected functions. Whatever the business process design is, however, the ERP platform will institutionalize them for good or for bad.
5. Builds a design into an integrated system that provides internal controls (segregation of responsibilities) and controls over processes that can be audited to ensure compliance with regulations (such as governance, risk, compliance, and functionality—GRC in SAP and other ERP platforms have other tools to do this). Beyond these controls, however, it is possible to design processes that serve as cross-verification of internal relationships between business departments that can provide insight into problems, errors, inefficiencies, instabilities, and other risk-associated factors that arise in every corporation. While insight into how this could be achieved can be learned through the audit tools, real comprehension of how these integration points work is necessary to create the tools that are needed.

To illustrate this point, let's look at a couple of examples of management systems that have grown over time to become problems that are difficult to resolve, even though they grew through well-intended actions taken without sufficient knowledge of logical relationships within the business and have resulted in serious unintended consequences.

MANAGEMENT SYSTEMS

The first example is based on experience with a number of companies and draws on historical events that happened, but not all with one company. The example also has elements that are consistent with the results but are constructed to explain observations. They may have occurred as part of the story but could just as well have been the result of other equally problematic actions or policies. When we are trying to explain situations and how they came to exist, it is useful to understand the organizations as they existed when the current situation was evolving. This requires taking a process view of how the designs developed over time and usually under multiple leaders. This example, however, draws on real experiences and points out the value an integrated system can bring to enterprise risk management functions. It also, by pointing out why situations come into existence, provides insight into the challenges in taking them apart. Ultimately, it points to the reasons outstanding executives find themselves trapped in the cultural and political processes meant to serve them and without all of the tools to resolve the issues that entrap them, as we will discuss in Chapter 6. The political process in executive groups that renders this so difficult was well covered by Chris Argyris in his book *Overcoming Organizational Defenses*, in which he points out the reasons that highly effective executives fail to collectively resolve difficult issues.[2] While true, the increase in knowledge of logical business relationships and a better understanding of the inevitable consequences of actions can help make issues more factual and less political.

Example 1: Services Industry

The first example is in the services industry. The purpose is to demonstrate how certain organizational structures, procedures, and processes that are dysfunctional today came into existence through perfectly proper, if not thoroughly thought-out, actions. Even though the illustration is a collection of events from different companies, it is representative of processes that exist in any number of companies and industries. This example helps answer the questions of

1. How do these organizations develop over time?
2. Why aren't these issues obvious during the years as they are evolving?
3. How can these issues be detected earlier?
4. What are the types of organizational support elements that have to be in place in order to work through the conflicts and agree on resolution,

recognizing that over time the natural evolution of the structures comes with significant cultural, political, and potentially even legal issues?

The Start of the Story

Services Industry Corporation (SIC) incorporated decades ago as a privately held company focusing on a number of major accounts where it provided information technology (IT)—related services. The breadth of services at the outset included hardware, data centers, and software support (either development, maintenance, or both). The business grew dramatically at the initial accounts, with each account operating as if it were a separate business, hiring resources at the local account, with each account manager managing a complete income statement. While simplistic, the accounts were added up, corporate overhead applied, and it worked well for the first few years. This was also well before the explosion of computing technologies that started to tie the business world together in faster and closer ways.

Early Growth

As the industry grew, both in capability and in reach, other products were developed, other approaches to engineered solutions were invented, and the complexity of delivery (and therefore account management) expanded rapidly. More accounts came online and more resources were hired at local levels. As workload needs fluctuated at accounts, the workforce flexed to keep in sync with demand. At first, this hiring/firing cycle was offset by using temporary workers for temporary work, but complexity was also expanding and required a broader approach to both staffing and skills development. As the industry was developing new technology, a more technically skilled workforce was also evolving on the same time line.

After a few years, the company became a publicly traded corporation and continued to expand rapidly, diversified its industry base, and took on more customers for various products, all within its core competencies. In addition, productivity improvements (based on new technology and efficiencies) were achieved, and clients started requesting more and different services, including hardware changes, network administration, security management, applications development, and others. Many of these were even more temporary in nature (projects where workers with very specific skills would come and go). The ability to rapidly scale up or down was an important differentiator for providing value to clients at competitive prices. Skill sets became more differentiated, allowing the industry to possess more specific technology skills;

however, it meant that many workers on individual accounts had to rotate through assignments and locations.

Other than a core group that would stay on the account, the need was evolving for a stable of "transient" resources with increasingly diversified technical and project-management skill sets. In a natural evolution of the business model, resource pools were created that specialized in developing and maintaining specific skills within disciplines. These could then be deployed locally, regionally, or, finally, nationally. Resources were hired into resource management pools, their skills and capabilities developed and catalogued and then deployed from the pools as needed. Although this changed the basic nature of the business model, it was seen as evolutionary growth, and the logical impact on how this would be managed was not foreseen.

The company grew exponentially with the technology explosion, also bringing on disciplines from ERP applications to business process outsourcing (BPO) of various functions. While there were still accounts with the majority of workers employed at the account level, more and more accounts were made up of a core group supported by a larger group of resources assigned from resource teams. At the same time, the Internet explosion was making connectivity, security, and bandwidth available to a broader and broader set of resources, and more and more work could be done remotely. Many of the resources were still being deployed from resource pools but were seen as long-term account employees, often moving to live at the account site, yet still managed out of a centralized resource pool by skill sets. At the same time, specialized skills were required for shorter periods of time to handle short-term specialized projects, which continued to promote building resource pools. Larger proportions of account resources were now supplied from a central resource management group, and an organizational structure and management technique grew up around resource pools. Because the company reported quarterly income, costs, and margins on an aggregated basis, with little attention to lines of business, it made sense; however, the services industry was growing quickly, driven both by the explosion of technologies and by the drive for businesses to reduce costs for core functions by outsourcing various aspects of their business. The intended consequences of this structure is obvious; however, the unintended consequences will become clearer in the following sections.

Changes in Leadership

As inevitably happens, senior leadership changed, and the corporate focus changed toward differentiating among lines of business. The industry was

maturing as technology provided opportunities to sell services to clients in new areas. As an aside here, it needs to be emphasized that as any organization grows beyond the ability of a core group of leaders to manage, it develops more complex management structures, such that corporate objectives can be transmitted effectively to the organization. Although there is a tendency to blame issues that arise on complexity, this is often a substitute for not knowing how to guard against unintended negative consequences of this complexity. In this case, the continued rapid growth, the introduction of skills pools, and the business models used at the account level created an environment where changes were difficult, mostly due to the fact that the approaches were incremental and impossible to change one at a time. The introduction of differentiating business lines for reporting purposes could have also introduced a redesign of the fundamental business functions to align better with these lines; however, skills pools continued to expand, creating further differentiation and clouding the lines between how resources were managed and assigned and how the business segments were reported. There are great examples of leading organizational change through transitions; however, for many business leaders this complexity leads to continued evolution without acknowledgment of the need for new business models to support the growing complexity. In other words, dramatic changes in business models are disruptive, so evolution is preferable. Not being able to fully conceptualize the issues that may arise is, at this point, a product of lack of collective knowledge of the logical relationships within the business. It is not the organization itself that creates the issues.

Continued Complexity

Each account now was given individual targets for each business segment and was often broken down yet another level. Account financials were aggregated by line of business first and then at the account level to create the overall account income statement. Resources were still acquired by a growing resource management group, which was now segmented by resource type, skill sets, and somewhat by the line of business that it supported. Leadership of resource pools was segmented by various means, some geographic, some by skills, some by the offering that they supported, but the aggregation of these resources was based on the ability to deliver the skills when needed and less by what part of the business they supported. A complex set of business rules grew up around the management and assignment of these resources.

How these resources were used at the account level, however, remained the province of individual account leaders, as in the case of project management. Although some skills and techniques are transportable between lines of business, such as IT outsourcing (ITO) or ERP, at a detail level they may be quite different. The resource management structure, however, did not provide a way to know what each assigned resource was actually doing. The design of the management structures was not intended to track these resource assignments by any methods except account statements.

Some of the business segment products tend to be sold as a comprehensive service with defined margins, while others, such as consulting, are often sold at published consulting rates, which usually contribute higher margins (sometimes by two or three times). Each account now had targets for revenue and margins by segment, with little differentiation between resources, and the habit developed of assigning resources to balance things out and achieve targets for all segments. Although the creation of resource pools and the assignment of these to account teams started out to manage resources and skills, the lack of visibility into how they were assigned at accounts would have unintended consequences later in the evolution of these programs. It is not a story of intended errors but of the unintended consequences that developed as a result of the progression of this industry and evolutionary decisions made along the way. As long as the corporation was focused on reporting total revenue and margins, this was not a problem; however, the change in reporting methods could have been cause for concern.

Corporate Restructuring

New executive leadership restructured the lines of business and incentive programs, placing further emphasis on the differentiated targets, even while much of the revenue was attributed incorrectly to other lines of business. Resource managers led their organizations based on demand for specific resources for individual accounts (short term, longer term, or permanent), which was consistent with their roles in the organization. They saw themselves as generally aligned around "systems engineering" skills that could be deployed across a whole range of different project types, and, more important, across different lines of business. At the same time, leaders were assigned to mentor the organizations to focus on differentiation of these skills and create professional progression programs based on skill and experience in more and more narrow areas of deployment. These two "evolutions" resulted in management structures and

techniques that were starting to render the existing account management and reporting models inadequate. Internal reporting systems were increasingly inadequate to detect this, and the methods of coding resources and revenue at the accounts became an accepted part of the culture, not as an intended consequence, but simply because the rules and the oversight were not sensitive to the issues that the current assignment and reporting methods were creating. As long as legacy (homegrown, proprietary) applications were not sophisticated enough to report on this by providing a view where resources were coded by line of business to allow revenue to follow the resource, which would immediately point out the differences between reporting at resource levels, compared to the account level rollup, there was virtually no way for this to become visible. Most organizations have grown up by some version of this story and have different but similar examples where actual results differ from what is reported, not in the aggregate, but in an analysis of product profitability or cost attribution. The majority of organizations today have these issues left over from decades of unintended consequences.

Enter ERP and Improved Business Applications Platforms

Two things happened to all of these IT services organizations:

1. Enter ERP platforms with the ability to track information across large, complex companies and perform an analysis of results from different views.
2. A need developed to manage global accounts as global accounts, rather than as loosely integrated international collections of accounts for a single client.

A business could now use the ERP platform to look at a cross-sectional slice of total revenue and margin globally by the types of resources deployed. As businesses attempted to look at business results from this different perspective, they quickly realized that this was a problem due to the lack of consistency in the way work was recorded at the account level. This had implications for the whole business organization that had grown up over the years. The point of the example is that decisions were made over decades driven by business growth that later proved to have unintended consequences for the companies. Furthermore, the illumination of the relationships between the functional components provided by the ERP systems provided the ability to recognize, analyze, and redesign the business process to make the results of changes more predictable. This, however, is a two-edged sword because the same processes that had served so well had been fully embedded into the

company and institutionalized by legal reporting, cultural and political issues, and the lack of well-developed alternative business models to migrate to. Throughout this book, we will refer back to these situations and define a methodology for program governance designed to assist organizations to manage through these changes. The salient points here are

- The issues developed as unintended consequences of actions taken to address immediate needs and were not poor designs at the time.
- These unintended consequences are now fully embedded in the organizational culture and require a different approach to resolve them.
- Not addressing the need for transformational change will lead to failure to achieve intended business benefits.

Example 2: Manufacturing and Distribution

Remember that these examples are intended to demonstrate how normal business and growth activities, exacerbated by industries that are being affected by changes in technology and customers, will end up evolving business processes and systems that become problematic. This always makes major events, such as the implementation of ERP applications, more difficult and results in the need for exceptional program governance to ensure the success of changes.

The second example is a manufacturing company making products in the printing industry. One of the characteristics of the industry at the time was that printing plates were sold in all kinds of shapes, sizes, and thicknesses to a large number of end clients (small family-owned shops). This industry, like virtually all industries associated with photo processes, has evolved to more computer-to-press technologies, and much of this description is now dated; however, the intent is to show the evolution of processes for reasons that seemed right at the time but eventually created an environment that was difficult to change. Again, as in the first example, this example is taken from a variety of sources, and some details are constructed to explain the observations in order to fill in the blanks, but the example makes the case about how things get to the point where they are difficult to change.

Early History

In the early days of the lithographic printing industry, printing was concentrated in a few printers, mostly because of the money needed to acquire equipment. There were a few different sizes of plates for different types of

equipment, and with modifications, there were a number of setups that had to be customized; however, the size and diversity of the product line were limited. With larger, better-funded businesses, supplies such as plates could be ordered ahead, and the time that it took to get from the factory order to the customer was well understood—it worked. As time went by, however, printers became more ubiquitous, causing an explosion of small printers close to their customers, which resulted in further modifications to equipment and setups. This caused the number of stocked end-items to rise, but with smaller print shops, inventory orders were smaller and delivery times more critical.

Growth Breeds Complexity

Demand for shorter and shorter lead times resulted in several changes:

- More and different setups required more stocked end-items.
- Delivery times were reduced to the point where transportation time became a significant component of competition.
- An intermediate layer of distributors in local cities expanded, acting as an intermediary to the smaller print shops.

In addition, once this process started, it continued to compress demand for stock items in various setups and for faster delivery times over several years. This was also during the time in the 1980s when literature talked more about excessive costs of working capital as Manufacturing Resources Planning (MRP II) thinking caused leaner stocks to be held at distributors and customers. Competition for customers became more and more dependent on reliability, defined as an ability to get their products quickly, and the ability to switch from one vendor to another became easier as the product moved from a specialty to a commodity.

Building a Better Distribution System

As the number of printers expanded and the products became commodities, regional sales offices responded by establishing their own regional distribution centers to supply product more quickly. Each distribution center "belonged" to the regional sales manager, and it became the customer for the manufacturing plant. Its orders would be received by manufacturing and placed into a production schedule; however, the production time lines varied significantly, with the result that stock levels in regional centers grew much faster than the business they supported. In many cases, this was essentially the "Boston Beer Case"

described by Peter Senge in *The Fifth Discipline*, where shortages result in allocation of stock, which results in increased orders, which results in excess demands on manufacturing, causing expansion of production output, which results in excess inventory at the distribution centers, which results in canceled orders as inventory grows.[3] Although this may have been a natural response to the supply-chain issues the company was experiencing, costs continued to grow out of proportion to business growth. For a more thorough explanation of the Boston Beer Case, *The Fifth Discipline* (Chapter 3) provides an insightful description of the law of unintended Consequences and is good reading.

Manufacturing Gets Clogged

With the perception of excess demand on manufacturing, the production organization staffed to keep up; however, new employees, long hours, and less average experience in workers resulted in some items arriving on time and others requiring expediting until so many orders were expedited, it took expediting within the expedited orders to get items to the customers on time. At the same time, back orders continued to rise, eventually peaking at $3.5M, and many items could be on back order for a month or more at a time. One of the final steps in manufacturing was cutting plates to size using large hydraulic cutters. The next remedy was that press cutters were ordered for each distribution center to be used for "emergencies." In this case, the distribution center would take a package of a larger size, open it, cut it down into the needed size, repackage it, and ship it. Despite the additional work, the lost yield on the plates, and the additional packaging materials, this initially met the need to get products to the final customers on time. Costs, however, in the form of inventory (which, of course, had to be increased to accommodate this rework department), labor, and waste increased significantly, even as the market price for the products was dropping precipitously.

The Situation at Its Worst

This is the point at which integrated systems were introduced into the mix. The situation was that sales were controlled regionally, each ordering directly on manufacturing; manufacturing was being cycled wildly as the Boston Beer Case scenario was playing out; quality was becoming worse and worse as expediting took over and inexperienced workers were introduced; and, not surprisingly, back orders continued to rise because nearly every plate that was cut down had been in stock to fill an order anticipated during the next few days. Eventually, more than half of all plates were produced, shipped to

distribution centers, recut, and then shipped to customers; inventory doubled overall in the system; and sales dropped precipitously.

Resolution

Inevitably, at the point where ERP systems are introduced, scenarios such as this have occurred in any number of functions within the company. The politics and the culture have adopted intransigent positions around how to solve the issues, and most of the discussions concern whose idea to use—remember that every idea represents a functional view of both the problem and the potential solutions. Each step along this path included steps taken to address the immediate problem, and each initially resulted in improved results. Each, however, resulted in unintended consequences as a result of lack of knowledge of how integrated business processes operate.

Again, this is an example of everyone working functionally to take actions to address real issues with real solutions, and only through the illumination of the business process logic could the creation of unintended negative consequences be addressed. In this case, an integrated approach to sales forecasting, distribution, and manufacturing planning was successful in transforming how the business operated. The same challenges exist today in the vast majority of ERP implementations and are often not addressed effectively, resulting in failure to achieve intended business benefits.

THE CHALLENGE

The salient points from these stories include

1. Things grow over the years by what were at the outset good ideas or, at least, not overtly bad ideas. These can include many different phenomena, from "not invented here" attitudes to issues of organizational size and individual contributions. Without any intent to create other problems or issues, the evolution of processes has always produced more consequences than those anticipated.
2. Leadership changes, legal status changes (private versus public), organizational structures designed to meet immediate needs continue to provide a change dynamic to any organization, which over time we label "corporate culture"—nothing earth shattering, simply the collection of managerial techniques and structures that grow over decades in any

company. The only real change is that the advent of ERP platforms is a dramatic shift in the ability to see and report across functions where numbers can be consistently applied.

3. The same structures that may serve a company well when they were established ultimately may be impediments to continued growth and progress decades later, but by then, they have become thoroughly entrenched in the politics and the culture of the organization. Everything from legal reporting to compensation incentives and promotion competition will become tied to these structures and are difficult to discuss.
4. Legal reporting (Sarbanes-Oxley) takes a look at several aspects of financial reporting to ensure that the stated financial results of the corporation accurately reflect the financial status of the company. In doing so, the audit process evaluates internal controls and process reliability to determine whether the company is meeting the standards set forth in the law. These tools have become more competent at identifying weaknesses in business process management.
5. There is a whole issue beyond legal reporting, however, that doesn't get touched by the audit process—board level enterprise risk management. Beyond simple financial analysis and evaluation techniques, it is possible to develop other statistical financial analysis documents that can point to where these structural risks and opportunities exist.
6. Discovery of these issues often occurs during the ERP implementation project, but project teams have a difficult time defining issues well enough to get resolution to highly political cultural issues at the executive level.
7. In order to ensure that these are identified and resolved, we need a wholly new and detailed process of program governance that works through high-level issues standing in the way. Essentially, we are not building a whole new organization; however, we are building an entire new mirror infrastructure that has a dramatic impact on how our corporations operate.

SUMMARY

This chapter outlines simple examples of how things develop over time and eventually create what Chris Argyris in *Overcoming Organizational Defenses* calls the triple-blind failure to resolve them. In other words, we decide not to discuss the fact that we cannot discuss why discussions around these thorny issues cannot be successful.

If you read back over the several iterations of what ended up being an intransigent cultural process that prevents improvement, think about what happens at each stage of the evolution when you try to change the system. As the system of managing resources and assigning them to accounts evolves, as the account managers learn how to manage resources to achieve business targets, as growth targets get set that drive compensation programs at all levels, and, finally, as the business is segmented into parts that are evaluated and reported on separately, this is a story of the inability to see the organization from top to bottom. In the second example, as the industry grows, in its early development systems are established to address market needs; however, as it grows, diversifies, and ultimately converts from a specialty business to a commodity business, all of the changes are made within the functional culture of the organization without any view to the impact that it is having on the other functions. Beyond that, because each change in organizational structure was developed and implemented by the functional departments, they are committed to their solutions and to demonstrating why the continuing issues are the fault of others.

It is this final part of the story that this book suggests calls for a new approach to achieving potential business benefits from the use of ERP systems.

NOTES

1. For more discussion of this, there are many articles available—one that is valuable is from Rob Norton titled "Unintended Consequences" and can be found at the Library of Economics and Liberty at http://www.econlib.org/library/Enc/UnintendedConsequences.html.
2. Chris Argyris, *Overcoming Organizational Defenses: Facilitating Organizational Learning* (Upper Saddle River, NJ: Prentice Hall, 1990).
3. Peter Senge, *The Fifth Discipline* (New York: Bantam Doubleday Dell Publishing Group, 1990).