

Using Information and Data Capital to Drive the Bottom Line

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Presentation Forthcoming

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Abstract

Leading indicators suggest that Energy revenues will remain flat in 2003. Maintain or increasing profitability through cost containment, therefore, must remain the paramount goal for the next 12 – 18 months. If the top line cannot grow in today's economy, the bottom line can only improve if the *cost of goods sold*, the *operating expense* line items in the income statement, and *cost of capital* are positively impacted. In order to manage costs while navigating the current economic waters only good, timely information that is acted upon with creativity will provide competitive advantage at good margin.

Moreover, now on the front burner, governance issues orbit the boardroom. With both the CEO and CFO personally responsible for the accuracy of reporting to shareholders and regulatory bodies, information management takes on a *materiality* that is inconsistent with the back office mindset of past.

The tools are available to structurally change the way organizations do business. One school of thought suggests that MANAGING REVENUE PRODUCING ASSETS MORE EFFECTIVELY WILL HAVE A GREATER IMPACT ON THE FIRM THAN ALL OF THE COST RESTRUCTURING OF THE PAST. To truly be the low cost provider, management will have to make the investment in time, resources, and new tools to better manage the firm of the future.

Organizations that take advantage of the current market malaise, and reposition themselves in their segments will be well positioned to enhance near-term results and become strategically unassailable over the long run.

The vision of the economy as an information system is in sharp contrast to the materialistic vision of the economy found in standard economic textbooks.

-- Mark Casson
1997¹

Introduction

Most firms view information technology as a cost to be managed down as they would any indirect expenditure. This approach may have been appropriate when economies were based on the flow of goods and services rather than the flow of information. However, it may be time to rethink the role and value of information to the organization.

As with much of the economic thinking developed during the Depression of the 1930s,² the economics of materiality (the manufacture of goods, and the labor and capital required to produce them and associated services) has evolved to include intangible components such as information. There is even a field of economic thought focused on the role of asymmetrical information in the negotiation of contracts whereby one economic agent knows something about the transaction or relationship that the other party(ies) does not and uses this information to his or her advantage.³ The role of information in any economic exchange process has been the subject of research for years. Various models describe or predict economic behavior based on information and used by economic players.⁴

Some readers may wonder what the relevance of this discussion on economics is to their everyday situation. These ideas are important, because organizational behavior is a function of beliefs about how transactions take place and what variables drive economic exchange. Management will subsequently respond based on their training and experience.

In much the same way, lay people do not understand chemical reactions and the role of catalysts in the process of changing molecular structure, non-IT individuals will respond to the use of information and those systems that generate data based on their biases and knowledge base.

The *tension at the margin* between IT and non-IT people is the subject of recurring discussion and is not the topic of this commentary. Decision-making processes are a function of available information, and not a function of information technology expertise.

Poor decisions are frequently made by organizations that are not knowledgeable buyers. Knowledgeable in the sense that management has clearly defined the problem(s) that information systems are expected to solve, and knowledgeable in the sense that IT professionals are aligned with the business processes. Collectively, this group can become a high performance team capable of capitalizing on the best business process change methodologies and enabling information technology can provide.⁵

The chemical industry is a capital-intensive industry. Physical and skilled human assets provide the capital base of successful organizations. It is useful to think of the data and subsequent information derived as capital as well. More an asset than a cost, information can be the asymmetrical competitive

differentiator. More importantly, information management can be the governance distinction that can catapult the firm into a new orbit of energy.

Economic value can only be realized if changes are made to the organization that allow it to capitalize on its knowledge driven investments. Real change is not easily accomplished, and can only be achieved if the organizational culture changes as well. Changing culture is perhaps the most difficult undertaking an organization will ever attempt.⁶

Moreover, change does not come easily. In their book, *The Commanding Heights*, Yergin and Stanislaw discuss in detail the evolution of global markets during the post World War II period.⁷ A clear theme in this economic history is that real change does not occur until a credible threat, most often external, manifests itself. Only then, does the inertia of the status quo ultimately breakdown.

One credible threat in today's marketplace is the issue of organizational governance. Executives from many industries have confessed that they do not understand or have good information about the exogenous and endogenous forces at work.⁸ This lack of understanding about the structural dynamics of the market are humbling once great firms and destroying others.

Structural Dynamics

We have all watched the television and heard the news that a major earthquake has struck towns and cities with calamitous results. Not yet predictable, but after the fact, a stream of experts can pinpoint the geographic position, depth, and magnitude with great accuracy. Suddenly, the unknowable is common knowledge, but yet, this new intelligence cannot prevent another event. To be certain, there are lessons learned, building code changes made, etc., however, the time and place of the next occurrence is still a mystery. Far below the surface and moving slowly but with great power, tectonic forces continue to relentlessly shape the very core of our earthly environment.

Market forces act in much the same way. Many readers are familiar with the eighteenth century economist, Adam Smith, whose premise of the market's *Invisible Hand*,⁹ provides the checks and balances that insure that the synergy of self-interests among all market participants promotes the general good of society. The ebb and flow of transactions has a dampening effect as this pendulum continues its swing.

Many of us are enamored with the story of the overnight success. That individual or individuals, who in their garage launched the next great whatever and captures instant market share, fame, riches, and glory. Not surprisingly, most overnight successes toiled in obscurity for years. One colloquial saying, "the harder I work, the luckier I get" addresses this phenomena in most cases. Luck is often a function of insight into the management of unseen forces, and not sheer fortune.

There are many examples of unseen forces at work. Monday morning quarterbacks always have better vision than the man in the arena the day before. Market forces are no different. Forces are at work long before making themselves known.

Simply put, these Structural Dynamics are the general direction a system is headed as it seeks a stable or equilibrium state. In actual practice, systems do not reach equilibria states, but only approach through feedback loops.¹⁰

While some readers will find this definition a bit technical, suffice to say that while most think of business process change, in actual fact, the structural premises upon which are business processes are built are in motion as well – sometimes with opposing forces.

This is relevant to this discussion because it is important for management to develop a better understanding of the aspects of structural dynamics as it manifest itself in their industry sector. Moreover, as the world becomes more global, the economics of an interconnected world will increase the number of intertwined forces acting on the organization.

It will become more important for executives to have the appropriate information readily available as well as a new set of information management tools to better interpret the data. If one accepts the premise that the economy is an information system then one must put in place the structure, process, and enabling technology to reap economic profits.

Chaos theory tells us that the world is self-organizing,¹¹ and while many see current disarray some see opportunity for early movement, but only for those who are prepared. *“The general who wins a battle makes many calculations in his temple before the battle is fought. The general who loses a battle makes but few calculations beforehand.”*¹²

Being prepared requires good, timely, information, solid managerial practices, and a motivated and trained force. Sun Tzu also discusses the need for good execution and follow-up. Words as true today as they were over two millennium ago.

Governance

Hot off the presses, corporate governance is the issue de jour. High profile executives have blamed everyone and everything, except themselves for managerial shortcomings. CEO and Board Room statements are sometimes full of FUD (fear, uncertainty, and doubt) to corporate owners that suggest that in today’s complex firm certain activities maybe unknowable and therefore ungovernable. Recently, one former CEO of a telecom company even stated that because of complex international governmental relationships the true revenue picture was unknowable. Another CEO of a major information technology firm indicated that market forces snuck up on them.

Unknowable and, therefore, unmanageable are not words in the vocabulary of successful firms. Understanding the current status of organizational undertakings has never been more important than they are today.

Economic organizations exist because the internal transaction costs between departments and business units is less expensive than with external suppliers.¹³ Once this ceases to be the case, the argument for the continuation of the firm in its current structure is not compelling. The level of corporate restructuring, acquisitions, and divestitures will most likely continue at a torrid pace as the structural dynamics of market forces erodes current positions.

As management surveys their environment, they are likely to see a number of issues orbiting the firm.¹⁴ Not only competitive pressures, but also constraints and boundary conditions not unlike those used with linear programming models that optimize process plant performance. This set of issues can be broken down into two fundamental groups: (1) those that are bet your company, career, and even jail time,

boardroom issues such as maximizing shareholder value, business continuity and security, transparency and internal control, regulatory compliance, and liquidity and sustainability, and (2) LOB issues such as Return on Capital Employed and reaching Operational Excellence.

Orbits Around the CEO & CFO



Source: Shemwell / Willis – Oracle, 2002

Line of Business (LOB) issues are the more operationally focused concerns the organization must deal with everyday. Using the physical universe metaphor, each issue has a level of energy associated with it that keeps it orbiting the firm. Changes to one element most likely will impact on the other throwing the system out of equilibrium. As firms attempt to reach Pareto equilibrium¹⁵ whereby they are operating at the economic efficiency frontier, in this constraint-based model, they must achieve a delicate balance. Knowledgeable executives are better positioned to drive such an enterprise than those who are less informed about the structural dynamics adding or detracting energy to the orbital system.

This year, a management guru coming down from the mountain will mostly likely bring the sage wisdom of focus and moderation. Focus on those things that the firm does well and as our mothers told us, “all things in moderation.” Issues around organizational governance will continue to loom large, as the capital markets will continue to demand assurances that investments will be protected and stewarded appropriately. The Street will accept high risk – high reward opportunities, but not from managerial talent and their outside professional service providers that get “surprised.” Moreover, CEO/CFO certification of the accuracy of quarterly and annual financial statements is fact and creates significant personal exposure for these individuals if information is materially incorrect.¹⁶

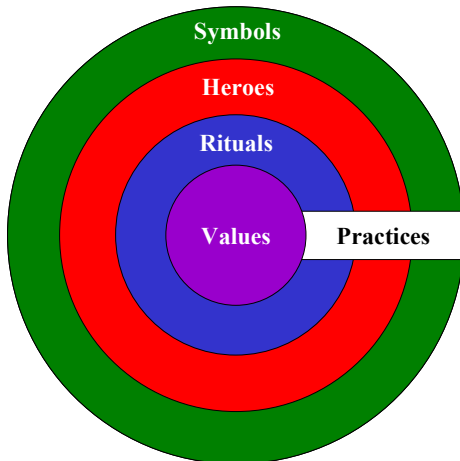
Firms must continue to adapt to the environment around them and structure their business to that portfolio of segments, products, and services where they can excel. Rapid and sustained change will be required and those organizations whose culture facilitates these realities will be well positioned to capitalize on cracks in the armor of those who are slower.

A Different Perspective

If knowledge is power, so the saying goes, then lack of knowledge is demise. The CEO cannot govern the firm if he or she does not have knowledge of the organization's behavior. The culture of the concern is set by the tone of management.

Hofstede¹⁷ addresses the development and maintenance of organizational culture. His view is that culture is the "software of the mind." His onion model delineates a number of aspects of culture that describe the behavior of individuals and by extension the organizations in which they labor. At the core of any firm is the set of Values that form the fundamental backbone that will weather any storm. This tenet is set early and does not readily change. Core values can be a source of strength when the going gets tough.

Manifestations of Culture



Source: Hofstede, 1991

The *Practices* of the organization radiate out in the form of Rituals, or those social behaviors that might not technically solve a given problem, but are essential to human interaction. Modern day organizational Heroes are individuals, living or dead, real or imaginary, who possess the characteristics the culture values highly and serve as role models. Finally, outward Symbols, or those most superficial and regularly copied words, gestures, pictures or objects that are recognized by those in the culture to project a specific meaning or intent.

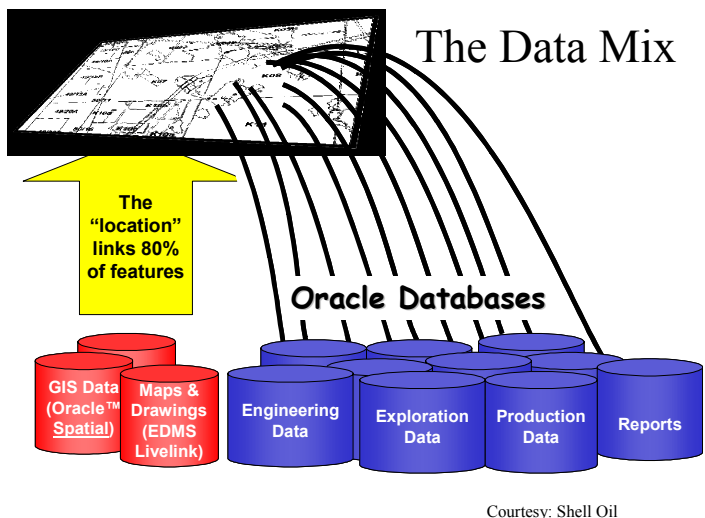
It is within this framework that business process change management along with its enabling information technology must work if real transformation is to occur. Cultural change is difficult, usually takes much longer and requires more effort than most realize. Even when victory is declared, backsliding can occur and management must be ever vigilant and take quick action to prevent old habits from reoccurring.

Today's IT Reality

Conventional IT wisdom suggests that today's complex global organization is composed of hundreds of software applications accessing hundreds of different databases. Integration, if it takes place at all, is between disparate applications.

This architectural approach has its roots in the computing past. Applications tended to evolve separately from one another, with only minimal interaction required. Moreover, firms were often compartmentalized, so this approach was consistent with workflow processes of that era.

Since the early 1990s, organizations have been focused on reworking or re-engineering workflow processes.¹⁸ Initially executed internally, now companies are looking to streamline processes across the extended enterprise and its supply chain. More recently, corporations have been implementing systems that help them capitalize on their customer base, continuing the movement of IT from the back office towards core business functions.



For example, customer acquisition and retention is a very expensive process and smart firms expend significant efforts to insure that their customer based is satisfied with the products and services provided. Furthermore, not every customer is a good customer. Organizations must also outline their customers and make decisions regarding the management of this portfolio.¹⁹ Some customers should be highly valued, and some actually cost more to service than the revenue they generate.

In today's world of integrated processes from raw materials to customers, the supply chain is critical to economic return. As trusted members of the extended enterprise, key suppliers will often need

access or provide data and information to the organization. The integration across organizational boundaries has been difficult and remains illusive to some. On the other hand, many firms are beginning to realize the promise of the extended enterprise.

Using a data architecture that integrates at the data middleware as opposed to across applications enables the extended enterprise to truly share data in real time. A single logical instance of the data enables all users, against appropriate security levels, to see a *single version of the truth*.²⁰ By amalgamating the enterprise data into an environment where all users can use the entire data mix as required to conduct their work, not only are IT costs dramatically reduced, but work process times are shortened. The end result – the stage is set for the organization to take out significant cost (20% or greater) while insuring better control and security.²¹

There are four main conclusions from the referenced EIU study that document successful cost savings work initiatives from the implementation of current Internet technologies:

- ❑ The business strategy must come first. Choosing technology for the sake of technology may actually raise costs not lower them. This is not a science project, but a new way of doing business.
- ❑ Real gains will come, not from just reengineering work processes, but rethinking the core assumptions and reinventing the organization and its processes. Understanding the structural dynamics of the environment is paramount if this effort is to be successful.
- ❑ Focus on short-term clearly recognized *Quick Wins* – gains that the organization can easily see and identify with.
- ❑ None of this will happen without the commitment of top management – from the CEO down, management must not only support, but also tacitly demand performance and clear roadblocks.

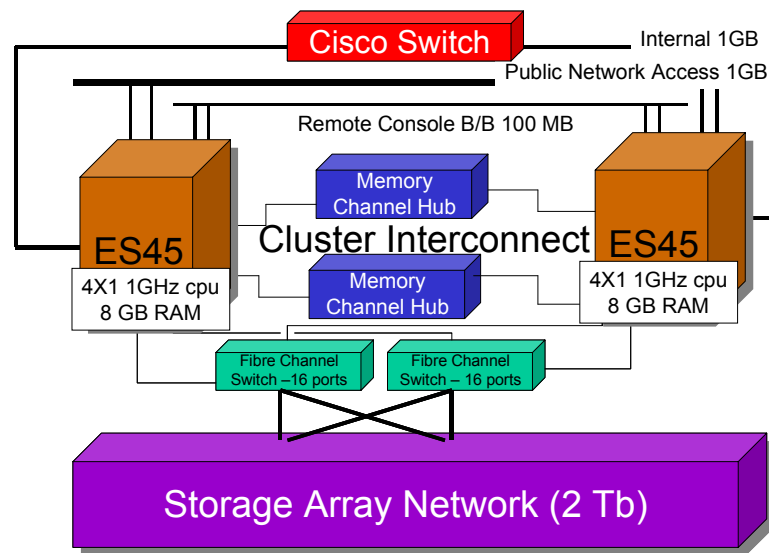
Availability, Security, and Interoperability

When the organization depends on single instance data availability for its operational excellence, failure is not an option. Where failure takes the form of hardware or software downtime, data corruption or

security breaches, these excuses are no longer valid. When the nervous system of the information economy is online, in real-time significant revenue can be at risk, not to mention the firm's reputation and possible exposure to litigation. In this environment, systems must work 24 – 7 and be bulletproof; both physically and logically. Moreover, systems must operate using a variety of applications, possibly the full suite of Enterprise Resource Planning (ERP) software applications, and perhaps the engineering and scientific applications associated with specific processes such as might be found in chemical plants.

As we move towards an environment where most transactions, both internally such as Human Resources (HR) and expense reporting, and externally such as Customer Relationship Management (CRM), or Supply Chain Management (SCM) are electronic, the transaction costs must include system downtime and security failures. If this component of the transaction cost is NOT zero (meaning no failures) then these costs are measurable and must be included in the cost of doing business. If these costs are too high, then the firm creates a *Crisis of Confidence* with its constituents.²²

Cluster Architecture at SIEP



Courtesy: Shell Oil

One approach for insuring availability, security, and interoperability has been undertaken by the Shell Oil division SIEP. This system takes full advantage of the robust failover and security features of the Oracle 9i Technology Suite as well as full hardware and network redundancy. Using hardware and software cluster technologies, which enable system traffic to be balanced across multiple computers, Shell is able to manage critical enterprise data efficiently and effectively.²³

These technologies are available today and have been used by a number of organizations to insure better governance and drive down costs. As *off-the-shelf* capabilities, they are available to all. What the organization does with them and how effectively they are deployed is the key to competitive advantage.

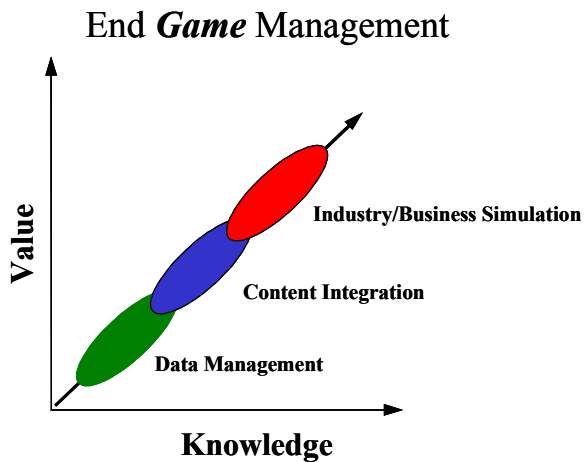
Emerging Trends

Business and other human endeavors are bound by invisible fabrics of interrelated actions, which often take years to fully play out their effects on each other. Since we are part of that lacework ourselves, it's

doubly hard to see the whole pattern of change. Instead, we tend to focus on snapshots of isolated parts of the system, and wonder why our deepest problems never seem to get solved.

-- Peter Senge²⁴

As challenging as the current environment is, the near future holds tremendous opportunities to further change the business landscape. Real-time and near real-time access to data and information brings the prospect of optimizing the entire business in much the same way chemical plant operators manage reactors – by simulation.



Source: Shemwell, 1999

This approach to *End Game Management* capitalizes on key technologies providing single instance of data and content management (data and information in context as interpreted by a knowledgeable individual/group) to add significant economic value using gaming techniques and other simulation algorithms.²⁵

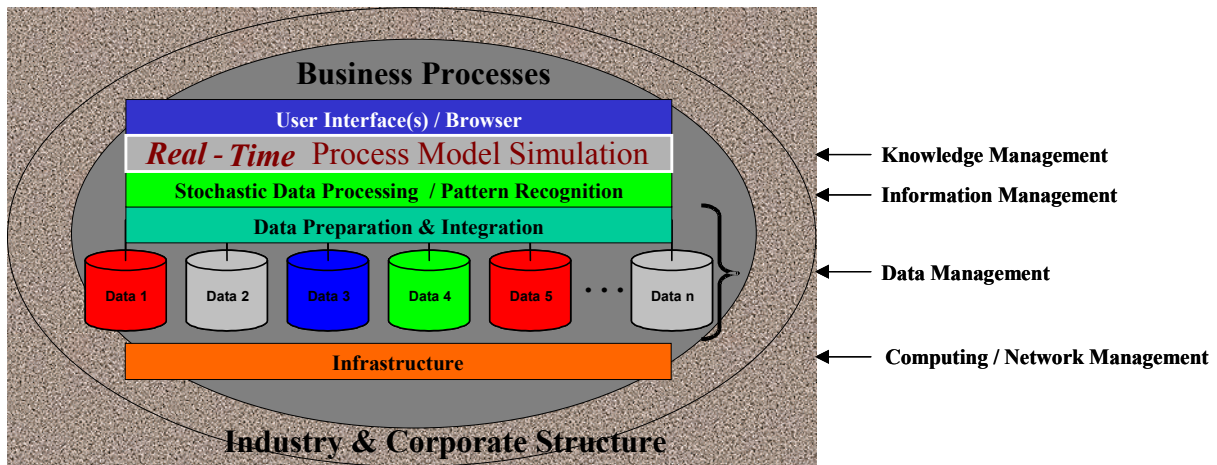
It is important to note that any simulation model must be bounded and constrained. Therefore, it is important that knowledge be brought to bear in any endeavor of this nature. This set of technologies will enable the knowledge organization to develop and maintain competitive

advantage. Knowledge truly is power when it is properly utilized.

Future *asset management* will entail the use of sophisticated data acquisition; data reduction and statistical process to condition data to best capitalize on real-time business process models. Users will utilize *dashboard* technologies to literally *fly* the organization. Asset optimization, from a business perspective, will include the use of market and economic data in addition to the engineering data associated with the process. This approach differs from the current use of non-technical data in that it will be incorporated directly into the asset management model.

Using the Structural Dynamics Management Model (SDMM)²⁶ pictures below, the full force of the information age will be brought to bear on business problems. The technology enablers are available today, and organizations that understand the value can achieve early adopter positioning at little risk. It should be noted that SDMM captures issues associated with exogenous variable such as market shifts.

Structural Dynamics Management Model



Source: Shemwell, 1997

Conclusion

Business is beset by a number of difficult issues. Recently, corporate governance and the market's demand for additional information and enhanced visibility have captured the media spotlight. Furthermore, demands for better asset performance in a down market have strained the bottom line. Deploying available off-the-shelf information technologies with an intelligent plan can solve both these and other issues. Others have already successfully implemented the concepts discussed in this paper. Realizing these benefits is no longer the leading edge and is available to all.

Glossary

These terms are discussed in this paper and used in the context as defined herein (not necessarily the only useful meaning for these words).

<u>Term</u>	<u>Definition</u>
Governance	A governance structure is thus usefully thought of as an institutional framework in which the integrity of a transaction, or related set of transactions, is decided. ¹³
Structural Dynamics	The morphology or patterns of motion towards process equilibrium of interpersonal systems. ¹⁰

About the Author

Scott Shemwell is the Vice President of Energy for Oracle Corporation and is a leading authority on information and management processes with more than 100 publications on a variety of business issues. He is an expert in business process modeling and simulation. He holds a Bachelor of Science degree in Physics, an MBA, and a Doctorate in Business Administration.

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