

14. The Future

Introduction

*"Predicting the future is a
hopeless, thankless task,
with ridicule to begin with
and, all too often, scorn
to end with."*

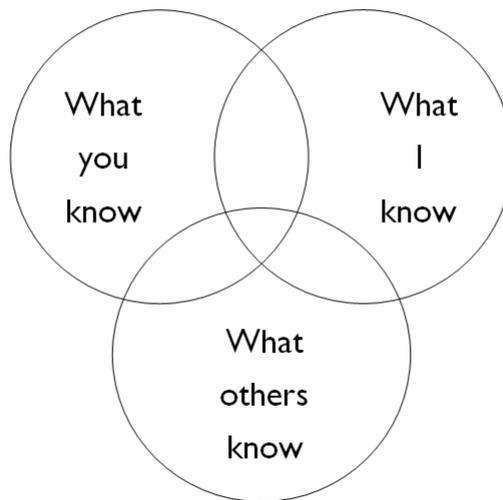
Issac Asimov

Management Information Systems (MIS) in Transportation¹ comprises three sources of learning.²

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I. Introduction to the Course and to Management Information Systems in Transportation

A mutual discovery and deeper development of shared
knowledge



12/19/2006

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Figure 1 Sources of Learning

What I know is partially represented in the lecture notes.³ What others know is partially represented in the text for the course.⁴ The “you” referred to represents the students in the course.

¹ A core course in the Masters of Science in International Transportation Management graduate program at SUNY Maritime College.

² James Drogan, *I. Introduction to the Course and to Management Information Systems in Transportation*, 2007, <http://jmsdrgn.squarespace.com/storage/1.%20Introduction%20to%20the%20Course%20and%20to%20Management%20Information%20Systems%20in%20Transportation.ppt>, [August 30, 2007]

³ A complete set of the lecture notes can be found at <http://jmsdrgn.squarespace.com/lecture-notes-mis-in-transport/>.

⁴ Effy Oz, *Management Information Systems (4e)*, Fourth Edition ed. (Boston: Thomson Course Technology, 2004) 0-619-21322-1

What this paper does is to extract the key ideas from my lecture notes and speculate as to how and why they may be changed by future developments, and the implications of these changes.

I subsequently consider whether there may be new ideas that may be raised in the future and what they might be.

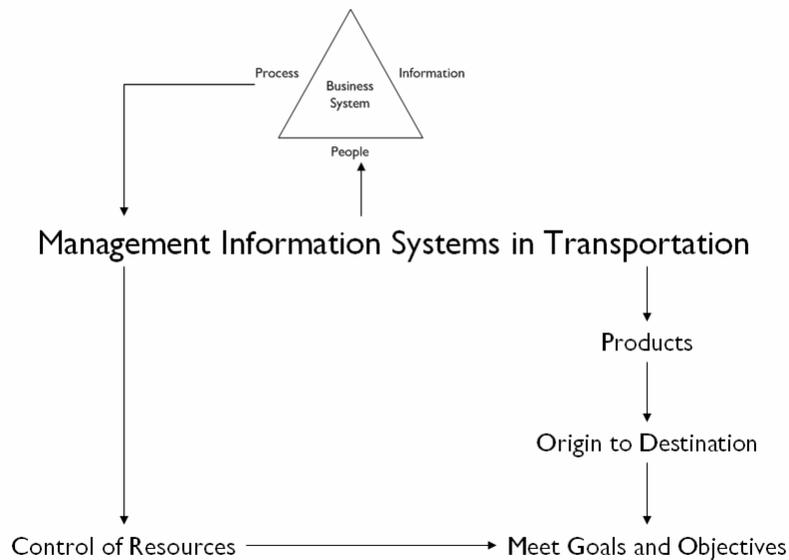
Lecture Notes

1. Introduction to the Course and to Management Information Systems in Transportation

This note⁵ puts forth a structure for thinking about MIS in Transportation.

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1. Introduction to the Course and to Management Information Systems in Transportation



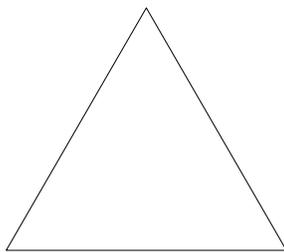
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Figure 2 Framework for Thinking

One thing that may change is the view of business systems.



becomes

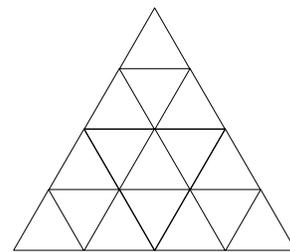


Figure 3 Changing Business Structures

⁵ Drogan, *1. Introduction to the Course and to Management Information Systems in Transportation*.

Organizations may become more tightly integrated as they seek collaboration as a means of improving business performance. That being true, then the consideration of MIS will necessarily include all of the tightly connected parties.

The implications are that the diagnostic, design, development, implementation, operation, and retirement process associated with managing the technology assets will need to change. We will take this up further when we discuss lecture note 11. Managing Information Technology in a New Age. There is also an implication that the breadth of human knowledge will need to expand in order to understand the impact of change on customers, suppliers, and competitors.

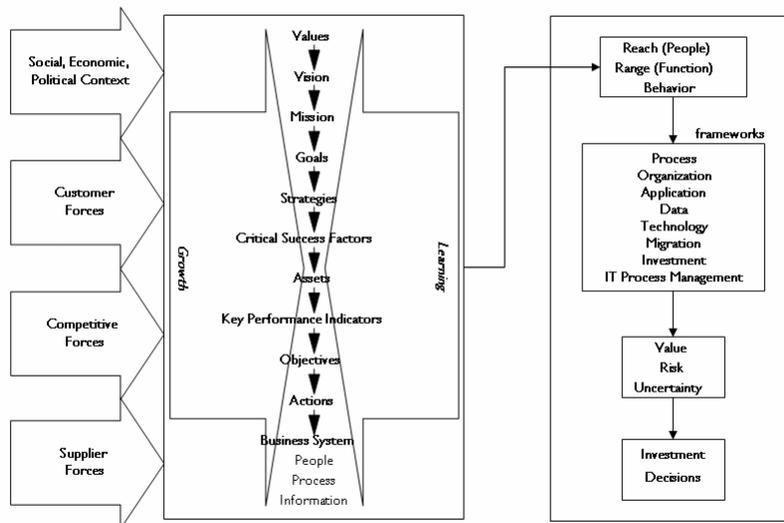


Figure 4 Business Drivers, Business Configuration, and IT Strategy

It has become increasingly clear to me, perhaps somewhat late relative to the understanding developed by others, that there are two additional external business drivers (the large, right facing arrows to the left in the figure) that influence the business configuration and hence the IT (information technology) strategy.

Geoclimatic Forces – these forces determine the distribution, shape, and capacity of the transportation infrastructure. While this has always been true, as global trade has expanded and will continue to expand, the limitations of the transportation system are being more readily found, congestion increases, and system performance drops.

One can no longer simply drop in a new port or railway.

These forces have a positive and negative implication.

In the first case, there is a motivation to be more innovative in thinking how technology can be used to overcome the limitations of existing transportation systems.

In the second case, the combination of geography and climate may represent a barrier to change in the transportation system and consequently impact the IT investment decisions.

Technology Forces – the development of technology seems to have a mind of its own. Technological innovation occurs almost for the sake of innovation itself, not because there is a fundamental business

need. During the early portion of my career with IBM, the company was sometimes derided for “selling solutions looking for problems.”

That feeling, I think, passed.

However, I think it easy to transfer that feeling to the myriad technological innovations that continue to arrive on the scene.

Rather than takes this easy way out, we should look upon this innovation as a stimulus for new thinking about business, how it can be changed, how new levels of performance can be reached. I've speculated that without a broad understanding of innovative developments in technology, one puts limits on strategic thinking.

Thus, a new version of this view is required.

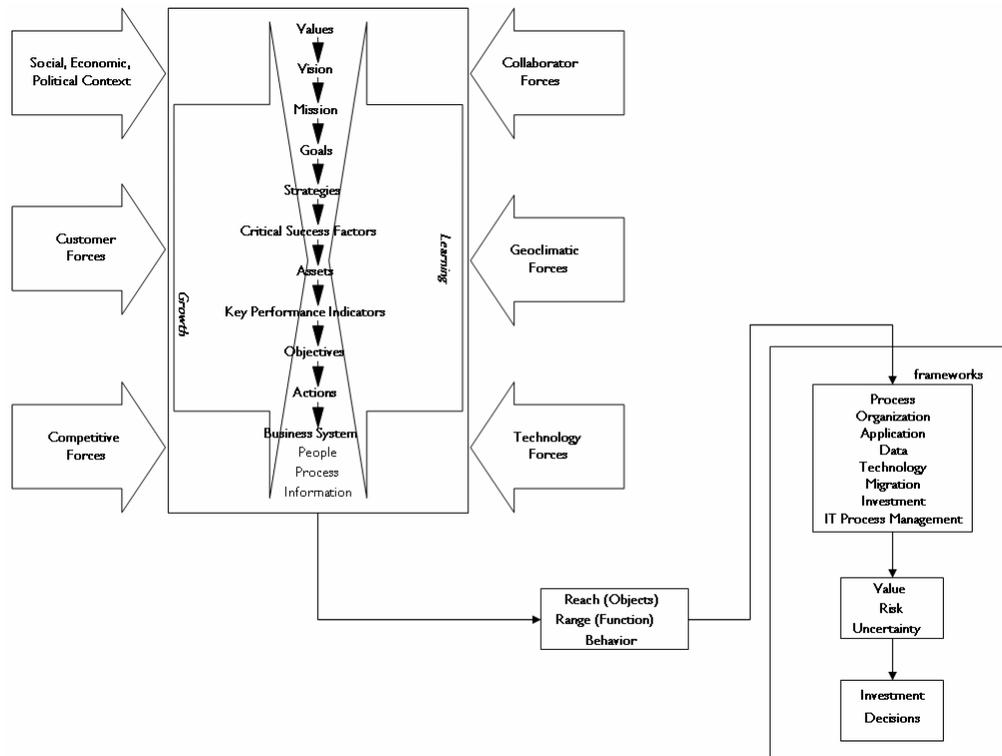


Figure 5 New View of Business Drivers, Business Configuration, and IT Strategy

What I am suggesting here is that the future will be marked by new ways of thinking about and realizing the value of the symbiotic relationship between business and IT.

What might some of these new ways be?

Systems Thinking – Figure 5 represents a system view linking external business drivers with IT investment decisions. Figure 3 Changing Business Structures on page 2 suggests that thinking regarding business structures will necessarily become more comprehensive. I’m suggesting here that this thinking will begin to encompass the entire system as represented in Figure 5.

“Systems thinking attempts to illustrate that events are separated by distance and time and that small catalytic events can cause large changes in complex systems. Acknowledging that an improvement in one area of a system can adversely affect another area of the system, it promotes organizational communication at all levels in order to avoid the silo effect. Systems

thinking techniques may be used to study any kind of system — natural, scientific, engineered, human, or conceptual.”⁶

A systems thinker is characterized by systems awareness. S/he knows that the object of their attention is part of a larger context. All too often, however, this awareness is not accompanied by curiosity. What is the relationship of the object to the context? How does one affect the other?

My sense is that the capability and capacity for systems thinking will become increasingly important in the future. The consequence is that the teaching of and the continual learning in this discipline will also become increasingly important.

But this may not be enough. The complexity and rate of change in emerging systems may be such that they can only be understood through collaboration between a number of parties.⁷ This implies that an ability to raise, establish and empower, and manage global teams may be of future importance.

IBM's Eric Lesser, in a presentation titled Transforming the Workforce⁸, suggests seven keys to workforce optimization.

The image shows a presentation slide from IBM Global Business Services. The slide has a blue header with the IBM logo and the text 'IBM Global Business Services'. The main content area is white with a blue border. The title is 'Seven keys to optimizing your workforce in a globally integrated world'. Below the title is a bulleted list of seven keys. At the bottom of the slide, there is a blue footer with the number '13' on the left and '© Copyright IBM Corporation 2007' on the right.

- Understand the demographics and capabilities of the workforce
- Predict future labor supply and demand
- Utilize social networks to increase the visibility and application of knowledge across the organization
- Facilitate collaboration across traditional organizational boundaries
- Enable individuals to perform work regardless of location
- Drive the rapid development of skills and capabilities to meet changing business conditions
- Evaluate employee performance and provide appropriate feedback

Figure 6 Workforce Optimization

If these are indeed critical success factors and if they apply to the business of transportation, then one can expect additional efforts being made in developing these abilities.

Systems Modeling – As systems become increasingly complex, on the one hand, and rapidly changing, on the other, people, gathered in highly efficient collaborative teams, will likely not be able to deal with the myriad, rapidly changing relationships that mark the systems of tomorrow. They will likely turn to

⁶ Wikipedia, http://en.wikipedia.org/wiki/Systems_thinking [September 3, 2007]

⁷ See James Drogan, Homer, *Great Books and Modern Life*, <http://jmsdrgn.squarespace.com/droganbloggin/2006/12/28/homer-great-books-and-modern-life.html> [January 29, 2007] for further words on collaboration.

⁸ Eric Lesser, "Transforming the Workforce: Seven Keys for Succeeding in a Globally Integrated World," IBM BCS Alumni Webcast, August 17, 2007

sophisticated computer models as a way to aid in diagnosis of and assessment of changes to these systems.

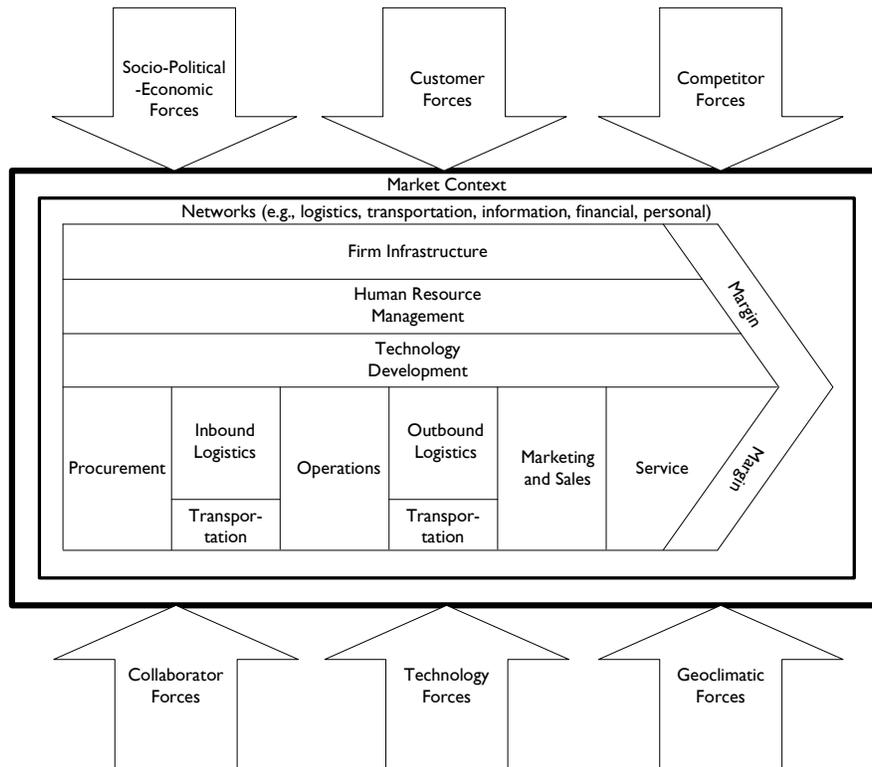


Figure 7 The Context of Interest

Here is another view of the context in which transportation exists.⁹ There are models of various kinds that cover portions of this context. What is likely to emerge is the integration of these models into a model of models.

⁹ The core of this diagram is adapted from Michel E. Porter, Competitive Advantage: Creating and Sustaining Superior Performance (The Free Press, 1985) 0-02-925090-0

Here is a simple example of this concept.

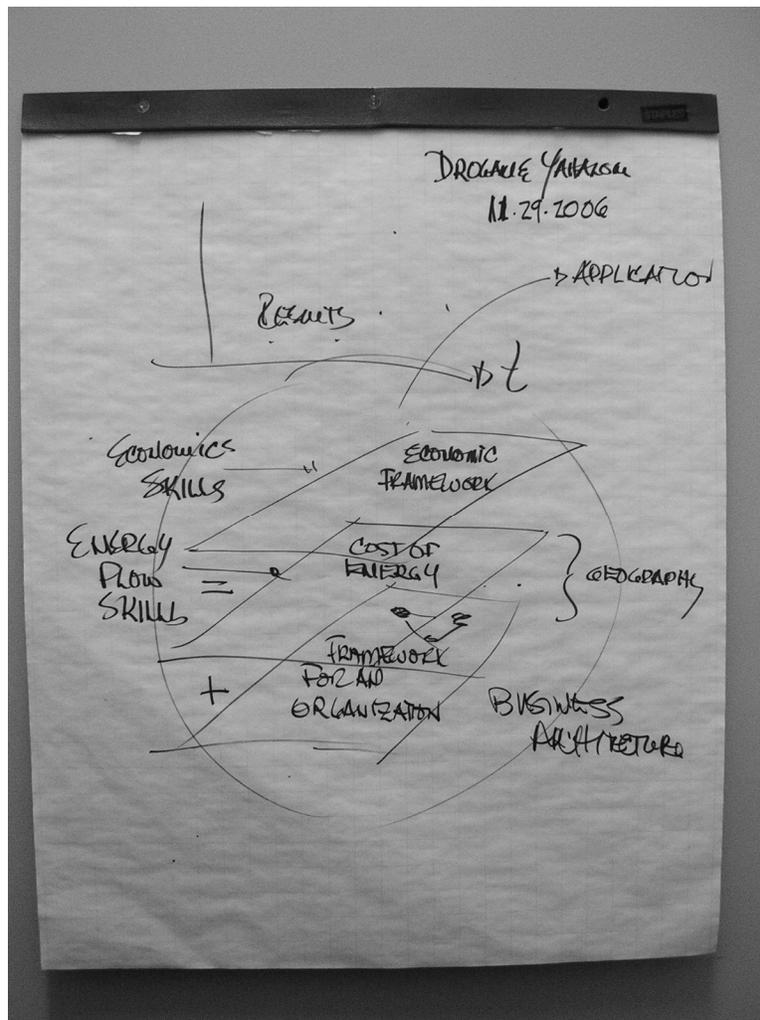


Figure 8 Energy-Driven Business Transformation

This comes from a meeting with Prof. Yahalom.¹⁰

The thrust of the discussion was of three models – the framework of an organization; the distribution, costs, and value of energy across geography; an economic framework to assess the impact of changes to one or both of the first two models. The idea would be to explore ways of improving business performance by changing business and the way it utilizes energy.

The implication is that knowledge, skills, and experience in building and integrating models will become increasingly important.

2. Principles for Applying Information Technology

This note¹¹ put forward four principles.

¹⁰ Global Business and Transportation Department, Maritime College.

¹¹ James Drogan, *Principles for Applying Information Technology*, 2005, <http://jmsdrgn.squarespace.com/storage/Principles%20for%20Applying%20Informaton%20Technology.pdf>, [January 29, 2007]

Principles for Applying Information Technology

- The only legitimate uses of information systems are to improve the performance of the enterprise.
- Information systems are inextricably intertwined with the mission, objectives and structure of the enterprise.
- Disciplined approaches to applying information systems are critical to success.
- Information systems are technology plus process plus tools plus skills plus culture.

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Figure 9 Principles for Applying Information Technology

I see the potential for two changes in this set of principles.

First, in keeping with Figure 3 Changing Business Structures on page 2, the enterprise view will be changed to value chain view.

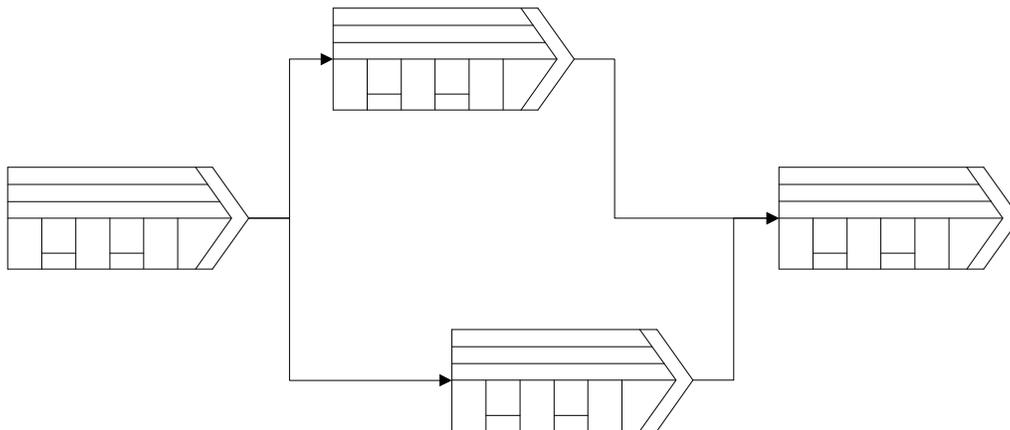


Figure 10 Linking Porter's Structure in a Value Chain

Figure 10 represents four companies linked together to provide value to an ultimate customer.¹² This will likely become the dominate view in IT systems analysis, design, implementation, and operation.

The implication is that the analyst, whom we previously implied was a systems thinker, will need to as much about the organizations to which his firm links as he does about the firm itself. Else how will s/he make good recommendations for change?

¹² The symbols for the four companies come from Porter, Competitive Advantage: Creating and Sustaining Superior Performance

The second change will be the increasing importance of culture as a major consideration in information systems. The basis for this is work by Javidan and House.¹³

Project GLOBE provokes us to understand how cultural differences affect what we do as a business

<i>Dimensions of Culture</i>	<i>Cultural Groups</i>
<ul style="list-style-type: none">• Assertiveness• Future Orientation• Gender Differentiation• Uncertainty Avoidance• Power Distance• In-Group Collectivism• Performance Orientation• Humane Orientation	<ul style="list-style-type: none">• Anglo• Arab• Confucian• East Europe• Germanic• Indigenous Africa• Latin America• Latin Europe• Nordic• South Asia

Project GLOBE http://www.ucalgary.ca/mgt/GLOBE/Public/Links/lessons_project_globe.pdf

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Figure 11 Consideration of Culture

How, for example, are we to deploy IT in a culture that exhibits significant power distance?¹⁴

The implication here is that an awareness and consideration of cultural issues will increasingly become important.

One final idea from this lecture note.

¹³ Mansour Javidan and Robert J. House, "Cultural Acumen for the Global Manager: Lessons from Project Globe," *Organizational Dynamics* 29.4 (2001).

¹⁴ "Power Distance is defined as the degree to which members of a society expect power to be unequally shared. It represents the extent to which a community maintains inequality amongst its members by stratification of individuals and groups with respect to power, authority prestige, status, wealth, and material possessions. It also reflects the establishment and maintenance of dominance and control of the less powerful by the more powerful." Javidan and House, "Cultural Acumen for the Global Manager: Lessons from Project Globe."

Augmented balanced scorecard.

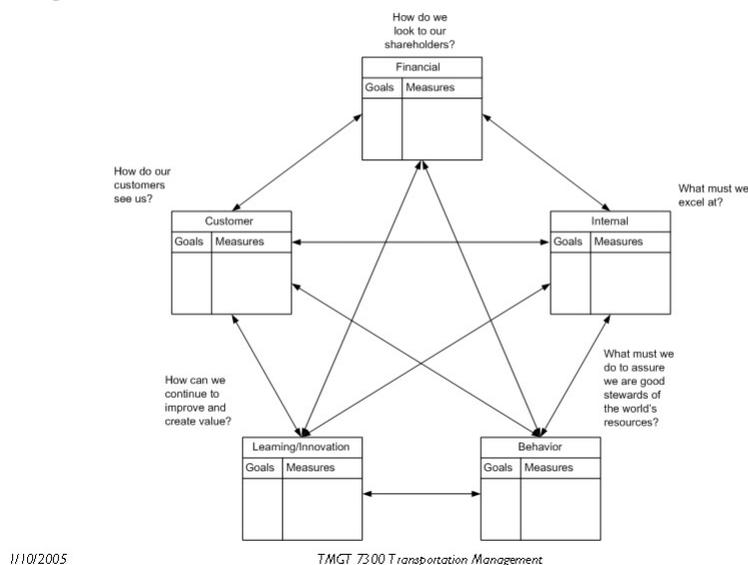


Figure 12 Augmented Balanced Scorecard

Performance will take on an added dimension.¹⁵ Environmental concerns will continue to rise in importance suggesting another field of expertise will be necessary to properly deploy IT in the future.

3. A Note on Business Drivers, Business Configuration, and Information Technology Strategy

Figure 4 Business Drivers, Business Configuration, and IT Strategy on page I introduced the notion of these three concepts. Additional detail is available.¹⁶

The potential changes highlighted to this point will, of course, impact various portions of A Note on Business Drivers, Business Configuration, and Information Technology Strategy, but these effects should be self-evident and I will not repeat them here.

A reasonable question, of course, is why bring this up at all if the conclusion is as above? The answer is it that is important to make explicit one's considerations of issue at hand. To ignore A Note on Business Drivers, Business Configuration, and Information Technology Strategy prompts two questions in the readers mind.

One, the future changes to A Note on Business Drivers, Business Configuration, and Information Technology Strategy are minimal and therefore it has not been explicitly considered. This is rational.

Two, the author forgot about A Note on Business Drivers, Business Configuration, and Information Technology Strategy. This is irrational.

¹⁵ This idea comes from Robert S. Kaplan and David P. Norton, "The Balanced Scorecard - Measures That Drive Performance," Harvard Business Review January-February 1992 (1992). I taught a graduate course in international logistics at Baruch College in 2002 and 2003. Discussion with my students resulted in adding the measure of behavior to the work of Kaplan and Norton.

¹⁶ James Drogan, A Note on Business Drivers, Business Configuration, and Information Technology Strategy, July 19, 2005, <http://jmsdrgn.squarespace.com/storage/A%20Note%20on%20Business%20Drivers%20Business%20Configuration%20and%20Information%20Technology%20Strategy.pdf>, [June 6, 2007

Better, I think, to make the situation explicit than to torment the reader with guesses.

4. Thinking About the Business Configuration

This note¹⁷ expands on [A Note on Business Drivers, Business Configuration, and Information Technology Strategy](#) by focusing on the business configuration. The use of the business configuration as a diagnostic is illustrated by drawing on data (slightly disguised) from a real consulting engagement.

The aforementioned changes imply an increasing amount of sharing between the members of the value chain. The level in the business configuration at which this sharing takes becomes an important consideration in the deployment of IT.

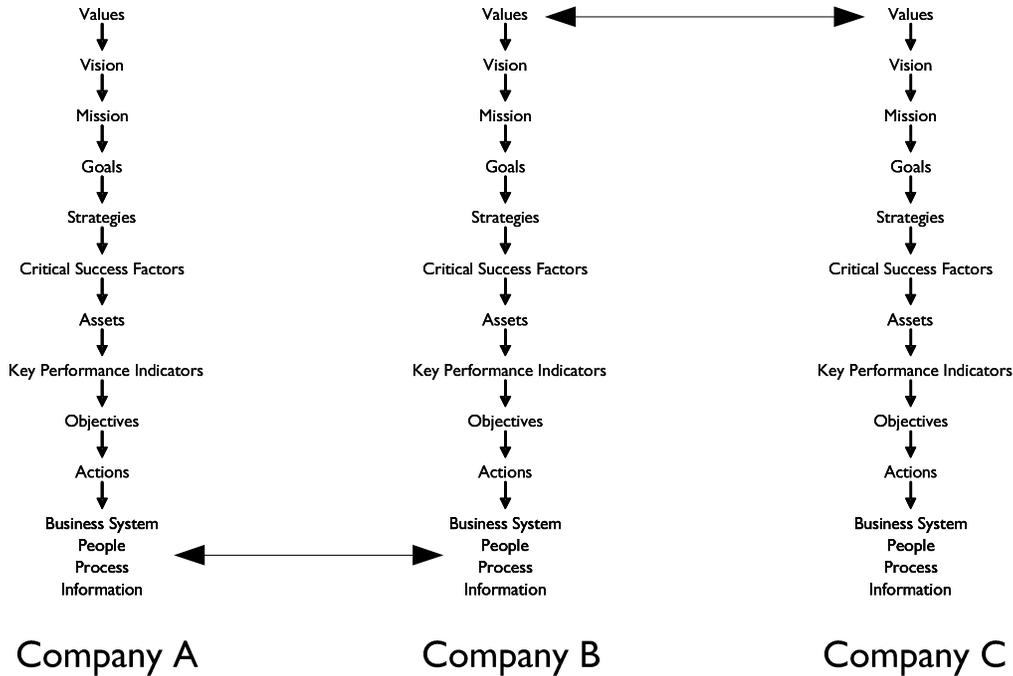


Figure 13 Sharing Between Business Configurations

Figure 13 aims to suggest by the arrows, levels of understanding and sharing. Companies A and B have a low level of understand and sharing; companies B and C have a high level of understanding and sharing.

Another way of looking at the right side of Figure 13 is that companies B and C are closely linked in a value chain, while companies A and B are loosely linked in a value chain.

This leads me to idea that the basic structure of the diagnostic (represented by Table 1 below) needs to be changed.

Business Configuration Characteristics	Current Situation	Desired Future
<p>Values</p> <p><i>Fundamental elements, or a set of beliefs which lie behind Corp as an organization (e.g., "Quality and safety are dominant principles in all we do," Respect</i></p>	<p>Quality Service</p> <p>We take pride in our work and are committed to delivering high quality service to internal and external customers. We are responsive, responsible and safe</p>	<p>Quality Service</p> <p>We take pride in our work and are committed to delivering high quality service to internal and external customers. We are responsive, responsible and safe</p>

¹⁷ James Drogan, [Thinking About the Business Configuration](http://jmsdrgn.squarespace.com/storage/Thinking%20About%20the%20Business%20Configuration.pdf), 2007, [February 28, 2007]

Business Configuration Characteristics	Current Situation	Desired Future
<p><i>for the Individual"). Other examples include the Nicene Creed and the Bill of Rights of the United States of America. Values should be simply stated, readily understood, and evident in the conviction, attitude and actions of all employees.</i></p>	<p>in all that we do.</p> <p>Integrity and Fairness</p> <p>We deal fairly and honestly with our colleagues, customers, suppliers and the community. We honor our obligations and our undertakings.</p> <p>Commercial Behavior</p> <p>We actively pursue profitable growth by understanding and responding to our customers' needs, recognizing and developing opportunities for growth and improving the profitability of our existing business.</p> <p>Creativity and Innovation</p> <p>We identify improved methods and procedures and use our initiative to find solutions to challenges and opportunities. We are open to new ideas and we continually aim to learn and improve.</p> <p>Mutual Respect and Trust</p> <p>We work together in ways which promote participation, teamwork and trust. We communicate openly and treat people fairly and equitably. We value and recognize the different contributions and efforts of our colleagues.</p>	<p>in all that we do.</p> <p>Integrity and Fairness</p> <p>We deal fairly and honestly with our colleagues, customers, suppliers and the community. We honor our obligations and our undertakings.</p> <p>Commercial Behavior</p> <p>We actively pursue profitable growth by understanding and responding to our customers' needs, recognizing and developing opportunities for growth and improving the profitability of our existing business.</p> <p>Creativity and Innovation</p> <p>We identify improved methods and procedures and use our initiative to find solutions to challenges and opportunities. We are open to new ideas and we continually aim to learn and improve.</p> <p>Mutual Respect and Trust</p> <p>We work together in ways which promote participation, teamwork and trust. We communicate openly and treat people fairly and equitably. We value and recognize the different contributions and efforts of our colleagues.</p>

Table 1 A Portion of An Example of Data About the Business Configuration

If the aforementioned changes are true, then there will be an increasing need to define the current and desired sharing between the organization, its customers, and its collaborators.

So suppose a structure looking like this.

Customers/Collaborators	Current Level and Nature of Sharing	Desired Level and Nature of Sharing
-------------------------	-------------------------------------	-------------------------------------

Table 2 Specification of Sharing

Imagine a number of rows corresponding with each of the organizations your firm has and/or desires a sharing relationship.

Somewhere along the line the nature of the relationship will need to be negotiated with the other party. This has two implications.

First, is the notion that there will be a need in your firm for negotiation knowledge, skills, and experience. All will be much easier if your firm and the other party can come to agreement on the level of sharing.

Second, being in a position to negotiate suggests that your firm understands something of the value proposition associated with sharing as seen by the other party. This means the development of an understanding of the other party's business configuration.

Before I go too much further I should emphasize that this course takes a top down view of MIS, preceding from fundamental principles and concepts to investment decisions. Hence, it is to be understood that possible changes described at a particular point in this document have their impact later in the document.

5. MIS Strategy

I have not provided a lecture note for this module, opting for an assignment in Oz¹⁸ and a number of supplementary readings.¹⁹

I am prompted, however, by a recent article in the McKinsey Quarterly Review.²⁰

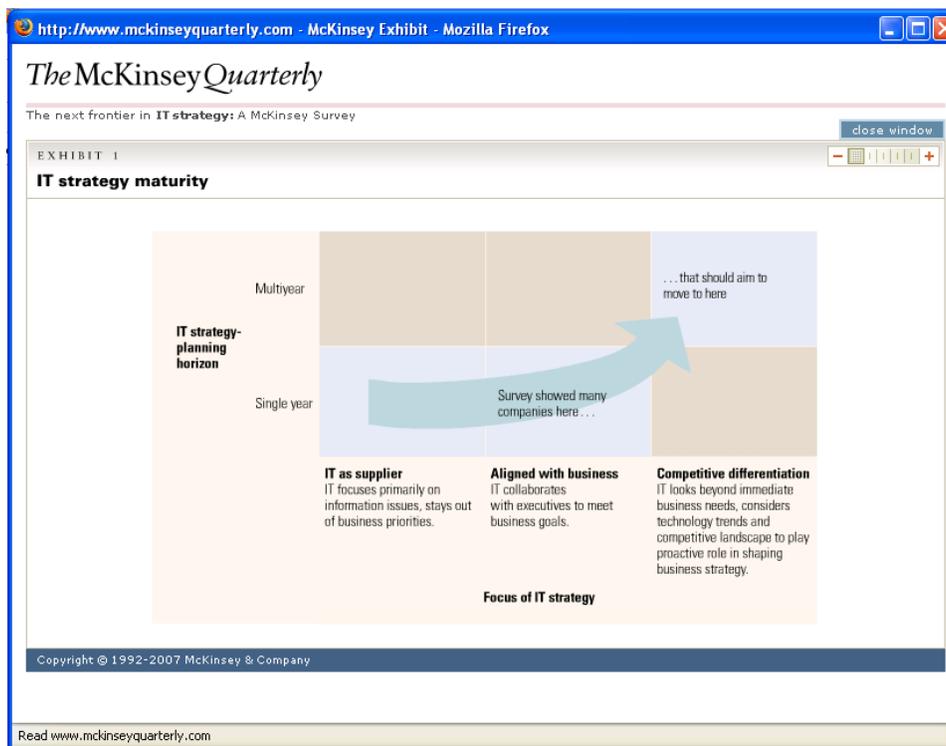


Figure 14 McKinsey Exhibit I

In a world of an increasingly higher frequency and amplitude of change in the fundamental business drivers, what characterizes a multiyear IT strategy-planning horizon?

¹⁸ Oz, *Management Information Systems (4e)* pp 552-575

¹⁹ Current supplementary readings include: Has Strategy Changed, Moving Ahead (UPS), Strategizing in the Real World, and Two More CEO Ousters Underscore the Need for Better Strategizing. Full reference to these can be provided if the reader is interested.

²⁰ David Craig, Kishore Kanakamedala and Ranjit Tinaikar, "The Next Frontier in It Strategy: A Mckinsey Survey," *The McKinsey Quarterly* (2007), vol. This article has become the basis for a lecture/discussion I led in Prof. Karl Lang's CIS 9000 Information Systems for Managers at Baruch College. Further comments here are taken from the notes for this event.

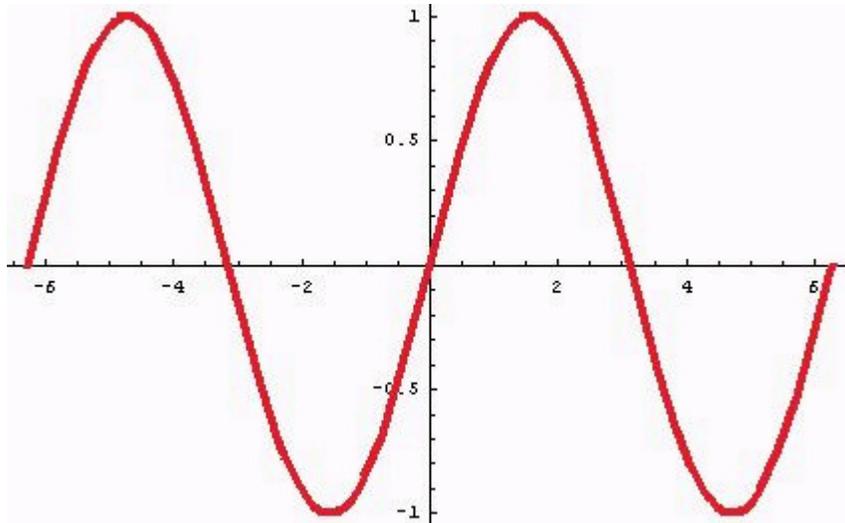


Figure 15 Waves of Change²¹

Think of this wave as representing the cycles of change with the amplitude representing the potential impact of the change. The issue, as I see it, is that we are no longer in the smooth regular world this figure implies. Rather, as time proceeds from left to right, the cycles get shorter implying more frequent change, and the amplitude gets larger implying an increasing potential impact. It's a bit like have a tone generator with two knobs. One controls the pitch, the other controls the volume. Starting at low volume and pitch one turns the knobs clockwise increasing the volume and the pitch. At some point I expect it begins to become painful.

I should also not that the x-axis in Figure 15 could be labeled commodities on the left and cosmetics on the right. As one proceeds from left to right, the cycles get shorter implying more frequent change, and the amplitude gets larger implying an increasing potential impact.

²¹ Google,
http://images.google.com/imgres?imgurl=http://www.mste.uiuc.edu/courses/ci399TSMsu02/students/hooper/Final/sinewaves/PureSine.jpg&imgrefurl=http://www.mste.uiuc.edu/courses/ci399TSMsu02/students/hooper/Final/sinewaves/Sinusoidal_Wave_Lesson_Page_1.html&h=263&w=426&sz=14&hl=en&start=129&um=1&tbnid=w2bd9Nqq7wYoPM:&tbnh=78&tbnw=126&prev=/images%3Fq%3Dsinusoidal%2Bwave%26start%3D120%26ndsp%3D20%26svnum%3D10%26um%3D1%26hl%3Den%26safe%3Doff%26client%3Dfirefox-a%26rls%3Dorg.mozilla:en-US:official%26sa%3DN [September 17, 2007]

Our approach to strategy then must become adaptive, alert to the changes in the waves, and be coupled with a capacity to very easily turn strategy into actions and results. This implies substantial changes in our ability to sense, interpret, decide, act, and learn.

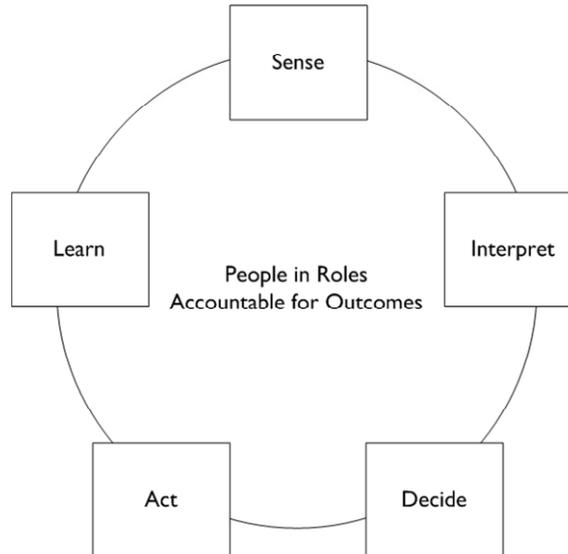


Figure 16 SIDAL²²

More thinking as to what needs to be done can be found in Drogan, Homer, Great Books and Modern Life.²³

Given that a company may comprise a number of businesses exhibiting a wide-range of basic business characteristics, including the nature of markets served, how are these businesses positioned on this strategic grid in Figure 14? Where do they need to be positioned? What does that imply for that part of a business system responsible for strategy and planning?

²² This figure is adapted from Stephan H. Haeckel and Adrian J. Slywotzky, Adaptive Enterprise: Creating and Leading Sense-and-Respond Organizations (Harvard Business School Press, 1999) 0875848745

²³ James Drogan, Homer, Great Books and Modern Life, <http://jmsdrgn.squarespace.com/droganbloggin/2006/12/28/homer-great-books-and-modern-life.html> [January 29, 2007]

Suppose we plot the businesses composing a company in the following fashion.

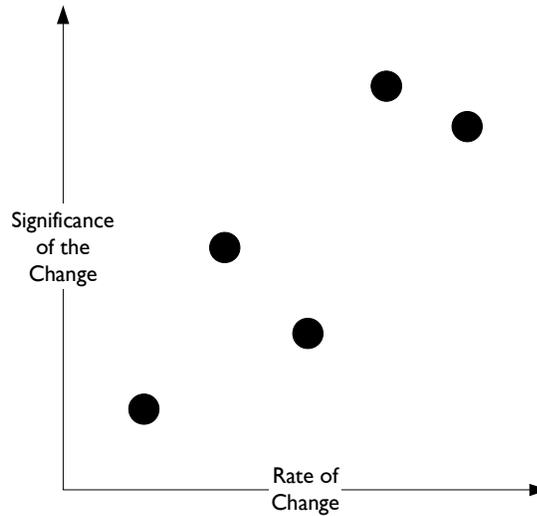


Figure 17 Rate and Significance of Change

The rate and significance of change is different for each of the businesses. The hypothesis here is that the strategy and planning processes for each business may well be different. However, the risk that one could run is an optimization of each of the businesses and the expense of the overall health of the company. This also applies, of course, to the previous argument made in favor of holding a view of the value chain.

This implies that our strategy and planning processes may need to be more comprehensive in their view of the context and carry an appreciation that trade-offs may be required to reach the point of optimum value to the stakeholders.²⁴

One can find tools and techniques that will help with this broad examination across the context, but they are of no use without a willingness to make that examination.

²⁴ Stakeholders is used here to mean any entity that is affected by the performance of the company. Shareholders are a subset of the stakeholders.

The McKinsey article contained to two additional exhibits that bear on the notion of strategy.

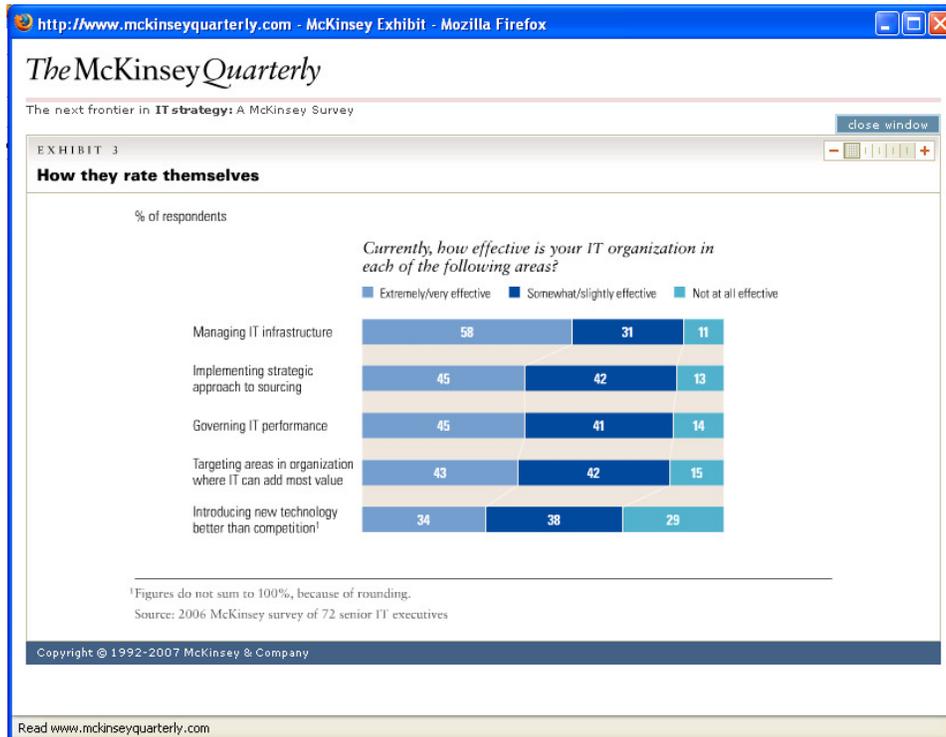
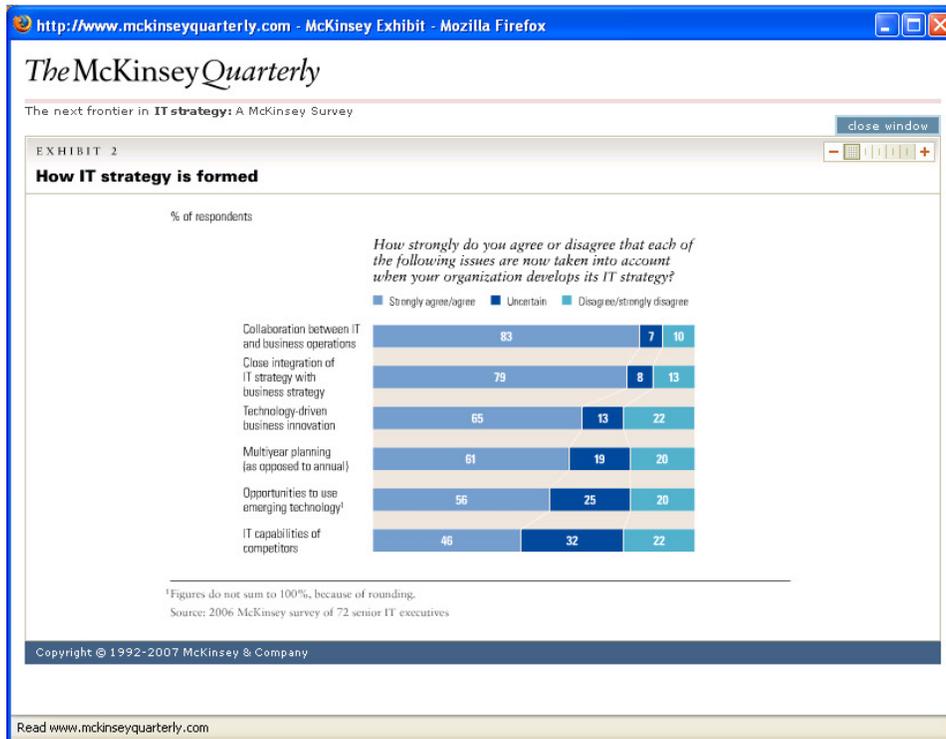


Figure 18 McKinsey Exhibits 2 and 3

What explains these patterns? For example, compare. Collaboration Between IT and Business Operations in Exhibit 2 with Introducing New Technology Better Than the Competition in Exhibit 3.

Where are the components of a company positioned in these and what does this positioning imply?

The implication here is that one needs to know where one is in order to get to where one wants to go. Thus, strategy becomes not only an exercise in dreaming and daring, but also in the hard, sometimes unfulfilling work of understanding the current status. Experience suggests that is the change implied by looking at the future that most often gets in the way of understanding the present.

*"There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new."*²⁵

Hence, how one approaches cultural change within the affected businesses will be critical to success. This suggests that capabilities and capacities in leading change will be required.

6. Information Economics

Information Economics²⁶ seems to be a robust and comprehensive methodology that has stood the test of time.²⁷

There is much about the world economic scene that is changing due to globalization. Work is becoming packaged in units that can be performed anywhere in the world. Outsourcing and distance learning are examples. Where this work is performed is a function of the economics associated with the required capability and capacity.²⁸

In the past, the economics of work was largely cost driven. This is becoming less and less the case. The value delivered is dictated by capability and capacity. It may well be, therefore, that the net benefit may not be found at that point where the costs are least.²⁹

What this means is that the technology investment decisions for global firms become more complicated by the flux in global economics, capability and capacity. This implies more attention being given to issues related to country risk.³⁰

²⁵ Machiavelli, Niccolo. *The Prince*. Trans. David Wootton. Indianapolis/Cambridge: Hackett Publishing Company, Inc., 1995.

²⁶ James Drogan, *Information Economics*, September 20, 2007, <http://jmsdrgn.squarespace.com/storage/Information%20Economics.pdf>

²⁷ Marilyn M. Parker, Edgar M. Trainor and Robert J. Benson, *Information Strategy and Economics* (Englewood Cliffs: Prentice-Hall, Inc., 1989) 0-13-464901-X

²⁸ Capability represents the collection of knowledge, skills, and experience required to satisfactorily perform the task at hand. Capacity represents the amount of capability available to perform the task at hand.

²⁹ Dell drops some tech calls to India, http://www.news.com/Dell-drops-some-tech-calls-to-India/2100-1022_3-5110933.html [September 26, 2007]

³⁰ "Country risk refers to the likelihood that changes in the business environment adversely affects operating profits or the value of assets in a specific country. For example, financial factors such as currency controls, devaluation or regulatory changes or stability factors such as mass riots, civil war and other potential events contributing to companies' operational risks. This term is also sometimes referred to as political risk, however country risk is a more narrow term, which generally only refers to risks affecting all companies operating within a particular country.

Political risk analysis providers and credit rating agencies use different methodologies to assess and rate countries' comparative risk exposure. Credit rating agencies tend to use quantitative econometric models and focus on financial analysis, whereas political risk providers tend to use qualitative methods, focusing on political analysis. However, there is no consensus on methodology in assessing credit and political risks."

Wikipedia, http://en.wikipedia.org/wiki/Country_risk [September 26, 2007]

7. Value Analysis³¹

Value analysis, as represented in this lecture note, highlights the following ideas.

1. The effectiveness and efficiency of solutions changes over time.
2. The significance of issues that give rise to the need for solutions changes over time.
3. Intangible benefits do not exist.

I expect these ideas to continue to have relevance in the future, but they will be increasingly difficult to manage.

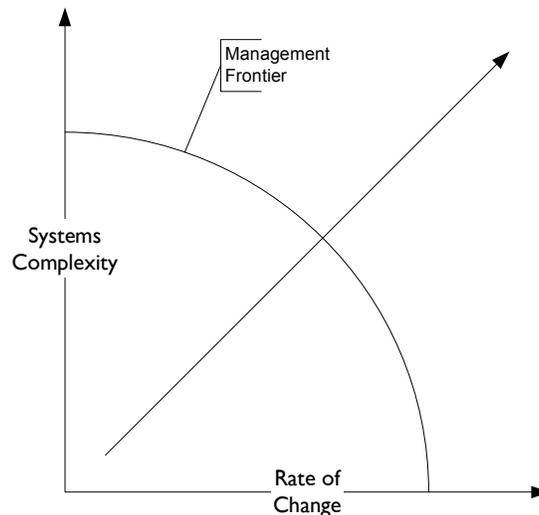


Figure 19 Increasing Complexity and Rate of Change

Figure 19 represents one view of this difficulty. Increasing systems complexity and rate of change will challenge the management capabilities and capacities of firms. There may well be a limit beyond which a firm, limited by its business management system, may not be able to proceed. The question will then become one of finding a way to push the management frontier out or adjusting the firm's reach to match its grasp.

The third idea – intangible benefits do not exist – will also be under assault by the change suggested in Figure 19. The ideas of value analysis described in the lecture note originated in a project that began over 35 years ago. The world of transportation was regulated and the rate of change was such that sufficient time could be taken to turn an intangible benefit into a tangible benefit.³² One may not, in the future, have the time to complete an effort of this sort before the decision window closes.³³

Value analysis then, becomes an increasingly difficult task – increasingly smaller decision windows, increasing complexity of systems. This may lead to increasing the value of risk management and of people confident in taking increasing amounts of risk.

³¹ James Drogan, *Value Analysis*, 2005, <http://jmsdrgn.squarespace.com/storage/Value%20Analysis.pdf>, [September 26, 2007]

³² Drogan, *Value Analysis*, Improved Quality of Waybill Data

³³ James Drogan, *The Relevance of Data, Information, and Knowledge*, 2007, <http://jmsdrgn.squarespace.com/storage/Data%20Information%20and%20Knowledge%20-%20Relevance%20and%20Understanding.pdf>, [September 28, 2007 contains a few more words on the decision window.

8. Note on Building a Management System³⁴

The future changes heretofore suggested begin to manifest themselves in a major way on the management system of the organization. To this point, everything that has been talked about required the expenditure of energy for thinking, negotiation, and the making of agreements between collaborative organizations.

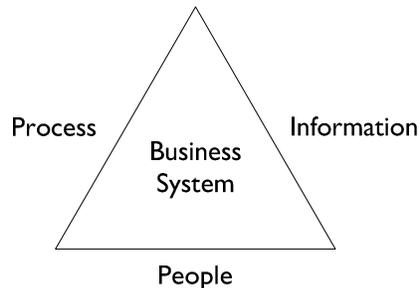


Figure 20 Business System

Now all that has preceded must be implemented. People need to be hired, facilities acquired, procedures documented, management reports created etc. There is the layout of cash and the occupation of space. Ideas now become real.

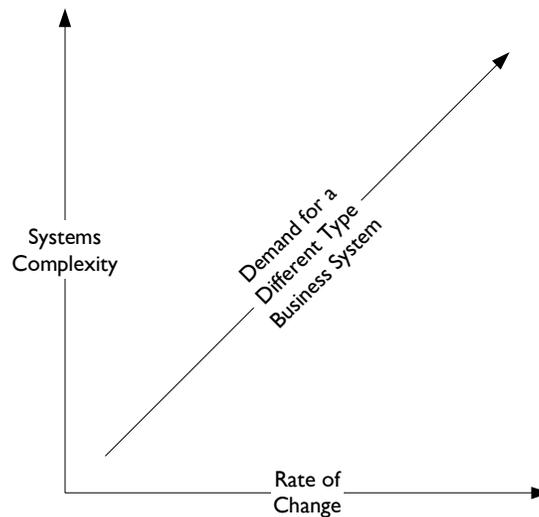


Figure 21 A Different Type of Business System

There will be a demand for a different type of business system – one that can cope with the aforementioned changes.

1. Processes: Processes based on rules may become processes based on concept. Processes will be shaped by the what, not the how.
2. Information: The increasing rapid change in the information may lead to new approaches to managing information. For example, if there is a rapid change in a variable that has little change on the outcomes of a process, perhaps the process won't be executed to determine the new result. Systems, all else being equal (which, of course, is likely not to be true), may become more efficient because resources will not be consumed to produce an output that will change but little.
3. People: Perhaps the largest difference in the emergent business systems will be in the people. The advances in technology have tended to move the line demarcating that portion of the business

³⁴ James Drogan, Note on Building a Management System, 2005, <http://jmsdrgn.squarespace.com/storage/Note%20on%20Building%20a%20Management%20System.pdf>, [February 28, 2007]

system that is performed by technology (e.g., an ATM) from the left to the right in the following figure. Labor has been displaced by technology.

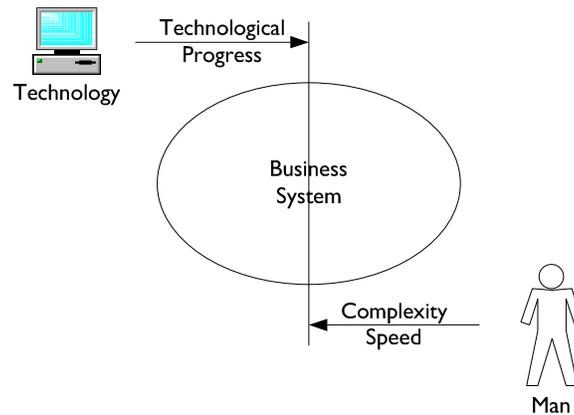


Figure 22 Symbiotic Systems

Technology works best when the rules are known and they can be codified (i.e., made into a program). I've been arguing, however, that increasing speed and complexity is making it increasingly difficult to know the rules, on the one hand, and codify them, on the other. That is to say, because of the changing nature of the future issues to be resolved, the line marking the division between man and machine in symbiotic systems³⁵ may be pushed to the left.

The implication here is that technology can take you only so far.³⁶ To get beyond the management frontier requires symbiotic systems of a different composition.³⁷

9. Information System Fundamentals³⁸

There is an implication in

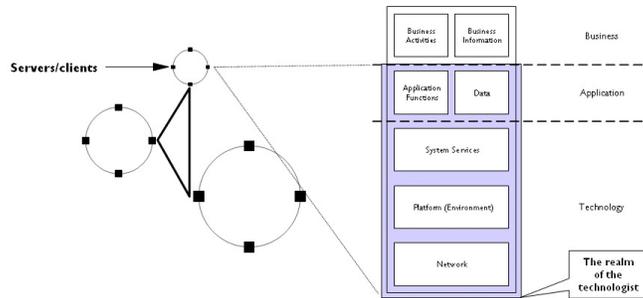
³⁵ Symbiotic systems are those that are architected in such a way that maximum advantage is made of the strengths of technology and the strengths of the person. These are represented most prolifically by the phrase "symbiotic decision support systems," a subject first introduced to me years ago by the late Marvin Manheim (http://en.wikipedia.org/wiki/Marvin_Manheim) of MIT, then Northwestern.

³⁶ Revisit Figure 19 Increasing Complexity and Rate of Change on page 19.

³⁷ Your attention is called to the following books I consider highly relevant to this subject. Ray Kurzweil, *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* (Penguin Books, 2000) 0-140-28202-5 and James Martin, *The Meaning of the 21st Century: A Vital Blueprint for Ensuring Our Future* (Riverhead Books, 2006) 1-57322-323-9.

³⁸ James Drogan, *Information System Fundamentals*, 2005, <http://jmsdrngn.squarespace.com/storage/Information%20System%20Fundamentals.pdf>, [January 28, 2007

Connecting visibility and manageability – the nodes.



7/29/2005

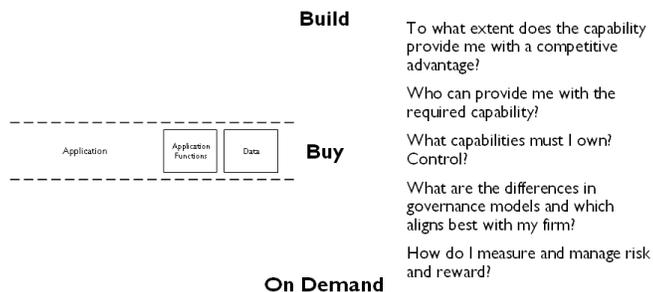
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Figure 23 Nodes

that the nodes are assets of the firm in the sense that they represent a capital investment. In a subsequent figure,

Application functions and data (i.e., capability)



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Figure 24 Application Functions and Data

it was suggested that the assets was not the hardware and software at the nodes, but rather the applications and data to which one had access. As citizens, we don't normally have an investment position in the utility providing electrical power. Rather we access the power we need on demand. Access to applications and data are increasingly "on demand" with little more required than access to the Internet through a browser.³⁹

One would expect that this trend from build through buy to on demand to continue. However, as suggested in Figure 24, there are important questions to consider when making a decision in this area.

³⁹ Google, "More Google Products," <http://www.google.com/intl/en/options/> [September 30, 2007]. On this page are a number of applications that are available on demand for which one once needed a personal computer,

I have heretofore suggested a complex, rapidly changing world. Success in this world will require an adaptive system (among other things⁴⁰). The nature of the adaptive system underscores the importance of the question in Figure 24.

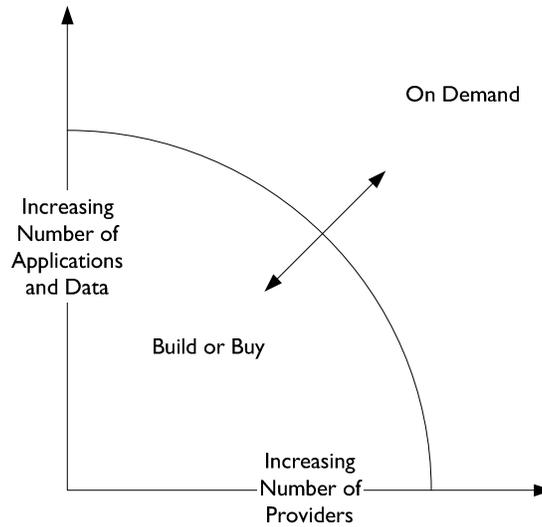


Figure 25 Asset Acquisition

There is some efficient mix of build or buy and on demand applications and data available from providers. Determining and managing this mix will likely require management attention, tools, techniques, and informed practitioners that have heretofore not given special attention. Critical to this will be consideration of the costs of changing the mix. For example, what are the costs associated with moving a substantial workforce, well trained in Microsoft Office, to Google applications?

Information systems can be thought of as a set of nodes and links (see the left side of Figure 23). It is these nodes (e.g., RFID, computers) and links (e.g., wireless communications, infrared) that most people associate most closely with the technology underlying information systems. Technology is the component of information systems that undergoes the most rapid and radical change.

This next figure is not in the lecture note.

⁴⁰ James Drogan, *Forces*, 2003, <http://jmsdrgn.squarespace.com/storage/Forces%20Introduction.pdf>, [December 29, 2006]

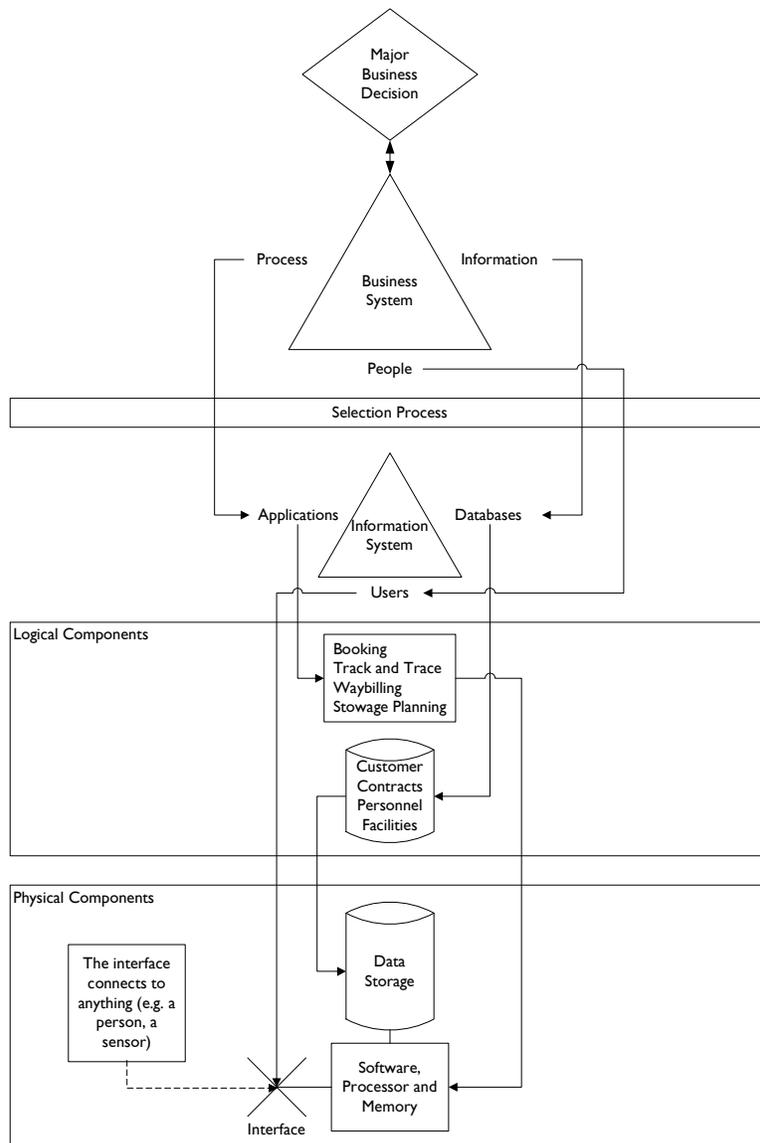


Figure 26 Technology Components and Relationships

The point we are at in this discussion is the rectangle labeled Physical Components. Perhaps the most widely recognized example of rapid changes in technology components are, on the hardware side, personal digital assistants, music players, and cell phones. On the software side it is undoubtedly open source software. On the data side it is the massive amounts of data residing all over the Internet leading to the law; "Once it's out there is out there."⁴¹ Moreover, we might not be able to find it.

I think it almost a fruitless task to try to predict, nay guess, at what might happen in the future at the component level. This prediction was an issue I first encountered when on a consulting engagement in 1991.⁴² If one can't predict the components, then the next best thing is to prescribe the behavior. Indeed, that's what we did in 1991.

⁴¹ When we think of the Internet we are generally considering, even though we don't know this, something on the order of two-tenths of all the information on the Internet. The other 99.8 percent is something called the Deep Web, http://en.wikipedia.org/wiki/Deep_web [October 1, 2007]

⁴² Drogan, *A Note on Business Drivers, Business Configuration, and Information Technology Strategy*. See the discussion beginning on page 5 that begins with, "The Phase I Report..."

If the desired behavior is understood by enough people who are continually looking into the onrushing stream of component development, then perhaps enough components can be pulled out of this stream to build the system that delivers the desired behavior.

These components, however, must have characteristics, much like Legos, that allows them to be conveniently assembled and disassembled.⁴³

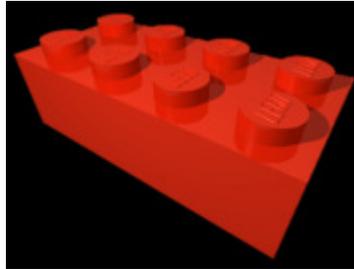


Figure 27 Two by Four Lego Brick⁴⁴

Legos work because of standards for the design of various pieces and the standards of quality of manufacturing. If the Legos metaphor is good, then one can conclude that some of the most important decisions to be made in the area of information systems are around the subject of standards for both the components and the manufacturers thereof.

10. Proposal for an Information Technology Strategy and Planning Project⁴⁵

Surely our proposals for information system strategy and planning will need to undergo significant change in the future. They will need, perhaps, to focus more on the principles of innovation and adaptability as a means to cope with complexity and speed of change.

Consider a general approach to consulting as represented in this figure.

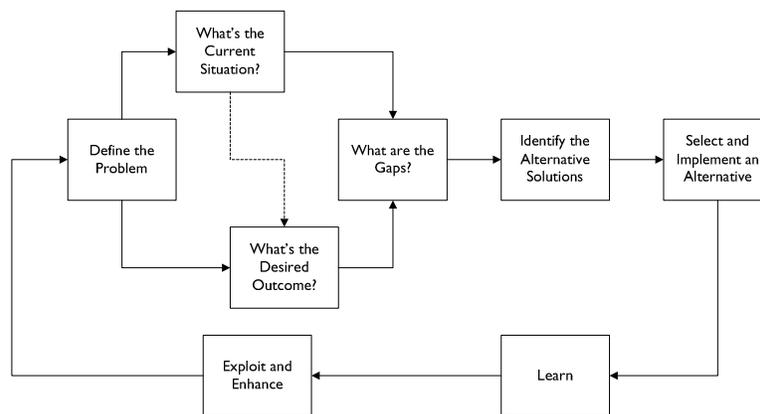


Figure 28 General Approach to Consulting

⁴³ This notion of convenient assembly and disassembly comes from a fundamental idea that sustainable competitive advantage comes from implementing management initiatives faster than the competition, and being able to back out failed initiatives just as fast.

⁴⁴ Wikipedia, [Lego](http://en.wikipedia.org/wiki/Lego), <http://en.wikipedia.org/wiki/Lego> [October 1, 2007]

⁴⁵ James Drogan, [Proposal for an Information Technology Strategy and Planning Project](http://jmsdrngn.squarespace.com/storage/Proposal%20for%20an%20Information%20Technology%20Strategy%20and%20Planning%20Project.pdf), <http://jmsdrngn.squarespace.com/storage/Proposal%20for%20an%20Information%20Technology%20Strategy%20and%20Planning%20Project.pdf>, [October 1, 2007]

This structured approach, for all the aforementioned reasons, may simply not work as quickly as we need in order to provide improvements in business performance.

The alternative may well be one of continuous improvement.

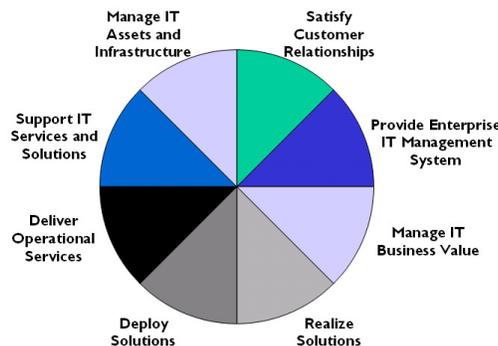
11. Managing Information Technology in a New Age⁴⁶

This lecture note is intended as a prompt for how we should think about managing information technology as an asset. Its inclusion, inasmuch as it's some seven years old, is not meant to be prescriptive. There is no shortage of material available on this issue.⁴⁷

SUNY Maritime

Notes on Building a Management System

A processes for turning IT investment into business value.



Source: IT Process Management (IBM)
11/21/2005

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Figure 29 IBM Model for IT Process Management

What may need to change in this model is the scope of the management processes. For example, it may not be enough to satisfy customer relationships, but one must also satisfy relationship with one's collaborators and with regulatory authorities.

I'm tempted to say at this stage that there is a risk of being held back by monolithic, unresponsive process and mental structures. In "The Relevance of Data, Information, and Knowledge" I identify the need for COMs (composer, orchestrator, maestro), collaboration, and highly responsive SIDAL cycles.⁴⁸

Managing the future is beginning to center around the quality of people, and the degree to which they are understand the characteristics of the organization to which they belong and are empowered to act on that understanding.

12. Ethical Issues

There is no lecture note for this module. I have opted for the ethical and societal issues sections in Chapters 1-17 of Oz.⁴⁹

⁴⁶ IBM, *Managing Information Technology in a New Age*, 2000, <http://www-935.ibm.com/services/us/its/pdf/g510-1178-00.pdf>, [October 1, 2007]

⁴⁷ A search of Amazon.com with the phrase "managing information technology" turned up 2,976 hits on October 1, 2007. All parties who presume to advise on this matter no doubt have their own approaches that add substantially to this number. This raises the interesting question, "Who do you trust?" Jim Kelly, former CEO of UPS, once remarked, "I believe that we're about to witness what may turn out to be the last competitive frontier business will see. It's going to be a war over the one priceless resource. Time. And when it comes, trust may turn out to be the best investment anyone's made."

⁴⁸ Drogan, *The Relevance of Data, Information, and Knowledge*, p 3

I have previously mentioned "...the massive amounts of data residing all over the Internet..." This ubiquity of data combined with the global heterogeneity of practice when it comes to ethics and the capability and capacity of technology may well give rise to new ethical issues.

In "Information Technology"⁵⁰ I identify two important emerging goals:

1. Everything Important is Always Visible
2. Everything to be Managed is Always Reachable

What ethical issues are raised when an "everything" is a person? Do we need to guard against the rise of George Orwell's Big Brother?⁵¹ Europeans, for example, seem to be much more comfortable than Americans with the notion of the government holding comprehensive personal knowledge.

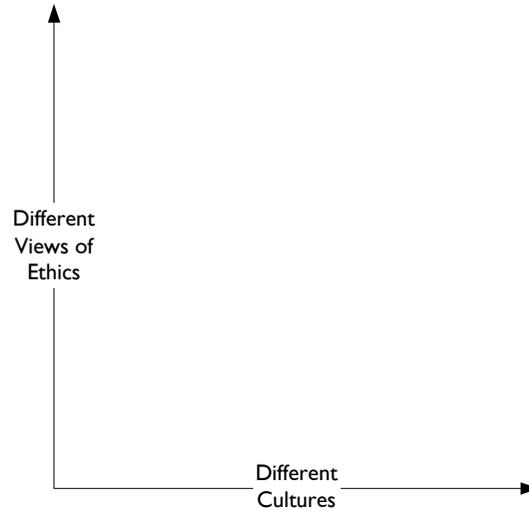


Figure 30 Ethics and Culture

This is all related to the next lecture note on culture. How well we are able to navigate in the space described in Figure 30 may well determine the performance of the enterprise.

13. Cultural Acumen for the Global Manager - Lessons from Project GLOBE

This note⁵² uses a global study of how managers in different cultures make decisions as the basis for the discussion of the impact of culture on the information systems.

⁴⁹ Oz, *Management Information Systems (4e)*

⁵⁰ James Drogan, *Information Technology*, <http://jmsdrgn.squarespace.com/storage/9.%20Information%20Technology.pdf>, [October 1, 2007]

⁵¹ George Orwell, *1984* (San Diego: Harcourt Brace Jovanovich, 1984) 0151660387

⁵² Javidan and House, "Cultural Acumen for the Global Manager: Lessons from Project Globe."

Project GLOBE provokes us to understand how cultural differences affect what we do as a business

<i>Dimensions of Culture</i>	<i>Cultural Groups</i>
• Assertiveness	• Anglo
• Future Orientation	• Arab
• Gender Differentiation	• Confucian
• Uncertainty Avoidance	• East Europe
• Power Distance	• Germanic
• In-Group Collectivism	• Indigenous Africa
• Performance Orientation	• Latin America
• Humane Orientation	• Latin Europe
	• Nordic
	• South Asia

Project GLOBE http://www.uccalgary.ca/rmg/GLOBE/Public/Link/lessons_project_globe.pdf

11/10/2005

TMGT 7500 Transportation Management

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Figure 31 Culture

What should be our approach, for example, to managing information in a culture with a pronounced power distance?⁵³

Concluding Comments

The fourth principle for applying information technology is, "Information systems are technology plus process plus tools plus skills plus culture."⁵⁴ Examination of the antecedents of this phrase would reveal that I did not always write it this way. I expect that if one examined a consensus of the significant issues associated with information systems (once called data processing systems) over the last four decades one would see changes in this list also.

The argument being advanced in this lecture note is that while significant and radical change is likely to occur in the underlying technology (i.e., the components described above) simply because it seems to have its own momentum, the significant and radical change that must take place is in the processes, tools, and skills with which we make change our ally, at best, and cope with it, at a minimum. At worst, of course, we fail on both counts and perish.

I have strongly suggested the processes, tools, and skills that we have long held to be satisfactory are becoming less so; that the big bang theory of information systems has outlived its usefulness; that continuous improvement and the rise of the COMS, collaboration, and short SIDAL cycles will be beneficial to the health of the enterprise.

Alluded to, but now needing to be made explicit, are people as the critical success factor. I repeat here;

"Managing the future is beginning to center around the quality of people, and the degree to which they are understand the characteristics of the organization to which they belong and are empowered to act on that understanding."

The role of the educational systems, particularly those in higher education, will be to produce a graduate attuned to the times, able to step into leadership positions, and with an uncommon integration of

⁵³ "Power Distance is defined as the degree to which members of a society expect power to be unequally shared. It represents the extent to which a community maintains inequality amongst its members by stratification of individuals and groups with respect to power, authority prestige, status, wealth, and material possessions. It also reflects the establishment and maintenance of dominance and control of the less powerful by the more powerful." Javidan and House, "Cultural Acumen for the Global Manager: Lessons from Project Globe."

⁵⁴ Drogan, Principles for Applying Information Technology.

technical, business, and relationship skills, will be paramount. My sense is that there is significant advancement to be made on this front.⁵⁵

The products of a high performance educational system need an equally enlightened enterprise framework, particularly with respect to the management of the human asset. The value of people to an enterprise is almost never accounted for, only their costs. This needs to change.

Innovation and continuous improvement would seem, on the face of it, to be oil and water. But I wonder whether this is indeed true. The future of information systems may well lie in aligning the strengths in each of these concepts.

James Drogan
October 1, 2007

⁵⁵ James Drogan, "Bizz School Re-Thinking 6/19/5," <http://jmsdrgn.squarespace.com/droganbloggin/2005/6/19/bizz-school-re-thinking-6195.html> [October 1, 2007]

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