"Systems Thinking for the Next Millennium: The Future of the IT Services Industry"

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Abstract:
As we prepare to enter the next millennium, Information Technology (IT) is creating huge changes in the business world. A whole new industry – the "IT services" industry – has grown up to help make that change happen, by designing, installing, and running computer systems.

This paper first reveals the underlying 'deep' structure of the IT services industry. It then examines how different behaviours are needed to be successful in different parts of that structure. Ultimately, the author shows, competitive advantage will come from a company's ability to build a system of mutually reinforcing resources and learning which crosses the entire industry.

It is a company's relative success in building that system which will determine their success in the next millennium, and will therefore drive the accelerating pace of change across the business world.

The paper is illustrated with numerous examples of how different companies' behaviour can be understood via the framework.

Introduction:

The theme of this conference is "Systems Thinking for the Next Millennium".

One of the key forces shaping the next millennium is information technology (IT). The IT services industry is already changing the shape of the business world, almost beyond recognition, by helping companies to design, implement, and operate computer systems. This paper describes how the winners in the IT services industry will be those that understand the underlying system which drives their competitiveness, and which then use that understanding to build a system of critical, mutually reinforcing resources. That reinforcing system will then play an even greater part in shaping the next millennium.

A Short History of the IT Services Industry:
The IT services industry began in the 1960s, when a young IBM salesman called Ross Perot noticed that many of the companies buying expensive mainframe computers were not using them all of the time. He reasoned that it would be cheaper for them to buy the processing time and storage space from a third party, who could then make a profit by getting higher utilisation of the equipment.

The IT services industry, then, began by operating the equipment on which other people's computer programs ran, as shown in Figure 1.

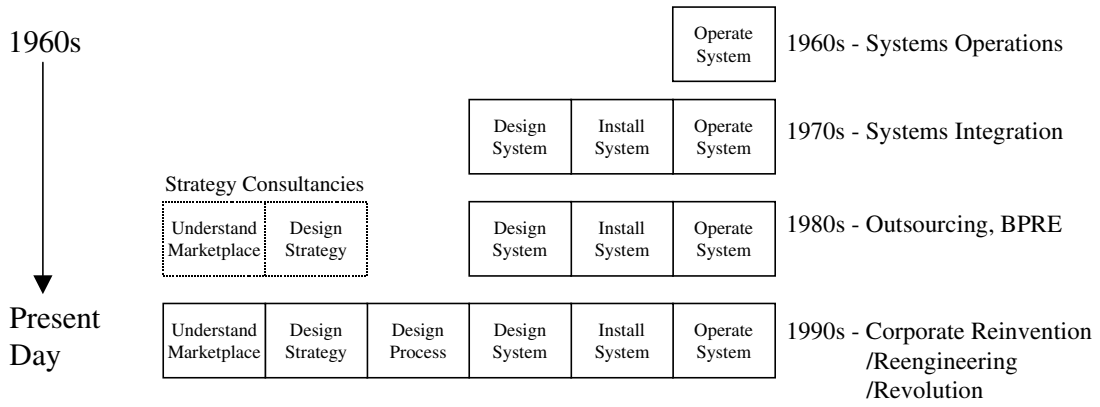

Figure 1: Evolution of the IT Services Industry

Over time, it was a natural progression for the industry to move from simply operating computer systems, to designing and installing them as well: the skills needed were complementary, and in short supply. IT service companies were therefore able to make a profit by leveraging two key resources: computer equipment, and the knowledge/expertise of their employees.

This progression, and the growth of the industry, was accelerated in the 1980s by two key trends. The first was the trend for companies to "stick to the knitting" (in other words to focus on what they did best) and to "outsource" whatever were their "non-core" activities (including IT) to a third party. This increased the size of the marketplace for the "operate systems" segment.
The second trend was the drive to "Business Process Re-engineering", in which companies did not just use IT to automate existing processes, but instead, first re-examined and redesigned their core processes, before then using IT to automate the new, leaner, faster process. This brought about a fundamental change within the industry, because it brought the IT services companies into the market space traditionally occupied by management consultants.
A prime example of a company which entered the same space, but from the other direction is Andersen Consulting, which moved from management consulting into IT implementation.

Today, almost all IT service companies proclaim their ability to offer an integrated, end-to-end solution. The value which IT service companies bring has changed from

simply “running your IT systems for you” to “designing and implementing strategic change in your business”.

What are these “Business Processes” that the Industry Automates:
So, the value which the IT services industry brings is to do with reinventing business processes, and then using IT as a way to encapsulate or package the process-concept so that it will work in the real world.

If we’re going to understand the industry as a whole, we also need to know what are the processes it reinvents.

At first sight the answer is highly complex, as the following short list will indicate:

- payroll, cheque and credit card processing
- booking systems for hotels, airlines, and car hire companies
- systems to help minimise inventory in manufacturing processes
- automated warehouse systems, that maximise the use that can be made of available space, and minimise the time taken to retrieve the stored objects
- systems for financial industry, from accounting systems, to back-office payment/settlement systems, to front-office arbitrage and automated trading systems

For all these processes, IT has provided step-changes in productivity. But all seem to be completely different.

The way to strip away this complexity is to define the processes according to the impact which they have on the business in which they operate. To do this it is useful to use a classification which was invented a number of years ago (though I unfortunately do not know the names of the original authors). This identifies four distinct types of process:

- “Core” processes:
  These are processes which drive the competitiveness of the business, and enshrine its key intellectual capital. For example, an automotive company is likely to consider its design and manufacturing processes as “core”.

- “Critical” processes:
  These are processes are not part of the business’ core values, but which need to work well in order to satisfy customers’ secondary needs. In the automotive example, the processes which determine time to delivery would be considered critical for most marques.

- “Non-Critical”:
  These are processes which bring a still-lower level of value to the customer, but which need to be carried out. These could be support functions, such as the Treasury processes associated with the payment and receipt of cash.

- "Mandatory" processes:
  These are processes which every business has to do, but which do not really confer advantage by doing them differently from competitors. An example could be the keeping and publishing of financial accounts.

It is important to note three things.

First, that what is "Core" for one company may not be core for another, even within the same industry. In the automotive industry, for example, different manufacturers choose to compete on different mixes of build quality, styling, service, and the ability to create a car which has "personality". They would each, therefore, see their "core" processes as different from their competitors. This difference in perception applies to all four categories of process, not just the "Core" processes.

Second, a "Critical" process today may become "Core" tomorrow, and *vice-versa*. Customers' wants and needs are changing continuously. It is the ability of managers to understand which processes bring "core" value to their customers, and which are "mandatory", that drives their business success.

Third, the value-cost mix is different for the different process-types. For core and critical processes, it is more important for a company to focus on being (say) 5% better than the competition than on being 5% cheaper. For Non-critical and Mandatory processes the reverse case holds.

These points are summarised in Figures 2a and 2b.

Figure 2a shows that we can now map the whole IT services industry: what the companies within it do ("design, implement, and run improved processes"), and the four types of process they may work on. Potentially, an IT Services company can choose to operate in any or all of the resulting zones.

Figure 2b illustrates the point that for core and critical processes it is more important to focus on value than on cost.

Figure 2c shows what happens when we apply the same value/cost analysis to the different parts of the service-continuum offered by the IT services companies.

In the early ("upstream") part of the service continuum, the focus is generally more on the value which can be added, than on cost. (This accounts for the high fees charged by strategy consultancies.) The second half of the continuum is all about implementing the identified solution. Here the relative focus is more on cost than on value. (Again, this is reflected in the pressures now being faced by IT service companies to drive down costs on what are increasingly seen as commodity services.)

Combining these views, Figure 2d shows how the competitive space of companies in the IT services industry can be mapped into four quadrants, these quadrants being fundamentally defined by the relative importance of value and cost of both the service being offered and the process it is acting upon.

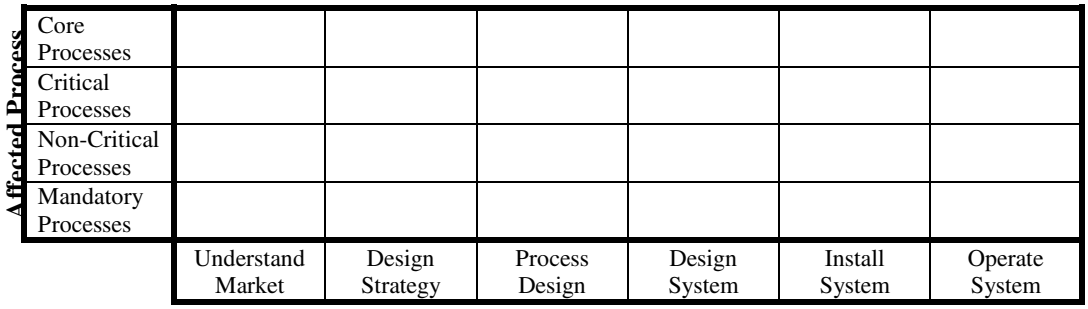

Figure 2a: Map of the IT Services Industry

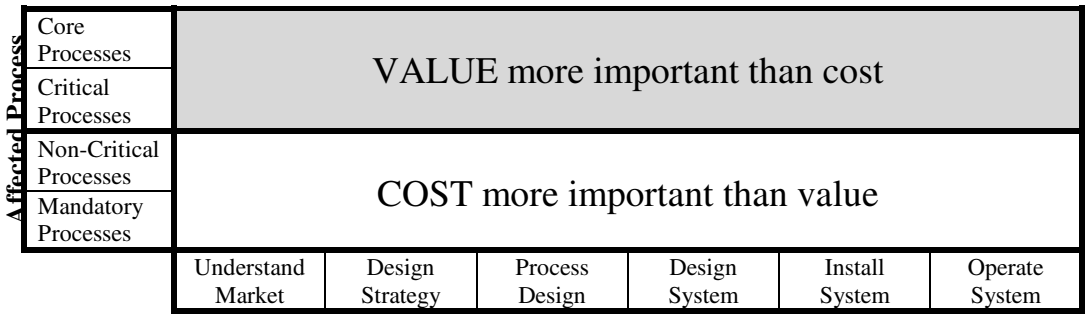

Figure 2b: Different Processes Show Different Emphasis on Value and Cost

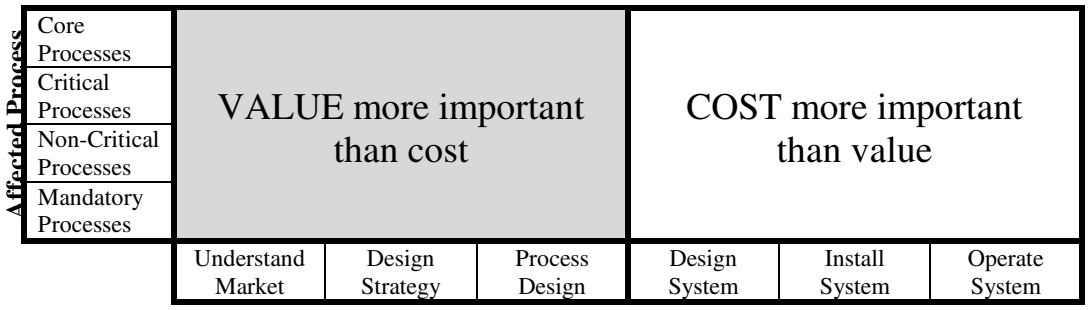

Figure 2c: Services Provided Have Different Emphasis on Value and Cost

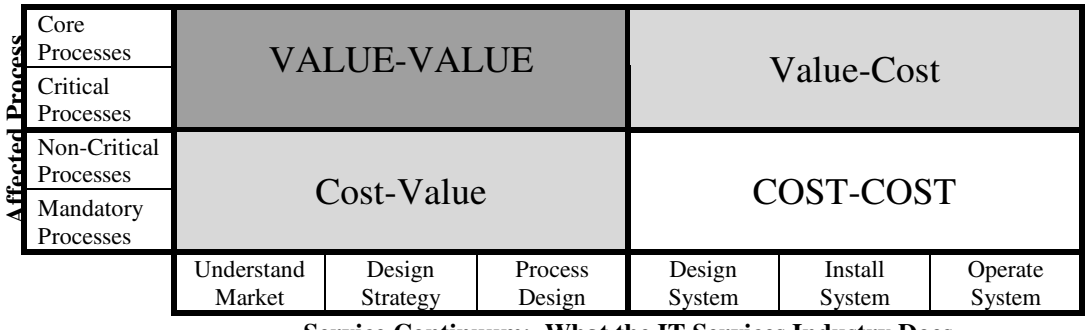

Figure 2d: Map of the IT Services Industry: The Overall Value-Cost Landscape within which Each IT Service Company Competes

Reality Check – Does This Map Make Sense:
Before examining the different behaviours required to make a company successful in each of the quadrants, let us first test this map against reality, to see whether it is possible to use it to deepen our understanding of some of the main competitors in the marketplace.

Andersen Consulting started in the value-value quadrant, as a management consultancy. It was quick to see the impact of information technology, and expanded 'horizontally' into the Value-Cost quadrant. Today its advertising focuses firmly on its ability to transform businesses, rather than its technological expertise.

PriceWaterhouseCoopers also began as an accountancy-/management consultancy house. It has invested heavily in positioning itself as a leading SAP* implementer, and so would be considered strongest in the bottom half of the chart. (*SAP is a suite of software programs which many businesses are using to automate and integrate the Non-Critical and Mandatory processes.)

CSC has a long history of systems integration and operation, mostly in the Mandatory/Non-critical customer back-office process areas. Its recent emphasis on creating strategic links with hardware companies, and its moves into e-business, are increasing its capabilities, both to design and to implement Core and Critical processes.

EDS began in the Cost-Cost quadrant, running processing centres for non-critical and mandatory processes. Over time, it has formed relationships with a number of key clients (such as General Motors and Rolls Royce) which place it firmly in the Value-Cost quadrant. Its acquisition, in 1995, of A.T.Kearney gives it key skills in the Value-Value quadrant. Both companies are working together on SAP implementations, which automate Non-critical and Mandatory processes.

IBM entered the IT services market in the 1980s as a result of increased competition and declining margins in its core business. IBM's hardware and software strengths place its core today in the Cost-Cost quadrant. But its heavy investment in advertising for e-business services, combined with its strong brand, global presence, and established customer base, mean that it could potentially leap out to cover the entire territory.

What Creates Competitive Advantage:
Having confirmed that the map does indeed enable us to draw meaningful conclusions about the relative positioning of companies in the marketplace, let us look next at the key drivers of their competitive advantage in each quadrant.

In the Cost-Cost quadrant it is more important to get a process that runs 5% cheaper than the competition than one which is 5% "better". It is also more important to have a quick, low-cost installation than one which is customised. In this quadrant the key drivers of success are efficiency and volume: volume of transactions to leverage fixed costs, and volume of customers/contracts to leverage the learning and

experience which comes with each project. Here volume drives learning and experience, and the Experience Curve drives down cost.

The Value-Value quadrant is quite different. Here the focus for the customer is on being 5% better than the competition. Here innovation, creativity and effectiveness are important. This is where companies are most willing to pay for innovative technologies, or innovative uses of existing technologies.

What then happens is that the same innovation can be reapplied, more cheaply, to other customers' processes. For example, early business applications of artificial intelligence were in financial markets, where the return on the (substantial) investment could be very large. That technology has now evolved into systems used in marketing (to identify clusters of different consumer types), and even in the design of something as commonplace as a car bumper or fender.

So, the key driver in the Value-Value quadrant is the identification and pursuit of the customer (or process) which will get the most value from the technological innovation/creativity.

Once the new idea has been proven, the Experience Curve means that the same technique can be re-applied, more cheaply, to other customers and processes. This, in turn, means that an IT service company which operates in the Value-Value quadrant will have competitive advantage over one which operates only in the Cost-Value quadrant.

In a similar way, a company with the volumes necessary to succeed in the Cost-Cost quadrant will have competitive advantage over a company which operates only in the Value-Cost quadrant.

Both these effects are shown in Figure 3.

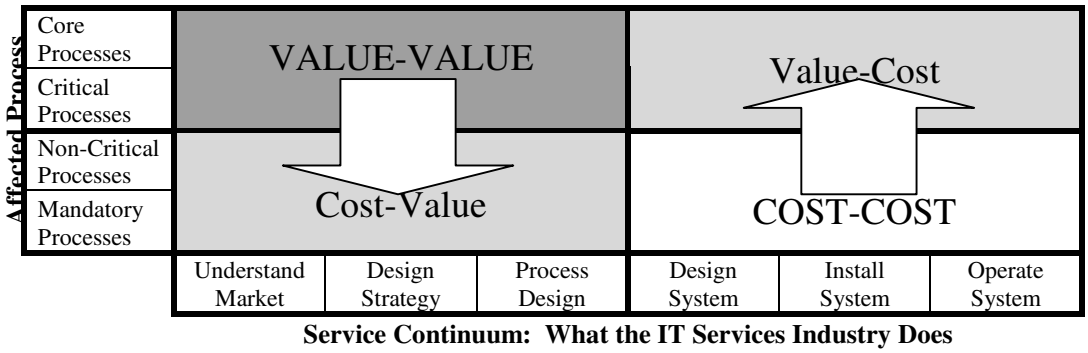

Figure 3: How Presence in One Quadrant Provides Advantage in Another

The final overview of the fundamental drivers of competitive advantage becomes clear when we add our earlier insight about the evolution of the IT services industry. That showed how IT service companies are now competing on their ability to provide an integrated, end-to-end service, because:

- understanding how the process being designed will later be implemented and run as an IT system, enables a company to do a better job in the left hand, 'consulting' part of the service continuum.
- understanding the strategy which the IT system is intended to achieve, enables a company to do a better job in the right hand, 'implementation' part of the continuum

These two effects work in both directions, for all four process types. But for value-focused processes (Core and Critical) the one which enables higher performance in the Value-Value quadrant is more important. For cost-focused processes (Non-critical and Mandatory), the more important effect is the one which works in the opposite direction.

The final picture, of the underlying, fundamental forces which drive competitive success in the IT services industry, is shown in Figure 4.

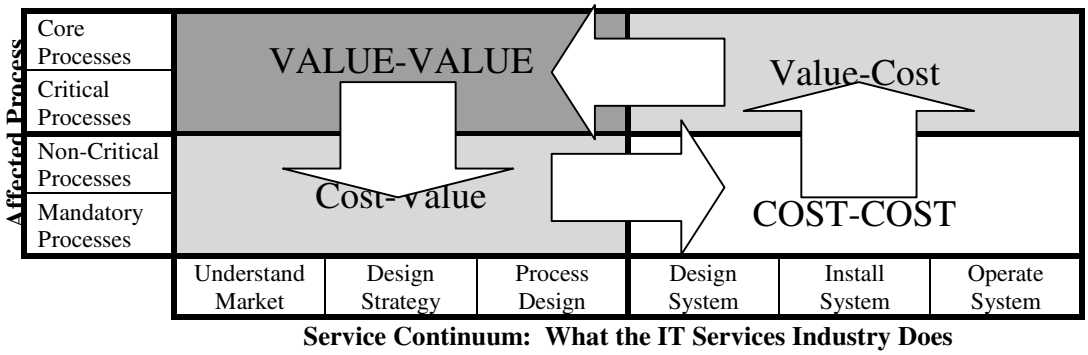

Figure 4: Underlying Drivers of Competitive Advantage in the IT Services Industry

Conclusions:

The IT services industry can be depicted as a map of competitive space comprising four quadrants, each of which is defined at a fundamental level by the relative importance of value and cost in that quadrant.

An IT services company may choose to operate in any quadrant (or sub-quadrant) of the map.

The behaviours and competencies necessary for success are different in different parts of the map. But a company that is successful in any one quadrant has the potential to use its strengths to create differentiation in a neighbouring quadrant, and thus to extend, diversify, and grow its business.

The direction of the arrows of competitive advantage between quadrants is such that a reinforcing feedback loop can be established.

Once that loop is established, then:

- The cost advantage needed to win in the Cost-Cost quadrant can be leveraged to provide competitive advantage in the design, implementation, and operation of Core and Critical business processes.
- Understanding how to design, implement and operate Core- and Critical-process IT systems provides competitive advantage in the quadrant concerned with understanding and designing those processes
- Success in understanding and designing Core and Critical processes can be leveraged to do a better job at understanding and designing Non-critical and Mandatory processes.
- Success in understanding and designing Non-critical and Mandatory processes, in turn, can bring additional volumes, which enhance advantage in the Cost-Cost quadrant, and so the cycle begins again.

Any IT service company which builds this virtuous cycle before its competitors do, will establish a reinforcing loop which continuously generates competitive advantage.

There is no “right” way to build the system, though there are clear pointers as to the best places to start.

Knowingly or unknowingly, we have seen that the major players in the industry have already established significant presence in different quadrants.

In order for the reinforcing cycle to work, the resources within it do not all have to be controlled by the same corporation: a group of companies co-operating together as a strategic alliance could achieve the same result.

What is sure is that once the system is in place, it will be better at designing and implementing business process change than its competitors, and so the general pace of business (process) change will accelerate.

This means that systems thinking, and the ability to identify how best to become part of the virtuous cycle described above, is going to be a critical success factor for all businesses in the next millennium, whether they are part of the IT services industry or not.