

## **Realizing Your Full Potential in “New World” of Possibilities: Writing the Story of Convergence**

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First, I would like to thank the organizers of Cyberposium and Harvard University for providing me the opportunity to discuss the emerging possibilities ahead. With multi-dimensional changes in the air, it is indeed difficult to talk about the future with a high level of certainty. We are all indeed humbled by the two successive years of stock market losses, corporate accounting issues, leaderships scandals in companies like WorldCom, Global Crossing, Enron and Tyco to name a few, high unemployment and generally very cautious and sobering stock market forecasts.

Raising one’s sights beyond the gloomy dynamics in today’s environment is easier said than done. History has however repeatedly underscored that how an individual views the situation – *as opportunity or threat* – determines how he/she will move forward in his/her life. Corporate and individual success stories have taught us that in situations when people/organizations have been able to sense and serve the “signals of opportunities”, however insignificant and/or weak they may first appear, they have not only been successful, most often they have ended up defining paths previously un-traveled, often unknown. It is my hope during the next forty minutes we will together identify a few such pathways, which you will define, and write the success stories which will be a source of inspiration for future generations.

In the last several years I focused on helping CEOs and leaderships of the corporate world deal with the forces of change enabled through the convergence of the 4C’s – Communications, Computing, Commerce and Content. As a problem-solver, deeply rooted in my belief, is that it is during times of transition and/or discontinuities that new ideas are born. As partners of clients, we continually help them find the bright spots that are often hidden in turbulent and difficult competitive landscape(s). Today I will build on my personal experience of helping clients dealing with three difficult questions which most of you face – particularly during transitional times – (i) Do I know where I want to be? (*Destination*), (ii) How do I self-navigate to get to where I want to be? (*Navigation*), and (iii) How best could I mobilize resources to secure results? (*Mobilization*)

When societies go through significant phase shifts, it is indeed difficult to maintain an objective balance between very opposite instincts – a fear of the unknown but fraught with possibilities, a discomfort of crowding/shrinking in the sweet spot of the “known”. In order to find ways to deal with this challenge of building outstanding careers in times of transition, I will try to answer three essential questions:

1. What is the nature of the environment you are in? *The short and long of possibilities ahead.*
2. The nature of pathfinding opportunities ahead? *The new S-curve*
3. Ways to engage with the new possibilities. *Becoming a pathfinder.*

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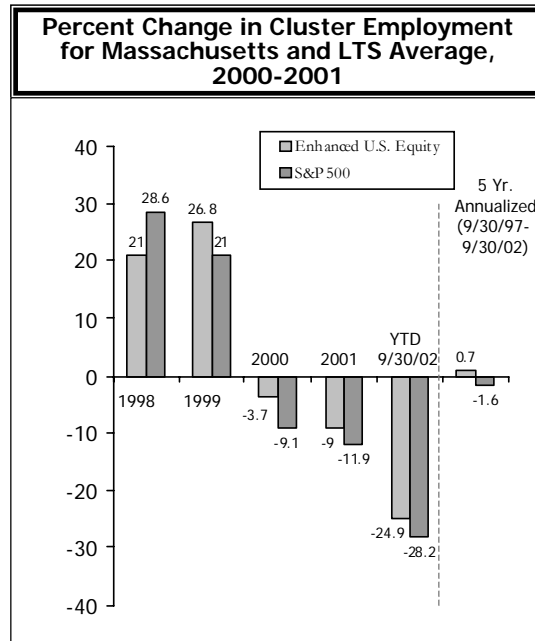
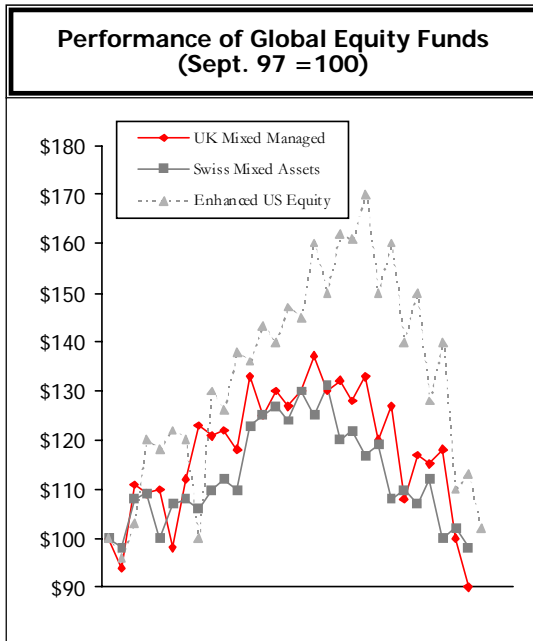
<sup>1</sup> The text of the speech reflects on the discussions the Partha Ghosh had with his colleagues during his association with ADVENTIS and the Mitchell Madison Group. He acknowledges everyone who had directly and indirectly supported in the preparation of the presentation at the Harvard Business School

# 1. Engaging with the world full of possibilities? Keeping faith in yourself

In order to sense the elements of opportunity, one has to be able to look beyond the gloom and doom of today. But, as future leaders, you must appreciate the underlying forces that drove the rise and fall of the equity markets in the last five years (Exhibit 1).

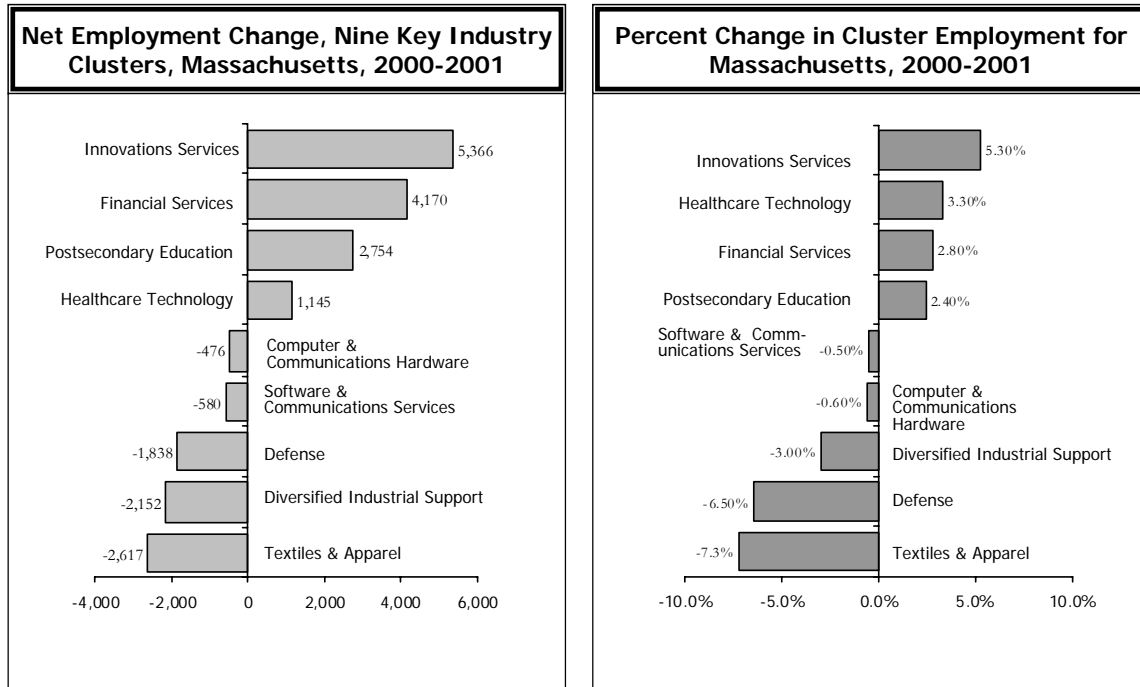
## Exhibit 1: Hope Beyond the Burst?

### The Tough Years— Behind Us ?



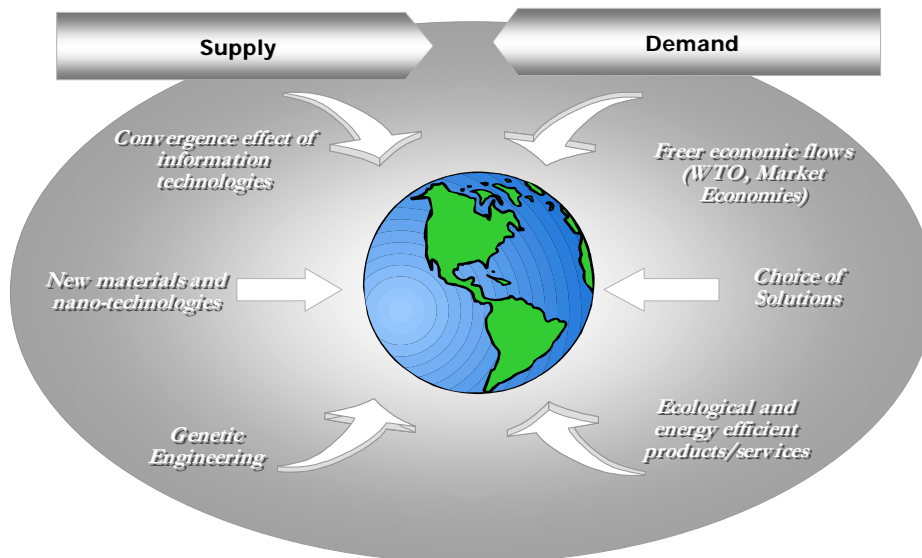
With returns on investments of around 20% in 1998 and 1999, expectations rose beyond the capacity of the economy causing disequilibrium between expectations and reality. This phenomenon led to lack of trust which got further reinforced by the unfortunate events of September 11<sup>th</sup> and the surfacing of a series of leadership and accounting scandals. All together, the rising disequilibrium switched our psyche from optimism to pessimism – both erroneous and short-sighted. In fact, in 2001, several sectors in Massachusetts have grown while several which were fashionable have shrunk (Exhibit 2), implying that we are in a world which will perhaps continuously switch from one of set of economic drivers to another set of drivers, to shape the next stage economy. “Resiliency” has indeed become the password for success in the future.

### Exhibit 2: Promising Trends Below the Surface



As you step out of your classroom, you should view the current dynamics as an opportunity. An opportunity to revitalize this economy, to find new ways to realize productivity gains, and, most importantly, to build a “new social and global trust” which will make the progress of civilization more robust and reliable. In order to do so, we have to be mindful of how several supply and demand side forces (Exhibit 3) are shaping the new economy.

### Exhibit 3: The Emerging Economic Environment



On the supply side (i) the convergence of the 4 Cs – communication, computing, commerce and content, (ii) technical advances in nano-technologies to uncover more specialized properties of surfaces and new materials, (iii) breakthroughs in genetics are providing a set of new tools which are extremely powerful, each with profound implications on our living and work spaces.

Also on the demand side, the forces at work are triggering fundamental changes on how in the future (i) economic flows across different regions of the world will be shaped through WTO inspired freer trade investment and information flows (will have access to lowest and best skills of the planet), (ii) consumers, who, in turn, will become increasingly demanding and expect a greater choice of solutions and/or expect perfect customization, (iii) ecological and energy consciousness will require us to redesign economic processes which are self-sustaining.

Indeed, as one thinks through what the mega influence each of the forces might be on our society, their collision could indeed have a profound transformational impact on the path forward for the entire civilization, only if you, as the future leaders, could make this process a positive one.

Particularly important of all these forces is the “force of convergence’ as it will perhaps have the most profound influence on the other forces themselves. The abundance of wireline/wireless bandwidth, the massive availability of intelligence in multiple devices are enabling creation of knowledge/content, which could be monetized on a real time basis leading to new models of commerce. This tornado-like dynamic will have impact the working processes, in turn structure of multiple industries.

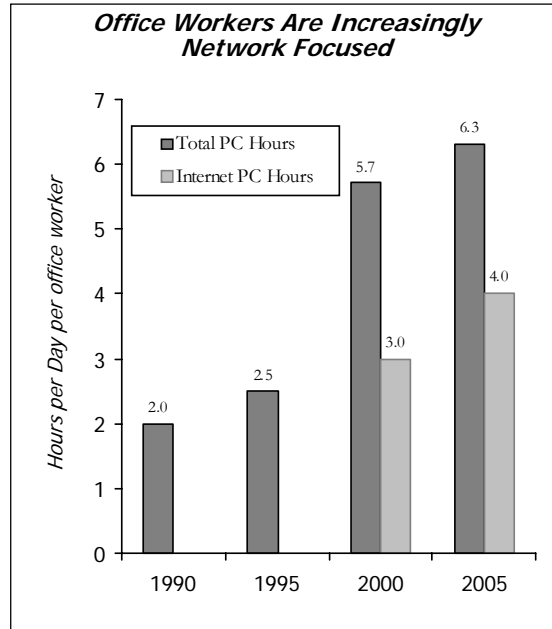
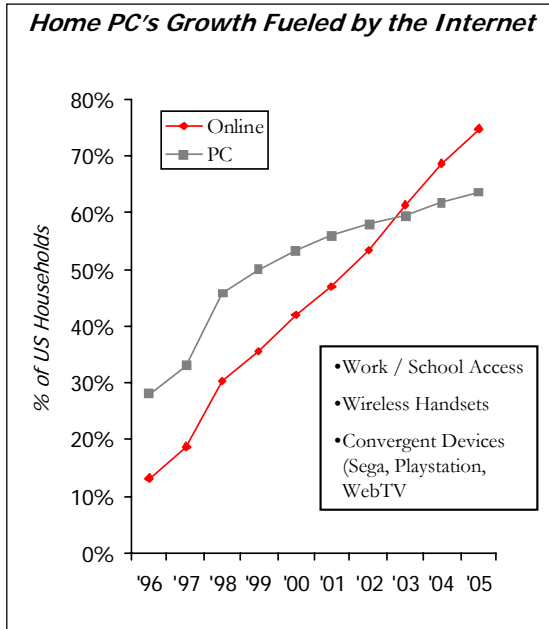
Thanks to the power of convergence, today the travel industry is able to make unutilized spots in airplanes and hotels available to last minute consumers through Internet services such as Priceline, Orbitz and their own websites. With greater visibility into their real time inventory, airlines and hotels are able to generate incremental revenue at little to no incremental cost, thereby enabling enhanced market efficiency. Even with substantial discounts, the emerging model creates a win for the provider, and a win for the consumers.

While such last minute specials are most profound and have become popular in the travel industry, real-time visibility into perishable and unutilized inventory combined with variable pricing models, creates breakthrough value in many industries. For example, Dutch flower auctions, online liquidators such as Overstock.com, freight transporters are a few examples where additional value has been created through better information technologies.

Building on these examples, it is my strong conviction the collision of these forces of infinite bandwidth, electronic and mobile commerce, massive distributed intelligence and interactivity and continually enriching knowledge will continue to be a source of “innovation energy” which will impact all the conventional industries – some more than others – while giving birth to new industries which are beyond our ordinary imagination.

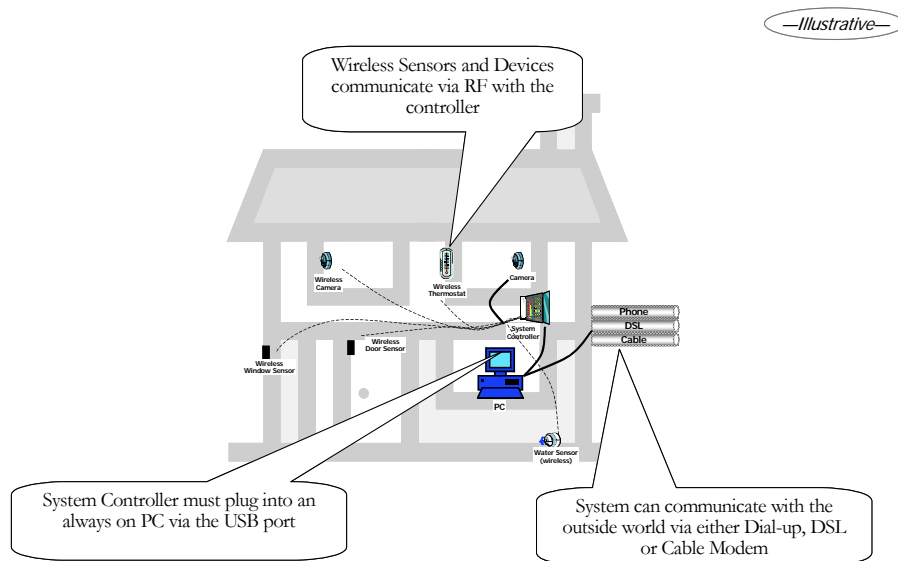
In fact, as increasing percentage of the US population gets connected and spends time in the dot.com world, knowledge creation/usage will only multiply.

### Exhibit 4: Penetration of "Networked Intelligence"



This year (2003) alone will generate as many bytes of knowledge (22 billion gigabytes<sup>2</sup>), which our civilization has created in the last 40,000 years since humankind drew the first painting on the walls of its caves. In turn, as knowledge intensity of society increases facilitated by the rapid decline in prices of enabling technologies the innovation capacity of society will exponentially increase. For example our living environment will undergo a fundamental change: brown goods and white goods will not only talk to each other, but will be remotely activated and monitored, and in synch with home security services (Exhibit 5) together

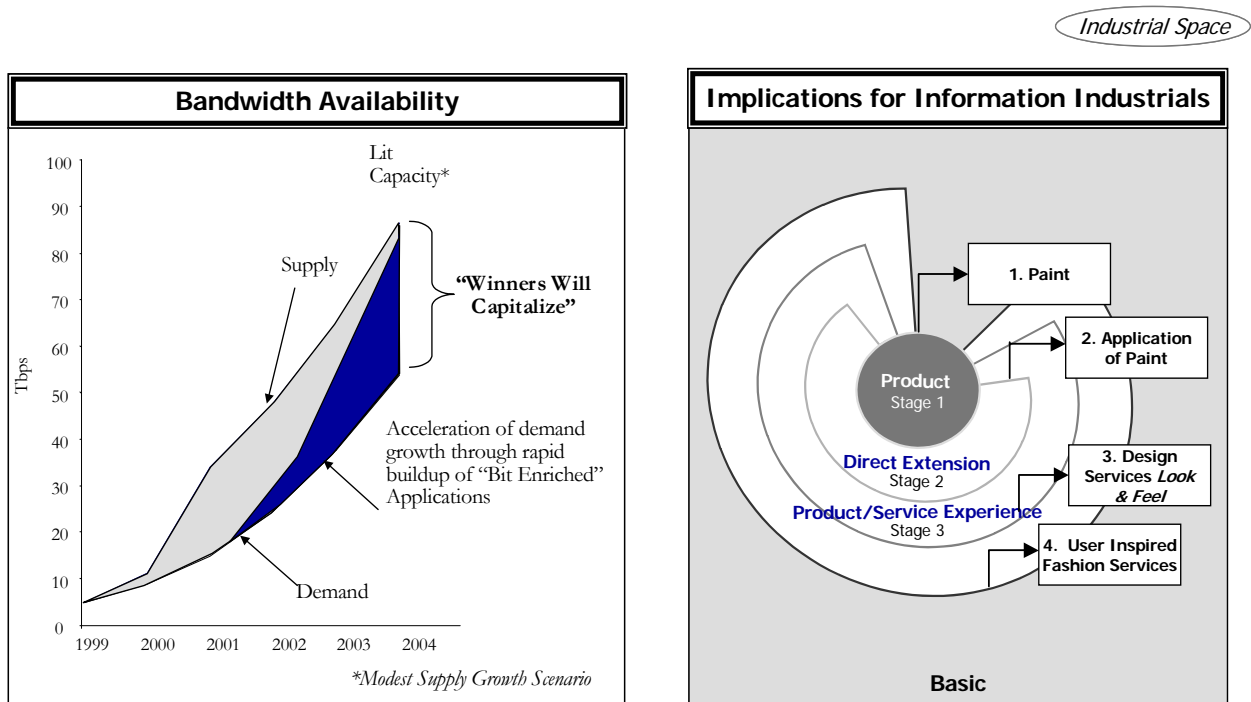
### Exhibit 5: Convergent Solutions for the Home



<sup>2</sup> Source: University of California, Berkeley  
 S:pghosh\Harvard Cymposium Speech

they will be offering “always on” higher value-added services to the household. By the same token, abundant and low cost bandwidth along with pervasive intelligence will enable industrial players to fundamentally reconfigure their value propositions in becoming more relevant for the user. For example, in the Paint industry, (one of the oldest industries) chemical companies by leveraging bandwidth and intelligence embedded in painting equipment, instead of selling liters of paint, could sell quality painted surfaces; they could even take full responsibility of the finished outer skin of cars over a certain warranty period on behalf of automobile companies – continually expanding the scope of their value proposition (Exhibit 6).

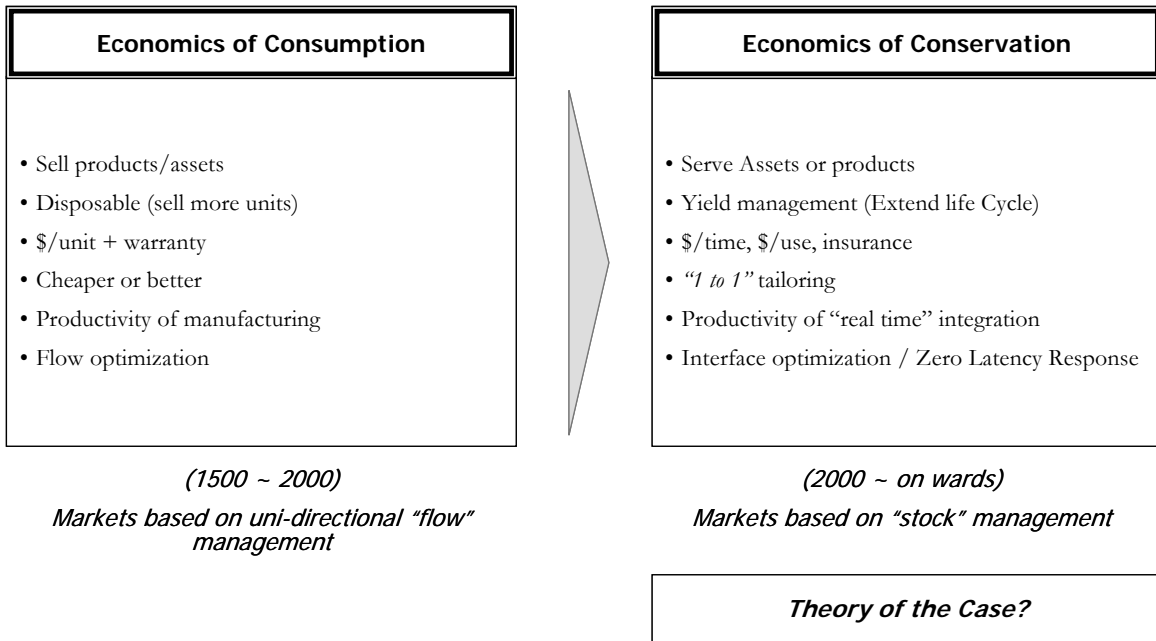
**Exhibit 6: Strategic Advantage in an Era of Abundant Bandwidth: Content Driven “Information Enriched” Propositions**



Indeed, many conventional industries for the first time since the industrial revolution are entering a new phase on their evolution, enabled by the turbulence of converging technologies, in the process making a shift from a “product based” paradigm to “user experience based” paradigm.

I do believe in the next 10 years with the new convergence infrastructure in place, new “user experience” focused business models will evolve which together has the potential to change the fundamental tenets on which modern day capitalism is based. Exhibit 7 illustrates the fundamental shift that will take place along multiple dimensions enabling the global economic systems to create wealth through creation of “closed loop” conservation focused economy in place of one dimensional “source to sink” consumption model.

## Exhibit 7: New Economics in the Making



It is our hope that in this decade, as we shape the agenda of the third millennium, we will give birth to a new economic process where wealth creation and ecology preservation (if not enrichment) could go hand-in-hand, not in conflict with each other.

For organization large or small to prepare for the phase shift, they must embrace seven essential beliefs which I think in concert with each other will define the dynamics that will shape the new economy.

### The Essential Beliefs Which Will Shape Next Decade

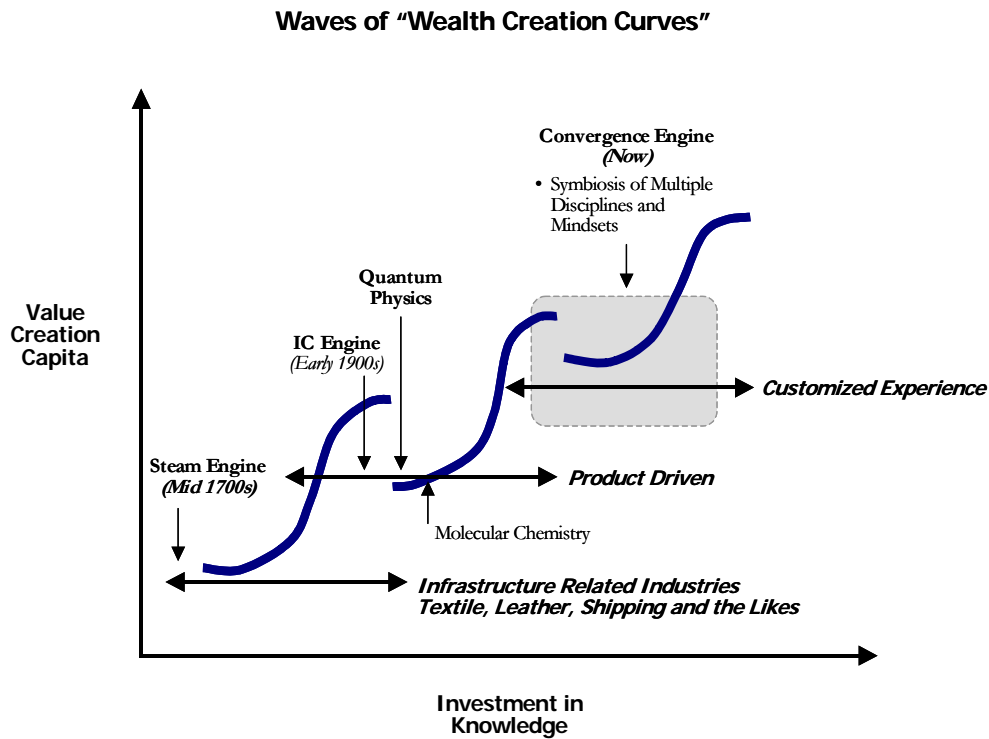
- Transient Industrial Ecologies: Cross Boundary Solutions(*Knowledge enriched value propositions*) will continually emerge to break the constructs of conventional industries
- Knowledge management, Integrative capacity and intellectual/attitudinal resiliency will be the three most critical skills organizations will need to develop
- Strategic Management will reemerge as a symbiosis of "art of imagination" & science of "systems oriented rigor/thinking"
- Boards of companies will need to be reconstituted so that together they form a team which could inspire innovation and stimulate ethics
- Capital markets and investors will learn how to account for both tangible and intangible assets

In such interesting times you as future leaders must ensure that passion and thirst for knowledge is at the core of your work; please keep in mind words of Albert Einstein, “*Without passion there would be neither mathematics nor natural science. Time and again, the passion for understanding has lead to the illusion that man is able to comprehend the objective world rationally, by pure thought.*”

## 2. The New S-Curve(?): Harnessing the Power of Convergence

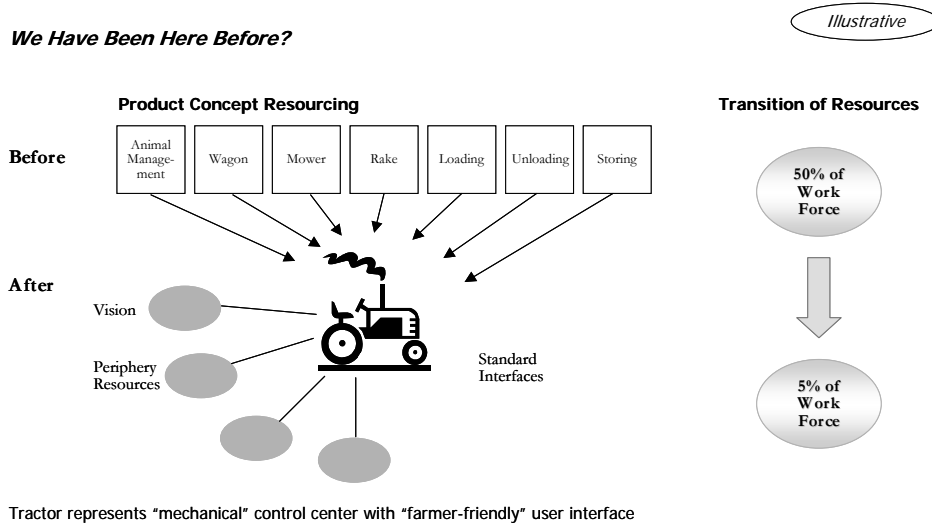
In view of the dynamics of the mega possibilities ahead, we are indeed at the beginning of a “new era” powered by the convergence engine. Similar to the way the steam engine redefined the transportation and the textile industries, the international combustion engine together with electronics, triggered mass surface and air transportation and gave birth to a host of new industries, the convergence engine could redefine the conventional industries while creating new services to improve productivity of society (Exhibit 8).

**Exhibit 8: The New S-Curve: The Challenge of Transformation**



For example, the way the fist tractor more than a century ago, powered by internal combustion engine integrated different physical manual activities in the agricultural field within one machine (Exhibit 9), to transform the agricultural sector and gave birth to new industries, the convergence engine will integrate value propositions from different industries to create new business models which are “user-centric”.

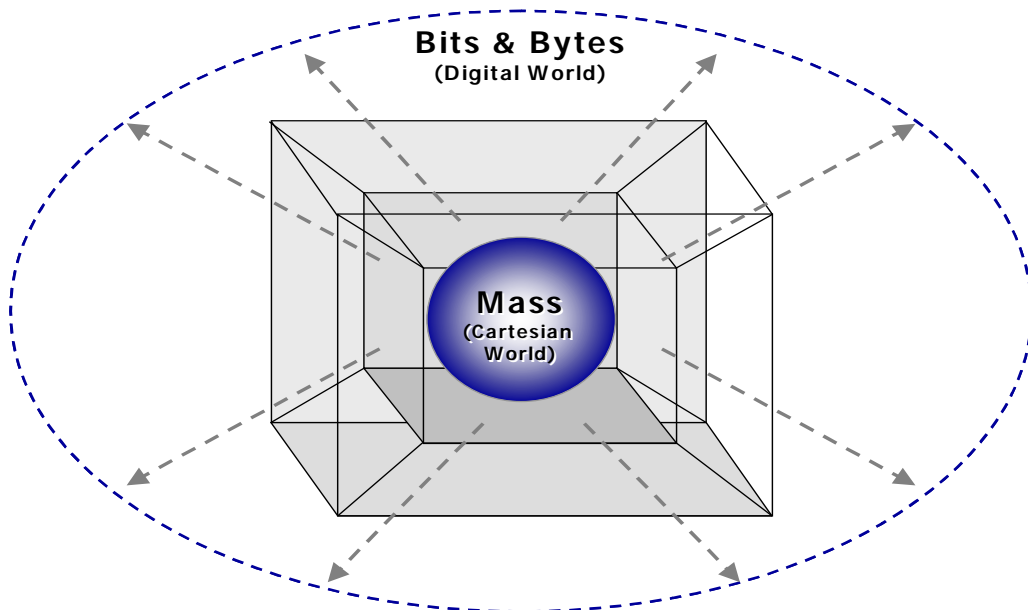
### Exhibit 9: Product Concepts Will Be Fundamentally Reconfigured



The convergence engine in the same spirit will perhaps create new sets of industries and/or transform today's industries, creating value propositions, which are enriched by bits and bytes. As the introduction of tractor almost 100 years ago caused large scale migration of workers employed by the agricultural sector (from 50% to 5%) to industrial centers, convergence could also cause large scale migration of work force from conventional industries to new industries. Exhibit 10 provides a conceptual picture of how value of conventional products (e.g., liter of paint) will be enhanced through innovative use of the "power of convergence" by providing more information-intensive, complete solutions (e.g., finished surfaces).

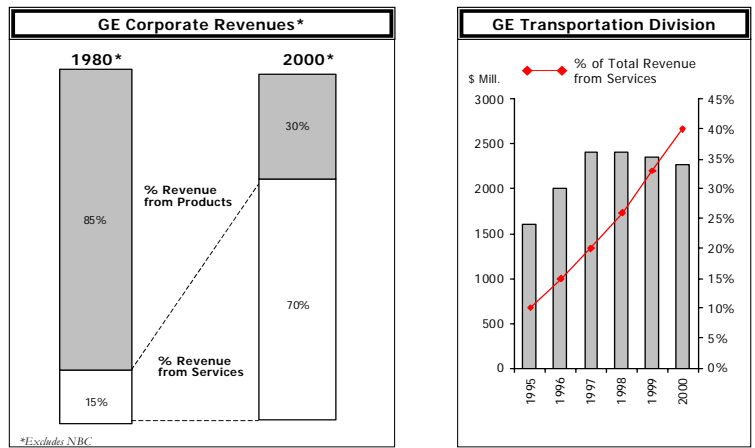
### Exhibit 10: Vision of the New Breed

***"Value Creation Through Integration of Bits and Bytes With Atoms and Molecules"***



Indeed, several forward looking organizations like GE, Honeywell, Westinghouse, Siemens have begun to move into value-added services through innovative use of convergence. Exhibit 11 illustrates how GE's revenue composition has shifted in favor of services in a period of 20 years and, more impressively, how service content in its traditional transportation business has kept the division vibrant with close to 45% of revenues coming from services.

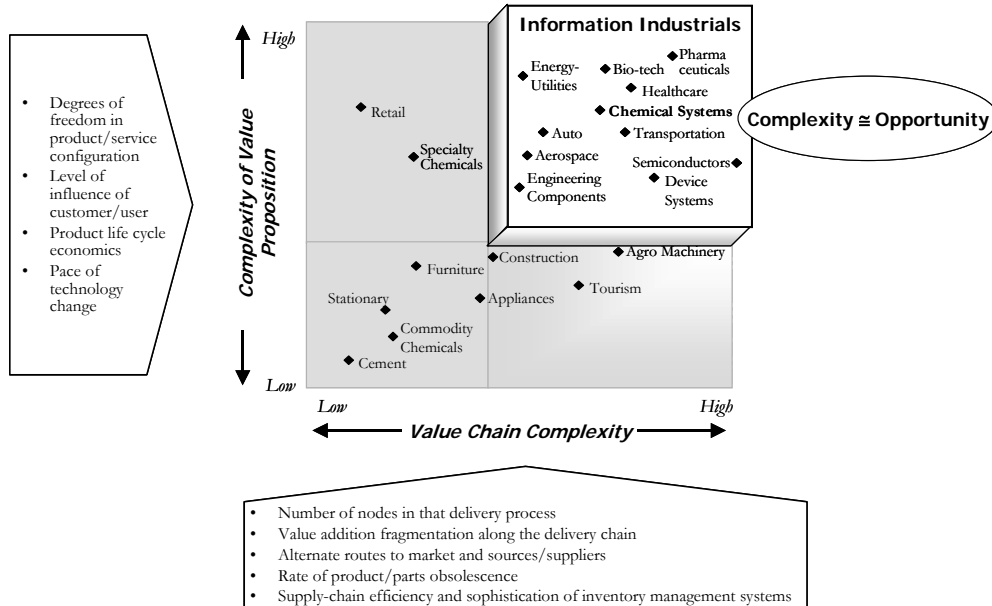
**Exhibit 11: GE's shift to Move to High Value-Added Services**



*GE's transformation to a Solutions Paradigm has migrated value capture from products to new services and ultimately to information and intellectual property*

The degree to which today's industries could benefit from the "convergence led phase shift" is essentially dependent upon two critical vectors (i) complexity of value proposition by the degrees of freedom and (ii) complexity of value delivery chain (Exhibit 12).

**Exhibit 12: Technology-Intensive Industries will Constitute the New Breed**



My observations have repeatedly underscored that a higher level of complexity offers more opportunities for “convergence-led” transformation of value propositions. As Exhibit 12 indicates, most of the knowledge intensive industries which draw value from multiple and diverse constituencies could unlock significant value through efficiency gains in terms of how today’s product offers are consumed and how they are delivered.

As leaderships of conventional industries draw courage to make the likely shifts that the convergence engine could facilitate, they could indeed build new profit opportunities built on the “new paradigm”. Exhibit 13 indicates likely paradigm shifts the Agrochemicals, chemicals, engine and pharmaceutical industries might experience.

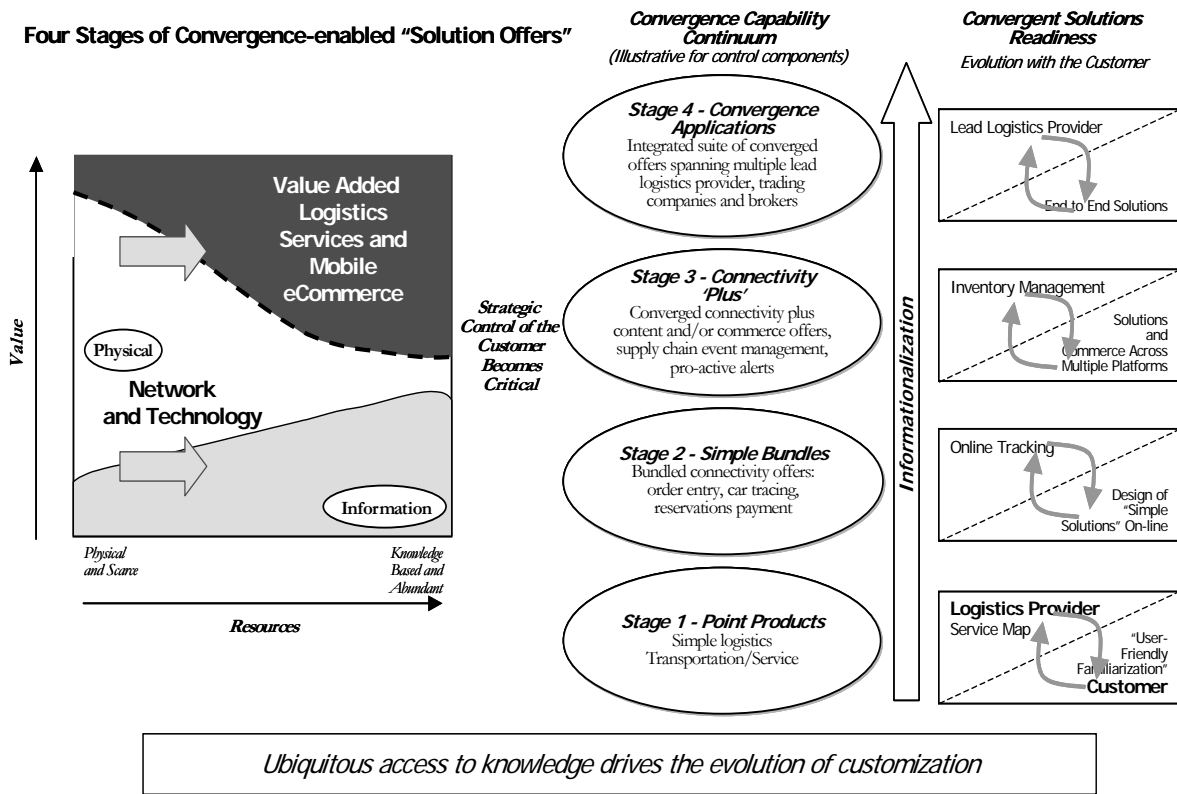
### Exhibit 13: Transient Industrial Ecology

*The Emerging Paradigm (examples)*

	Old Paradigm		New Paradigm
<b>Agrochemical</b>	<ul style="list-style-type: none"> <li><b>Product Concept:</b> • Functional/crop focused</li> <li><b>Pricing Model:</b> • \$/unit</li> <li><b>Industry Structure:</b> • Vertical flows (provider centric)</li> </ul>	➤	<div style="border: 1px solid black; padding: 2px;"><b>Farm Service Provider Model</b></div> <ul style="list-style-type: none"> <li>• Life cycle Economic value per season</li> <li>• Service package (\$/month)</li> <li>• Integration of multiple value providers (farm/farmer centric)</li> </ul>
<b>Chemicals</b>	<ul style="list-style-type: none"> <li><b>Product Concept:</b> • Chemical formula with specific material properties</li> <li><b>Pricing Model:</b> • \$/unit (e.g. \$/ton, \$/barrel)</li> <li><b>Industry Structure:</b> • Scale driven</li> </ul>	➤	<div style="border: 1px solid black; padding: 2px;"><b>ASP Model</b></div> <ul style="list-style-type: none"> <li>• Molecular solutions (e.g., end use functionalities)</li> <li>• \$/unit of function performed (e.g., unit protection)</li> <li>• Solution/scope driven</li> </ul>
<b>Engines</b>	<ul style="list-style-type: none"> <li><b>Product Concept:</b> • Performance of source of power</li> <li><b>Pricing Model:</b> • \$/unit for different HPs</li> <li><b>Industry Structure:</b> • Engine technology centric</li> </ul>	➤	<div style="border: 1px solid black; padding: 2px;"><b>PPU Model</b></div> <ul style="list-style-type: none"> <li>• Power solutions</li> <li>• \$/power supply-cycle, \$/unit-time</li> <li>• Usage/network centric</li> </ul>
<b>Pharmaceuticals</b>	<ul style="list-style-type: none"> <li><b>Product Concept:</b> • Unit dosage</li> <li><b>Pricing Model:</b> • \$/unit</li> <li><b>Industry Structure:</b> • Oligopoly around makers</li> </ul>	➤	<div style="border: 1px solid black; padding: 2px;"><b>PPV Model</b></div> <ul style="list-style-type: none"> <li>• Cure of root cause</li> <li>• \$/cure, \$/treatment efficiency</li> <li>• Health solutions integrations (on and off-line)</li> </ul>

Irrespective of the industries, how much “new value” each industry could create will depend upon how innovatively the organization could serve unique customer experiences? This would significantly improve the productivity of end users’ “economics of consumption”. Exhibit 14 illustrates how an old industry such as railroads leveraging their network could move beyond conventional transportation/logistics services through staged upgrade of the scope of their value proposition.

## Exhibit 14: Value Creation Will Depend on the Degree of Ownership

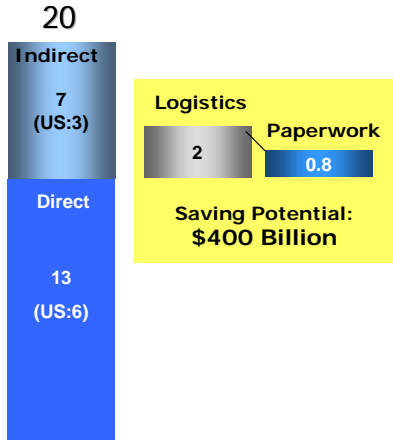


In order to unlock convergence-led productivity opportunity, companies will need to look beyond the internal activities of the organization, look across the value chain. For example, in the discrete manufacturing of close to \$1.8 trillion of expense base 34% of costs are associated with cross company interactions and close to 45% of expenses are determined during design and planning phase (which are often influenced by multiple vendors/organizational units). By building on traditional accounting systems, which typically account for labor, overhead, sourced expenses and services, toward activity based accounting, it will be easy to notice when and how the next stage productivity gains could occur across the value chains and at the interfaces of various organizations.

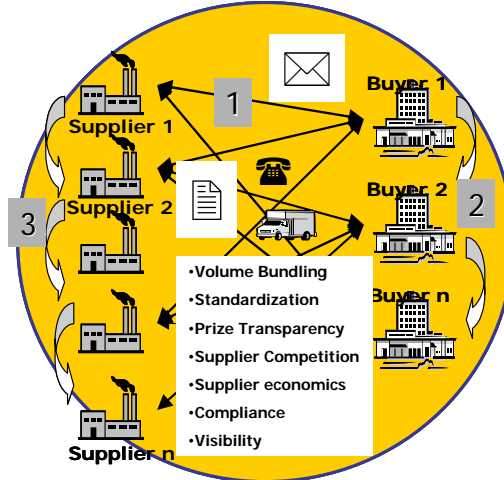
It will indeed involve improving productivity of interfaces between companies; particularly as technological specialization continues and globalization enables more efficient division of labor (manual or knowledge workers) companies will be increasingly dependent upon outsourcing. Indeed future productivity gains will be dependent on how cross boundary workspaces are designed (Exhibit 15).

### Exhibit 15: Unlocking the Potential in the Cross-Boundary Workspace

**Business Spending on External Goods and Services (\$ Trillion p.a)**

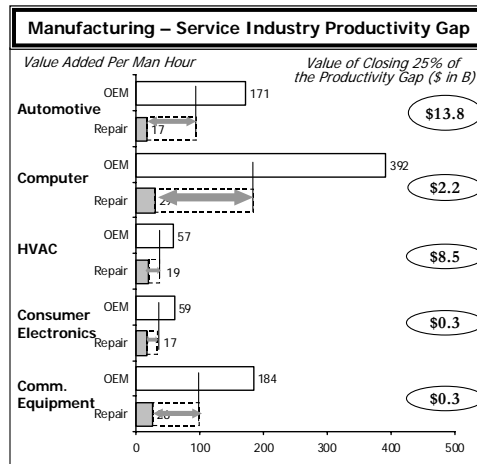
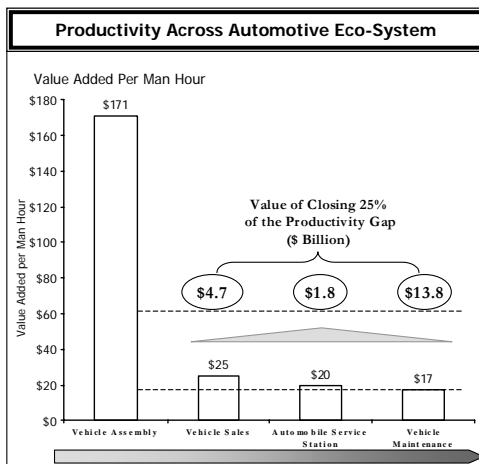


**The cross-boundary Workspace and Savings Levers**



In fact, it is my strong conviction that in the next decade at current level of production in the US alone close to \$1 trillion of value could be unlocked as long as today’s and future leaders like you commit to explore frontier opportunities by leveraging the power of convergence. Furthermore, when you turn your attention to those segments of the service sectors which are involved in MRO of high tech equipment, machines, etc. (such as automotive, communications equipment, home electronics, HVAC) there are significant productivity gaps that could be closed. As Exhibit 16 shows, in the automotive value chain while the manufacturing sector will enjoy productivity opportunities in the range of \$170/hour, the productivity of sales, service and repair organization are around \$20/hour.

### Exhibit 16: Likely Gains in Service Productivity in Downstream Sectors



These five industries represent a \$25.1 Billion productivity opportunity. While in the extended automotive eco-system upwards of \$20 Billion could be realized

**10 - 22% Cost Reduction**

Note: Total cost reduction by industry is heavily influenced by the size of the labor productivity gap and the labor to materials ratio. Source: US Census Bureau, US Bureau of Labour Statistics and ADVENTIS Analysis

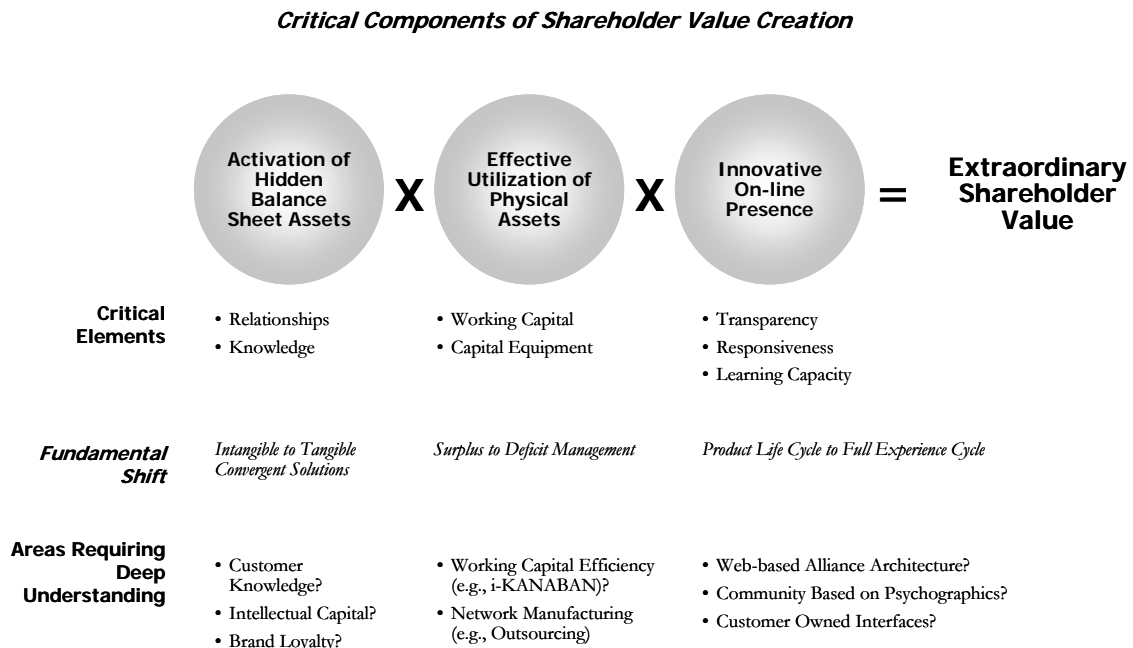
Experience with specific clients has repeatedly underscored by use of new productivity tools enabled by convergence (e.g., remote monitoring and diagnostic kits) MRO organizations could significantly reduce travel times of maintenance crews while perfecting and speeding their diagnostic, monitoring and predictive maintenance capabilities.

### 3. Revitalizing the economy with a new mind-set: Becoming a Pathfinder

In hindsight, most analysts from Wall Street think the valuation of dotcoms in the mid to late nineties might have been too bullish, eventually causing its burst. But convergence has given to the hands and the minds of executives indeed an extraordinary power. It could enable significant increases in growth and profitability. Apart from the fundamental transformation of how people search for and process knowledge, the convergence engine has the potential to create efficiency gains which were not possible earlier. Exhibit 17 demonstrates how market capitalization of companies could be positively influenced and improved:

- I. Monetization of soft assets – intellectual property, customer relationships, formal and informal corporate alliances
- II. Utilization of physical assets across organization boundaries enabling efficient sharing of capabilities, plant capacities and working capital
- III. Innovation of value proposition on line by real time collaboration between the user and providers of technological elements

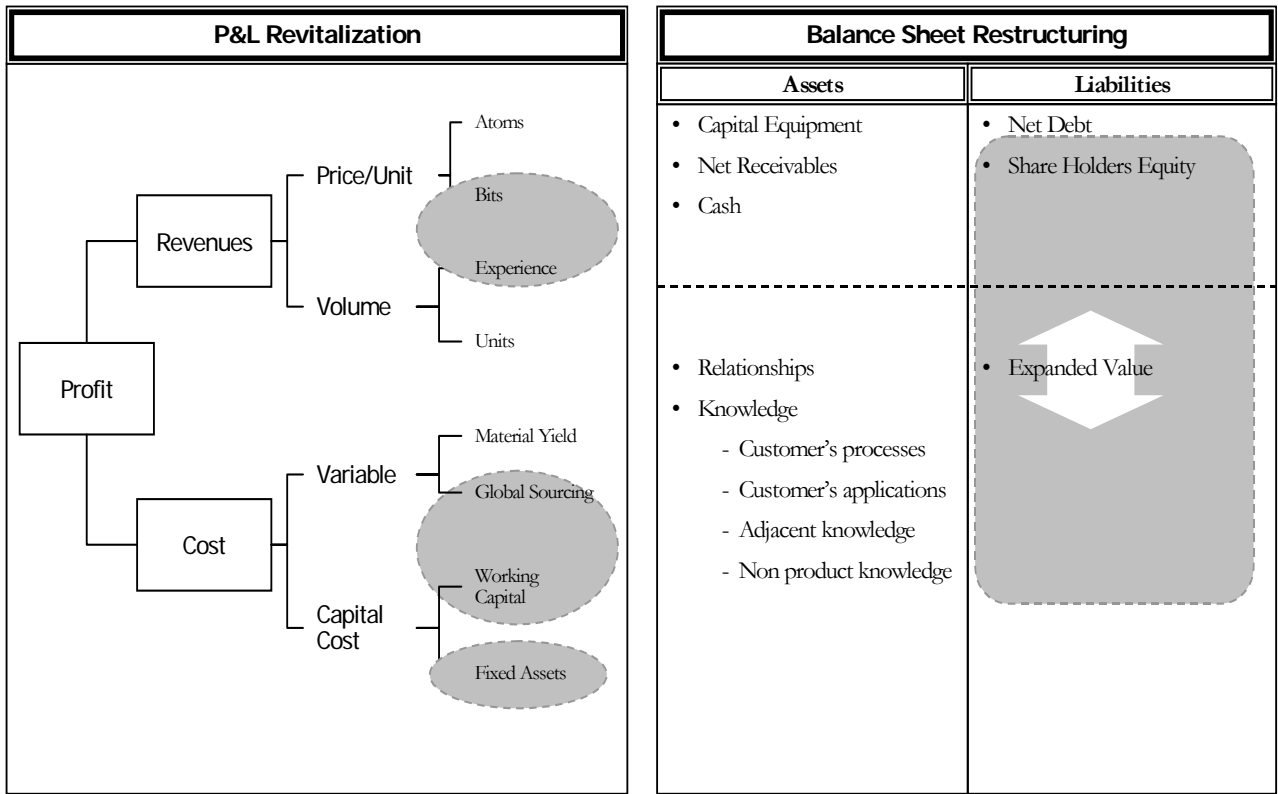
#### Exhibit 17: Historic Opportunity to Enhance Market Capitalization



In other words, if the new environment could be creatively structured, companies could significantly reduce the cost of uncertainties by improved visibility of relationships and knowledge, physical assets and users' real-time requirements; in turn enabling "zero latency" mobilization of capabilities and capacities across the ecosystem.

Exhibit 18 illustrates how different components of profit and loss and balance sheet statements could be effected in the new paradigm.

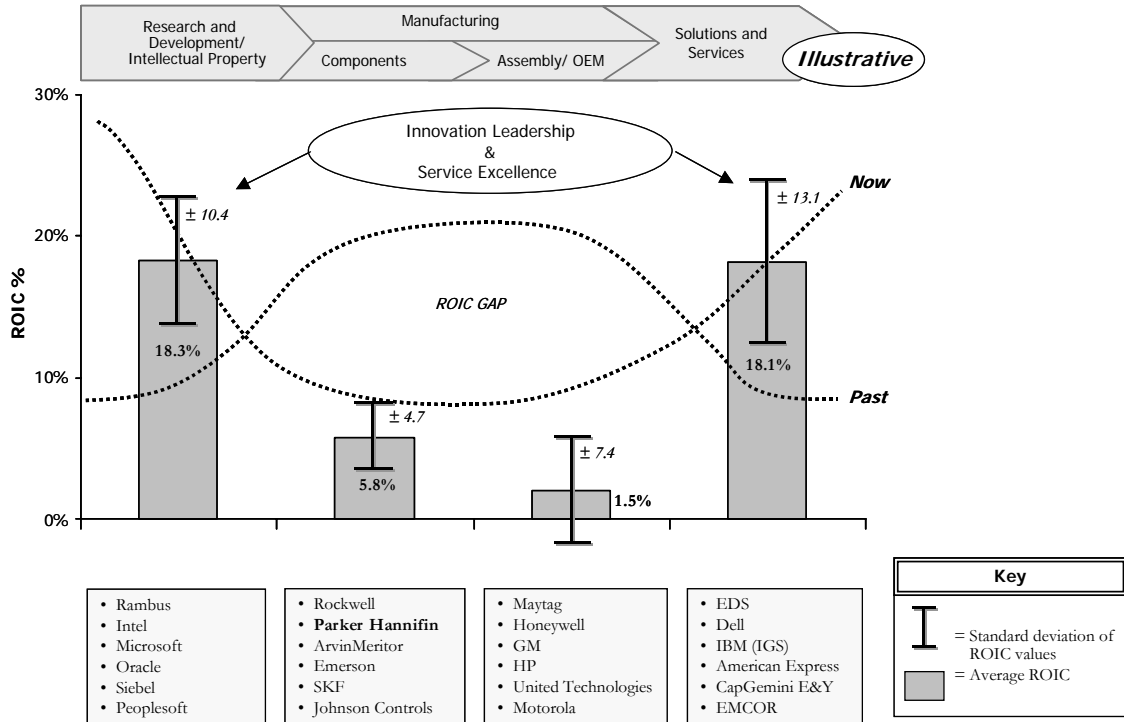
**Exhibit 18: Realizing the "Upside" through Focus on Soft Assets to Unlock the Hidden Value**



As a result, during times of economic slowdown, companies such as Dell, GE who have offered bit enriched value propositions and have taken advantage of convergence to remove inefficiencies across the value chain have performed relatively better and their business models have turned other disadvantages into their advantages.

Furthermore, by taking advantage of networked manufacturing managed through aggressive use of "convergence", companies, like Dell, have moved to more creative components of the value chain focusing on servicing the customer and innovating future value propositions, while outsourcing the manufacturing to low cost environments in the world. Exhibit 19 indicates that while return on invested capital of companies who have much of their physical assets tied up on manufacturing is only 2% to 6%, the ones who are lean on physical assets, and focused on services and innovation enjoy close to 20% ROIC.

### Exhibit 19: Convergent Solutions Space and the Attractive Areas of the Industry Value Chain



Source: ADVENTIS Analysis, Hoovers Online, Company Annual Reports

### Role of the CEO/Board

In order to create the new value proposition, the role of the CEO has to fundamentally shift from being a “conductor of the orchestra” to “scope enhancer”, who is continually challenging the boundaries of his/her business and inspiring the organization to renew value propositions with increasingly wider and deeper perspectives of users economics and convenience .

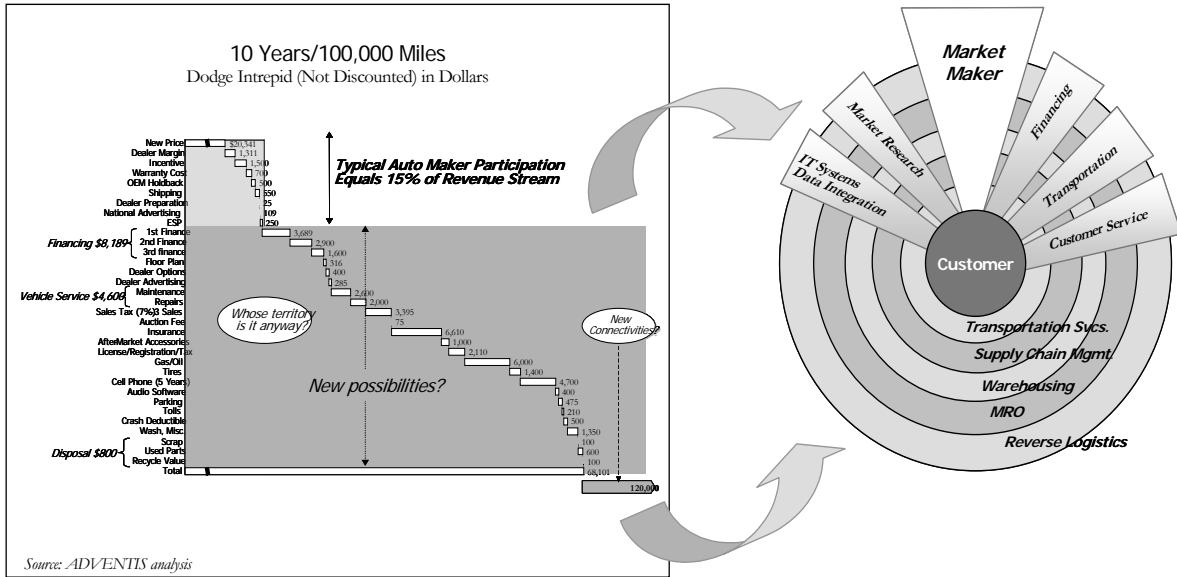
On one hand, to serve today’s competitive environment, companies need to focus on continuous operations improvement though improved and efficient use of information and knowledge, on the other hand, to stay ahead of technological disruptions and/or create new value propositions, companies will need to continually examine adjacent opportunities across their value delivery chains and value propositions themselves.

Exhibit 20 illustrates how, in the automotive sector, by examining the economics of the car owner over the life cycle of the car, an auto company could offer value-added services which not only improve the users’ experience of the car itself, but also helps the user to participate in transactions which would have otherwise happened without the convenience of the car.

## Exhibit 20: Dynamic Networks are an Opportunity to Extend reach throughout the Eco-System

Manufacturer's or Infomediary's Business (?)  
Estimated Revenue Stream Over

Case Study 1: Automotive Industry

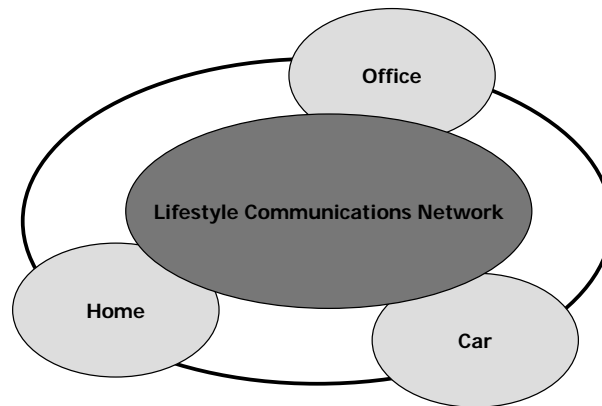


In fact, as conceptualized in Exhibit 21, through effective use of telematics, perhaps fuel cells in the future cars how automotive companies could position the car as a portal for energy, information and communication.

## Exhibit 21: Compelling Vision?

Automotive Company: Network Services

*Illustrative*

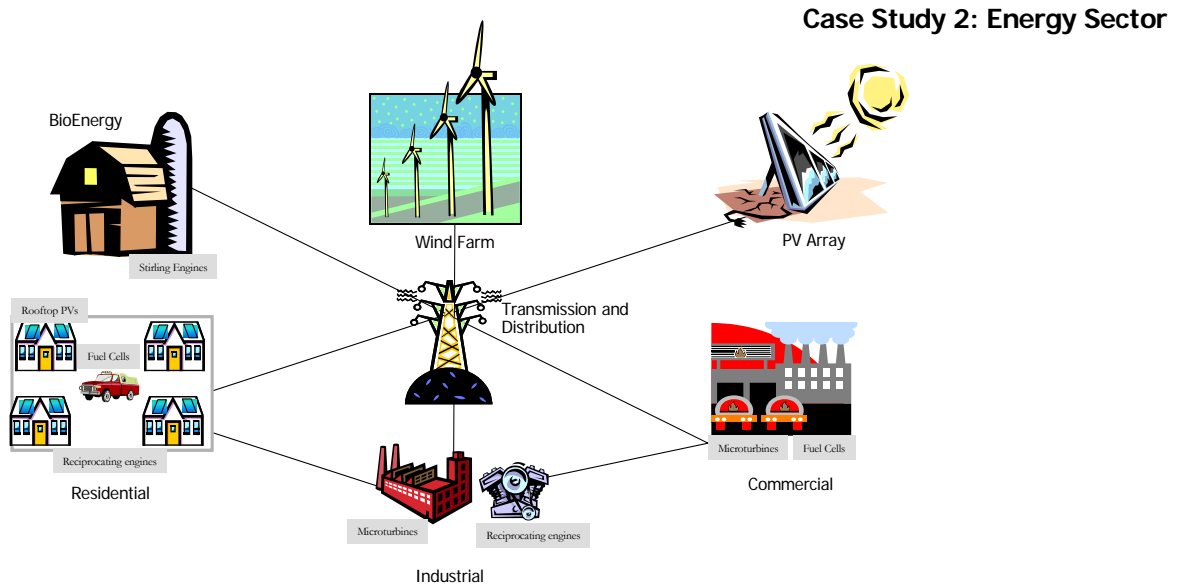


"The Convergence Phenomenon is the enabler to connect these environments."

In other words, auto companies could create and sell customized environments that connect the world for individual customers.

In the same spirit, the energy infrastructure could be renewed by transitioning out of centralized power plants fueled by hydrocarbons or nuclear fuel to distributed power generation architecture by the deployment of wind power, fuel and solar (Photovoltaic) cells synchronized with each other on a broadband network, to enable sharing and optimization at the community level (Exhibit 22).

### Exhibit 22: The NexGen Distributed Power Infrastructure

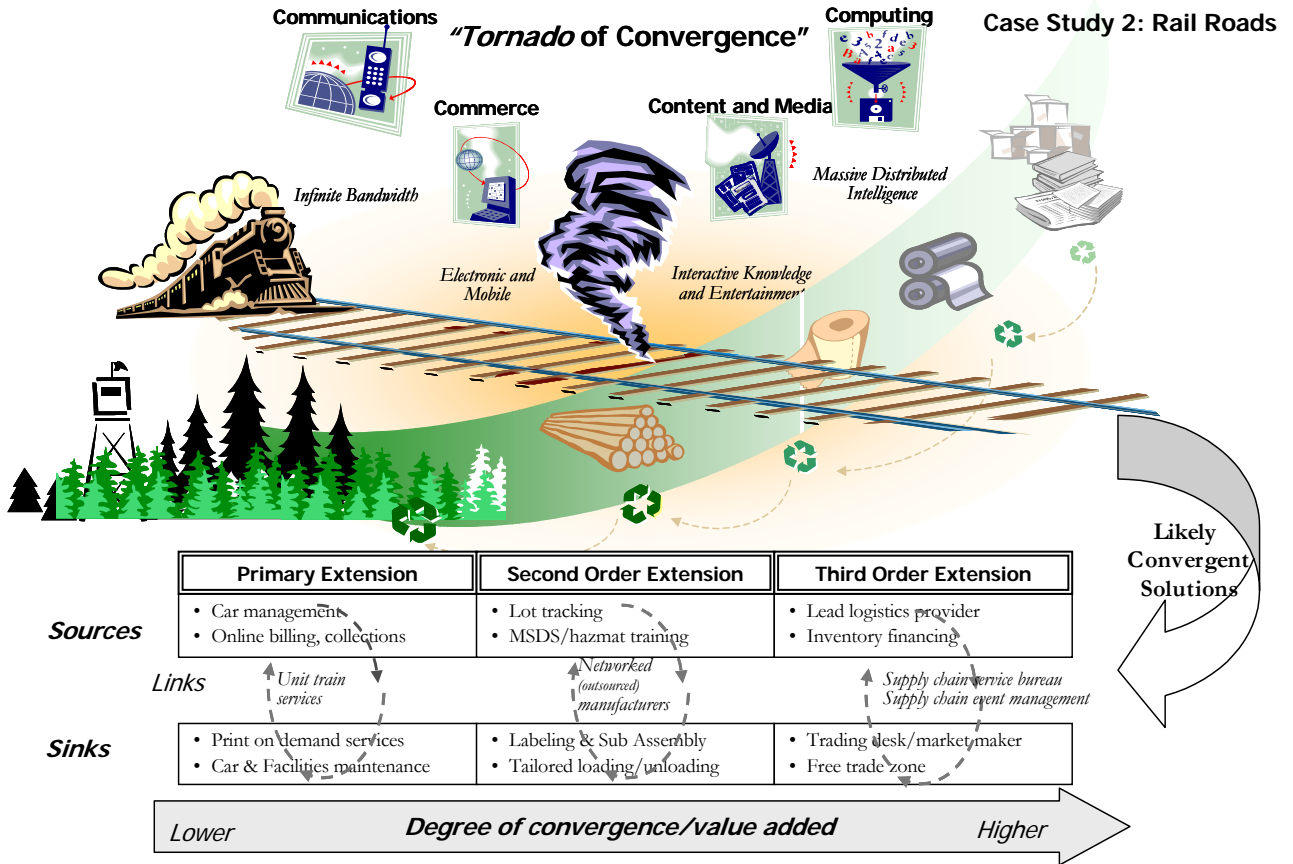


#### The Virtual Power Plant

- Aggregates the output of thousands of micropower technologies
- Peak shaving becomes power trading on the wholesale market
- Coordination and control through a new communications infrastructure

Furthermore, at the crossroad of two traditional industries, rail transport and pulp paper, the innovative power of convergence could enable creation of services through which railroads could significantly improve the logistics efficiency of the industry across the value chain (Exhibit 23).

### Exhibit 23: At the Intersection of Two Deeply Rooted Industries –Pulp and Paper and Railroads, Convergence Could Create the Opportunities for Resurgence

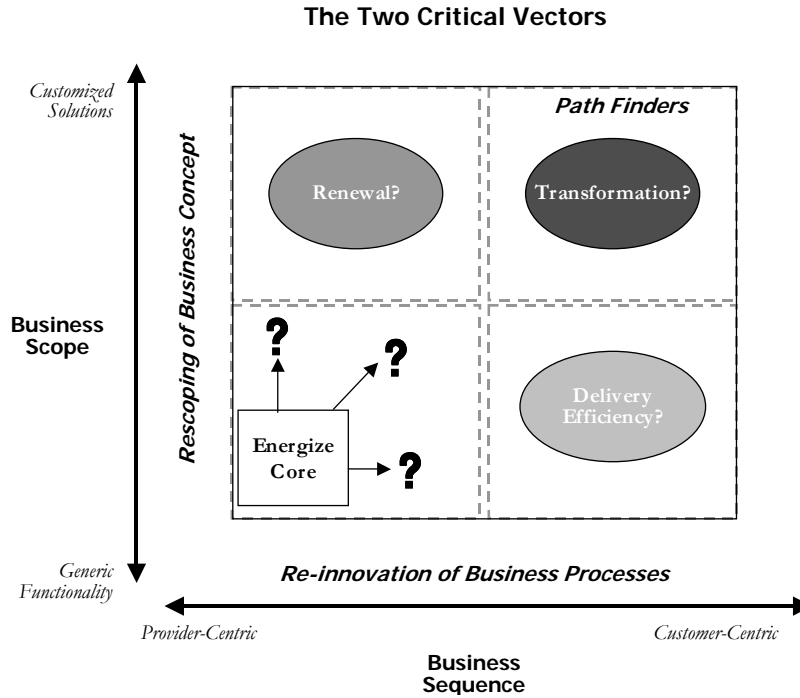


It is our belief, that both the industries could unlock significant value by using the power of convergence in the reconfiguring how the two industries interface with each other.

These are just a few examples to illustrate that almost every industry – some more than others – could benefit from the power of convergence, as this new power is innovatively harnessed. This new power could provide significant benefits in terms of innovation of new value proposition, creation of new “customer based” IP, and integration of the best and the most efficient resources across the world.

Indeed, you are stepping into the corporate world at a time when it is seeded with limitless possibilities. You, as an aspiring leader, whether you are in consulting or investment banking, corporate or non-profit organization, must find ways to manage your thinking along two dimension – (i) “how do I rescope the content of what I do” and (ii) How do I re-innovate the process if I follow in delivering my value?” As Exhibit 24 indicates, in each level of the organization, during times of dramatic change, you could chart new paths to create value previously unthinkable.

**Exhibit 24: The Leadership Challenge: Creating the Up-Side?**



Corporate leaderships after the hardships of the past two years are in search of breakthrough possibilities and you have the opportunity to serve this appetite.

Final point, we have to all remember that to secure the full potential that the new environment offers us today, organizations will need to shift from the mechanistic command and control model to a biological self-enriching model. This would improve the management of knowledge as enabled through an organization’s learning, information processing and knowledge creating, sharing and filtering creating capacities and capabilities. Each of the processes, when managed right, themselves are *self-enriching*, when managed poorly are *self-consuming*. It is important that while leaders of organizations wake up to this new reality, you as the new person in the team must help your immediate environment invent new organizational mechanisms which are “*knowledge enrichment*”- centric, and not “*command & control*” or “*ego-centric*”.

Thank You & Cheers...