

Re-Defining Work and Management In the Modern Technological and Information Age

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Abstract: Technology in the mass production era of the Twentieth Century produced products more efficiently than the previous era of the output of crafts. The technological design of work (the product of engineers) required obedient people who responded to the technology's demands. The technology contained within itself the controlling intelligence and process, which created output. People functioned as a subordinate support for output produced by machines-purely physical acts.

Technology in the modern era, for example, the computer, produces "information" to be used by decision making people. The technology, particularly in the services, does not produce the output but becomes the instrument or tool to be used with output determined by the skills, knowledge, and expertise of the users of the technology. The most advanced computers in a brokerage house do not produce wealth. Value will come from integration of technology (the thing) and knowledge (the people).

The information age calls for a different meaning of work than the mass production age. The de-skilled, simplified work of the previous age is being replaced by the need for knowledge, information, and expertise work in the information age. In the world of mass production work did not need mind, it needed body. In an information world where technology does not produce output but information, work needs mind and expertise. The accomplishment of work must be in the operational units. The creation of wealth is the integration of both technology and skilled people.

Introduction

The organization has traditionally two basic biases of reasoning. The first of these is the functional bias which perceives the organization as a given in the world of "reality", and therefore, change is a question of more or less of what is already present. The second bias is the evolutionary context of meaning, which assumes that the organization moves in developmental fashion from one point to another - with the new containing the old. Change is cumulative in this context with one stage adding to the previous stage and containing within itself what went before. However, if these biases (as interpreters of reality) are not true or contain only a part of the meaning of change then significant elements of change are both unexplained and unexplainable.

The social-cultural-technological environment, through new discoveries, global interdependencies, technological discontinuities, social and political upheavals, revolutionary intellectual

and moral reformulations (new paradigms) destroy past continuities. Examples of this are the scientific revolutions discussed by Kuhn (1970) and Butterfield (1952); the great transformation of modern society from societal meaning to individual reality as noted by Karl Polanyi (1964), the scientific revolutions of Galileo, Copernicus, Newton and Darwin (Hesse, 1980), the movement of work from a technological definition to an information and expertise definition as noted by Serge (1993) and Lawler (1996), with the current growth of global market interdependencies and the world product. The discovery of transistors made RCA irrelevant as an electronic powerhouse, since it was technologically and mentally cemented into vacuum tubes. The current revolution from electromechanics to electronics which involves such industries as computers, watches, calculators and all of the consumer electronics industries, feeding into telecommunications and manufacturing industries destroy the old in the process of creating the new (Cooper and Smith, 1992). The presence of “dispersed” knowledge; information and expertise outside of management and administration and into the operational units make it imperative to re-define the functions and meaning of management principles. Namely, neither a functional nor an evolutionary definition can explain the discontinuity, turbulence or the changes, which are taking place. God, humanity and the universe had to be redefined when Galileo, Copernicus, and Darwin presented us with a new meaning of nature and the universe.

Functional and evolutionary change are considered to be improvements on the past while discontinuous change often destroys the past and re-defines its meaning. Transistor technology destroyed not only vacuum tubes but also the skills, the products, the expertise, and the markets for vacuum tubes and made them “valueless” in the overall context of consumer electronics. The semi-skilled US production worker in manufacturing has a precarious existence in a global market, with capable and competent workers in other countries, willing to take jobs at 10-20% of US wages. The production worker is further threatened by the “waiting in the wings” technology able to replace 8-10 million manufacturing jobs, with employment results similar to those in agriculture. The global market also threatens the jobs of US engineers, scientists, research and development specialists in an environment of highly skilled scientists, engineers and researchers in Eastern Europe, India, Asia, and elsewhere.

Change is more than evolving into the future. It is, in effect, also destroying the past. This means that the ability to define the present and the future is the ability to deal with the new premises of discovery, revolution and change, which are unhinged from where we have been. Questions such as the following put these dimensions of meaning into perspective beyond traditional reasoning:

- a) What does the power position in an organization mean if new technologies and skills destroy its traditional base? (the control of information)
- b) What are the management functions in an environment where the major portion of the productive skills, competence and knowledge are present in subordinates and operating units?
- c) Can management structures and processes designed for a mass production environment of unskilled work evolve to an environment for information and

knowledge work?

- d) If modern “value-added” comes from skill, expertise and knowledge as opposed to the traditional definition of machinery and capital what is the relationship between capital and labor relative to the production of wealth and its meaning?

Rethinking Management Functions

When Peter Drucker in 1988 discussed the organization of the future (the 21st century) he noted that the presence of information and expertise outside of managerial power positions would revolutionize the functions and roles of people in management positions. Common (and accepted) language in the management literature today, such as “empowering employees” must be connected to its meaning - namely “to empower” means that significant amounts of power must be taken away from those who presently possess it (management). The language of “customer satisfaction” translated into the popular phrase “the customer is number one” in a business environment dominated by “services” means that the point of contact between the organization and the customer requires highly trained, knowledgeable and competent people. The organization cannot prioritize the customer (outside the organization) without prioritizing the people who are in contact with the customer. Namely, the organization’s resources should be designed to serve these people in order to strengthen and “empower” them to provide quality in the delivery of services. However, “to empower,” means to give power over the work to the people “doing” the work and to take power from where it was previously. For example, in the retailing sector what value to a customer “with questions” is provided when sales people have little knowledge of the products? Management saved money on training but the environment communicates incompetence and ignorance. Clearly, the customer is not number one. The environment does “not sense” the customer nor does it strengthen the sense of dignity and pride of its salespeople which comes from being knowledgeable and useful.

The system of management for large organizations, designed in the early part of the century, with principles based on the implementation of Weber, Fayol, Taylor, Gantt, and a mass production technology is a system of “subordination” (Amabile, Conti, Coion, et. al., 1997). This subordination represents an ordered principle of authority in which each office below is subject to the definition of the office above with no office above being accountable to the office below. The command and control process points upward. No office is functionally accountable to the office below. No manager in this system is accountable to the people being managed or “subordinated”. Is this a viable definition when the skill and knowledge necessary for the future is in the organization’s operational units?

A system of logic designed for a de-skilled and simplified work environment may possess a justification that the same system lacks in an information, expertise and service environment. The simplified techno system of mass production is distinctly different than a complex socio-technical system and the complex service context of the modern environment (Gioia and Pitre, 1990). The “subordination” of information and expertise to position-power limits the implementation and output potentials of both information and expertise. A classic example (with disastrous results) of the

“subordination” principle to one of the highest socio-technical, information and expertise filled environments was the Space Challenger fiasco. Administrators at NASA chose to disregard the advice of the expertised people - the technicians and scientists. Functionally, the information people were “subordinate” to the decision-makers who were not accountable to their scientists (Passmore, 1997). This is a clear example of the application of the traditional principles of management and organization to a modern environment, with fatal consequences.

The example cited above cannot be explained in terms of ignorance, personal power definitions, flawed reasoning, or external pressures. Rather, the “decision” was made in terms of the systemic definitions of the function and role of management relative to the function and role of subordinates, and the meaning of each relative to the other. If the executives knew that the Space Challenger would disintegrate they never would have sent it up. However, following the logic of a management system, containing the implicit assumption that administrators knew what was best in relation to their subordinates (the scientists and technicians) they proceeded. Max Weber and Frederick Taylor live on. The world of mass production and the theories of management, which flowed out of that period, still dominate our idea of what the management functions are.

High Performance Work Environments

A high performance workforce is a direct challenge to traditional American management principles. These traditional principles of management and organization are based on the operational competence and knowledge of management. However, high performance workforces are based on the critical knowledge and competence of the workforce at the operational level (Sanderson and Uzumeri, 1995). It is not an accident that whenever Japanese/American joint ventures occur the US company (GM, Ford, and Chrysler) put the Japanese in charge of the design and operations of the manufacturing facility. Namely, the US companies recognize the ability of the Japanese to create a high performance work environment. E.E. Lawler (1996) noted that there are two dimensions necessary for creating an effective high performance environment:

1. the presence of organizational competencies,
2. the presence of organizational capabilities.

A high performance organization and work environment is centered on the significance of skill, competence, information, knowledge in the work as well as the ability of the organization’s systems to promote these organizational attributes (Katzenbach and Smith, 1993). The modern organization is an information distribution system between operational units and people relative to products, services, and customers as noted by Lawler. The success of an organization lies with the organizational and management structure and its ability to understand that the success of a brokerage house is not in its technology but the skills of its brokers; the success of a university lies in the knowledge of its professoriate; the success of an auto service and repair company is in the skilled knowledge of its service people. The same would apply for any complex socio-technical system or service industry. However, the use and application of skill and knowledge will be successful only to the extent that management serves it well in the context of maintaining an efficient and productive environment.

The capital wealth of the company serves the value adding components of its expertise, information and service based producers who increase the capital wealth of the organization. The functions of management are to bring traditional capital together with the wealth adding potentials and information in order to create more wealth - a partnership between capital and labor for wealth creation.

The modern organization is filled with people who know more, can do more, and see more than their managers relative to their work. This is how it should be in an ever-expanding universe. There would be no future if this were not so. However, we have a system of management, which assumes a small and limited environment, which can be controlled by a small number of people (executives and managers) who possess the capabilities of defining what reality is. It is the “power” of superiority. The allusions of Peter Drucker, Peter Senge, E.E. Lawler, and the theorists of groups, project teams, quality environments are all about smart work and high performance environments. They are all about the “humility” of management, as it stands in an information and skill environment larger than it could ever be. The issue is not the control of management - but the service of management to an ever-expanding world. The use of power of position is, by definition, the limitation of the world by limited insights.

The functions of management are how to serve the future and how to speak to the dimensions beyond the power functions of order, predictability and control. The translation of how to serve the future is, in reality, how to serve the skill, competence; expertise and knowledge that are present in the existing organization and simultaneously create wealth. However, in the American system of management - definitions are power or control definitions. These definitions are not service definitions.

An organization’s management, perceiving itself in terms of power tends to undervalue the meaning and significance of the functional expertise below it. Operational competence in today’s world is the basis for development and growth. In the pre-mass production world of skills and craftsmanship the manager could not control this expertise but could only serve it. Decision-making resided in the craftsmen. However, with mass production and job simplification the manager was able to control and define, and the basic system of management was built on managerial “control” rather than expertise. Simple work is easily defined and controlled.

In the modern environment administrative and managerial competence is distinctly different than operational competence. The administrative and managerial functions should be centered on the internal capital flows, cost structures, earnings, efficiencies, short and long term profit potentials, coordinating functions, internal control systems and support and service functions provided to the “managed” units. Imagine the manager controlling “the work” of the broker, the doctor, the mechanic, the professor, the service giver - the reality is that the work itself should be controlled by competence, knowledge, information, and expertise.

The Problem of Priorities

If a management is aware that the future is dependent not on the management alone but the development of the skills and competence of “the producers of wealth”, then serving these producers takes on a different dimension of meaning, a partnership. Serving produces an environment in which wealth potentials are magnified. The use of power tends to limit and control these potentials within the framework of the power definition.

Clearly, we are discussing the “discontinuity” between traditional and modern functions and definitions of the role of management in organizations and society. In a stable environment management could control the future in terms of its own definitions (Weber, Fayol, Taylor). In a changing environment the traditional definitions of management can only limit the future’s potentials since these are limited by management’s definitions.

The future is not going to be arrived at by the traditional management definition. Rather, it will come from the realities of intelligent working operational expertise. This operational expertise will need service to be implemented. Success or failure will not be determined by power but by the servant (management) which promotes and implements the work of those who are not managers (Passmore, 1997). This is the driving force of Drucker’s thought and the basis of Lawler’s reasoning for the modern organization.

The basis of the old organization for management was the possession of the power of definition, preset in the control of information. The problem of the modern organization is that “too much” information and expertise lie outside of the control of management. The perpetuation of the old system requires the limitation on the competence of subordinates. Namely, the traditional organization required smart and competent people to be “dumbed” down to size in order to recognize their place in a system of management designed for a factory - a mass production environmental system (Arthur, 1994). A manager must always be superior to the “managed”.

In the US, organizations have two major systems separate from each other:

- 1) administrative systems which essentially have their own priorities, orientations and “secrets”.
- 2) operational and functional systems which are oriented to getting the job done, operating with as much independence as possible from the administrative systems.

Operational systems see administrative systems as defined by power rather than service. Administrative systems perceive operational systems as “subordinate” to their superior authoritative definitions. The superior and the subordinated govern the approach of each to the other. The concept of management service is limited to non-existent or present only in the context of managerial or administrative benefit.

The Corporation is its Shareholders

Shareholders value has become the biblical truth handed down to us from our mentors in economics, financial management, accounting and allied disciplines. It has become a “common sense” reality: the investors are owners and that real wealth is capital (Bartlett and Ghoshal, 1995). Therefore, it is the function of decision making to maximize this capital wealth of the shareholder. Therefore, we understand clearly that capital, technology, equipment and buildings are critical wealth sources and “owned” by investors. In the dynamics of a mass production world, value was clearly present in these “productive” assets of the company. Labor was and is considered to be a cost or liability (in accounting terms). A lay-off (downsizing) of 50,000 people translates into lower costs and decreased liability, which also translates into increased savings (for shareholders) and an improved bottom line. What has been omitted in this equation is the measurement of what those 50,000 people have been contributing to the corporation. Namely, one side of the ledger has been measured; the other side has been omitted as not important. We label the end result an efficient reorganization (lean and mean). Capital is put in the asset class - labor is put in the cost class. Therefore, the simple truism “lower the costs and increase the assets” seems like a logical conclusion. However, has the organization lost assets or growth potential? This is not measured. This question would not be an important question if we were functioning in the mass production age of Weber and Fayol. Work was production, simple and physical. However, in an age of information, knowledge, services and expertise, “labor” becomes more complex in meaning and less physical in output (Blackler, 1993). However, the principles of downsizing are the application of the old mass production principles of “labor” and “its meaning”.

A production worker in mass production served the technology, which required of the worker servility and obedience to provide output. An information worker uses the technology in the application of personal expertise to provide output. In the first case the technology produces the output - in the second case the person produces the output, using the technology as an instrument. In the first case the technology is the productive base of wealth creation, in the second case technology is the instrument used by the wealth creator - the person. The presence of costly high technology in an emergency room or an intensive care unit does not produce more products but information to be used by the experts (doctors and nurses), who deliver the services. (Perhaps, in understanding this we will understand the problems of measuring productivity in a service environment - higher costs without increases in measurable productivity).

We return to “shareholder wealth” and the definition of “capital” (Ellsworth, 1985). In traditional thinking money and technology (translated into equipment) are assumed to be capital. In modern organizations “capital” is also knowledge and expertise or intellectual assets. Shareholder wealth grows not because of the technology and traditional capital but because of skill, expertise and knowledge. Namely, modern wealth creation requires a partnership between traditional capital and modern labor. Immediately, we are put into discontinuity. The shareholder owns traditional “capital” - but people own “modern productive capital”. The pharmaceutical industry, the computer industry, the education industry, the telecommunications industry, the systems development industry, or the research industry understands that “capital” is different today than it was yesterday. Namely, we are beginning to understand the modern meaning of “capital” similar to the successful monopoly player. The neophyte

thinks that capital is money - the experienced know that monopoly success is not determined by how much money one has (initially) but how many properties or improvements you make on the property. In the modern environment productive wealth is determined not by the capital alone but by the expertise. When this is understood then the corporation is more than its shareholders - it becomes the labor (which creates wealth), working in cooperation with its capital investors to increase the value of their investments. If the meaning of the corporation is limited to its quarterly earnings for shareholders then the behavior of a former Scott Chief Executive becomes ultimately rational and reasonable. Wealth is capital. Therefore, buy it from others, lay off, sell off, merge and downsize. However, what is happening to the modern creators of wealth within the corporation? An issue of no great significance in an environment of short-term and impatient capital. The strip mining of yesterday has become the corporation of today. The moves are determined by the capital markets of investors and the issue of sustainable prosperity is not faced. Present value determines meaning rather than its sustainability (Lazowick and O'Sullivan, 1997).

The Corporate Executive

There are those who criticize the high salaries of corporate executives. The basis of this criticism is that they do not deserve these salaries. However, if we start with the given (and accepted) premise of "capital" - namely money and shareholder investment - and the function of the corporate executive to maximize shareholder wealth, in an impatient capital market structure, the corporate executive deserves whatever the market will bear? The corporate executive does not function to create a great company, provide customer satisfaction, please employees, satisfy communities, act to generate respect for the corporation amongst its publics. The corporate executive functions to maximize shareholder profits. This is what is taught in MBA programs, economics, and financial management and implicitly in accounting. Therefore, if shareholders benefit should not the corporate executive benefit? The issues are not whether the corporation produces the best product, has positive employee relations, respects the environment of the corporation's activities, pleases the customer "in the long term" (advertising in the short term may bring the customer along), provides philanthropy, etc. The issue is the shareholder - all else is secondary. The organization is its capital and the people who provide it (deVries, 1996). The issue is not the product, its people or its product success or failure. A former great company, Harcourt-Brace-Jovanovich was destroyed by its shareholders in their short-term demands - the capital market. Its CEO, Jovanovich, was a failure despite the fact that he (and his people) had created one of the most successful and profitable publishing-theme park-insurance companies in the United States. However, in order to respond to "the shareholder" it was necessary to permit the capital markets to tear apart the company for short-term high profit returns.

The discontinuity of the modern environment of management and organizations is the definition of "productive capital". Is it a thing or is it people? Or is it both joined together in a partnership? If it is a thing - equipment and money, then the corporate executive not only deserves every dollar he/she makes, but probably more. If it is people, then he/she may be too highly paid since the productivity and success is also related to the expertise and competence of the organization's people who should share in the wealth produced. If it is a partnership then shareholders-executives-the organization's people

should share in the wealth creation in a balanced framework of the contribution of both capital (the thing) and skills (the value added).

The traditional definition of the shareholder concept and its meaning is challenged by a broader concept of capital and its meaning. It is assumed that higher salaries for labor (sharing in capital wealth) promote inflation. However, there is also another relationship, which must be dealt with: higher wages and the acceptance of lower profits and returns would limit the need for higher prices. The premise of this different meaning lies in the “contribution” base of value added wealth. Perhaps it is time to re-visit Adam Smith and David Ricardo’s labor theory of value in the context of an information environment of work.

The information organization raises the significant issue of wealth and capital. The abstract answer of the market wage does not answer the question since the imperfect marketplace is subject to the definitions arising from the presence of differential power. Present day examples relate to the low differential wages of scientists, engineers, researchers, teachers, etc. in countries throughout the global market (even Adam Smith recognized the differential power present between owners and employees).

Perhaps the most logical and incorrect inferences of technology as the prime mover of wealth creation was taken by General Motors when it assumed that modern and advanced technology would create automotive leadership. Therefore, the investment in state of the art technology would create and maintain economic leadership in the automotive industry. The most advanced technology would lead to industrial leadership.

It was an example of the traditional definition of “capital” as the creator of wealth. However, modern technology is a “means” to an end - not an end unto itself. In traditional mass production industry G.M. would have been correct - in assuming that the technology created the wealth and people were mere accidents in the process. However, this technology required skilled and trained personnel in order to work. G.M. did not have these people. Capital as a thing was therefore unable to create wealth. It needed competence and skill. This, G.M. did not have. Therefore, its technology was worthless. Inventions have value only when implementation can transform great ideas into functional realities.

The great idea is useless in an environment of unprepared implementers. However, this is the traditional approach to definition in an environment where “things” such as technology define reality, separated from the meaning of people and skills. “Capital” creates wealth remains the stumbling block of American management.

Entrepreneurial Innovation & Discontinuity of Meaning

At a recent international technology conference a seminar was conducted comparing Japanese and US innovativeness. The general consensus of the participants (all Americans) was that the US was more oriented to creativity and entrepreneurialism because of its “individualistic” environment than the Japanese who tended to be more “collectivist” in orientation. Entrepreneurial behavior amongst the

panelists was defined in terms of “individual entrepreneurialism”. However, this tends to be more of an ideological bias. By any standard of innovation, discovery and economic progress, the success of Japan in terms of patents, leadership in both high and low technology areas must be accounted for. Namely, discovery, innovativeness and implementation success in competitive markets represent strengths which lie in the creativeness and progress of groups (as well as individuals) (Nonaka, 1997). In modern environments the reality of success in the creation of wealth and progress is becoming less the outcome of individuals and more the outcome of groups working together - pharmaceuticals, chemicals, computers, electronics, technology of all types, capital equipment, machine tools, precision instruments, work design, work implementation, and general innovation. The reality is that “entrepreneurial behavior” which creates large wealth bases in modern societies is more the outcome of groups (teams, collectivities) than it is of individuals (DeDoussis, 1995). There have always been those more special individuals like Bill Gates, Steve Jobs, Michael Milken, Andrew Carnegie, Henry Ford. However, the generalization of the individual entrepreneur as the creator of high wealth is not supportable beyond the anecdotal. A story or an individual is not a valid basis for a generalized conclusion. Akio Morita conceptualized the “Walkman” while he was Chief Executive of Sony. The executive board turned the idea down. “It was not a workable idea.” However, the persistence of Morita brought him down into the different levels of the Sony Corporation to talk with the people who had the ability to translate an idea into a working reality - the micro-processing people, the engineers, the technicians, the marketers, the manufacturers. The idea was translated into a workable idea by highly competent technicians who could do for the idea of the Walkman what Akio Morita could not do (Sanderson and Uzumeri, 1995).

The reality is that “entrepreneurial behavior” which creates large wealth bases is more the outcome of groups than it is of individuals. A handful of geniuses “doth not the world make”. Progress, innovation, and discovery are more of a social than an individual reality - whether in ideas, money, innovation or meaning. The great wealth producers in modern environments of “innovation and discovery” are not individuals but teams (groups) of people working together not only to invent but also to translate and to implement. This is called “group entrepreneurialism”. Darwin did not create evolution, Smith did not create the free enterprise system, Marx did not create socialism, and Ford did not create the mass production system. Their genius was in synthesizing, “going beyond”, seeing applications and developing new meanings. In modern environments the name of the entrepreneur is a “symbol” for all of the people worked with to create the innovation. A complex drug for curing a disease will seldom be the result of a single mind - it will result from the endeavor of many. The Sony Walkman was an idea of Akiu Morita - its implementation was the result of the expertise of its engineers, technicians, and marketers.

The American mind conceptualizes meaning in individuals (an ideology). The Japanese mind conceptualizes meaning in groups (an ideology). To speak of individual entrepreneurialism or group entrepreneurialism requires an understanding of the assumptions for each definition. However, what is clear in the modern environment where information is critical, the growth event or the discovery event will come from many, with few exceptions. The Japanese and the European understand this. The American mind is embedded in the concept of the super-hero, the search for the singular star or performer and the inability to understand the role of the cast in the creation of something new and better (Basadur, 1992).

As information demands are understood and large projects are pursued interacting skills and talents become the difference between success and failure. There is no need for a high performance team in an environment of simple work - the need is only for hard working individuals. This problem of the complex and the simple becomes the problem of discontinuity between the traditional definition of the meaning of work and the modern definition of work. A creative idea is not worth a subway token without the ability to translate and implement the idea.

The recent-past when we talked about, wrote about, and consulted about quality and dismissed it because in reality, we didn't understand it, informs us clearly that we find it impossible to shed our past. Quality is not the individual but the integration of well-trained people working together in a unified organizational unit and across units to produce excellence. However, if excellence is individually defined - the unit becomes accidental and secondary. The old factory still exists in the modern work context. We still measure the work of individuals. The innate contradictions between a forced-choice performance appraisal system and a quality-high performance environment are unnoticed. The ideology of the individual persists when the demands are for strong working teams (groups) of people who are integrated in unit output. The discontinuity of the demands of modern work and task environments with the traditions of individual job environments dooms the serious meaning of quality, re-engineering of the recent past and management by objectives, participative management, gainsharing of the long past. It is difficult to learn new meanings when mentally we are still bound to the old factory and the individual work output mentality. How many investment bankers, lawyers, accountants, consulting firms, and financial managers does it take to do a merger? Is it unreasonable to assume that the dynamic working teams are less necessary for doing information-knowledge work within the environment of the organization? Buying something new seems to have significantly more appeal than developing and using what is old (namely, the existing company and its resources).

The Present Discontinuity: Between Capital and Labor

The system of organization and management has come to us from the past. It functionally was based on the technical organization of work, requiring a technology that produces and the simple physical work of people responding to the technological definition of that work - the mass production of products. The conversion of a technical system, requiring obedience of workers to the machines, was extended to administrative obedience and centralized decision making. Information and expertise were controlled by the technology and the management of the organization's system.

The present discontinuity radically shifts the productive base of the organization into a socio-technical system in which the technology becomes the information-intensive instruments requiring knowledge and expertise of the "users" to produce output. Namely, as was noted, the technology in this information environment does not produce the output but requires high level competence on the part of the "user" to translate the information into real output. The computer is symbolic of the change from the technical to the socio-technical system. It is not a producer of wealth but an instrument which people use to create wealth or output. The proportionate contributions of services to a nation's gross product and employment in industrialized societies of services relative to manufacturing have changed

drastically. Likewise, the problems of measuring productivity become more difficult as technology ceases to be the main producer of wealth and becomes the instrument that people use to create wealth.

The present discontinuity arises with the shift from a technical to a socio-technical system. Previously, (in the mass production era), capital created wealth with the accidental or subordinate role played by people. Currently, capital (money and technology) enables information people to “use” technology and their expertise to produce value. A computer in a brokerage house produces no value. It is dependent on the expertise of the broker to interpret and rearrange the information for the production of wealth and value.

The functions and role of management become more ambiguous in an information environment in which productive information is controlled within the operational units, which depend on the skill and the expertise of the people “doing the tasks”. Power lies in the expertise rather than the position as opposed to the traditional “position” definitions of decision making.

The ability to re-define meaning becomes the imperative for redefining structure. Involved in this re-definition are drastic re-formulations of reality:

1. Value added is no longer a capital meaning
2. Shareholder primacy is questionable when wealth addition must be created by an integral partnership between capital and labor.
3. Management functions to balance the interests of both shareholders, employees, and customers.
4. Management works for both its shareholders and employees.
5. Structures and systems require re-design based on increasing corporate value as defined by training, development of internal competencies and organizational capabilities.

Each of these elements present us with discontinuities since they challenge existing thought, structure, as well as economic and financial definition. The paradox of the traditional role of management as the “agent” of investors is that it is incomplete and discounts modern productive wealth and value added. A capital market system, based on impatient capital, limits the ability of corporate decision making in the pursuit of creating the value-added component of the organization’s resources. Its bias is to extract value in the short term, squeeze out the efficiencies, and play out its scenario within the capital market system rather than the product and service market system. Its decision-making structures are bound in by a series of tactical planning horizons rather than strategic thinking. Everything is contingent on satisfying the capital market demands and its limited time frames.

The balance of meaning between capital value and labor value re-adjusts the significance of wealth creating factors of production. It redefines the roles and functions of management based on re-

adjusting value meaning. Strategy, structure and processes require redefinition based on a more comprehensive definition of value and wealth.

Conclusions

Innovation and change in technologies, skills, markets, finance and ideas are re-formulations of meaning and significance. They may destroy existing technologies, skills and meanings or they may develop and improve them in a progressive process of evolutionary change.

The organization - its structure, systems, and beliefs designed in one period may cease to be functional in another period. When this occurs previous competencies, skills and ideas are no longer relevant, e.g., steam engines to diesel, vacuum tubes to transistors, the Ptolemaic to the Copernican world, and most importantly, the changing ideology of meaning from one period to another.

Technological and ideological changes bring new meanings, many of which are totally divorced from previous meanings. A decision-maker in a world of simple and controllable reality must function differently in a complex and information filled world - too much information exists outside of his/her abilities for definitions. What productive power does a manager have in an environment of "information" filled work and workers when the use of power defines the role? Is the manager accountable to this knowledge and expertise?

The major discontinuity of the modern environment is the meaning of capital. Is it a thing - land, equipment, technology, or is it a "new" concept of value added beyond traditional capital? If the concept has changed, then Adam Smith, rather than Marshall and his marginality should become the center of meaning insofar as "intelligent" labor creates wealth in conjunction with traditional capital. Unless the re-conceptualization of capital can be integrated into the modern meaning of capital the thought of Drucker, Senge, Lawler, participative management, empowerment, total quality, teams and working groups will be peripheral contexts of meaning. The manufacturing and service economy of today differs from that of the mid-nineteen hundreds. Modern theory's applicability depends on the ability to understand that the efficiency and output of the 1900's will have a different meaning than that of the millennium. Success will be determined not by a physical output process but an intellectual, expertise and knowledge output - from the auto mechanic to the health care worker, from the computer scientist and programmer to the salesperson of television sets and women's clothing, from the university professor to the associate at Home Depot. The understanding of these realities is what Deeming was talking about when he spoke of quality, what Senge was discussing when he spoke of the knowledge organization, what Drucker was emphasizing when he talked about the new organization and what Lawler is talking about when he speaks of competencies and capabilities.

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