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KNOWLEDGE MANAGEMENT

Knowledge management refers to an organization's strategic efforts to gain a competitive advantage by capturing and using the intellectual assets held by its employees and customers. Efforts to archive best practices and lessons learned, and to make better use of information stored in databases, also fall under the rubric of knowledge management. Advocates of knowledge management believe that capturing, storing, and the distributing knowledge will help employees work smarter, reduce duplication, and ultimately produce more innovative products and services that meet the customers' needs and offer a good value.

If a company knows something (e.g., changing tastes of the customers, innovative solutions to international tax issues, or how to use information systems to better monitor production processes) that its competitors do not, then that company has an opportunity to offer a distinguishing product or service. Knowledge management, as a business practice, impacts the entire organization by helping employees, managers, and executives share information and best practices that positively impact collective performance. Unlike downsizing, which emphasizes the reduction and control of costs (often through attrition and layoffs), knowledge management is a value-adding practice that seeks to enhance profits, innovation, and decision making by providing more and better information to every member of the organization.

To better understand why knowledge has become a critical factor in businesses, we need to understand that the United States and many other industrial countries are moving toward a knowledge economy. A knowledge economy is one where a majority of workers

spend their day applying know-how to the production of goods and delivery of services. In a knowledge economy, employees work to improve decision-making, design, and delivery processes, while only a limited number of people are involved with the actual manufacturing of goods. Important questions that we might ask about a knowledge economy include:

- How many people now spend their day applying knowledge?
- How did the change to a knowledge economy come about?
- How do organizations go about managing knowledge?

American labor trends indicate that the percentage of people working in an information-intensive capacity is increasing while the number of people working in agriculture, manufacturing, nonprofessional service industries is decreasing.

As another indicator of the shift, during the second half of the twentieth century, knowledge-intensive companies (those that have 40 percent or more knowledge workers) account for 28 percent of the total U.S. employment and produced 43 percent of all new employment growth.

The rapid increase in knowledge-intensive work is often attributed to communication technologies, and especially digital technologies, that allow employees to transfer or access large amounts of data in minutes. Since the end of World War II, the world has seen the invention of the first programmable computer, satellite technology, fax machines, microprocessors, floppy disks, portable computers, cellular telephones and pagers, and the World Wide Web. All of these technologies are historically important because they allow great quantities of information to be shared with partners who are geographically

separated from us and who, using earlier technologies, might have had to wait hours, days, or even weeks to receive information. Technology has, in effect, brought people closer together by allowing voice, text, and images to be rapidly transmitted across great distances.

In 1969, the Department of Defense launched the Advanced Research Project Agency, which created a distributed network (precursor to the Internet) that allowed researchers to share information and connect with other computers on the network. Later, researchers added e-mail bulletin boards to the system so that messages could be transmitted back and forth. This broad digital network took information sharing to an entirely new level. Whereas a fax machine might be able to transfer 2,000 words from New York to Los Angeles in a matter of minutes, this new digital network—today represented by the World Wide Web—allows information to be transmitted at the speed of light. Current statistics indicate that an ever-increasing number of people are using the Web to communicate and gather information. In 1983, there were an estimated 2,000 people using the Arpanet. In 1990, the count increased to just over 1 million users. By 2005, it was estimated that more than 900 million people worldwide would be using the Internet that year to gather and transmit information, and this figure was expected to more than double within five years. The consequence of all this growth is that decision makers now have almost instant access to large quantities of data that can be used to improve decision-making, strategic planning, and product design, and customer service.

Recognizing that knowledge systems are usually based on local area network (LAN) or Internet technology, several critical questions arise when an organization attempts to implement a knowledge management system. First, how do you measure the value of a knowledge management system? Like soft-skills training, many organizations and experts are struggling to measure the value added by a knowledge management system. For example, the value of new technology in a manufacturing plant can be measured with relative accuracy and be said to decrease production costs by a certain amount per unit. Knowledge management systems, however, commonly do not have such a direct impact on operations. How can we accurately measure value of having immediate access to information that improves decision-making or strategy?

Another problem is, how do you create an organizational culture that values sharing? The old adage “Information is power” exemplifies the cultural reasons why knowledge management systems can be challenging to implement. Traditionally in the United States, employees have been recognized and rewarded for individual effort and achievement. Collaborative effort and cooperation have not traditionally been rewarded. Consequently, implementing a knowledge management system may likely require that an organization reassess the values by which business is con-

ducted, the performance evaluation instruments, and the pay/bonus structures so that employees see ample incentive to share knowledge and cooperate throughout the organization.

How much information is too much? Information overload is a concern in organizations that are developing a knowledge management system. What information do we attempt to capture and make available? What information do we overlook? In large organizations, the answers to such questions can have a dramatic impact on the quantity and quality of information available to employees.

Finally, can knowledge really be captured? Knowledge managers assume that knowledge can be captured, replicated, and made useful for other members of an organization. Much knowledge, however, is tacit. It is unexpressed. For example, how do we capture the knowledge that an operations manager develops after years of working in manufacturing plants? How do we capture the sense of history, the habitual patterns of thinking, or the principles for good decision making that have proven effective over the years? If explicit knowledge is framed by tacit knowledge, how do we capture and share both forms of knowledge so that the user of the knowledge management system does not feel like the recipient of baseless or de-contextualized facts and figures?

SEE ALSO: Electronic Commerce; Electronic Data Interchange and Electronic Funds Transfer

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FURTHER READING:

Harvard Business Review on Knowledge Management. Boston: Harvard Business School Press, 1998.

Huotari, M.L., and M. Iivonen. *Trust in Knowledge Management and Systems in Organizations*. Hershey, PA: Idea Group Publishing, 2003.

Malhotra, Y. “Integrating Knowledge Management Technologies in Organizational Business Processes: Getting Real Time Enterprises to Deliver Real Business Performance.” *Journal of Knowledge Management* 9, no. 1 (2005): 7–28.

Stewart, Thomas A. *Intellectual Capital: The New Wealth of Organizations*. New York: Doubleday/Currency, 1997.

Vouros, G.A. “Technological Issues Towards Knowledge-Powered Organizations.” *Journal of Knowledge Management* 7, no. 2 (2003): 114–127.

KNOWLEDGE WORKERS

Knowledge workers, alternatively termed knowledge entrepreneurs, free agents, or human capital, constitute the fastest growing sector of the workforce in the world. Peter Drucker, the eminent management

writer credited with coining the term knowledge worker, defines these individuals as “high level employees who apply theoretical and analytical knowledge, acquired through formal education, to develop new products or services”. Knowledge workers are those who acquire, manipulate, interpret, and apply information in order to perform multidisciplinary, complex and unpredictable work. They analyze information and apply expertise in a variety of areas to solve problems, generate ideas, or create new products and services.

Examples of knowledge workers include professionals, scientists, educators, and information system designers. Knowledge work is characterized by the use of information, by unique work situations, and by creativity and autonomy. Knowledge workers make decisions rather than physical items and work with ideas rather than with objects. Their work focuses on mental rather than muscle power and is characterized by non-repetitive tasks. Knowledge workers use different methods and techniques to solve problems and have the authority to decide what work methods to use in order to complete their varying job tasks.

CATEGORIZATION OF KNOWLEDGE WORKERS

Knowledge workers can be grouped into various categories, based on the amount of time spent on individual tasks or on the type of information or skills possessed. The fact that knowledge workers can be classified in different ways is indicative of the variety of jobs they hold.

Knowledge workers can be categorized according to the amount of time engaged in routine versus innovative behaviors. On one end of the scale, workers perform tasks that are primarily repetitive and routine in nature but occasionally use complex information to make independent decisions, often with regard to customer service issues. Employees at the spectrum’s opposite end spend most of their time accessing information and making independent decisions with regard to that information.

A second way to categorize those whose work focuses on information and ideas is as follows: specialty knowledge workers, portable knowledge workers, and creation of knowledge workers. Specialty knowledge workers possess a significant amount of knowledge related to a specific company’s products or services. These individuals can be thought of as housing vital corporate assets in their heads. Portable knowledge workers possess information of wide and immediate utility. They are familiar with knowledge that is in demand by a variety of organizations. Software programmers, librarians, and persons with business degrees are examples of portable knowledge workers. Creation of knowledge workers focuses the

majority of their efforts on innovative behaviors, such as product design and development. Examples of creation of knowledge workers include scientists and information systems designers.

KNOWLEDGE WORKER CHARACTERISTICS

Knowledge work is complex, and those who perform it require certain skills and abilities as well as familiarity with actual and theoretical knowledge. These persons must be able to find, access, recall, and apply information, interact well with others, and possess the ability and motivation to acquire and improve these skills. While the importance of one or more of these characteristics may vary from one job to the next, all knowledge workers need these basic qualifications. More jobs now require college degrees than ever before and a shortage of knowledge workers is imminent. Another future concern is the retirement of experienced plant managers, research scientists, and other knowledge workers that will lead to reduced capacity to innovate and pursue growth strategies as well as increase costly operational errors and decrease efficiency in the management of resources and productivity.

POSSESSING FACTUAL AND THEORETICAL KNOWLEDGE

Knowledge workers are conversant with specific factual and theoretical information. Schoolteachers possess information regarding specialized subject matter, teaching strategies, and learning theories. The sales representative commands factual knowledge concerning the product he or she sells and theoretical knowledge about how to interest customers in that product. Prospective knowledge workers may need years of formal education to master the information needed to enter a particular field of work. Because knowledge is always being created, this type of employee will be acquiring additional information on a continual basis.

FINDING AND ACCESSING INFORMATION. At a time when the operations of today’s information society depends on knowledge that is continually growing and changing, distribution of information within organizations has become problematic due to the massive amount of information with which employees need to be familiar. Knowledge workers must therefore know how to independently identify and find such material. Such employees need to know which sources provide the information they need and how to use these sources in order to locate information successfully.

ABILITY TO APPLY INFORMATION. Knowledge workers use information to answer questions, solve problems, complete writing assignments, and generate ideas. Use of analogical reasoning and relevance judgment enables employees to address successfully personal and

customer service-related issues. Analogical reasoning is a knowledge-based problem-solving process in which persons apply information from precedents to new situations. Relevance judgment is the process by which individuals decide whether or not a precedent is applicable to the problem at hand. The non-repetitive nature of knowledge workers' jobs makes crucial the ability to apply information to new situations.

COMMUNICATION SKILLS. Knowledge work is characterized by close contact with customers, supervisors, subordinates, and team mates. Successful knowledge workers present clearly, in spoken and written word, both factual and theoretical information. These employees listen with understanding and ask for clarification when they do not understand what is being said to them.

Knowledge workers must be able to speak, read, write, and listen in one-on-one and group settings. Emphasis on quality customer service and customization of goods and services to meet individual customer needs and wants brings knowledge workers into close contact with customers. The goals of organizational effectiveness and continual improvement of products, together with the need to continually consider new information in order to accomplish work, require communication between supervisor and supervised and among team mates or colleagues. Knowledge workers possess communications skills that enable them to collaborate with one another for goal-setting, decision-making, and idea generating purposes.

MOTIVATION. The nature of knowledge work requires continual growth, in terms of mastery of information and skill development, on the part of those who do this type of work. Knowledge workers must become and remain interested in finding information, memorizing that information, and applying it to their work. Because new technological developments call on knowledge workers to change continuously the way they accomplish their work, these individuals must maintain a desire to apply their talents toward incorporating new information and new technologies into their work.

INTELLECTUAL CAPABILITIES. Knowledge workers must have the intellectual capabilities to acquire the skills discussed above. Such intellectual capacities include those concerned with the understanding, recall, processing and application of specialized information. Persons who perform knowledge work must possess the abilities needed to acquire appropriate communication skills and to learn how to figure out where and how information can be located. Knowledge workers are able to learn how to read and write at post-secondary levels and to perform abstract reasoning. They also have the intellectual capacity to understand

the value of acquiring and maintaining the knowledge and skills needed to accomplish their work.

HISTORICAL BACKGROUND

Some occupations have always centered on the use of specialized information. Only recently, however, have persons employed in these types of occupations begun to outnumber those employed in jobs that do not require intensive use of specialized knowledge. In the late 1950s and early 1960s, writers such as Fritz Machlup and Peter Drucker first identified and described the reasons behind this phenomenon. Today the increase in knowledge work professions concerns business administrators, professors, management consultants and others interested in learning how to increase business profits or improve life's quality.

Recently, the number of persons employed in traditional types of knowledge work professions has escalated while new types of knowledge work have appeared. Throughout history, people such as writers, teachers, and ministers, for example, have engaged themselves in intellectual activity. Their numbers grew as the population of Europeans in North America increased in the 1700s and early 1800s. Industrialization then fostered the creation of new categories of employees who used information to make their livings: inventors, consultants, and managers. As the population continued to grow, so did the economy, which became able to support greater numbers of knowledge workers.

In the 1950s, computer science and other knowledge based professions rapidly expanded. Economist Fritz Machlup examined the distribution, use, and creation of information in the United States. He used statistical information to show that manual workers' share of the labour force was decreasing while the white-collar share was increasing. He tried to differentiate among various types of knowledge workers. Machlup showed that knowledge-producing occupations were growing much faster than manual labour occupations, and he redefined the word "work" in terms of a way to manage and use knowledge.

Peter Drucker wrote extensively on the subject of the knowledge worker. Drucker identified and described the reasons for the decline of the blue collar worker and the rise of the knowledge worker, and he made what are now considered accurate predictions about the knowledge worker's future place in society. He described how knowledge-based positions evolved from manufacturing and agricultural jobs as automation changed the way these jobs were accomplished. Drucker argued that service sector activities had increased, expanded, and diversified, causing the number of knowledge workers to grow. He explained how emphasis on and developments in science and technology fostered the creation of new knowledge

professions while an expanding economy enabled their growth.

Information continues to influence work and alter the way it is accomplished. Technology makes possible computerized databases to manage and access such information. In turn, the introduction of new technologies creates jobs for those who design, manage, and utilize these technologies. Organizational expansion, brought on by the use of new knowledge, also creates this type of work, as employees turn their attention toward coordinating additional work. Information's importance in the workplace continues to make crucial its accessibility.

KNOWLEDGE WORKER SHORTAGE

The information society requires a highly qualified workforce. As compared to the past, a larger proportion of the population should attend college and participate in formal training programs designed to teach specialized information and specific skills associated with knowledge work. The fact that traditional blue-collar workers cannot acquire easily the knowledge and skills needed to become knowledge workers will create a shortage of these types of workers. Although colleges and universities may adapt their curriculum's to prepare students for various types of knowledge work, it is unlikely that significantly greater percentages of the population will attend college. The American Society for Training and Development maintains that, while nine-tenths of all new jobs now require post-secondary levels of reading, writing, and math, only half of those entering the workforce for the first time have attained these skills. When the traditional blue-collar worker cannot make the transition to knowledge work, society will face problems caused by both unemployment and understaffing.

HIRING AND RETAINING THE KNOWLEDGE WORKER

The shortage of knowledge workers makes employers concerned with attracting and retaining these employees. In order to hire and retain knowledge workers, employers may offer higher salaries, attractive work environments, and continuing educational opportunities. Employers take actions designed to attract and retain knowledge workers by creating a free-agent community, respecting knowledge workers as new bosses, and providing growth opportunities. In a free-agent community, employees have the freedom to choose their work methods and work in the environments in which they function best. Treating knowledge workers as the new bosses means that management operates as a facilitator rather than as a controller of work. This gives knowledge workers the autonomy they need to complete their work as they see fit. Employers

make work attractive and rewarding by providing growth opportunities, such as those that are associated with ongoing training and development, special assignments, and rotation of jobs and job responsibilities. In such ways, employers attempt to address the knowledge worker shortage.

IMPROVING KNOWLEDGE WORKER PRODUCTIVITY

Knowledge worker productivity influences success in today's competitive work economy, and businesses are focusing on increasing this productivity. Management facilitates the knowledge worker's job performance by providing access to relevant information; environments that promote this information's desired use, continuing educational opportunities, and a balance between guidance and autonomy.

Employers use costly technologies to facilitate access to and manipulation of information. The term information technology refers to computer equipment and programs used to access, process, store, and disseminate information. Examples of information technologies include word processing, spreadsheet, and electronic mail programs, and a variety of other software programs designed to process information in specific ways. Information technologies are designed to reduce the amount of time employees spend on information access, management and manipulation and to increase the accuracy of these processes. Information technology is important because it helps make information accessible and manageable in a time when accessibility and manipulation of information are crucial to the world economy.

THE WORKPLACE

The characteristics of each individual knowledge worker's workplace depend on the type of work accomplished and what the employer is willing and able to provide. Workplace arrangements range from traditional physical office space occupied by employees between the hours of 9:00 A.M. to 5:00 P.M. each workday to virtual office space which can exist just about anywhere.

The traditional clerk or manual labourer's workspace may remain basically the same as it was in the past, altered slightly in order to bring employees into closer contact with one another and with their customers or to permit the introduction of new equipment. This being the physical aspects of this type of workplace center on the completion of repetitive tasks and job duties.

Knowledge workers who work exclusively with ideas and information may operate in a non-traditional workplace situated anywhere that employees have

access to needed computer and communication equipment. Individuals who work in such “virtual offices” may utilize physical office space as necessary or use “hoteling” to visit customers. Hoteling is a process by which those who work out of virtual offices schedule physical office space for meetings with colleagues, customers, clients, and sales representatives. Writers, researchers, outside sales representatives, and product designers are examples of knowledge workers who might utilize non-traditional workspaces.

CHALLENGES AND OPPORTUNITIES

The increasing demand for employees who use their skills and talents to perform complex and non-repetitive work presents both challenges and opportunities. The challenges include attainment and maintenance of a well educated, highly skilled, and efficient workforce. Opportunities include chances for greater numbers of working age people to hold more rewarding jobs than previously possible and for employees to be judged according to their unique talents and abilities rather with regard to how quickly they complete repetitious tasks or how well they conform to pre-established work standards.

Education of a properly skilled workforce will take special effort. Society will need to convince its members to pursue educational and training opportunities that will qualify them for knowledge work. Businesses and educational institutions may work together to determine exactly what skills and knowledge students need to enter the workforce and how to educate students accordingly. Educators and employers will need to ensure that those who need to know how to use certain technologies are able to do so and will not become disconnected because they are unable to use advanced computer programs or telecommunications equipment. While potential knowledge workers will require familiarity with specialized information related to the type of work they plan to undertake, it will be important that their educational backgrounds give them a common basis for understanding one another.

Hiring, retention, and productivity of knowledge workers will remain important issues. As the shortage of persons qualified to perform knowledge work increases, employers will be challenged to find more effective ways to hire and retain these individuals. In order to improve productivity, employers will try to figure out how to promote teamwork among knowledge workers, how to best design the workplace, and how to keep knowledge workers from becoming overwhelmed with the information they need to do their jobs.

The use of information technology to manage and manipulate information presents a series of challenges. Employees will need to find ways to fund these technologies and to provide training on their use. In order to maximize the value of information technologies,

employers will want to determine how and when information technologies increase knowledge worker productivity and performance, how to best match a particular technology with a specific job, and how computer programs can be best used to locate, process, and create information. Employers will also need to know how to evaluate employee use of information technologies and how to cope with underutilization of and resistance to these technologies. With this user-oriented infrastructure, mission critical business news, financial and research data is now available upon demand to the user’s desktop. In fact, the availability of critical information via the web has created a new breed of telecommuting knowledge workers with anytime/anyplace capabilities.

The shift from blue-collar jobs to knowledge work presents new opportunities. Greater numbers of people will be able to hold jobs that enable them to develop their talents and use their creativity. These new knowledge workers will have greater job mobility. Employers will respect them as individuals who bring unique talents and abilities to their jobs as opposed to workers who perform repetitious tasks. Leadership opportunities will be open to increasingly greater numbers of people.

The twenty-first century has brought a new challenge in the form of outsourcing knowledge workers in several sectors of the economy. Business process outsourcing services are now flowing to countries such as India, the Philippines, Russia and China. Consultant A.T. Kearney predicts that analysis and research, regulatory reporting, human resources, and accounting will be the next generation of financial industry jobs migrating overseas. Concern about high costs and poor quality resulting from cultural and communication issues due to outsourcing, has been expressed. Under utilization and cost demands of business worldwide are influencing the changes in knowledge worker skills, requirements, and work location. Identifying and utilizing the knowledge worker in an effective and cost efficient manner is a challenge for business and for the economy today.

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FURTHER READING:

Cortada, James W., ed. *Rise of the Knowledge Worker*. Boston: Butterworth-Heinemann, 1998.

Donlan, Thomas G. “Catch a Tiger by the Tail.” *Barron’s*, 14 February 2005. Available from <http://proquest.umi.com>

Drucker, Peter F. *Managing in a Time of Great Change*. New York: Truman Talley Books/Dutton, 1995.

“Knowledge-Worker Productivity: The Biggest Challenge.” *California Management Review* 41, no. 2 (1999): 41–57.

Goldsmith, Marshall. "Retain Your Top Performers." *Executive Excellence* 14, no. 11 (1997): 10–11.

Gordon, Edward E. "The New Knowledge Worker." *Adult Learning* 8, no. 4 (1997): 14–18.

Gould, Susan B., and Barbara R. Levin. "Building a Free Agent Community." *Compensation and Benefit Management* 14, no. 3 (1998): 24–30.

"High Cost of Lost Knowledge." *IIE Solutions* (June 2002).

Krebsbach, Karen. "Outsourcing: Fighting a Giant Sucking Sound: Banks Face Backlash on IT Job Exports Overseas." *Bank Technology News* (August 2003). Available from <http://infotrac.galegroup.com>

Munk, Nina. "The New Organization Man." *Fortune*, 137, no. 5 (1998): 34–41.

Price, Steven M. "Facilities Planning: A Perspective for the Information Age." *IIE Solutions* 29, no. 8 (1997): 20–23.

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LAYOUT

In manufacturing, facility layout consists of configuring the plant site with lines, buildings, major facilities, work areas, aisles, and other pertinent features such as department boundaries. While facility layout for services may be similar to that for manufacturing, it also may be somewhat different—as is the case with offices, retailers, and warehouses. Because of its relative permanence, facility layout probably is one of the most crucial elements affecting efficiency. An efficient layout can reduce unnecessary material handling, help to keep costs low, and maintain product flow through the facility.

Firms in the upper left-hand corner of the product-process matrix have a process structure known as a jumbled flow or a disconnected or intermittent line flow. Upper-left firms generally have a process layout. Firms in the lower right-hand corner of the product-process matrix can have a line or continuous flow. Firms in the lower-right part of the matrix generally have a product layout. Other types of layouts include fixed-position, combination, cellular, and certain types of service layouts.

PROCESS LAYOUT

Process layouts are found primarily in job shops, or firms that produce customized, low-volume products that may require different processing requirements and sequences of operations. Process layouts are facility configurations in which operations of a similar nature or function are grouped together. As such, they occasionally are referred to as functional

layouts. Their purpose is to process goods or provide services that involve a variety of processing requirements. A manufacturing example would be a machine shop. A machine shop generally has separate departments where general-purpose machines are grouped together by function (e.g., milling, grinding, drilling, hydraulic presses, and lathes). Therefore, facilities that are configured according to individual functions or processes have a process layout. This type of layout gives the firm the flexibility needed to handle a variety of routes and process requirements. Services that utilize process layouts include hospitals, banks, auto repair, libraries, and universities.

Improving process layouts involves the minimization of transportation cost, distance, or time. To accomplish this some firms use what is known as a Muther grid, where subjective information is summarized on a grid displaying various combinations of department, work group, or machine pairs. Each combination (pair), represented by an intersection on the grid, is assigned a letter indicating the importance of the closeness of the two (A = absolutely necessary; E = very important; I = important; O = ordinary importance; U = unimportant; X = undesirable). Importance generally is based on the shared use of facilities, equipment, workers or records, work flow, communication requirements, or safety requirements. The departments and other elements are then assigned to clusters in order of importance.

Advantages of process layouts include:

- Flexibility. The firm has the ability to handle a variety of processing requirements.
- Cost. Sometimes, the general-purpose equipment utilized may be less costly to purchase and less costly and easier to maintain than specialized equipment.

- **Motivation.** Employees in this type of layout will probably be able to perform a variety of tasks on multiple machines, as opposed to the boredom of performing a repetitive task on an assembly line. A process layout also allows the employer to use some type of individual incentive system.
- **System protection.** Since there are multiple machines available, process layouts are not particularly vulnerable to equipment failures.

Disadvantages of process layouts include:

- **Utilization.** Equipment utilization rates in process layout are frequently very low, because machine usage is dependent upon a variety of output requirements.
- **Cost.** If batch processing is used, in-process inventory costs could be high. Lower volume means higher per-unit costs. More specialized attention is necessary for both products and customers. Setups are more frequent, hence higher setup costs. Material handling is slower and more inefficient. The span of supervision is small due to job complexities (routing, setups, etc.), so supervisory costs are higher. Additionally, in this type of layout accounting, inventory control, and purchasing usually are highly involved.
- **Confusion.** Constantly changing schedules and routings make juggling process requirements more difficult.

PRODUCT LAYOUT

Product layouts are found in flow shops (repetitive assembly and process or continuous flow industries). Flow shops produce high-volume, highly standardized products that require highly standardized, repetitive processes. In a product layout, resources are arranged sequentially, based on the routing of the products. In theory, this sequential layout allows the entire process to be laid out in a straight line, which at times may be totally dedicated to the production of only one product or product version. The flow of the line can then be subdivided so that labor and equipment are utilized smoothly throughout the operation.

Two types of lines are used in product layouts: paced and unpaced. Paced lines can use some sort of conveyor that moves output along at a continuous rate so that workers can perform operations on the product as it goes by. For longer operating times, the worker may have to walk alongside the work as it moves until he or she is finished and can walk back to the workstation to begin working on another part (this essentially is how automobile manufacturing works).

On an unpaced line, workers build up queues between workstations to allow a variable work pace. However, this type of line does not work well with large, bulky products because too much storage space may be required. Also, it is difficult to balance an extreme variety of output rates without significant idle time. A technique known as assembly-line balancing can be used to group the individual tasks performed into workstations so that there will be a reasonable balance of work among the workstations.

Product layout efficiency is often enhanced through the use of line balancing. Line balancing is the assignment of tasks to workstations in such a way that workstations have approximately equal time requirements. This minimizes the amount of time that some workstations are idle, due to waiting on parts from an upstream process or to avoid building up an inventory queue in front of a downstream process.

Advantages of product layouts include:

- **Output.** Product layouts can generate a large volume of products in a short time.
- **Cost.** Unit cost is low as a result of the high volume. Labor specialization results in reduced training time and cost. A wider span of supervision also reduces labor costs. Accounting, purchasing, and inventory control are routine. Because routing is fixed, less attention is required.
- **Utilization.** There is a high degree of labor and equipment utilization.

Disadvantages of product layouts include:

- **Motivation.** The system's inherent division of labor can result in dull, repetitive jobs that can prove to be quite stressful. Also, assembly-line layouts make it very hard to administer individual incentive plans.
- **Flexibility.** Product layouts are inflexible and cannot easily respond to required system changes—especially changes in product or process design.
- **System protection.** The system is at risk from equipment breakdown, absenteeism, and downtime due to preventive maintenance.

FIXED-POSITION LAYOUT

A fixed-position layout is appropriate for a product that is too large or too heavy to move. For example, battleships are not produced on an assembly line. For services, other reasons may dictate the fixed position (e.g., a hospital operating room where doctors, nurses, and medical equipment are brought to the patient). Other fixed-position layout examples include

construction (e.g., buildings, dams, and electric or nuclear power plants), shipbuilding, aircraft, aerospace, farming, drilling for oil, home repair, and automated car washes. In order to make this work, required resources must be portable so that they can be taken to the job for “on the spot” performance.

Due to the nature of the product, the user has little choice in the use of a fixed-position layout. Disadvantages include:

- **Space.** For many fixed-position layouts, the work area may be crowded so that little storage space is available. This also can cause material handling problems.
- **Administration.** Oftentimes, the administrative burden is higher for fixed-position layouts. The span of control can be narrow, and coordination difficult.

COMBINATION LAYOUTS

Many situations call for a mixture of the three main layout types. These mixtures are commonly called combination or hybrid layouts. For example, one firm may utilize a process layout for the majority of its process along with an assembly in one area. Alternatively, a firm may utilize a fixed-position layout for the assembly of its final product, but use assembly lines to produce the components and subassemblies that make up the final product (e.g., aircraft).

CELLULAR LAYOUT

Cellular manufacturing is a type of layout where machines are grouped according to the process requirements for a set of similar items (part families) that require similar processing. These groups are called cells. Therefore, a cellular layout is an equipment layout configured to support cellular manufacturing.

Processes are grouped into cells using a technique known as group technology (GT). Group technology involves identifying parts with similar design characteristics (size, shape, and function) and similar process characteristics (type of processing required, available machinery that performs this type of process, and processing sequence).

Workers in cellular layouts are cross-trained so that they can operate all the equipment within the cell and take responsibility for its output. Sometimes the cells feed into an assembly line that produces the final product. In some cases a cell is formed by dedicating certain equipment to the production of a family of parts without actually moving the equipment into a physical cell (these are called virtual or nominal cells). In this way, the firm avoids the burden of rearranging its current layout. However, physical cells are more common.

An automated version of cellular manufacturing is the flexible manufacturing system (FMS). With an FMS, a computer controls the transfer of parts to the various processes, enabling manufacturers to achieve some of the benefits of product layouts while maintaining the flexibility of small batch production.

Some of the advantages of cellular manufacturing include:

- **Cost.** Cellular manufacturing provides for faster processing time, less material handling, less work-in-process inventory, and reduced setup time, all of which reduce costs.
- **Flexibility.** Cellular manufacturing allows for the production of small batches, which provides some degree of increased flexibility. This aspect is greatly enhanced with FMSs.
- **Motivation.** Since workers are cross-trained to run every machine in the cell, boredom is less of a factor. Also, since workers are responsible for their cells’ output, more autonomy and job ownership is present.

OTHER LAYOUTS

In addition to the aforementioned layouts, there are others that are more appropriate for use in service organizations. These include warehouse/storage layouts, retail layouts, and office layouts.

With warehouse/storage layouts, order frequency is a key factor. Items that are ordered frequently should be placed close together near the entrance of the facility, while those ordered less frequently remain in the rear of the facility. Pareto analysis is an excellent method for determining which items to place near the entrance. Since 20 percent of the items typically represent 80 percent of the items ordered, it is not difficult to determine which 20 percent to place in the most convenient location. In this way, order picking is made more efficient.

While layout design is much simpler for small retail establishments (shoe repair, dry cleaner, etc.), retail stores, unlike manufacturers, must take into consideration the presence of customers and the accompanying opportunities to influence sales and customer attitudes. For example, supermarkets place dairy products near the rear of the store so that customers who run into the store for a quick gallon of milk must travel through other sections of the store. This increases the chance of the customer seeing an item of interest and making an impulse buy. Additionally, expensive items such as meat are often placed so that the customer will see them frequently (e.g., pass them at the end of each aisle). Retail chains are able to take advantage of standardized layouts, which give the customer more familiarity with the store when shopping in a new location.

Office layouts must be configured so that the physical transfer of information (paperwork) is optimized. Communication also can be enhanced through the use of low-rise partitions and glass walls.

A number of changes taking in place in manufacturing have had a direct effect on facility layout. One apparent manufacturing trend is to build smaller and more compact facilities with more automation and robotics. In these situations, machines need to be placed closer to each other in order to reduce material handling. Another trend is an increase in automated material handling systems, including automated storage and retrieval systems (AS/AR) and automated guided vehicles (AGVs). There also is movement toward the use of U-shaped lines, which allow workers, material handlers, and supervisors to see the entire line easily and travel efficiently between workstations. So that the view is not obstructed, fewer walls and partitions are incorporated into the layout. Finally, thanks to lean manufacturing and just-in-time production, less space is needed for inventory storage throughout the layout.

SEE ALSO: Lean Manufacturing and Just-in-Time Production; Product-Process Matrix

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FURTHER READING:

Finch, Byron J. *Operations Now: Profitability, Processes, Performance*. 2nd ed. Boston: McGraw-Hill/Irwin, 2006.

Stevenson, William J. *Operations Management*. 8th ed., Boston: McGraw-Hill/Irwin, 2005.

LEADERSHIP STYLES AND BASES OF POWER

Studies of leadership styles are diverse in nature and multiple definitions have been offered. However, leadership style can be defined broadly as the manner and approach of providing direction, implementing plans, and motivating people.

Bases of power refer to the methods that managers and leaders utilize to influence their employees. When examining bases of power, the concept of authority must also be considered. These two are interconnected attributes tied to the behavior of superiors over subordinates. In their article, "Are There No Limits To Authority?", David Knights and Darren McCabe explain that "power should be understood to be a condition of social relations. Thus, it is erroneous to ask who has power. Instead, it is necessary to explore how power is exercised."

In turn, the nature of how power is exercised is a workable definition for authority. In short, authority

and power are intertwined, with power being the ability to do things or have others do what one has ordered while authority is the foundation on which that power is built.

STYLES OF LEADERSHIP

Three different styles of leadership were identified by Kurt Lewin, renowned social scientist, in 1939: authoritarian, democratic, and laissez-faire. His results indicated that the democratic style is superior to the other two styles. Attributes of each style are outlined below

- The *authoritarian* makes all decisions, independent of member's input. The authority figure dictates direction, leaving members in the dark about future plans. The authority figure selects which members will work collaboratively and determines solely the work tasks for the teams. This leader type is very personal in his praise and criticisms of each member, but does not actively participate with the group, unless demonstrating to the group. The authority figure is friendly and/or impersonal, but not openly hostile.
- The *democratic* leader welcomes team input and facilitates group discussion and decision making. This leader type shares plans with the group and offers multiple options for group consideration. Encourages members to work freely with each other and leaves division of tasks to the group. This leader is objective in praise and criticism, and joins group activities without over-participating.
- The *laissez-faire* leader allows the group complete freedom for decision-making, without participating himself. This leader type provides materials and offers to assist only by request. The laissez-faire leader does not participate in work discussions or group tasks. This leader does not offer commentary on members' performance unless asked directly, and does not participate or intervene in activities.

Since 1939, Lewin's research has been the basis for many further research studies and articles on organizational behavioral in theory and in action. Each leadership style can be appropriate depending on the environment within which it is implemented, the members of the group (employees), and the goals or tasks that are being undertaken by the group. Leaders may adjust their style of leadership to fit certain tasks, groups, or settings.

An authoritarian leadership style can be effective when a situation calls for expedited action or decision-

making. Group members who are not self-motivated, who prefer structure, and appreciate significant direction and monitoring may thrive under this style.

A democratic leadership style allows for multiple viewpoints, inputs, and participation, while still maintaining control and the leadership role. A quality democratic leader recognizes each member's strengths and effectively elicits the best performance from each member, all the while guiding and leading effectively. A challenge for the democratic leader is to recognize that not all tasks need to be handled by the group; that the leader should appropriately address some issues alone.

A laissez-faire leadership style works best when group members are highly skilled and motivated, with a proven track record of excellence. This hands-off approach can allow these capable members to be productive and effective. The laissez-faire style is interpreted by the members as a sign of confidence and trust in their abilities and further empowers them to be successful and motivated.

BASES OF POWER

Five bases of power were identified by French and Raven in 1960, which laid the groundwork for most discussions of power and authority in the latter half of the twentieth century. These five types of power are coercive, legitimate, reward, referent, and expert. Power can be manifested through one or more of these bases.

COERCIVE POWER. Coercive power rests in the ability of a manager to force an employee to comply with an order through the threat of punishment. Coercive power typically leads to short-term compliance, but in the long-run produces dysfunctional behavior.

Coercion reduces employees' satisfaction with their jobs, leading to lack of commitment and general employee withdrawal. In the United States, Canada, and Western Europe, coercive power has seen a decline in the last 50 years. Several reasons contribute to this, ranging from the legal erosion of employment-at-will and the awareness of employee violence or other forms of retaliatory behavior.

Equally important as an effect on the receding popularity of coercion as a basis of power has been the influence of quality management theorists, such as Philip Crosby and W. Edwards Deming. They suggested that there is a decline in productivity and creativity when coercive power is employed. The use of coercive power results in an atmosphere of insecurity or fear. In spite of this insight, coercion as a base of power continues to play a role even in those organizations influenced by theories of quality management.

In times of economic crisis or threats to the survival of the organization at large, coercion may come

to the forefront. Coercive power may also materialize as organizations attempt to streamline their operations for maximum efficiency. If employees must be fired, those who fail to conform to the organizational goals for survival will be the most likely candidates for termination. The threat of termination for failure to comply, in turn, is coercive power.

LEGITIMATE POWER. Legitimate power rests in the belief among employees that their manager has the right to give orders based on his or her position. For example, at the scene of a crime, people usually comply with the orders of a uniformed police officer based simply on their shared belief that he or she has the predetermined authority to give such orders. In a corporate setting, employees comply with the orders of a manager who relies on legitimate power based on the position in the organizational hierarchy that the manager holds. Yet, although employees may comply based on legitimate power, they may not feel a sense of commitment or cooperation.

REWARD POWER. Reward power, as the name implies, rests on the ability of a manager to give some sort of reward to employees. These rewards can range from monetary compensation to improved work schedules. Reward power often does not need monetary or other tangible compensation to work when managers can convey various intangible benefits as rewards.

Huey describes Sam Walton, founder of Wal-Mart Stores, Inc., as an active user of reward power. Walton relies heavily on these intangible awards, indicating that "nothing else can quite substitute for a few well-chosen, well-timed, sincere words of praise. They are absolutely free-and worth a fortune".

When reward power is used in a flexible manner, it can prove to be a strong motivator, as Crosby, Deming, and others have shown. Still, when organizations rely too rigidly on rewards, the system can backfire. Employees may be tempted to unethically or even illegally meet the quotas to which overly rigid reward systems may be tied.

Another problem associated with rewards as a base for power is the possibility that the rewards will divert employees' attention from their jobs and focus their attention instead on the rewards dangled before them.

REFERENT POWER. Referent power derives from employees' respect for a manager and their desire to identify with or emulate him or her. In referent power, the manager leads by example. Referent power rests heavily on trust. It often influences employees who may not be particularly aware that they are modeling their behavior on that of the manager and using what they presume he or she would do in such a situation as a point of reference.

The concept of empowerment in large part rests on referent power. Referent power may take considerable time to develop and thus may not prove particularly effective in a workforce with a rapid turnover of personnel.

One common error in applying referent power in cross-cultural situations, however, comes in misunderstanding the ways in which employees identify with their superiors. Since identification with one's superior in the United States is hampered by symbols of legitimate power (for example, titles or dress), those who advocate its use encourage managers to dress down to the level of their employees and use terms such as "facilitator" and "coach" coupled with "associates" and "group members" rather than "boss" and "subordinates."

In societies such as Argentina or Mexico, symbols of legitimate power may not readily hamper identification, whereas American-style egalitarianism may diminish the respect employees feel for the manager. In short, U.S. employees are likely to identify with managers by personally liking them and feeling liked in return, whereas Argentine and Mexican employees are likely to identify with managers by respecting them and feeling respected in return. Thus, referent power may be more cross-culturally variable than the other four bases of power laid out by French and Raven.

Imberman describes how specialized training is now used in the grocery industry to train Latino immigrants in the democratic supervisory techniques of U.S. managers. In the past, when these men and women were promoted to supervisory positions, they tended to rely heavily on the Latino model of authoritarianism under which they were raised. The managerial style hindered their ability to effectively supervise employees or to garner the respect they were seeking. To remedy this situation, specialized training programs are now utilized. The end result is effective and confident supervisors, motivated workers, higher productivity, less waste, and better customer service.

EXPERT POWER. Expert power rests on the belief of employees that an individual has a particularly high level of knowledge or highly specialized skill set. Managers may be accorded authority based on the perception of their greater knowledge of the tasks at hand than their employees.

Interestingly, in expert power, the superior may not rank higher than the other persons in a formal sense. Thus, when an equipment repair person comes to the CEO's office to fix a malfunctioning piece of machinery, no question exists that the CEO outranks the repair person; yet regarding the specific task of getting the machine operational, the CEO is likely to follow the orders of the repair person.

Expert power has within it a built-in point of weakness: as a point of power, expertise diminishes as knowledge is shared. If a manager shares knowledge or skill instruction with his or her employees, in time they will acquire a similar knowledge base or skill set. As the employees grow to equal the manager's knowledge or skills, their respect for the superiority of his expertise diminishes.

The result is either that the manager's authority diminishes or that the manager intentionally chooses not to share his or her knowledge base or skill set with the employees. The former choice weakens the manager's authority over time, while the latter weakens the organization's effectiveness over time.

MULTIDIMENSIONAL POWER

Traditional theories such as those of French and Raven, as well as the empowerment advocates of the 1980s, such as Crosby and Deming, have tended to approach power and authority as one-dimensional. By contrast, several experts have more recently begun to reconfigure how power is viewed to a more multidimensional interweaving of relations or conflicting needs.

For example, Robert Grant et al. described TQM's consumer-focused goals and traditional management's economic model of the firm as two inherently opposed paradigms. Because these two paradigms are grounded in two independent sources of authority, they produce different but coexisting dimensions of power.

It has also been argued that authority is culturally based. Geert Hofstede, in one of the most thorough empirical surveys on cross-cultural influences on work-related values, delineated marked differences in what he called "power distance."

For Hofstede, power distance is the degree to which members of a culture feel comfortable with inequalities in power within an organization; that is, the extent to which one's boss is seen as having greater power than oneself. Thus, views regarding both power and leadership shape the conception of authority within an organization. And because both these facets of authority conception differ drastically from culture to culture, authority itself is conceived of differently from society to society.

Consequently, no single dimension of authority and power is likely to hold equally for all managers and employees in a multicultural domestic setting or in the multicultural milieu of the multinational corporation.

Finally, one can also argue against the one-dimensional view of authority and power when they are viewed not as independent elements in the abstract, but as intrinsically derived from relations within the

organization. Power and authority are multidimensional because relationships are by nature multidimensional.

The ways in which managers influence their employees and encourage them to be productive depend on many variables, including the personality of the leader, the skills of the group/employees, the task or assignment at hand, or the group dynamics and personalities of group members. As with leadership styles, each base of power has its place in management and can prove effective in the right setting and right circumstances.

Along with leadership styles, there is much similarity and terminology crossover in the study of leadership theories; researchers should examine both terms in the available literature to access the full spectrum of knowledge on the topic of leadership.

SEE ALSO: Chain of Command Principle; Leadership Theories and Studies; Management Styles; Organizational Culture; Span of Control

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FURTHER READING:

Alanazi, F.M., and Arnaldo Rodrigues. "Power Bases and Attribution in Three Cultures." *The Journal of Social Psychology* 143, no. 3 (June 2003): 375–395.

Carson, Paula Phillips, Kerry D. Carson, E. Leon Knight, Jr., and C. William Roe. "Power in Organizations: A Look Through the TQM Lens." *Quality Progress* 28, no. 11 (November 1995): 73–78.

Crosby, Philip B. *Quality Is Free: The Art of Making Quality Certain*. New York, NY: McGraw-Hill, 1979.

Deming, W. Edwards. *Out of the Crisis*. Cambridge, MA: Massachusetts Institute of Technology Press, 1986.

French, J.P.R., Jr., and B. Raven. "The Bases of Social Power." In *Studies in Social Power*. Dorwin Cartwright, ed. Ann Arbor, MI: University of Michigan Press, 1959.

Grant, Robert M., Rami Shani, and R. Krishnan. "TQM's Challenge to Theory and Practice." *Sloan Management Review* 35, no. 2 (Winter 1994): 25–35.

Heller, T. "Changing Authority Patterns: A Cultural Perspective." *Academy of Management Review* 10, no. 3 (July 1985): 488–495.

Huey, John. "Sam Walton in His Own Words." *Fortune*, 29 June 1992, 98–106.

Imberman, Woodruff. "Managing the Managers." *Progressive Grocer* 84, no. 3 (2005): 26–27.

Knights, David, and Darren McCabe. "Are There No Limits to Authority?: TQM and Organizational Power." *Organization Studies* 20, no. 2 (March 1999): 197–224.

Lewin, Kurt, R. Lippitt, and R.K. White. "Patterns of Aggressive Behavior in Experimentally Created 'Social Climates'." *Journal of Social Psychology* 10, no. 2 (May 1939): 271–301.

O'Regan, N., and A. Ghobadian. "Leadership and Strategy: Making it Happen." *Journal of General Management* 29, no. 3 (Spring 2004): 76–92.

Steensma, H., and F. van Milligen. "Bases of Power, Procedural Justice and Outcomes of Mergers: The Push And Pull Factors Of Influence Tactics." *Journal of Collective Negotiations* 30, no. 2 (2003): 113–134.

Victor, David A. *International Business Communication*. New York, NY: HarperCollins, 1992.

LEADERSHIP THEORIES AND STUDIES

Leadership can be defined as a process by which one individual influences others toward the attainment of group or organizational goals. Three points about the definition of leadership should be emphasized. First, leadership is a social influence process. Leadership cannot exist without a leader and one or more followers. Second, leadership elicits voluntary action on the part of followers. The voluntary nature of compliance separates leadership from other types of influence based on formal authority. Finally, leadership results in followers' behavior that is purposeful and goal-directed in some sort of organized setting. Many, although not all, studies of leadership focus on the nature of leadership in the workplace.

Leadership is probably the most frequently studied topic in the organizational sciences. Thousands of leadership studies have been published and thousands of pages on leadership have been written in academic books and journals, business-oriented publications, and general-interest publications. Despite this, the precise nature of leadership and its relationship to key criterion variables such as subordinate satisfaction, commitment, and performance is still uncertain, to the point where Fred Luthans, in his book *Organizational Behavior* (2005), said that "it [leadership] does remain pretty much of a 'black box' or unexplainable concept."

Leadership should be distinguished from management. Management involves planning, organizing, staffing, directing, and controlling, and a manager is someone who performs these functions. A manager has formal authority by virtue of his or her position or office. Leadership, by contrast, primarily deals with influence. A manager may or may not be an effective leader. A leader's ability to influence others may be based on a variety of factors other than his or her formal authority or position.

In the sections that follow, the development of leadership studies and theories over time is briefly traced. Table 1 provides a summary of the major theoretical approaches.

Table 1
Leadership Perspectives

Historical Leadership Theories		
Leadership Theory	Time of Introduction	Major Tenets
Trait Theories	1930s	Individual characteristics of leaders are different than those of nonleaders.
Behavioral Theories	1940s and 1950s	The behaviors of effective leaders are different than the behaviors of ineffective leaders. Two major classes of leader behavior are task-oriented behavior and relationship-oriented behavior.
Contingency Theories	1960s and 1970s	Factors unique to each situation determine whether specific leader characteristics and behaviors will be effective.
Historical Leadership Theories		
Leadership Theory	Time of Introduction	Major Tenets
Leader-Member Exchange	1970s	Leaders from high-quality relationships with some subordinates but not others. The quality of leader-subordinates relationship affects numerous workplace outcomes.
Charismatic Leadership	1970s and 1980s	Effective leaders inspire subordinates to commit themselves to goals by communicating a vision, displaying charismatic behavior, and setting a powerful personal example.
Substitutes for Leadership	1970s	Characteristics of the organization, task, and subordinates may substitute for or negate the effects of leadership behaviors.

HISTORICAL DEVELOPMENT

Three main theoretical frameworks have dominated leadership research at different points in time. These included the trait approach (1930s and 1940s), the behavioral approach (1940s and 1950s), and the contingency or situational approach (1960s and 1970s).

TRAIT APPROACH. The scientific study of leadership began with a focus on the traits of effective leaders. The basic premise behind trait theory was that effective leaders are born, not made, thus the name sometimes applied to early versions of this idea, the “great man” theory. Many leadership studies based on this theoretical framework were conducted in the 1930s, 1940s, and 1950s.

Leader trait research examined the physical, mental, and social characteristics of individuals. In general, these studies simply looked for significant associations between individual traits and measures of leadership effectiveness. Physical traits such as height, mental traits such as intelligence, and social traits such as personality attributes were all subjects of empirical research.

The initial conclusion from studies of leader traits was that there were no universal traits that consistently separated effective leaders from other individuals. In an important review of the leadership literature published in 1948, Ralph Stogdill concluded that the

existing research had not demonstrated the utility of the trait approach.

Several problems with early trait research might explain the perceived lack of significant findings. First, measurement theory at the time was not highly sophisticated. Little was known about the psychometric properties of the measures used to operationalize traits. As a result, different studies were likely to use different measures to assess the same construct, which made it very difficult to replicate findings. In addition, many of the trait studies relied on samples of teenagers or lower-level managers.

Early trait research was largely atheoretical, offering no explanations for the proposed relationship between individual characteristics and leadership.

Finally, early trait research did not consider the impact of situational variables that might moderate the relationship between leader traits and measures of leader effectiveness. As a result of the lack of consistent findings linking individual traits to leadership effectiveness, empirical studies of leader traits were largely abandoned in the 1950s.

LEADER BEHAVIOR APPROACH. Partially as a result of the disenchantment with the trait approach to leadership that occurred by the beginning of the 1950s, the focus of leadership research shifted away from leader traits to leader behaviors. The premise of this stream of research was that the behaviors exhibited by leaders

are more important than their physical, mental, or emotional traits. The two most famous behavioral leadership studies took place at Ohio State University and the University of Michigan in the late 1940s and 1950s. These studies sparked hundreds of other leadership studies and are still widely cited.

The Ohio State studies utilized the Leader Behavior Description Questionnaire (LBDQ), administering it to samples of individuals in the military, manufacturing companies, college administrators, and student leaders. Answers to the questionnaire were factor-analyzed to determine if common leader behaviors emerged across samples. The conclusion was that there were two distinct aspects of leadership that describe how leaders carry out their role.

Two factors, termed consideration and initiating structure, consistently appeared. Initiating structure, sometimes called task-oriented behavior, involves planning, organizing, and coordinating the work of subordinates. Consideration involves showing concern for subordinates, being supportive, recognizing subordinates' accomplishments, and providing for subordinates' welfare.

The Michigan leadership studies took place at about the same time as those at Ohio State. Under the general direction of Rensis Likert, the focus of the Michigan studies was to determine the principles and methods of leadership that led to productivity and job satisfaction. The studies resulted in two general leadership behaviors or orientations: an employee orientation and a production orientation. Leaders with an employee orientation showed genuine concern for interpersonal relations. Those with a production orientation focused on the task or technical aspects of the job.

The conclusion of the Michigan studies was that an employee orientation and general instead of close supervision yielded better results. Likert eventually developed four "systems" of management based on these studies; he advocated System 4 (the participative-group system, which was the most participatory set of leader behaviors) as resulting in the most positive outcomes.

One concept based largely on the behavioral approach to leadership effectiveness was the Managerial (or Leadership) Grid, developed by Robert Blake and Jane Mouton. The grid combines "concern for production" with "concern for people" and presents five alternative behavioral styles of leadership. An individual who emphasized neither production nor was practicing "impoverished management" according to the grid. If a person emphasized concern for people and placed little emphasis on production, he was termed a "country-club" manager.

Conversely, a person who emphasized a concern for production but paid little attention to the concerns of subordinates was a "task" manager. A person who

tried to balance concern for production and concern for people was termed a "middle-of-the-road" manager.

Finally, an individual who was able to simultaneously exhibit a high concern for production and a high concern for people was practicing "team management." According to the prescriptions of the grid, team management was the best leadership approach. The Managerial Grid became a major consulting tool and was the basis for a considerable amount of leadership training in the corporate world.

The assumption of the leader behavior approach was that there were certain behaviors that would be universally effective for leaders. Unfortunately, empirical research has not demonstrated consistent relationships between task-oriented or person-oriented leader behaviors and leader effectiveness. Like trait research, leader behavior research did not consider situational influences that might moderate the relationship between leader behaviors and leader effectiveness.

CONTINGENCY (SITUATIONAL) APPROACH. Contingency or situational theories of leadership propose that the organizational or work group context affects the extent to which given leader traits and behaviors will be effective. Contingency theories gained prominence in the late 1960s and 1970s. Four of the more well-known contingency theories are Fiedler's contingency theory, path-goal theory, the Vroom-Yetton-Jago decision-making model of leadership, and the situational leadership theory. Each of these approaches to leadership is briefly described in the paragraphs that follow.

Introduced in 1967, Fiedler's contingency theory was the first to specify how situational factors interact with leader traits and behavior to influence leadership effectiveness. The theory suggests that the "favorability" of the situation determines the effectiveness of task- and person-oriented leader behavior.

Favorability is determined by (1) the respect and trust that followers have for the leader; (2) the extent to which subordinates' responsibilities can be structured and performance measured; and (3) the control the leader has over subordinates' rewards. The situation is most favorable when followers respect and trust the leader, the task is highly structured, and the leader has control over rewards and punishments.

Fiedler's research indicated that task-oriented leaders were more effective when the situation was either highly favorable or highly unfavorable, but that person-oriented leaders were more effective in the moderately favorable or unfavorable situations. The theory did not necessarily propose that leaders could adapt their leadership styles to different situations, but that leaders with different leadership styles would be more effective when placed in situations that matched their preferred style.

Fiedler's contingency theory has been criticized on both conceptual and methodological grounds. However, empirical research has supported many of the specific propositions of the theory, and it remains an important contribution to the understanding of leadership effectiveness.

Path-goal theory was first presented in a 1971 *Administrative Science Quarterly* article by Robert House. Path-goal theory proposes that subordinates' characteristics and characteristics of the work environment determine which leader behaviors will be more effective. Key characteristics of subordinates identified by the theory are locus of control, work experience, ability, and the need for affiliation. Important environmental characteristics named by the theory are the nature of the task, the formal authority system, and the nature of the work group. The theory includes four different leader behaviors, which include directive leadership, supportive leadership, participative leadership, and achievement-oriented leadership.

According to the theory, leader behavior should reduce barriers to subordinates' goal attainment, strengthen subordinates' expectancies that improved performance will lead to valued rewards, and provide coaching to make the path to payoffs easier for subordinates. Path-goal theory suggests that the leader behavior that will accomplish these tasks depends upon the subordinate and environmental contingency factors.

Path-goal theory has been criticized because it does not consider interactions among the contingency factors and also because of the complexity of its underlying theoretical model, expectancy theory. Empirical research has provided some support for the theory's propositions, primarily as they relate to directive and supportive leader behaviors.

The Vroom-Yetton-Jago decision-making model was introduced by Victor Vroom and Phillip Yetton in 1973 and revised by Vroom and Jago in 1988. The theory focuses primarily on the degree of subordinate participation that is appropriate in different situations. Thus, it emphasizes the decision-making style of the leader.

There are five types of leader decision-making styles, which are labeled AI, AII, CI, CII, and G. These styles range from strongly autocratic (AI), to strongly democratic (G). According to the theory, the appropriate style is determined by answers to up to eight diagnostic questions, which relate to such contingency factors as the importance of decision quality, the structure of the problem, whether subordinates have enough information to make a quality decision, and the importance of subordinate commitment to the decision.

The Vroom-Yetton-Jago model has been criticized for its complexity, for its assumption that the decision makers' goals are consistent with organizational goals, and for ignoring the skills needed to arrive at group decisions to difficult problems. Empirical research has supported some of the prescriptions of the theory.

The situational leadership theory was initially introduced in 1969 and revised in 1977 by Hersey and Blanchard. The theory suggests that the key contingency factor affecting leaders' choice of leadership style is the task-related maturity of the subordinates. Subordinate maturity is defined in terms of the ability of subordinates to accept responsibility for their own task-related behavior. The theory classifies leader behaviors into the two broad classes of task-oriented and relationship-oriented behaviors. The major proposition of situational leadership theory is that the effectiveness of task and relationship-oriented leadership depends upon the maturity of a leader's subordinates.

Situational leadership theory has been criticized on both theoretical and methodological grounds. However, it remains one of the better-known contingency theories of leadership and offers important insights into the interaction between subordinate ability and leadership style.

RECENT DEVELOPMENTS

Although trait, behavioral, and contingency approaches have each contributed to the understanding of leadership, none of the approaches have provided a completely satisfactory explanation of leadership and leadership effectiveness. Since the 1970s, several alternative theoretical frameworks for the study of leadership have been advanced. Among the more important of these are leader-member exchange theory, transformational leadership theory, the substitutes for leadership approach, and the philosophy of servant leadership.

LEADER-MEMBER EXCHANGE THEORY. Leader-member exchange (LMX) theory was initially called the vertical dyad linkage theory. The theory was introduced by George Graen and various colleagues in the 1970s and has been revised and refined in the years since. LMX theory emphasizes the dyadic (i.e., one-on-one) relationships between leaders and individual subordinates, instead of the traits or behaviors of leaders or situational characteristics.

The theory's focus is determining the type of leader-subordinate relationships that promote effective outcomes and the factors that determine whether leaders and subordinates will be able to develop high-quality relationships.

According to LMX theory, leaders do not treat all subordinates in the same manner, but establish close

relationships with some (the in-group) while remaining aloof from others (the out-group). Those in the in-group enjoy relationships with the leader that is marked by trust and mutual respect. They tend to be involved in important activities and decisions. Conversely, those in the out-group are excluded from important activities and decisions.

LMX theory suggests that high-quality relationships between a leader-subordinate dyad will lead to positive outcomes such as better performance, lower turnover, job satisfaction, and organizational commitment. Empirical research supports many of the proposed relationships (Steers et al., 1996).

TRANSFORMATIONAL LEADERSHIP THEORIES. Beginning in the 1970s, a number of leadership theories emerged that focused on the importance of a leader's charisma to leadership effectiveness. Included within this class of theories are House's theory of charismatic leadership, Bass's transformational leadership theory, and Conger and Kanungo's charismatic leadership theory.

These theories have much in common. They all focus on attempting to explain how leaders can accomplish extraordinary things against the odds, such as turning around a failing company, founding a successful company, or achieving great military success against incredible odds. The theories also emphasize the importance of leaders' inspiring subordinates' admiration, dedication, and unquestioned loyalty through articulating a clear and compelling vision.

Transformational leadership theory differentiates between the transactional and the transformational leader. Transactional leadership focuses on role and task requirements and utilizes rewards contingent on performance. By contrast, transformational leadership focuses on developing mutual trust, fostering the leadership abilities of others, and setting goals that go beyond the short-term needs of the work group.

Bass's transformational leadership theory identifies four aspects of effective leadership, which include charisma, inspiration, intellectual stimulation, and consideration. A leader who exhibits these qualities will inspire subordinates to be high achievers and put the long-term interest of the organization ahead of their own short-term interest, according to the theory. Empirical research has supported many of the theory's propositions.

SUBSTITUTES FOR LEADERSHIP THEORY. Kerr and Jermier introduced the substitutes for leadership theory in 1978. The theory's focus is concerned with providing an explanation for the lack of stronger empirical support for a relationship between leader traits or leader behaviors and subordinates' satisfaction and performance. The substitutes for leadership theory suggests that characteristics of the organization, the

task, and subordinates may substitute for or negate the effects of leadership, thus weakening observed relationships between leader behaviors and important organizational outcomes.

Substitutes for leadership make leader behaviors such as task-oriented or relationship-oriented unnecessary. Characteristics of the organization that may substitute for leadership include formalization, group cohesiveness, inflexible rules, and organizational rewards not under the control of the leader. Characteristics of the task that may substitute for leadership include routine and repetitive tasks or tasks that are satisfying. Characteristics of subordinates that may substitute for leadership include ability, experience, training, and job-related knowledge.

The substitutes for leadership theory has generated a considerable amount of interest because it offers an intuitively appealing explanation for why leader behavior impacts subordinates in some situations but not in others. However, some of its theoretical propositions have not been adequately tested. The theory continues to generate empirical research.

SERVANT LEADERSHIP. This approach to leadership reflects a philosophy that leaders should be servants first. It suggests that leaders must place the needs of subordinates, customers, and the community ahead of their own interests in order to be effective. Characteristics of servant leaders include empathy, stewardship, and commitment to the personal, professional, and spiritual growth of their subordinates. Servant leadership has not been subjected to extensive empirical testing but has generated considerable interest among both leadership scholars and practitioners.

Leadership continues to be one of the most written about topics in the social sciences. Although much has been learned about leadership since the 1930s, many avenues of research still remain to be explored as we enter the twenty-first century.

SEE ALSO: Contingency Approach to Management; Leadership Styles and Bases of Power; Management Styles

Tim Barnett

FURTHER READING:

Bass, Bernard M., Bruce J. Avolio, Dong I. Jung, and Yair Berso. "Predicting Unit Performance by Assessing Transformational and Transactional Leadership." *Journal of Applied Psychology* 88 (2003): 207–218.

Blank, Warren, John R. Weitzel, and Stephen G. Green. "A Test of the Situational Leadership Theory." *Personnel Psychology* 43 (1990): 579–597.

Fiedler, Fred E. *A Theory of Leadership Effectiveness*. New York, NY: McGraw-Hill, 1967.

- Graeff, Claude L. "The Situational Leadership Theory: A Critical View." *Academy of Management Review* 8 (1983): 285–291.
- Graen, George, and William Schiemann. "Leader-Member Agreement: A Vertical Dyad Linkage Approach." *Journal of Applied Psychology* 63 (1978): 206–212.
- Greenberg, Jerald, and Robert A. Baron. *Behavior in Organizations: Understanding and Managing the Human Side of Work*. Upper Saddle River, NJ: Prentice-Hall, 2000.
- House, Robert J. "A Path-Goal Theory of Leader Effectiveness." *Administrative Science Quarterly* 16 (1971): 321–339.
- House, Robert J., and Ram N. Aditya. "The Social Scientific Study of Leadership: Quo Vadis?" *Journal of Management* 23 (1997): 409–473.
- Kirkpatrick, Shelley A., and Edwin A. Locke. "Leadership: Do Traits Matter?" *Academy of Management Executive* 5 (1991): 48–60.
- Kinicki, Angelo, and Robert Kreitner. *Organizational Behavior*. Boston, MA: McGraw-Hill Irwin, 2006.
- Luthans, Fred. *Organizational Behavior*. Boston, MA: McGraw-Hill Irwin, 2005.
- Podsakoff, Philip M., et al. "Do Substitutes for Leadership Really Substitute for Leadership? An Empirical Examination of Kerr and Jermier's Situational Leadership Model." *Organizational Behavior and Human Decision Processes* 54 (1993): 1–44.
- Steers, Richard M., Lyman W. Porter, and Gregory A. Bigley. *Motivation and Leadership at Work*. New York: McGraw-Hill, 1996.
- Stogdill, Ralph M. "Personal Factors Associated with Leadership: A Survey of the Literature." *Journal of Psychology* 25 (1948): 335–71.
- Stogdill, Ralph M., and Bernard M. Bass. *Handbook of Leadership: A Survey of Theory and Research*. New York, NY: Free Press, 1974.
- Vroom, Victor H., and Phillip W. Yetton. *Leadership and Decision Making*. Pittsburgh, PA: University of Pittsburgh Press, 1973.
- Wren, Daniel A. *The Evolution of Management Thought*. New York, NY: Wiley, 1994.
- Yukl, Gary. *Leadership in Organizations*. Englewood Cliffs, NJ: Prentice-Hall, 1994.

LEAN MANUFACTURING AND JUST-IN-TIME PRODUCTION

Associated with Japanese management techniques, just-in-time production (JIT) is a set of principles and practices based on the philosophy that firms should hold little or no inventory beyond that required for immediate production or distribution. That is, a manufacturer should receive raw materials or parts from its suppliers perhaps just hours before they will be used in production, and the firm's output should be

shipped to its customers as soon after completion as possible—without holding onto a stock of either raw goods or finished products.

In practice, JIT has often been expressed as a holistic management system aimed at reducing waste, maximizing cost efficiency, and securing a competitive advantage. Thus, a number of additional conditions are considered necessary for the successful implementation of JIT. These include small lot sizes, short setup and changeover times, efficient and effective quality controls, and perhaps most of all, designing the whole production process to minimize backups and maximize the efficiency of human and machine labor.

Lean manufacturing encompasses a number of things. It essentially is a Westernized version of JIT and Japanese *kaizen*, or continuous improvement. Lean manufacturing is a process for measuring and reducing inventory and streamlining production. It is a means for changing the way a company measures plant performance. A knowledge-based system, lean manufacturing takes years of hard work, preparation, and support from upper management. Lean manufacturing is so named because it purports to use much less of certain resources (space, inventory, workers, etc.) than is used by normal mass-production systems to produce comparable output. The term came into widespread use with the 1990 publication of the book *The Machine That Changed the World* by James P. Womack, Daniel T. Jones, and Daniel Roos.

The *APICS Dictionary* defines lean manufacturing as a philosophy of production that emphasizes minimizing the amount of all resources (including time) used in various enterprise activities. It involves identifying and eliminating non-value-adding activities in design, production, supply chain management, and customer relations. Lean producers employ teams of multiskilled workers at all levels of the organization and use highly flexible, increasingly automated machines to produce volumes of products in potentially enormous variety. In effect, they incorporate the advantages of both mass production (high volume, low unit cost) and craft production (variety and flexibility). Quality is higher than in normal mass production. Compensation and rewards are based on meeting the total cost equation rather than on labor, overhead, or individual quality measures.

Lean manufacturing and JIT (lean/JIT) share most of the same characteristics, goals, and philosophy. In fact, the terms are often used interchangeably.

HISTORY OF LEAN MANUFACTURING/JIT

Lean/JIT have roots in both Japan and the United States.

JAPAN. Since Japan is a physically small country with minimal resources and a large population, the Japanese have always been careful not to waste

resources such as time, labor, and space. Waste is seen as abhorrent to the Japanese because they have so little space and so few natural resources. Hence, it has been necessary for the Japanese to maximize the yield from minimally available resources. Also, dense population has made it necessary for the Japanese people to maintain mutual respect in order to work and live together.

Under this *wa* (harmony) culture, everyone tries to maintain the best possible human relationship and is reluctant to be involved in any confrontations. Additionally, most Japanese firms have a *rentai* relationship, which entails maintaining a “joint responsibility” between management and workers. Under this relationship, management should treat all workers equally. In exchange, each worker respects management’s leadership position and follows orders exactly without mistakes, cooperates with coworkers, and generates ideas and creativity to improve the firm’s competitiveness. This type of culture reinforces the basic tenets of lean/JIT: waste minimization, continuous improvement, and respect for all workers.

This concept was originally developed in Japan in the mid-1970s by the Toyota Motor Corporation. In fact, many firms continue to refer to lean/JIT as the Toyota system. The concept emphasized the avoidance of waste of materials, space, and labor. Significant attention was paid to identifying and correcting potential problems that could lead to any form of waste. Operations were constantly being improved and fine-tuned so as to further eliminate waste and thereby increase productivity and yield. In addition, equal respect was paid to all workers, while minimizing the trappings of status. As a result, by using lean/JIT, Toyota was able to reduce the time needed to produce a car from fifteen days to one day.

UNITED STATES. In 1924 Henry Ford’s Highland Park plant, and later the River Rouge operation, mass-produced Model T parts just-in-time for assembly while assembly lines pulled work forward to the next assembly stations just-in-time. One hundred freight cars of material were unloaded daily, with materials flowing through fabrication, subassembly, final assembly, and back onto the freight cars. The production cycle was twenty-one days. At River Rouge the cycle was only four days, and that included processing ore into steel at the on-site steel mill.

Unfortunately, this “just-in-time” type manufacturing soon gave way to the large lot sizes and lengthy cycle times dictated by the economies of scale of mass production, mass markets, and standard designs with interchangeable parts. U.S. manufacturers held on to this paradigm until the early 1980s, when the development of the Toyota production system caused it to shift. U.S. manufacturers initially greeted lean/JIT with a great deal of ambivalence, thinking that the

concept would never work in the United States due to its reliance on the cultural aspects of the Japanese work environment. However, this view changed when firms such as Hewlett-Packard and Harley-Davidson yielded significant benefits from its use.

MANUFACTURING

The idea behind lean/JIT is a concept called ideal production. Simply produce and deliver finished goods just in time to be sold, subassemblies just in time to go into subassemblies, and purchased materials just in time to be transformed into fabricated parts. The goal of lean/JIT is to find practical ways to create the effect of an automated industry that will come as close as possible to this concept of ideal production.

While the prevailing view of lean/JIT is that of an inventory control system, lean/JIT goes much further. It is an operational philosophy that incorporates an improved inventory control system in conjunction with other systems. These systems include:

- A setup improvement system
- A maintenance improvement system
- A quality improvement system
- A productivity improvement system

INVENTORY CONTROL SYSTEM. When larger quantities are ordered or produced, average inventory obviously is larger. This larger inventory results in increased inventory-carrying charges. If a reduction in carrying costs is desired, smaller quantities should be ordered and orders should be placed more often. However, the practice of ordering smaller quantities can have the side effect of increasing ordering costs. To balance these two costs, the concept of economic order quantity (EOQ) was developed. The EOQ formula derives the point, or order quantity, where inventory carrying costs and ordering or setup costs are the same. An order of this quantity will minimize the sum of the two costs.

However, the EOQ formula is flawed. While carrying costs and ordering/setup costs are obvious, other costs that can significantly affect lot size are not considered. The user of the formula often fails to consider quality, scrap, productivity, and worker motivation and responsibility. In addition, the EOQ formula user frequently fails to consider that even though setup costs are significant, they are not unalterable. American manufacturing managers traditionally considered setup costs as a necessary evil and made little or no effort to reduce them.

The lean/JIT philosophy suggests that a firm should eliminate any reliance upon the EOQ formula and seek the ideal production quantity of one. Of course, a lot size of one is not always feasible, but it is a goal used to focus attention on the concept of rapid

adjustments and flexibility. Naturally, a reduction in inventory levels means an increase in setups or orders, so the responsibility rests with production to make every effort to reduce setup time and setup costs. It should be noted that this assumes setup time and cost are positively related. This is not always true because the cost to reduce setup time could be very high if retooling or equipment redesign were involved.

SETUP COST REDUCTION SYSTEM. Toyota began a campaign to reduce setup times in 1971. Five years later, the time required to set up presses to form fenders and hoods had fallen from 1 hour to 12 minutes, while U.S. manufacturers needed 6 hours to perform the same task. Toyota continues to strive for a concept it calls “single setup,” which means less than 10 minutes for performing a setup. As the company continued to emphasize reduction of setup times, its operations became capable of “one-touch” setups, which take less than 1 minute.

Setup time can be divided into two phases: external time and internal time. External time includes activities that can take place while the machine is running, such as transporting dies between storage and the machines. These items are external to the run time and do not interrupt it. Internal time includes activities that can only be conducted when the machine is stopped, such as mounting and removing dies. These are items that will interrupt the run time. External time can be eliminated by ensuring that appropriate tools are ready before changeover begins. Internal time can be reduced by addressing the question, “How can operations be quickened?” Appropriate responses could include the use of locating pins and hand levers to replace bolts, the standardization of any remaining bolts, permanent installation of wrenches to adjusting nuts, and the use of an air driver instead of a ratchet.

Management sometimes tends to analyze the large, obvious costs such as direct labor, but then treat setup as an inherent cost that must be accepted. However, only by reducing setup time and costs can lot sizes be reduced toward the ideal lot size of one.

PREVENTIVE MAINTENANCE SYSTEM. Most arguments against preventive maintenance (PM) suggest that PM programs are more expensive than programs that only repair broken equipment. The flaw in this line of thought arises from the unpredictable nature of equipment breakdown. This reaction mode of maintenance usually means that the maintenance personnel must temporarily patch the equipment and defer the substantive repair until time allows. Unfortunately, since the equipment already has suffered lost time due to the initial breakdown, the likelihood of finding repair time decreases. The result often is a circular process of “adjust and tinker,” with an increased risk of unexplained defects in the output.

A proposed requirement for lean/JIT is that machinery be in top running condition at all times. When using small lot sizes, management can ill afford unexpected downtime in production flow. Equipment must be in condition to produce whatever is needed, whenever it is needed. Therefore, a little time should be scheduled each day to ensure that machinery is capable of producing top quality results. Preventive maintenance is necessary for continuous, long-term improvement in the quality of the production process.

QUALITY IMPROVEMENT SYSTEM. In order for companies to successfully produce goods while receiving only minimum deliveries, no room can be allowed for poor quality. This requires an overhaul in the thinking of management, which traditionally sought the so-called acceptable quality level (AQL). After receipt, delivered goods are randomly inspected to see how many defective parts there are within a predetermined sample size. If the number of defects exceeds a certain amount (the AQL), the entire batch is rejected. No such provision is made under lean/JIT; all parts must be good. The Japanese use the term *zero defects* to describe this philosophy.

Zero defects certainly cannot be obtained overnight, nor can it be expected from all of a firm’s current suppliers. To facilitate the receipt of high quality goods, a firm must offer more than the usual short-term contract or purchase order to the lowest bidder. A firm also may have to eliminate or decrease the use of multiple sourcing, or purchasing the same part from several sources as a backup in case one source experiences quality or delivery problems. By issuing long-term contracts to a single source, the lean/JIT firm gives its supplier the confidence and incentive to spend time and money on ensuring near perfect quality and constantly improving the product. Frequently, this makes for a captive supplier who must maintain the required quality in order to survive. The lean/JIT firm should then work constantly and directly with the supplier to monitor quality and provide technical support.

The use of lean/JIT improves the quality of suppliers, as well as the lean/JIT firm’s internal quality. When lot sizes are drastically reduced, defect discovery is naturally enhanced. If a worker produces a lot size of one and passes it to the next station, the quality of feedback will be immediate. In this way, defects are discovered quickly and their causes can be corrected immediately. Production of large lots with high defect rates is avoided.

U.S. manufacturers traditionally allowed lot sizes and inventory levels to remain high “just in case” a quality problem, an equipment problem, or a delivery problem should arise. This “just in case” inventory, commonly called buffer stock, allowed the firm to maintain its production flow while the problem was being corrected. When a quality problem emerged and

inventory was ample, the search for the source of the problem was postponed until a more suitable time. This suitable time may have never occurred. When lot sizes are minimal, one worker's problem threatens to bring subsequent processes to a halt. This means that all production workers and management must collaborate to find an immediate solution. The benefits here are twofold. First, the firm avoids the production of large quantities of defective parts. Secondly, good managers will be able to use this as motivation for unity of purpose within the workforce.

PRODUCTIVITY IMPROVEMENT SYSTEM. Productivity can be defined as good output divided by required input. The productivity facet of lean/JIT been described as nothing sitting idle, which wastes time. If equipment is operated only for productive purposes, then energy waste is eliminated. If all inventory is converted into product, then material waste is eliminated. If errors are not allowed, then rework is eliminated.

A number of productivity improvements may result from lean/JIT implementation. Among these are lower inventory levels, lower scrap rates, reductions in rework costs, reduction inventory carrying costs, smaller floor space requirements, reduced material handling, simpler inventory accounting, and more positive inventory control. All of these lower the input component or increase the good output of the productivity ratio.

Reductions in idle inventories allow the firm to reduce internal lead times—from the purchase of raw materials to the shipping of finished goods—allowing quicker changes in product mix and production quantities. Furthermore, the firm's ability to forecast is enhanced because the forecast horizon is shortened.

TEN STEPS TO LEAN/JIT PRODUCTION

Steve L. Hunter lists ten steps to implement a lean/JIT production system:

1. Reengineer the manufacturing system
2. Reduce setup
3. Integrate quality control
4. Integrate preventive maintenance
5. Level and balance the system
6. Integrate a pull system
7. Control inventory
8. Implement a vendor program
9. Utilize computer integrated manufacturing (CIM) benefits

While it was noted that inventory reduction is not the sole goal of lean/JIT implementation, it is a very obvious benefit. Less workspace is now needed due to

the use of smaller lot sizes and reduced inventory levels. Much of this inventory was stored between and within work centers. By reducing inventory, firms have been able to actually move work centers closer together, freeing up space and reducing material handling distances. This results in a neater, more organized facility that provides for speedy identification of bottlenecks and fewer lost parts.

Additionally, this reduction in inventory and lot sizes promotes rapid feedback from downstream work centers when there is a quality problem. This feedback results in a reduction in scrap and rework, and ultimately a higher level of overall quality.

Reduced inventory and lot sizes also result in increased inventory turns. Inventory turn increases have been noted at Haworth (a twofold increase), Hewlett-Packard (a threefold increase), Richardson-Vicks Homecare Products (a threefold increase), IBM, Raleigh (a fourfold increase), and Harley-Davidson (a sixfold increase).

The introduction of preventive maintenance and the use of smaller, more flexible machinery combine to yield increased equipment utilization. One major firm was able to change from three lines running three shifts to two lines running one shift with no change in output.

The lean/JIT producer combines the advantages of craft and mass production, while avoiding the high cost of the former and the rigidity of mass production. Lean/JIT producers set their sights explicitly on perfection: continually declining costs, zero defects, zero inventories, and endless product variety. Lean/JIT manufacturing is the new paradigm for manufacturing, replacing a mass-production system that has existed for more than 70 years.

SEE ALSO: Cellular Manufacturing; Continuous Improvement; Flexible Manufacturing; Japanese Management; Poka-Yoke; Quality and Total Quality Management; World-Class Manufacturer

R. Anthony Inman

FURTHER READING:

Cox, James F., III, and John H. Blackstone, Jr. *APICS Dictionary*. 9th ed. Falls Church, VA: American Production and Inventory Control Society, 1998.

Hunter, Steve L. "The 10 Steps to Lean Production." *FDM* 76, no. 5 (2004): 22–25.

Stevenson, William J. *Operations Management*. 8th ed. Boston: Irwin/McGraw-Hill, 2005.

Womack, James P., Daniel T. Jones, and Daniel Roos. *The Machine That Changed the World: Based on the Massachusetts Institute of Technology 5-Million Dollar 5-Year Study on the Future of the Automobile*. New York: Rawson Associates, 1990.

Womack, James P., and Daniel T. Jones. *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*. New York: Simon & Schuster, 1996.

LEVERAGED BUYOUTS

A leveraged buyout (LBO) is a restructuring of the capitalization and ownership of a company. The term *leveraged* refers to the use of debt as the primary method of financing the restructuring. The *buyout* portion refers to the fact that the method is often used to transform a publicly held company into one that is privately held. There are a number of reasons why this type of transaction might take place. These include cost savings, managerial incentives, decreasing the total number of owners, tax benefits, flexibility, and control. Oftentimes, the group pursuing the buyout includes the publicly held firm's upper management. This type of action is known as a management buyout (MBO).

Among the multiple parties involved when a public firm is taken private, there normally are both winners and losers. Existing shareholders who have their shares purchased in the buyout often win big. This is because most LBOs involve the payment of a premium over the market price at which the shares were trading prior to the announcement of the takeover. Similarly, the parties taking control of the firm gain managerial control and the enhanced flexibility normally associated with privately run firms. The new owners also have access to the firm's assets and cash flows, which formerly were part of the public corporation.

The biggest losers in an LBO are the firm's existing creditors. Because the buyout is financed primarily with debt capital, existing bondholders become creditors of a much riskier firm. This drives down the market value of outstanding bonds and makes future debt service much more uncertain. During the 1980s a number of institutional investors who held large bond positions in firms that were the subject of MBOs sued the management of the firms. They claimed that managers knowingly engaged in activities that harmed their economic investment as creditors of the corporation. These suits resulted in settlements and damage awards in several instances.

HISTORY OF LEVERAGED BUYOUTS

When a public firm experiences an LBO, its entire equity is purchased by a small group of investors. This group often includes the firm's current upper management. In order to entice existing shareholders to sell the firm's outstanding shares, the group often offers a premium above the stock's prevailing market value. The capital they need to purchase the shares is obtained by issuing debt, in the form of bonds, against the firm's assets and cash flows. From a balance-sheet perspective, the action all takes place on the right-hand side.

That is, the transaction involves the exchange of debt for equity. The result is that creditors have a larger claim, and owners a smaller claim, on the firm's assets. Note that the assets on the left-hand side of the firm's balance sheet do not change. Instead, what changes is how they are financed.

During the 1980s leveraged buyouts became a huge part of America's corporate landscape. This largely was the result of a single investment banking firm, Drexel Burham Lambert, and the efforts of one of its principals, Michael Milken. It was Milken who determined that high-yield bonds could fill an existing funding gap in corporate financing. The bonds, commonly referred to as junk bonds because of their riskiness, would be enticing to investors who otherwise might not be willing to take an equity position in high-risk firms. Drexel developed a market for junk bonds and served as the investment bank for corporate raiders and management groups interested in taking over existing corporations. The market flourished for several years, before Milken was prosecuted and convicted of securities violations. Drexel Burham Lambert ultimately went bankrupt, but the firm's legacy lives on in the active market for high-yield debt.

REASONS FOR TAKING A FIRM PRIVATE

The junk bond market enabled small investor groups to raise large sums of money in order to take public companies private. A number of reasons motivated managers and investors to pursue LBOs.

One advantage that a private firm has over a public one is administrative cost savings. A publicly traded company must produce annual reports, 10-K reports, comply with numerous regulations required by the Securities and Exchange Commission, hold annual shareholder meetings, and respond to shareholder requests. The management of publicly held firms must meet regularly with security analysts who follow the firm's stock, and maintain a shareholder relations department to deal with investor concerns. These costs are not required of a privately held firm.

In a private firm, managers no longer have to answer to the shareholder constituency. Lack of public accountability translates into greater management flexibility, since managers no longer have to focus as strongly on short-term operating results. The intense interest in reported quarterly earnings can bias managers in public firms to devote a great amount of effort and resources on short-term performance. Thus, managers of private firms have the luxury of being able to engage in investment activity that takes longer to produce tangible rewards. This greater flexibility and freedom from having to answer to shareholders is very enticing to upper-level management.

In addition, the process of buying up existing shares of the firm's stock severely diminishes the

absolute number of shareholders. Because of their large capital investment and the fact that they now answer to themselves, the shareholders that remain after an LBO are highly interested in the firm's operations. These shareholders play an active role in the firm's management, as opposed to the hundreds of thousands of passive investors that hold a publicly traded firm's common stock.

The new entity's management has enhanced incentives to operate efficiently and profitably. This is because the high amount of debt service resulting from an LBO leaves little room for corporate perks and excess. The combination of having to pay the large interest expense on the debt and working for themselves, as opposed to anonymous shareholders, results in much greater motivation for management to perform. Equity holders remaining after an LBO often have some special expertise or talent that they bring to the firm, such as access to additional capital sources. Shareholders in the new private firm who are not part of active management also have much greater incentive to monitor active management, since their personal stake in the firm is typically high.

Corporate tax shields are another potential advantage of restructuring with debt financing. The corporate tax code in the United States allows companies to deduct the interest paid on debt as an expense for tax purposes. No such deduction is allowed for dividends paid on equity shares. Thus, increased use of debt results in lower tax obligations owed to the Internal Revenue Service. Firms facing large tax liabilities may reap considerable benefits from the tax savings that result from debt financing.

Finally, large publicly held corporations in mature industries typically have access to large amounts of free cash flow. These dollars are valuable, because they can be used to develop new products and markets or invest in other firms. In a public corporation, these cash flows may be used for perquisites such as corporate travel to conventions and trade shows, company cars, membership in clubs, and other types of nonmonetary rewards. By taking the firm private, remaining shareholders gain access to the firm's free cash flow and can put it to use, thereby reaping direct benefits.

THE 1990S

With the demise of Drexel Burnham Lambert and the default on several prominent junk bond issues associated with 1980s restructurings, leveraged buyout activity slowed considerably in the 1990s. The appetite of investors for new junk bond issues decreased, and some of the firms that had previously gone private subsequently were recapitalized as public corporations.

THE 2000S

After a lull in the 1990s, leveraged buyouts began to regain some of their charm in the early part of the twenty-first century. According to Dealogic, a New York-based deal tracker, LBO firms accounted for 10 percent of the \$540 billion in mergers and acquisitions announced in the United States, double the average of 5 percent over the previous 10 years. Europe also showed a significant increase in LBO activities throughout the early 2000s.

Although leveraged buyouts relinquished the center stage they once held in American corporate finance, the concept of restructuring by replacing equity with debt and continuing under private management remains a significant opportunity for investors. Management in the modern corporation has greater incentive to operate efficiently and pay attention to shareholder concerns, lest the threat of a buyout cost them their positions with the firm.

SEE ALSO: Financial Issues for Managers; Shareholders

Howard Finch

Revised by Hal P. Kirkwood, Jr.

FURTHER READING:

Amihud, Yakov, ed. *Leveraged Management Buyouts: Causes and Consequences*. Washington, DC: Beard Books, 2002.

Berstein, Peter L. *Capital Ideas: The Improbable Origins of Modern Wall Street*. New York: Free Press, 1992.

Dolbeck, Andrew. "The Return of the Leveraged Buyout Deal." *Weekly Corporate Growth Report*, 23 August 2004, 1–3.

Higgins, Robert C. *Analysis for Financial Management*. 7th ed. Boston: Irwin/McGraw-Hill, 2004.

Rickertsen, Rick, and Robert E. Gunther. *Buyout: The Insider's Guide to Buying Your Own Company*. New York: AMACOM, 2001.

Thornton, Emily, Ronald Grover, and Tom Lowry. "Those Bulging Buyouts." *Business Week*, 9 February 2004, 74.

LICENSING AND LICENSING AGREEMENTS

A license provides the legal authority to engage in certain acts. Some licenses are required for the protection of the public. For example, a physician is licensed to assure professional competence, and the owner of a bar and restaurant is licensed to prove moral fitness. Some licenses are designed to raise government revenue (e.g., automobile licenses) or to grant some other party permission to make use of land (e.g., land easement). In business, a license is the granting of permission to use a property right in a limited capacity,

while still allowing the licensor to retain ownership. For example, under a licensing agreement a U.S. clothing manufacturer may allow a foreign producer to use its designs and specifications to make clothes.

For a license to exist, there must be a contract between two or more parties giving an explanation as to what property rights the licensor is agreeing to give up to the licensee. This agreement or contract is known as the licensing agreement. These agreements have been in existence since the first copyrights and patents were issued in the late 1700s.

The licensing agreement is a complex legal document that begins by identifying parties to the agreement, as well as the dates of the agreement. It specifies the subject matter to be licensed, including patents and trade secrets. Also specified are the provisions or rights of the license, such as whether it grants exclusive rights or is subject to other agreements. Any limitations, such as territorial and quantity restrictions, are also specified. A final section can specify duration, termination, and related provisions of the agreement.

In business, licensing agreements or arrangements are mutually beneficial. The licensor provides his or her property right and the licensee contributes expertise in the particular industry or territory covered by the license. The resulting relationship becomes much the same as a joint venture or partnership. Licensing agreements include several types, including copyright licensing, patent licensing, merchandise licensing, trademark licensing, and software licensing.

BENEFITS OF LICENSING

Typically, a trademark owner will grant a license in order to exploit the trademark rights in areas where he or she does not have the appropriate expertise, infrastructure, or capital resources to maximize the value of the right. While the licensor is exploiting the trademark right, the licensee is betting that the name or symbol recognition of the property will influence consumers and motivate them to buy a particular item. Characters that have enjoyed popularity from trademark licensing relationships include Mickey Mouse, Barbie, and the Lion King. A major trend has been for manufacturers and retailers to build the core of their business with trademark-licensed products.

When granting a license, copyright owners are motivated by the prospect of receiving royalties for each product, performance, or copy of their work. In the case of a publication, the copyright is an exclusive right given to an author of an original work. Books, plays, magazines, photography, paintings, sculpture, articles, musical compositions, and radio and television programs are additional commodities that can be copyrighted. The exclusive right also allows copyright owners to reproduce their own work or allow others to do so.

LICENSING AS A GLOBALIZATION STRATEGY

In its most general sense, licensing is a key mode of entry for firms considering international expansion. A licensing agreement gives a foreign company the rights to produce and/or sell another firm's goods in their country. The agreement also may include production and sales in more than one country. The licensee takes the risks and makes the investment in facilities for handling the manufacturing of the goods, as well as managing other supply chain linkages to deliver and even sell the goods to the final consumer. The licensor is normally paid a royalty on each unit produced and sold. Because there is little investment for the licensor, this method is seen as an easier way to become an international or global company.

Licensing is growing as manufacturers and retailers build their core businesses and change their strategies to include more licenses. For example, Merck and Upjohn have licensed organizations in other parts of the world to manufacture and sell their pharmaceutical products. Other firms using licensing agreements in this way include McDonald's, Nestlé, Anheuser-Busch, and KFC.

The release of hot movies like the *Lord of the Rings* trilogy also triggers many license agreements and ties between mass merchandisers and licensors for toys, games, and children's apparel. Some retailers go so far as to demand exclusive agreements for licensed apparel and movie tie-in products in order to pursue marketplace differentiation strategies.

Service-based businesses also can benefit from licensing arrangements. Within the airline industry, many of the code-sharing arrangements that allow airlines to sell each other's seats are much like licensing agreements. Airlines and other firms enter such agreements when they need help commercializing a new technology, expanding a brand franchise globally, or building a marketing image. Rather than entering a new or international market alone, licensing is a faster way to grow a market and achieve market-share dominance. It also may allow firms to gain a larger market for their non-licensed products.

In the early 2000s a growing number of technology companies began launching intellectual property (IP) licensing programs in order to turn dormant projects into revenue, penetrate new markets, and evaluate potential business partners. These firms conducted inventories of their knowledge bases and patent families, and identified technologies that were outside the core business yet still offered some potential for development. They then sought to license these technologies to other firms.

In *Licensing Journal*, George A. Frank explained: "Patents that some corporations had obtained for reasons not directly related to the development or transfer

of technology were proving to be a vast untapped resource. IP licensing has now become a tremendous income source, and indeed is not an important benchmark by which a corporation's success is measured" (2004). IBM, for example, earns more than \$1 billion per year from its IP licensing program.

RISKS TO LICENSING

There are some risks and disadvantages to licensing. The firm may lose control over the manufacture and marketing of its goods in other countries. As a mode of international market entry, licensing also may be less profitable than other choices because returns must be shared between two parties. There even is a risk that the foreign licensee may sell a similar competitive product after the license agreement expires. Other risks and issues involve selecting a partner, as well as all of the general uncertainties in doing business with an international partner, including language, culture, political risk, and currency fluctuations. Alternatives to licensing include exporting, acquisitions, establishing a wholly owned international subsidiary, franchising, and forming strategic alliances.

SEE ALSO: Franchising; Intellectual Property Rights

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FURTHER READING:

Bradbury, Danny. "Breaking the Licensing Mould: Software Licensing Models Have Gone Through Some Changes in Recent Years, but None Are as Controversial as Microsoft's Latest Initiative." *MicroScope* 32, no. 3 (2002).

Ferraro, Neil P. "Poetic License? Caveats for Buying or Selling Technology: A Well-Crafted License Agreement Helps Maximize Financial and Technological Profits and Reduce Risk." *Contract Management* 44, no. 7 (2004).

Frank, George A. "Licensing IP Rights: Why, How, What, and When—A Corporate Perspective." *Licensing Journal* 24, no. 6 (2004).

Nanayakkara, Tamara. "Negotiating Technology Licensing Agreements." *International Trade Forum* April 2002. Available from <<http://www.tradeforum.org/news>>.

O'Haver, R. Russ. "Management Intangibles: Capitalizing on Your IP Assets." *Journal of Internet Law* 7, no. 6 (2003).

Pitts, Robert A., and David Lei. *Strategic Management: Building and Sustaining Competitive Advantage*. 2nd ed. Cincinnati: South-Western College Publishing, 2000.

LIFELONG LEARNING TRENDS

SEE: Continuing Education and Lifelong Learning Trends

LINE-AND-STAFF ORGANIZATIONS

Organizational structure involves, in addition to task organizational boundary considerations, the designation of jobs within an organization and the relationships among those jobs. There are numerous ways to structure jobs within an organization, but two of the most basic forms include simple line structures and line-and-staff structures.

In a line organization, top management has complete control, and the chain of command is clear and simple. Examples of line organizations are small businesses in which the top manager, often the owner, is positioned at the top of the organizational structure and has clear "lines" of distinction between him and his subordinates.

The line-and-staff organization combines the line organization with staff departments that support and advise line departments. Most medium and large-sized firms exhibit line-and-staff organizational structures. The distinguishing characteristic between simple line organizations and line-and-staff organizations is the multiple layers of management within line-and-staff organizations. The following sections refer primarily to line-and-staff structures, although the advantages and disadvantages discussed apply to both types of organizational structures.

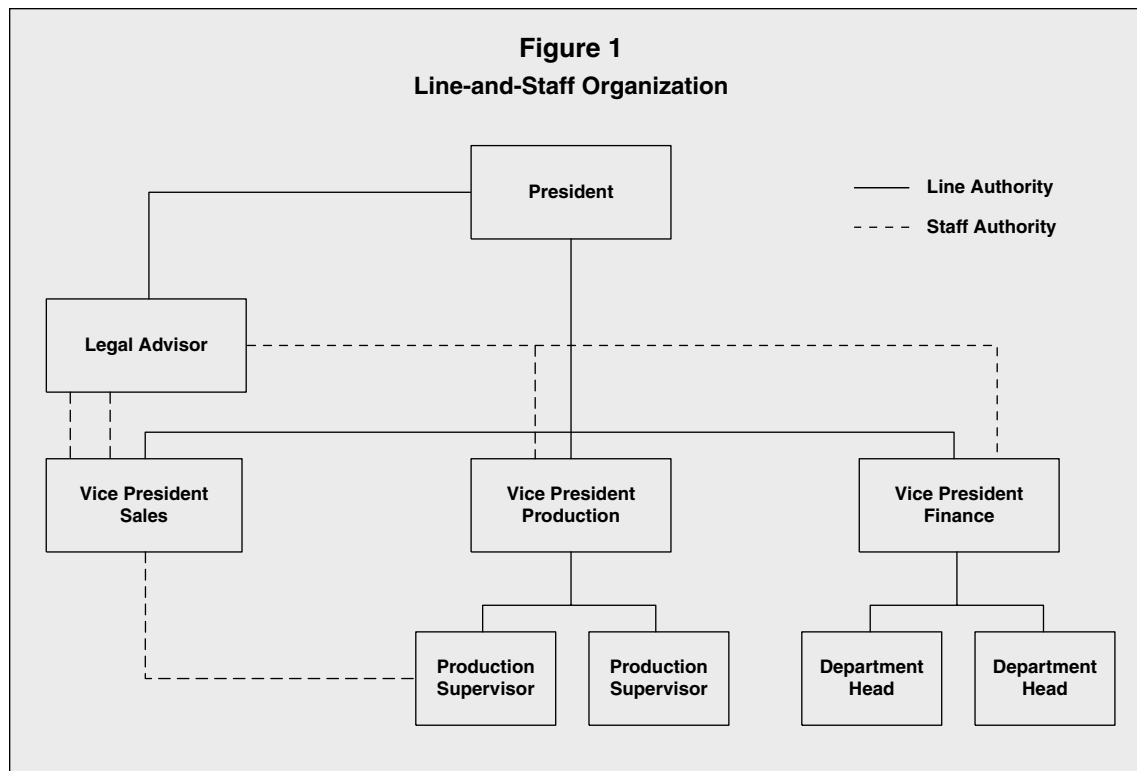
Several advantages and disadvantages are present within a line-and-staff organization. An advantage of a line-and-staff organization is the availability of technical specialists. Staff experts in specific areas are incorporated into the formal chain of command. A disadvantage of a line-and-staff organization is conflict between line and staff personnel.

LINE-AND-STAFF POSITIONS

A wide variety of positions exist within a line-and-staff organization. Some positions are primary to the company's mission, whereas others are secondary—in the form of support and indirect contribution. Although positions within a line-and-staff organization can be differentiated in several ways, the simplest approach classifies them as being either line or staff.

A line position is directly involved in the day-to-day operations of the organization, such as producing or selling a product or service. Line positions are occupied by line personnel and line managers. Line personnel carry out the primary activities of a business and are considered essential to the basic functioning of the organization.

Line managers make the majority of the decisions and direct line personnel to achieve company goals. An example of a line manager is a marketing executive.



Although a marketing executive does not actually produce the product or service, he or she directly contributes to the firm's overall objectives through market forecasting and generating product or service demand. Therefore, line positions, whether they are personnel or managers, engage in activities that are functionally and directly related to the principal workflow of an organization.

Staff positions serve the organization by indirectly supporting line functions. Staff positions consist of staff personnel and staff managers. Staff personnel use their technical expertise to assist line personnel and aid top management in various business activities. Staff managers provide support, advice, and knowledge to other individuals in the chain of command.

Although staff managers are not part of the chain of command related to direct production of products or services, they do have authority over personnel. An example of a staff manager is a legal adviser. He or she does not actively engage in profit-making activities, but does provide legal support to those who do. Therefore, staff positions, whether personnel or managers, engage in activities that are supportive to line personnel.

LINE-AND-STAFF AUTHORITY

Authority within a line-and-staff organization can be differentiated. Three types of authority are present: line, staff, and functional. Line authority is the right to carry out assignments and exact performance from other individuals.

LINE AUTHORITY. Line authority flows down the chain of command. For example, line authority gives a production supervisor the right to direct an employee to operate a particular machine, and it gives the vice president of finance the right to request a certain report from a department head. Therefore, line authority gives an individual a certain degree of power relating to the performance of an organizational task.

Two important clarifications should be considered, however, when discussing line authority: (1) line authority does not ensure effective performance, and (2) line authority is not restricted to line personnel. The head of a staff department has line authority over his or her employees by virtue of authority relationships between the department head and his or her directly-reporting employees.

STAFF AUTHORITY. Staff authority is the right to advise or counsel those with line authority. For example, human resource department employees help other departments by selecting and developing a qualified workforce. A quality control manager aids a production manager by determining the acceptable quality level of products or services at a manufacturing company, initiating quality programs, and carrying out statistical analysis to ensure compliance with quality standards. Therefore, staff authority gives staff personnel the right to offer advice in an effort to improve line operations.

FUNCTIONAL AUTHORITY. Functional authority is referred to as limited line authority. It gives a staff person power over a particular function, such as safety

or accounting. Usually, functional authority is given to specific staff personnel with expertise in a certain area. For example, members of an accounting department might have authority to request documents they need to prepare financial reports, or a human resource manager might have authority to ensure that all departments are complying with equal employment opportunity laws. Functional authority is a special type of authority for staff personnel, which must be designated by top management.

LINE-AND-STAFF CONFLICT

Due to different positions and types of authority within a line-and-staff organization, conflict between line and staff personnel is almost inevitable. Although minimal conflict due to differences in viewpoints is natural, conflict on the part of line and staff personnel can disrupt an entire organization. There are many reasons for conflict. Poor human relations, overlapping authority and responsibility, and misuse of staff personnel by top management are all primary reasons for feelings of resentment between line and staff personnel. This resentment can result in various departments viewing the organization from a narrow stance instead of looking at the organization as a whole.

Fortunately, there are several ways to minimize conflict. One way is to integrate line and staff personnel into a work team. The success of the work team depends on how well each group can work together in efforts to increase productivity and performance. Another solution is to ensure that the areas of responsibility and authority of both line and staff personnel are clearly defined. With clearly defined lines of authority and responsibility, each group may better understand their role in the organization. A third way to minimize conflict is to hold both line and staff personnel accountable for the results of their own activities. In other words, line personnel should not be entirely responsible for poor performance resulting from staff personnel advice.

Line-and-staff organizations combine the direct flow of authority present within a line organization with staff departments that offer support and advice. A clear chain of command is a consistent characteristic among line-and-staff organizational structures. Problems of conflict may arise, but organizations that clearly delineate responsibility can help minimize such conflict.

SEE ALSO: Leadership Styles and Bases of Power; Organizational Chart; Organizational Structure; Organizing

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FURTHER READING:

Hitt, Michael, Stewart Black, and Lyman W. Porter. *Management*. Englewood Cliffs, NJ: Prentice Hall, 2004.

Jones, Gareth R. *Organizational Theory, Design, and Change*. Upper Saddle River, NJ: Prentice Hall, 2004.

Judge, Timothy A., and Herbert G. Heneman, III. *Staffing Organizations*. Boston, MA: McGraw-Hill-Irwin, 2006.

Young, Gary J., Martin P. Charns, and Timothy C. Heeren. "Product-Line Management in Professional Organizations: An Empirical Test of Competing Theoretical Perspectives." *Academy of Management Journal* 47, no. 5: 723–735.

LISTENING

Listening is a critical part of communication, and poor listening can contribute to a host of interpersonal and organizational problems. Because a great deal of communication time is spent listening, errors are often costly. Communications research indicates that listening errors are common; organizational members often listen inadequately, hindering personal and organizational success.

There are two major types of listening: recall listening and empathic listening. With recall listening, a person attempts to correctly interpret and remember the content of what another person says. Recall listening can be improved greatly by minimizing distractions and practicing other good listening habits. Empathic listening involves expressing certain attitudes toward the speaker, such as openness to their message, enthusiasm, and concern. A good empathic listener will use nonverbal signals like nodding and eye contact to indicate a willingness to hear the message.

There are a number of ways to improve listening. These include avoiding distractions, listening for the speaker's emotions and controlling one's own emotions, recognizing gender differences in communication style, and engaging in active listening. By mastering techniques for improved listening, managers can better communicate with their supervisors, subordinates, coworkers, and customers.

AVOIDING DISTRACTIONS

The most basic approach to improving listening in the workplace is to avoid distractions that prevent one from concentrating on what is being said. Even when distractions cannot be completely eliminated, they can be minimized in order to improve concentration. In an office setting, listeners can close their office door to minimize outside noise, or move to a more quiet location such as an empty meeting room. Additionally, it may be necessary to ignore telephone calls and newly arrived e-mail in order to fully concentrate. Finally,

interruptions from others, including coworkers, should be dealt with quickly so that attention can be returned to the speaker.

Not all distractions come from others in the organization; listeners are often distracted by work or other thoughts when they should be listening. Therefore, when it is important to listen, individuals should stop working, stop reading, and stop using their computers. When distracted by thoughts, listeners should focus their minds on what the speaker is saying. Mental wanderings are as distracting as physical interruptions.

Concentration and eye contact can minimize distractions and improve listening. To better concentrate, it is important to look the speaker in the eyes and sit at a proper distance. Listeners should sit close enough that the speaker knows that he or she has their attention. Listeners should also look at the speaker so that they are better able to follow his or her words. Finally, it is important to maintain eye contact when the other person is speaking.

One major threat to effective listening is speaking too often, and especially interrupting the speaker. If listeners do not allow the speaker time to finish his thoughts, they will miss the full meaning of his words. Additionally, if listeners are concerned with their response to the speaker, they likely are thinking about their own words and not listening properly. Thus, it may be useful for speakers to pause after the speaker has finished, making sure that she has said all that she intends to say. Furthermore, this is courteous to the speaker, and allows listeners time to gather their thoughts before responding.

MANAGING EMOTIONS

To listen effectively, it is important for listeners to read the speaker's emotions and manage their own feelings. Any anger, frustration, or hostility from either party can hinder the ability to listen properly. When listening to a person who is expressing negative emotion, listeners should try to show that these feelings have been recognized. Oftentimes, speakers want their feelings to be acknowledged before they are reading to discuss the content of their concern. This is particularly true with customers or clients; discussing a problem with an angry customer is likely to be futile if the listener does not first show that their feelings have been recognized and understood.

If listeners are unable to diffuse a speaker's negative emotions in a discussion, they are likely to be the target of hostile words. In this case there are several ways for listeners to respond: ignore the remark and continue listening to the speaker, make an issue of the comment, or respond to the comment in passing and continue with the original conversation. The response

of choice will often depend on the situation, but in all cases should be made deliberately and not based on emotion. Responding with anger is not likely to improve the situation.

In addition to reading the speaker's emotions, listeners must recognize their emotional reaction to the speaker and to his or her words. First, it is important to recognize the things that trigger negative emotions; listeners often are aware of topics and opinions that they have a strong reaction to. Knowing these can help listeners to step back from a conversation and minimize the emotional reaction to a particular topic. Second, people may have negative reactions to particular coworkers or customers that can impede effective listening. Again, advance recognition of feelings about a person may allow the listener to set them aside more easily when it is important to listen. Finally, when negative emotions occur unpredictably, listeners must remember that highly emotional communication is rarely effective in a business context. It may be necessary for listeners to physically excuse themselves for a short time to control their emotions before resuming discussion.

GENDER DIFFERENCES

Gender differences in communication can cause problems. By understanding these differences, listeners can improve their effectiveness when they are addressed by someone of the opposite sex. The major difference in communication is that women prefer to give many details before coming to a conclusion, while men prefer to give "the bottom line" with few details. This may lead male listeners to think that a female speaker is rambling or avoiding her opinion. Subsequently, the female speaker may believe that the male is not listening because he does not consider the details to be important. Conversely, a female listener may find a male speaker's comments too abrupt, or may believe the speaker is hiding details that he does not want others to know. On average, males and females may be different in the way that they communicate. However, not all individuals fit these generalized characteristics. Thus, in order to listen effectively it is important to recognize the way each person communicates, beyond mannerisms related to gender.

ACTIVE LISTENING

One specific technique to improve listening is called active listening. Active listening involves asking questions, using nonverbal cues, giving feedback, and using reflective listening to more effectively understand the speaker.

Oftentimes, a speaker may give incomplete information or speak in a way that the listener cannot understand. To understand the speaker, the listener

may need to ask questions to elicit the information that has not been received. This can involve the use of closed questions, which require only a yes or no answer, and open questions, which require the speaker to elaborate. There are different times in which each is appropriate. For instance, assume a subordinate comes to a manager's office to discuss a lack of progress on a project and says, "There are some interpersonal issues with my team members." This would best be followed by an open question, such as, "What are some of the things that have been going on that are leading to these interpersonal issues?" A closed question, such as, "Is your team leader causing problems?" is unlikely to elicit the necessary information. Conversely, there are times when closed questions are most appropriate, particularly as follow-ups to open questions. After discussing the team problems with the subordinate, the aforementioned manager might confirm: "So, you'd like for me to meet with the team tomorrow to clarify each person's responsibilities?" Closed questions can often help to come to conclusions after a discussion.

Active listening also involves reading a speaker's tone of voice and body language, both of which may convey a different message than that of the words used. A person's tone of voice may reveal feelings that contradict his words; an employee who assures that she is excited to tackle a difficult task, but speaks in a flat, dull voice, may be hiding her hesitance to attempt that task. Body language can also convey more than words. A speaker who does not make eye contact and looks down may be conveying embarrassment or discomfort. A speaker who leans forward and gestures often may be excited or enthusiastic. Some commonly held beliefs about body language are not necessarily accurate. Crossed arms from a listener, often believed to be a sign of resistance to the speaker's words, may only be a sign of the listener's most comfortable sitting position. Some people believe that unwillingness to make eye contact indicates lying. However, many people can look others in the eye and lie, or may lack eye contact due to shyness or other reasons.

Feedback is a critical part of active listening; both nonverbal and verbal responses can improve listening. To show that they understand the listener, a speaker may nod their head, smile, or raise their eyebrows. Verbal responses to show comprehension include saying, "uh huh," "I agree," and "yes." To indicate a lack of understanding or the need for further information when listening, a listener might furrow his eyebrows or cock her head to one side. Replying, "I don't understand" or "Can you explain?" can improve a listener's ability to understand the speaker. One previously discussed element of feedback is acknowledging the speaker's feelings, particularly when the speaker is emotional. Before listeners can effectively understand the topic of discussion, they should recognize any negative feelings that the speaker appears to have.

Reflective listening is a hallmark of active listening and is a special type of feedback. With reflective listening, the listener takes the message that the speaker says and returns it to him or her for confirmation. For example, an employee may say, "I'm feeling very frustrated with our weekly staff meetings. We just seem to talk around all the same issues and I never get much out of them except the feeling that no one knows what anyone else is working on." In this case, a manager might respond, "It sounds as if you feel that the staff meetings are disorganized and not a good use of time." By rephrasing the speaker's words, the manager confirms that they are understood, which makes the speaker feel as if he has been heard correctly. One concern with reflective listening is that the speaker may feel as if the listener has just agreed with or validated his or her feelings. In some cases, the listener may disagree with the speaker's opinion, but still wants to indicate understanding of the message. In this circumstance, it is important to preface the reflective comment with, "I hear you saying that. . ." or "It seems you are. . ." to indicate that the message is the speaker's and not necessarily the listener's.

Listening is a critical business skill, and it can be improved by avoiding distractions, recognizing the speaker's emotions, understanding gender differences in communication style, and using active listening. By improving listening, problems associated with miscommunication in the workplace may be minimized.

SEE ALSO: Communication

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FURTHER READING:

"Be a Better Listener." *The Hindu Business Line* 9 June 2003.

Biech, Elaine. "The Lucrative Art of Authentic Listening." *Successful Meetings* 54, no. 1 (2005): 32-33.

Brody, Marjorie, and Danine Alati. "Learn to Listen." *Incentive* 178, no. 5 (2004): 57-58.

Colombo, George. "Are You Really Listening to Your Customers?" *Business Credit* 106, no. 6 (2004): 66-67.

Cooper, Lynn O. "Listening Competency in the Workplace: A Model for Training." *Business Communication Quarterly* 60, no. 4 (1997): 75-84.

Cousins, Roland B. "Active Listening Is More Than Just Hearing." *SuperVision* 61, no. 9 (2000): 14-15.

DiSanza, James R., and Nancy J. Legge. *Business and Professional Communication: Plans, Processes, and Performance*. Boston, MA: Allyn and Bacon, 2000.

Wilkie, Helen. *Writing, Speaking, Listening. The Essentials of Business Communication*. Oxford, United Kingdom: How To Books Ltd., 2001.

LOCATION STRATEGY

Being in the right location is a key ingredient in a business's success. If a company selects the wrong location, it may have adequate access to customers, workers, transportation, materials, and so on. Consequently, location often plays a significant role in a company's profit and overall success. A location strategy is a plan for obtaining the optimal location for a company by identifying company needs and objectives, and searching for locations with offerings that are compatible with these needs and objectives. Generally, this means the firm will attempt to maximize opportunity while minimizing costs and risks.

A company's location strategy should conform with, and be part of, its overall corporate strategy. Hence, if a company strives to become a global leader in telecommunications equipment, for example, it must consider establishing plants and warehouses in regions that are consistent with its strategy and that are optimally located to serve its global customers. A company's executives and managers often develop location strategies, but they may select consultants (or economic development groups) to undertake the task of developing a location strategy, or at least to assist in the process, especially if they have little experience in selecting locations.

Formulating a location strategy typically involves the following factors:

1. **Facilities.** Facilities planning involves determining what kind of space a company will need given its short-term and long-term goals.
2. **Feasibility.** Feasibility analysis is an assessment of the different operating costs and other factors associated with different locations.
3. **Logistics.** Logistics evaluation is the appraisal of the transportation options and costs for the prospective manufacturing and warehousing facilities.
4. **Labor.** Labor analysis determines whether prospective locations can meet a company's labor needs given its short-term and long-term goals.
5. **Community and site.** Community and site evaluation involves examining whether a company and a prospective community and site will be compatible in the long-term.
6. **Trade zones.** Companies may want to consider the benefits offered by free-trade zones, which are closed facilities monitored by customs services where goods can be brought without the usual customs requirements. The

United States has about 170 free-trade zones and other countries have them as well.

7. **Political risk.** Companies considering expanding into other countries must take political risk into consideration when developing a location strategy. Since some countries have unstable political environments, companies must be prepared for upheaval and turmoil if they plan long-term operations in such countries.
8. **Governmental regulation.** Companies also may face government barriers and heavy restrictions and regulation if they intend to expand into other countries. Therefore, companies must examine governmental—as well as cultural—obstacles in other countries when developing location strategies.
9. **Environmental regulation.** Companies should consider the various environmental regulations that might affect their operations in different locations. Environmental regulation also may have an impact on the relationship between a company and the community around a prospective location.
10. **Incentives.** Incentive negotiation is the process by which a company and a community negotiate property and any benefits the company will receive, such as tax breaks. Incentives may place a significant role in a company's selection of a site.

Depending on the type of business, companies also may have to examine other aspects of prospective locations and communities. Based on these considerations, companies are able to choose a site that will best serve their needs and help them achieve their goals.

COMPANY REQUIREMENTS

The initial part of developing a location strategy is determining what a company will require of its locations. These needs then serve as some of the primary criteria a company uses to evaluate different options. Some of the basic requirements a company must consider are:

- **Size.** A company must determine what size property or facility it needs.
- **Traffic.** If it is in the service business, a company must obtain statistics on the amount of traffic or the number of pedestrians that pass by a prospective location each day.
- **Population.** Whether a service or manufacturing operation, a company must examine the population of prospective locations to ensure that there is a sufficient number of potential customers (if a service business) or

a sufficient number of skilled or trainable workers. In addition, manufacturers also benefit from being close to their customers, because proximity to customers reduces shipment time and increases company responsiveness to customers.

- **Total costs.** Companies must determine the maximum total costs they are willing to pay for a new location. Total costs include distribution, land, labor, taxes, utilities, and construction costs. More obscure costs also should be considered, such as transportation costs to ship materials and supplies, and the loss of customer responsiveness if moving further away from the customer base.
- **Infrastructure.** Companies must consider what their infrastructure requirements will be, including what modes of transportation they will need and what kinds of telecommunications services and equipment they will need.
- **Labor.** Companies must establish their labor criteria and determine what kind of labor pool they will need, including the desired education and skilled levels.
- **Suppliers.** Companies must consider the kinds of suppliers they will need near their locations. In addition, having suppliers nearby can help companies reduce their production costs.

Besides these basic requirements, companies must take into consideration their unique requirements of prospective locations. These requirements may correspond to their overall corporate strategy and corporate goals and to their particular industries.

LOCATION SELECTION TECHNIQUES

MANUFACTURING. Several techniques exist that can be used as part of a location strategy to determine the merits of prospective sites. Location strategists often divide assessment of prospective locations into macro analysis and micro analysis. Macro analysis encompasses the evaluation of different regions and communities, whereas micro analysis includes the evaluation of particular sites. The main macro analysis techniques are factor-rating systems, linear programming, and center of gravity.

Factor-rating systems are among the most commonly used techniques for choosing a location, because they analyze diverse factors in an easily comprehensible manner. Factor-rating systems simply consist of a weighted list of the factors a company considers the most important and a range of values for each factor (see Table 1). A company can rate each site with a value from the range based on the costs and benefits offered by the alternative locations, and multiply this

value by the appropriate weight. These numbers are then summed to get an overall “factor rating.” Then a company can compare the overall ratings of alternative sites. This technique enables a company to choose a location systematically based on the best rating.

Table 1
Sample Factor-Rating System

Factor	Rating (1-100)	Weight	Factor-Rating
Energy availability	60	.3	18
Labor availability	80	.2	16
Transportation	40	.2	8
Supplies	90	.1	9
Taxes and regulations	70	.1	7
Infrastructure	70	.1	7
Overall Factor-Rating	—	—	65

Linear programming provides a method for evaluating the cost of prospective locations within a production/distribution network. This technique uses a matrix of production facilities and warehouses that shows the unit shipping costs from a manufacturing location designated by a variable, such as X , to prospective destinations, such as warehouses designated by other variables— E , F , and G —and the total amount of goods the prospective manufacturer, X , could produce. Other prospective manufacturing locations and the same information for each are also included in the matrix. After computing the total costs for each prospective location, a company can determine which one has lower total costs in terms of the entire production/distribution network.

The center of gravity method is useful for identifying an individual location by considering existing locations, the distances between them, and the volume of products to be shipped. Companies use this method mostly for locating distribution warehouses. To use this technique, companies plot their existing locations on a grid with a coordinate system (the particular coordinate system used does not matter). The idea behind this technique is to identify the relative distances between locations. After the existing locations are placed on the grid, the center of gravity is determined by calculating the X and Y coordinates that would have the lowest transportation costs.

SERVICES. Since service businesses generally must maintain a number of sites to remain close to customers, the location selected should be close to the targeted segment of the market. The market also can influence the number of new locations, as well as their size and features.

A simple technique for determining service locations is to establish a set of minimum criteria for opening new outlets. These criteria should be developed so that the locations selected have strong chances of success. A company could assess the potential of prospective locations based on primary criteria such as:

- The population of the community should more than 100,000.
- The annual per capita income should be more than \$35,000.

After selecting locations that satisfy these criteria, a company might further evaluate the potential locations based on a set of criteria that considers the location's industrialization, person/car ratio, labor availability, population density, and infrastructure.

TRENDS IN LOCATION STRATEGY

Globalization and technology have been the biggest drivers of change in the location decision process over the last thirty years. Location activity has been very high in recent decades as a result of technology improvements, economic growth, international expansion and globalization, and corporate restructuring, mergers and acquisitions.

The top five location factors for global companies are costs, infrastructure, labor characteristics, government and political issues, and economy. Key sub-factors are the availability and quality of the labor force, the quality and reliability of modes of transportation, the quality and reliability of utilities, wage rates, worker motivation, telecommunication systems, record of government stability, and industrial relations laws. Other sub-factors—protection of patents, availability of management resources and specific skills, and system and integration costs—are of increasing importance.

Whereas wages and the industrial relations environment are significant factors in multinational location decisions, by far the main determinant is the host country market size. Furthermore, global economic considerations have become paramount in location strategy as companies contemplate the advantages afforded by various locations in terms of positioning in international markets and against competitors.

When companies seek new sites they generally strive to keep operating and start-up costs low, and so they often choose locations in collaboration with economic development groups to achieve these goals. Companies also now expect to move into new facilities more quickly than in the past, so they tend to focus more on leasing facilities than purchasing land and building new facilities. Also, by leasing facilities, companies can relocate every few years if the market requires it.

Technology, especially communications technology, has not only been a driver of change, but has facil-

itated the site selection process. Managers can obtain initial information on alternative locations via the Internet and promotional software. Site selections agencies increasingly use geographical information system (GIS) technology, and e-mail has become a dominant mode of communication in location research and negotiation.

Location databases have enabled companies to do initial screening themselves, hence reducing their need to rely on economic developers to providing only very specific information and details on locations—such as commuting patterns and workforce characteristics.

Telecommunications technology has created the “virtual office” of employees working from remote locations. The growth of the virtual office has impacted location strategy in that some companies no longer need as much workspace because many employees work from remote sites. When these employees need to work at the office, they can call and reserve office space for themselves. The decrease in facility size can lead to millions of dollars worth of savings each year, while increasing productivity.

SEE ALSO: Globalization; International Business

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Revised by R. Anthony Inman

FURTHER READING:

Bognanno, Mario F., Michael P. Keane, and Donghoon Yang. “The Influence of Wages and Industrial Relations Environments on the Production Location Decisions of U.S. Multinational Corporations.” *Industrial and Labor Relations Review* 58, no. 2 (2005): 171.

MacCarthy, B.L., and W. Atthirawong. “Factors Affecting Location Decisions in International Operations—A Delphi Study.” *International Journal of Operations and Production Management* 23, no. 7 (2003): 794–828.

Spee, Roel, and Wim Douw. “Cost-Reduction Location Strategies.” *Journal of Corporate Real Estate* 6, no. 1 (September 2003): 30–38.

Talley-Seijn, Margaret. “30 Years of Location Strategies.” *Plants, Sites and Parks* 31, no. 3 (July 2004): 26–29.

LOGISTICS AND TRANSPORTATION

According to the Council of Supply Chain Management Professionals (CSCMP), logistics management can be defined as, “that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the

point of origin and the point of consumption in order to meet customers' requirements."

The history of logistics is rooted in its military application. Since WWII it has developed into an important function of business as it became evident that logistics and transportation add place and time value to products and enhance the form and possession value added by manufacturing and marketing.

The concept of logistics as a business discipline began to appear in the business-related literature in the 1960s when it was called physical distribution. At that time its focus was on the outbound side of the logistics system. With the emerging importance of Supply Chain Management, logistics and transportation has become even more crucial as supply chain managers realize that the coordination and integration of the logistics systems of all organizations with the supply chain are requirements for success.

According to Coyle, Bardi and Langley there are four subdivisions of logistics:

- Business logistics—this is the same as the definition from the CSCMP and approach we are adopting in our discussion.
- Military logistics—all that is necessary to support the operational capability of military forces and their equipment in order to ensure readiness, reliability, and efficiency.
- Event logistics—management of all involved (activities, facilities, and personnel) in organizing, scheduling, and deploying the resources necessary to ensure the occurrence of an event and efficient withdrawal afterwards.
- Service logistics—acquisition, scheduling, and management of facilities, personnel, and materials need to support and sustain a service operation.

Within the context of this essay we will be addressing the concept of business logistics. Business logistics systems can be classified into four categories:

Balanced System. Firms with a balanced system have reasonably balanced inbound and outbound flows.

Heavy inbound. These firms have a very heavy inbound flow but a very simple outbound flow. Firms with heavy inbound flow typically do not warehouse their finished goods, for example, aircraft manufacturers.

Heavy outbound. These firms have a complex outbound flow and a very simple inbound flow. Their inbound flow is usually raw material from a relatively short distance. Typically their outbound shipments are a wide variety of packaged finished goods

requiring storage and transportation to the final consumer.

Reverse system. Reverse supply chain logistics systems have reverse flows on the outbound side of their system. Durable products are returned for credit, trade-in, repair, salvage or disposal or the firm utilized returnable or reusable containers.

Coyle, Bardi and Langley list a number of activities that lie within the realm of logistics:

- Order fulfillment—activities involved with completing customer orders. Obviously, transportation and logistics would be an integral part of completing the orders since they directly impact delivery.
- Traffic and transportation—the physical movement of goods.
- Warehousing and storage—a number of warehousing decisions directly impact logistics and transportation. For example, how many warehouses are needed, where should they be located, how large should they be, how much inventory should be held in each?
- Plant and warehouse site location—location can alter time and place relationships between the warehouse and the customer. Frequently transportation cost is a major factor in plant and warehouse location.
- Materials handling—the placement of goods and the movement of goods within a warehouse, factory or other facility. This includes incoming movement of goods and the movement of goods from storage to order-picking areas to dock areas for shipment.
- Industrial packaging—transportation directly impacts the type packaging needed. Fast methods of transport, such as air, generally require little in the way of packaging while the slower modes, such as water or rail, require substantial packaging expenditures to ensure safe shipment.
- Purchasing—quantities purchased directly affect transportation costs. Also, transportation relates directly to the distance or location of goods purchased by the firm. Purchasing and logistics are increasingly integrated in many major firms.
- Demand forecasting—accurate and reliable forecasting is essential for effective inventory control purposes, especially within firms utilizing lean manufacturing and JIT.
- Inventory control—this is directly related to transportation and warehousing. If

transportation is slow higher levels of inventory are needed, ergo, more warehouse capacity is needed.

- Production planning—production planning must operate in close coordination with logistics in order to ensure adequate market coverage. Production planning and logistics are increasingly integrated within large corporations.
- Parts and service support—the effectiveness of parts and service support depend upon speed of transportation, location of warehouses, and forecasting of support function needs. Obviously, parts and service support have a direct impact on customer service levels.
- Return goods handling—reverse supply chain logistics is an increasingly important but frequently overlooked dimension in logistics.
- Salvage and scrap disposal—disposal is an integral part of the reverse supply chain. There is an increasing interest, in the logistics literature, in the impact of the location of evaluation and disposal facilities for returned goods.
- Customer service levels—logistics plays an extremely important role in ensuring that customers get the right products at the right place at the right time. Transportation, warehousing, forecasting, inventory control, and production planning all have a direct impact on customer satisfaction.

The two most obvious aspects of logistics are warehousing and transportation.

WAREHOUSING AND STORAGE. Warehousing is defined as the storage of goods: raw materials, semi-finished goods, or finished goods. This includes a wide spectrum of facilities and locations that provide warehousing. Since this is a point in the logistics system where goods are held for varying amounts of time, the flow is interrupted or stopped, thereby creating additional costs to the product.

In a macroeconomic sense, warehousing creates time utility for raw materials, industrial goods and finished products. It also increases the utility of goods by broadening their time availability to prospective customers.

TRANSPORTATION. Transportation involves the physical movement or flow of goods. The transportation system is the physical link that connects customers, raw material suppliers, plants, warehouses and channel members. These are the fixed points in a logistics supply chain.

The basic modes of transportation are water, rail, motor carrier, air and pipeline. Water being the slowest mode with rail, motor carrier, and air following in order of speed of delivery. Generally, the order is reversed when looking at costs.

Selection of the appropriate carrier has several steps. First the firm selects a transportation mode. The shipper must compare the service desired with the rate or cost of service. Service usually means transit time or the time that elapses from the time the consignor makes the goods available for dispatch until the carrier delivers to the consignee. Pickup and delivery, terminal handling and movement between origin and destination account for the time involved in transporting goods.

The firm must balance the “need for speed” with the costs inherent in the mode of transport. This includes the rate charged for the service, minimum weight requirements, loading and unloading facilities, packaging, possible damage in transit, and any special services that may be desired or required. If next day delivery is imperative, the shipper will utilize an air freight carrier but will pay a premium price for such rapid service. If time is not a particularly critical element the shipper may elect to use rail or a motor carrier, or may even utilize a water carrier if time is inconsequential. Water-based modes of transportation are the least expensive and are used for commodity type products such as grain, coal, and ore. Some firms even utilize more than one mode of transportation, called intermodal transport, to move their goods.

Once a mode is selected, the shipper must decide the legal classification or type of carrier they wish to utilize: common, regulated, contract, exempt or private.

Common carriers serve the general public at reasonable prices and without discrimination. They cannot refuse to carry a particular commodity or refuse to serve a particular point with the scope of the carrier’s operation. Common carriers are liable for all goods lost, damaged, or delayed unless caused by an act of God, an act of a public enemy, an act of public authority, an act of the shipper, or some defect within the good itself.

Regulated carriers are required to provide safe and adequate service and facilities upon reasonable request and are liable for damage up to limits established by the carrier. Regulated carriers can be motor carriers or water carriers and are subject to minimal federal controls.

A contract carrier does not serve the general public, but, rather serves one or a limited number of contracted customers. They have no legal service obligation. They often provide a specialized service and usually have lower rates than common or regulated carriers.

Exempt carriers are exempt from regulation regarding rates and services. Exempt status comes from the type commodity hauled or the nature of the

carrier's operation. Exempt motor carriers are usually local and typically transport such items as agricultural goods, newspapers, livestock, and fish. Exempt water carriers transport bulk commodities such as coal, ore, grain, and liquid. Exempt rail carriers transport piggy-back shipments and exempt air carriers haul cargo.

A firm's own transportation is termed a private carrier. Private carriers are not "for-hire" and not subject to the same federal regulations as other types of transport. However, the carrier's primary business must be something other than transportation.

Once the mode and type of carrier is determined a final decision can be made based on other factors. Accessibility is one such factor. Some firms have geographic limits to their routing network. Others may not possess physical access to needed facilities or have the ability to provide the equipment and facilities that movement of a particular commodity may require. Reliability, the consistency of the transit time a carrier provides, is also a key factor. Finally, convenience and communication are other important considerations when selecting a carrier.

Measures that a transportation firm would use to judge its performance include: orders shipped on time, orders shipped complete, order preparation time, product availability, and transit time. From the customer perspective performance can be gauged from orders received on time, orders received complete, orders received damage free, orders filled accurately, and orders billed accurately.

GLOBAL LOGISTICS

The expansion of the global marketplace puts the concept of global logistics into the limelight. Logistics experts must now manage all of the aforementioned logistics activities within a world-wide arena spanning a multitude of countries, languages, cultures, governments, and regulations. Along with this expansion of the marketplace comes the need for global channel intermediaries. Today's global logistics manager would be familiar with the role of each of the following:

- Foreign freight forwarders—handlers of a myriad of foreign freight services: rate quotes, vessel chartering, booking of vessel space, handling of documentation and cargo insurance, tracing and expediting, arranging inland transportation and providing translation services.
- Export management companies—suppliers of expertise to those wishing to sell products overseas but lacking the necessary resources.
- Export trading companies—locaters of overseas buyers. They also handle export docu-

mentation, transportation and the meeting of foreign government requirements.

- Customs house brokers—overseers of the movement of goods through customs. They also ensure that accompanying documents are complete and accurate.
- Ship brokers—sales representatives for ship owners and purchasing representatives for the shipper.
- Ship agents—local representative of the ship operator that handles the ship's arrival, berthing, clearance, loading and unloading.
- Export packers—suppliers of export packaging services.
- Port authorities—owner and operator of the port. They provide wharf, dock, and other terminal facilities at port locations.

SEE ALSO: Exporting and Importing; Forecasting; Lean Manufacturing and Just-in-Time Production; Reverse Supply Chain Logistics; Warehousing and Warehouse Management

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FURTHER READING:

Coyle, John J., Edward J. Bardi, and C. John Langley, Jr. *The Management of Business Logistics: A Supply Chain Perspective*. Mason, OH: South-Western Thomson Learning, 2003.

LONGITUDINAL SCENARIOS

Strategic planning and forecasting tend to use projections of past events to develop future plans. Such approaches rely on historical data and assume a continuation of past business practices and environmental stability. Scenarios are used to develop plans for significant changes in products, personnel, or processes for which data are limited and uncertain. The premise is that the best way to prepare for radically different situations is to think through various events that could occur and consider alternatives for responding to those situations if they should happen.

One early application of this technique was a 1968 forecast for the Royal Dutch Shell Group that foresaw the 1973 OPEC oil price rise. By thinking through this possibility, Shell executives were able to respond more rapidly than their competitors. This allowed Shell to move from its position as the eighth-largest oil producer to the second-largest in two years time. Businesses in energy intensive industries like

trucking or airlines could benefit by considering what would happen and how should they respond if gas prices were to reach extremely high levels.

Scenarios typically look at potential situations from one of two perspectives. Some firms approach scenario development by looking at possible chain reactions resulting from a possible change. For example, new medical technology could raise average life expectancies beyond 100 years. In this case, one might ask what the impact would be on labor markets, health care, retirement programs, and housing. In other words, how would the change in average life expectancy change business?

An alternative approach is to look at a desired future state and proceed backward to consider the precursor developments that would be necessary to achieve the desired state. Firms could look at what changes in immunology, surgery, and drug development would be necessary to make it possible for life expectancies to reach 100. The question becomes what could the business do to make this possibility a reality?

There are many different approaches firms can use to develop meaningful scenarios. In their 2001 article, "The Essentials of Scenario Writing," Steven Schnaars and Paschalina Ziamou suggested the following:

1. Optimistic vs. best guess vs. pessimistic scenarios. This approach looks at the most likely (best guess) future situation based on current information. The optimistic scenario introduces questions regarding what things would or could happen to result in a better than anticipated outcome, and how the organization can make those things actually happen. The pessimistic scenario looks at many of the things that could go wrong and tries to help decision makers plan responses to deal with these problems should they arise.
2. Good vs. bad scenarios. This approach avoids the tendency to focus on the most likely alternative of the "best guess" and forces managers to give more attention to both extremes.
3. Arrayed scenarios. These scenarios look at alternatives associated with a continuum along a single criterion or dimension. Firms could plan their response to a slight, moderate, or severe change in the price of gasoline or another key resource.

4. Independently themed scenarios. This approach looks at different aspects of the future. One scenario could look at possible technological breakthroughs, another at environmental concerns, and a third at potential market changes. Each scenario is conceptually independent of the others.

Firms can use scenarios to develop a variety of strategies. Some firms strive to develop strategies that perform equally well across all scenarios, while others try to develop strategies that would work well in response to each possible scenario. A third approach is to develop a strategy to postpone commitment and keep options open as long as possible.

Scenario development allows firms to deviate from a linear projection of past business practices. This is accomplished by developing potential situations that question traditional assumptions about the firm's relevant industry, processes, markets, and people that may make it necessary to significantly alter the current strategy. Great strategists are more attuned to their environment and notice small changes in it before their less attentive counterparts. Scenario analysis allows firms to recognize some of these possible changes before their competitors and plan responses accordingly.

SEE ALSO: Contingency Approach to Management; Forecasting; Strategic Planning Tools

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FURTHER READING:

Mitchell, Donald W., and Carol Bruckner Coles. "Establishing a Continuing Business Model Innovation Process." *Journal of Business Strategy* 25, no. 3 (2004): 39–49.

Mitroff, Ian I. *Crisis Leadership: Planning for the Unthinkable*. Hoboken, NJ: Wiley, 2004.

Nutt, Paul C. "Expanding the Search for Alternatives During Strategic Decision-Making." *Academy of Management Executive* 18, no. 4 (2004): 13–28.

Roney, Curtis W. "Planning for Strategic Contingencies." *Business Horizons* 46, no. 2 (2003): 35–42.

Schnaars, Steven, and Paschalina Ziamou. "The Essentials Of Scenario Writing." *Business Horizons* 44, no. 4 (2001): 25–31.

von Oetinger, Bolko. "A Plea for Uncertainty: Everybody Complains about Uncertainty, but It Might Be a Good Thing." *Journal of Business Strategy* 25, no. 1 (2004): 57–59.