

Industrial engineers: in demand in the society essay



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ABSTRACT The Industrial engineering (IE) is about choices. Other engineering disciplines apply skills to very specific areas. Industrial engineering gives you the opportunity to work in a variety of businesses. The Industrial Engineering field has developed an infinite number of ways to reduce assembly time. For example, using “ key-ways” to mark the proper orientation of a part reduces errors and the subsequent time to correct them.

As companies adopt management philosophies of continuous productivity and quality improvement to survive in the increasingly competitive world market, the need for industrial engineers is growing. Industrial engineers are the only engineering professionals trained as productivity and quality improvement specialists. The need for industrial engineers is growing. Many people are misled by the term “ industrial engineer”. The “ industrial” does not mean just manufacturing. It encompasses service industries as well.

It has long been known that industrial engineers have the technical training to make improvements in a manufacturing setting. Now it is becoming increasingly recognized that these same techniques can be used to evaluate and improve productivity and quality in service industries. The industrial engineer integrates people into the design and development of systems, thus requiring an understanding of the physical, physiological, physiological, and other characteristics that govern and affect the performance of individuals and groups in working environments. The philosophy and motivation of the industrial engineering profession is to find the most efficient and effective methods, procedures, and processes for an operating system, and to seek continuous improvement. Thus, industrial engineering is utilized to help organizations grow and expand efficiently during periods of

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prosperity, and extreme line costs and consolidate and reallocate resources during austere times. Industrial engineers, particularly those involved in manufacturing and related industries, work closely with management.

Therefore, some understanding of organizational behavior, finance, management, related business principles and practices is needed. Human factors and work systems combines the traditional areas to work measurement and design with the analysis and evaluation of the human element, which includes the physiological and psychological considerations in designing products and work systems. Designing the admissions procedure at a hospital includes in projects of industrial engineers from surgery studies, assessments, and redesign in the surgery department.

Onsite hospital visits, which include observations and interviews to understand the flow of patients through operating rooms, are conducted to help surgeons and anesthetists understand their own efficiency levels.

Anybody who needs surgery studies, assessments, redesign in the surgery department includes in projects of industrial engineers. Effective layouts are based on flow of materials being produced or conditioned.

As the number and diversity of parts or products increase, the complexity of flow analysis grows and the methods of analysis change. In the materials handling and plant layout go hand in hand. It is seldom possible to plan or change one without affecting other. People at work experience physical stress related to repetitive manual jobs, such as stuffing envelopes.

The problems experienced are caused by the repetitive motions, uncomfortable postures that must be achieved and held for a long period of

time and having to grasp something too forcefully. The time and motion study can find out how much physical stress workers are exerting so it can be controlled. The Gilbreth System of Therbligs broke important ground in the study of work and work methods. Indeed, with the addition of two Therbligs (Hold and Plan) and the elimination of one (Find), the system remains relatively unchanged from when they first developed it. But the Gilbreth's always wanted the Therblig system to be a work in progress, which is just what has happened. Therbligs have been used for every form of work imaginable.

Indeed, the system has been applied to work in robotics and interactive computer systems. Where not used directly, the method has been a model for systems analyzing other aspects of work. **ACKNOWLEDGMENT** The researcher would like to give due acknowledgment to the following individuals who have contributed a lot for the completion of the project: To Mr. Emmanuel P. Fria, Technical English Professor, for giving the opportunity to study and learn new things and to look for the answers in the problems.

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8 Appendix Glossary Index References CHAPTER 1 Introduction Industrial engineering, as the name is used in industry, commerce and government throughout the world, may be the broadest of all the modern management functions.

A wide variety of tasks are established for the purpose of designing, implementing and maintaining management systems for effective and efficient operations. In fact, the range of industrial engineering activities is so broad that one prominent industrialist said that “ Industrial engineering consists of all of the engineering and management activities that cannot be clearly designated as a part of other engineering or management functions” (Ferrell, 1992). With this, IEs work to make higher quality goods and services that are less expensive, readily available and better design to meet the customer’s satisfactions. Industrial engineers can help improve the lives of the people and can contribute to nation-building. The aim and, to a remarkable degree, the achievement of modern industry is to produce large volume of well-designed and effective goods priced within reach of the largest number of consumers (W.

K. H. , 2002). The capacity of doing so underlies in the concept of industrial engineering. Industrial engineering is a branch of engineering that concerns the research and development, evaluation, improvement and implementation of integrated systems of the key elements of a

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manufacturing terms namely manpower, money, machines, materials, moment and methods (Wikipedia, 2008). IE is the field that has grown up around the study of methods.

Becoming an industrial engineer (IE) places one in an exciting field of engineering that focuses on productivity improvement worldwide. It is a field that deals heavily with human aspects of work as with today's sophisticated tools of work. What sets industrial engineering apart from other engineering disciplines is its broader scope. The industrial engineer applies problem-solving techniques in almost every kind of industry, business, or institution. There are IEs in banks, hospitals, government institutions, transportation, construction, social services, manufacturing, and logistics at all levels (Brennan et. al.

, 2007). A. Background of the Study Industrial engineers determine the most effective ways for an organization to use the basic factors of production—people, machines, materials, information, and energy—to make or process a product (Mundel & Danner, 1994). They serve as a bridge between management and operations. Industrial engineers carefully study the product and its requirements, design manufacturing and information systems, and use mathematical analysis methods to meet those requirements (Hicks, 1994). B.

Statement of the Problem This study aims to name the pioneers of Industrial Engineering and the remarkable industrial engineers, and identify their contributions and benefits in the field of engineering. This study also aims to determine the role and functions of an Industrial Engineer. Specifically, this

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study will deal with the following questions: 1. Who pioneered Industrial Engineering? 2.

Who are the remarkable industrial engineers? 3. What are the contributions of the remarkable industrial engineers in the field of engineering? 4. What are the benefits of the works of these industrial engineers in the field of engineering? 5. What are the role and functions of industrial engineers? C. Objective of the Study Engineering is in demand all over the world. It focuses on industrial engineers: the pioneers, the remarkable industrial engineers with their amazing works that benefit a lot in the field of engineering.

The used of their works also focus on how it can use in the industrial production. Since Industrial Engineering is not that known compared to other engineering field, we intended to do this project to pursue to at list Industrial Engineering field to be known liked the other engineering field. With this project it can help even in a small way to recognize Industrial Engineering. D. Significance of the Study This study will benefit the following: 1. Students Student who will soon graduate from their high school will benefit from this study.

This research paper will help them to choose what course they will take in college. With the remarkable industrial engineers who distributed a lot in the field of engineering identified in this project. 2. Future Industrial Engineers The functions and activities that determined in this project can helped them to study and focused more, so that when they already in the position they will no longer confuse in the career that they chosen.

E. Scope and Limitation This study deals with the pioneers of Industrial Engineering, namely Frank Gilbreth and his wife Lillian Gilbreth, remarkable industrial engineers with their amazing contributions in the field of engineering and the role and function of industrial engineers. F. Methodology The agonizing part of choosing what to research is over and the task of finding the specific information we need is more like solving a puzzle or going on a treasure hunt.

If any part of this process is going to be fun, this is the part. The methods we used in processing this research paper are follows: 1. Reading materials There is no doubt that books, magazines, encyclopedia and other forms of written or printed media are still one of the most variable materials for research purposes. These materials give not just an overview of the subject matter, functions, capabilities and features of existing device. These can also give the reader some insights on the possible development and even probable enhancements of existing devices which later might serve as a head start for another and set of discoveries not only for this particular device but also for other devices processing the same concepts incorporated.

. Internet This new technology indeed has been a great help for many people and most especially for students. Net surfing gives users or researchers a vast directory of information in - line with the desired topic. The only key in using the Internet is patience, considering that it could offer a thousand or even more than a thousand website for a single topic alone.

CHAPTER 2 A. Historical Background of Industrial Engineering Research and studies conducted in the early part of the 20th century resulted on the new knowledge about industrial production, which refers to the methods used factories for the efficient manufacture of goods and led to the introduction of scientific methods for the management of work. The field of industrial engineering broadened accordingly when the powerful concepts and techniques developed by early pioneers were discovered to be applicable not only to manufacturing and production but also to many other operating systems (W. K.

H. , 2002). Early pioneers of management emerged during and after the Industrial Revolution in England and United States. The great force in changing the way that factory work was performed in America and later in Europe, was started by Frederick W.

Taylor, known as the “ Father of Scientific Management” when he published his last book in 1911, “ The Principles of Scientific Management,” where he called a formula for maximum productions (Ferrell, 1992). By 1912, Frank and Lillian Gilbreth came along that the importance of motion study really began to be widely recognized. The Gilbreths isolated and identified the basic motions that make up all human activity and called them “ therbligs” (Gilbreth spelled backwards) (Ferrell, 1992). Gilbreth’s “ therbligs” later formed the basis for the research that ultimately led to the development of methods – time measurement, which is still widely used by industrial engineers. Gilbreth’s efforts in the field of motion study had previously been considered to be rather theoretical and impractical (Ferrell, 1992). Until, in 1927, H.

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B. Maynard, G. J. Stegemerten, and S. M. Lowry, wrote “ Time and Motion Study”, which pointed out the importance of motion study and good methods (Ferrell, 1992).

In motion study, the motions used in performing productions or processing operations are analyzed to determine the fundamental elements of movement, and then any unnecessary motions are eliminated, necessary motions are simplified, and the most favorable motion sequence for maximum efficiency is established (Niebel, 1999). It is then followed by “ Methods engineering”. Many engineers were working on finding better ways to improve operations during the 1930’s (Ferrell, 1992). The scope of the industrial engineering function began to expand rapidly in the years immediately following World War II and has continued to expand since then (Ferrell, 1992). B.

Activities of Industrial Engineers Management Management was one of the earliest disciplines to emerge in human history. It is traced back at least as far as early Egyptian times. Management is the process for managing, training or directing. Management also means: an organizational or administrative process; a science, discipline or art and the group of people running an organization (Hicks, 1994). The execution of Management functions is essential in a reasonable amount of time.

Management in most modern texts begins the development of scientific concepts by Frederick W. Taylor. Frederick Taylor is the “ Father of Scientific Management” and the “ father of Industrial Engineering” (Niebel, 1999).

There should be no confusion between the two courses: production

management and industrial engineering. Production management is a sequence of one to two courses at the undergraduate level that attempts to familiarize management students with concepts and techniques specific to the analysis and management of production activity. Industrial engineering, on the other hand, is an engineering degree curriculum concerned with the analysis, design, and control of productive systems.

A productive system is any that produces either a product or a service.

Managing in a production environment, with less attention paid to the analysis and design of productive system are often primarily concerned of production management system (Babcock & Moise, 2002). Industrial engineering students, on the other hand, are taught the concept of the design, improvement and installation of integrated systems of people, material, equipment and energy. Industrial engineers are not the one who operates the system they design. Operation research Operations research is concerned with optimal decision making in, and modeling of deterministic and probabilistic system that originates from real life.

These applications, which occur in government, business, engineering, economics and the natural and social sciences, are largely characterized by the need to allocate limited analysis such as that provided by operations research. The contribution from scientific analysis such as that provided by operations research. The contribution from the operations research approach stems primarily from: (1) Structuring the real life situation into a mathematical model, abstracting the essential elements so that a solution relevant to the decision makers' objectives can be sought. This involves looking at the problem in the context of the entire system. (2) Exploring the <https://assignbuster.com/industrial-engineers-in-demand-in-the-society-essay/>

structure of such solutions and developing systematic procedures for obtaining them.

(3) Developing a solution, including the mathematical theory, if necessary, that yields an optimal value of the system measure of desirability for possibly comparing alternative courses of action by evaluating their measure or desirability (Hiller & Lieberman, 1986). Mass productionThe production of long-runs of standardized goods for a mass market was introduced into United States at the beginning of 19th century. The first industrialist to make full use of this system was Henry Ford and as a result it became known as Fordism. This has been described as “ the mass production standardized goods, using dedicated machines and moving assembly lines employing unskilled and semi-skilled labour in fragmented jobs, with tight labour discipline in large factories” (Meyers, 1993). The efficiency of mass production results from the careful, systematic application of ideas.

Careful, skilled industrial engineering and management are required to achieve the maximum benefits that application of the basic principles of mass production (Meyers, 1993). Facilities planning and design Plant layout of facilities and planning design embraces the arrangement and orientation of physical facilities, including storage and supporting services used by company in the production of its products. It includes the availability of the satisfactory features such as space, freedom from adjacent dirt and fumes, trained labor supply, water and utilities. It also includes the evaluating the availability, sustainability and along range cost of land site, raw materials power and few to mention (Turner, 1993).

Transportation facilities are very important in plant layout. Work sampling
Work sampling is a work measurement technique consisting of intermittent, instantaneous observations of work activity or delays. Observation times may be regularly or randomly spread over the total observation period or over several time strata of the observation period, but in any event they must be stochastically independent of the work cycles observed. The objective of such a study generally is to determine the actual percent time spent on the observed activities or delays.

However, this can be converted to an Average Time or (if observations included an effort rating) to a Normal time for each activity (Hicks, 1994). Work sampling provides frequent information faster and at considerably less cost than stopwatch techniques. In conducting work sampling studies, analysts take comparatively large number of observations at random intervals (Hicks, 1994). The application of work sampling was first made by L. H. C.

tippet in the British textile industry. Later work sampling known under the name “ ratio - delay” study and received a considerable attention in this country. Materials handling Material handling is defined simply as moving material. Material handling has affected (positively) working people more than any other area of work design. Today, we say that the physical drudgery has been eliminated from work by work material handling equipment. Every expense in business must be cost justified and material handling equipment is no exception.

The money to pay from material handling equipment must come from the saving on labor, material, or over head costs, and this moneys must be covered in two years or less (50 percent ROI or higher) (Meyers, 1993).

Quality control Quality control (QC) is the process of examining the quality aspects of a product as a portion of a total system. It includes the determination of the cost and acceptability of alternate quality levels and the provision of working and control tools to achieve desired quality goals.

Quality control aims to provide quality through excellent integration of the controllable aspects of (1) policies, planning and administration; (2) design; (3) procurement; (4) production; (5) customer experience and feedback; (6) corrective action and (7) employee selection, training and motivation (Turner, 1993). C.

Roles of Industrial Engineers Many people are misled by the term “ Industrial Engineer”. The “ industrial” doesn’t only mean manufacturing. It encompasses service industries as well. (Lamar University, 2000). It has been known that the roles of Industrial Engineers to make plants and other operations more cost-effective, produce xactly what each worker really wants – job security (Hicks, 1994).

Industrial engineers seek for solutions to the extremely broad range of problems throughout the society concerning day-to-day problems from industry, business and government. Manufacturing is today the largest employer of industrial engineers. They are assigned to reduce production costs by using the latest advanced automation, robotics, computer science and integrated manufacturing (Hicks, 1997). IEs design systems to enable people and society to improve effectiveness and efficiency and the quality of <https://assignbuster.com/industrial-engineers-in-demand-in-the-society-essay/>

the work environment. They have a dual role, both to extend human capacity to operate, manage and control overall production system and to ensure the safety and well being of those working in the system, that must be apply in a creative manner to achieve the best solution in this increasingly competitive world (Dalhousie University, 2006). The analysis on the use of manpower, machines, materials, methods, moment and money in an organization is made by industrial engineers so that the organization can increase its productivity and profitability.

Because of this, industrial engineers are equipped to solve on-the-job problems such as (1) designing and selecting production equipment and tools, and specifying the operating procedures for them; (2) designing plant facilities, including the arrangement of machinery, materials handling equipment, and storage areas; (3) reducing costs by making a detailed analysis of all production and supporting elements in a manufacturing operations and recommending improved methods; (4) establishing labor performance standards; (5) analyzing and evaluating job skills, developing wage scale for skilled level and work done; and (6) developing and implementing production and quality control procedures (Niebel, 1999). As a result, they are exposed to have employment growth of 20 percent over the projections decade, faster than the average compared to other occupations (U. S. Department of Labor, 2007). According to Enriquez (2007), the current demand for IEs is extremely strong and consistent.

IEs are able to work in different fields or disciplines. They enjoy a high level of job assignments or positions. Industrial engineers figure out how to do things better. This is why IEs end up being promoted into managerial

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positions. Companies adopt management philosophies of continuous productivity and quality improvement to survive in the increasingly competitive world. They make processes better in the following ways: (1) effective and efficient manufacturing practices; (2) high levels of customer service (3) product quality; (4) ability to produce more with less time; (5) make work safer; and (6) help companies to reduce costs associated with new technologies (Lamar University, 2000).

D. Contributions to Industrial Engineering Field Time and Motion study A time and motion study would be used to reduce the number of motions in performing a task in order to increase productivity. The best known experiment involved bricklaying. Through carefully scrutinizing a bricklayer's job, Frank Gilberth reduced the number of motions in laying a brick from 18 to about 5.

Hence the bricklayer both increased productivity and decreased fatigue (Wikipedia, 2008). The motion and time study refers to a broad of knowledge dealing with the determination of the time required for the use of human and/or machines to perform the work by stipulated method, with the development of materials required to make practical use of these data, and with the systematic determination of preferable work methods (Meyers, 1994). Time measurement is often a part of the basis on which alternatives methods are compared. While the work measurement is used to refer some of the techniques of time measurement. The motion study aspect consists of a wide variety of procedures.

Motion study can save large percentage of manufacturing cost than anything else they can do in a manufacturing plant. Motion studies performed to eliminate waste movements (Meyers & Stewart, 2002). Motion studies provide the proper way to consistently make good product. The echnologies used the tools of methods study to develop new methods, to correct all ineffective habits, to analyze process and operations, and to develop appropriate person and machine combinations for production (Niebel, 1993) In the evaluation of industrial performance, analysis of the time spent in going through the different motions of a job or series of jobs.

Time-and-motion studies were first instituted in offices and factories in the United States in the early 20th century. These studies came to be adopted on a wide scale as a means of improving the methods of work by subdividing the different phases of work. Micromotion study Gilbert invented the technique known as micromotion study to identify the basic motions employed in human work. This method used a 16-millimeter industrial camera to record events at normal (1000 frames per minute) or faster than the normal camera speed; therefore, the time between successive frames was 0.001 minutes.

It is used for the analysis of short, highly detailed operations that move at too rapid speed for satisfactory visual observation. The camera was driven to act as a timing device for measurements of motions or elements. By examining the successive frames, usually with the aid of a frame counter attached to the projector, the detailed human activity could break down into detailed work elements (Meyers & Stewart, 2002). For displaying a micromotion study analysis a “simo chart” is used.

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Micromotion study involve amount of film; therefore, a memomotion study (similar to the time lapse photography) techniques was developed, which employs a longer time interval between successive frames (Meyers & Stewart, 2002). In recent years, the introduction of the video camera has become common practice to record the performers of the worker on video tape as part of the time study. If there is any questions in the future of the efficiency of the prior performance rating for establishing the time standard can be reevaluated by reviewing the video taped worker performance. Time - study performance rating was done on the spot by the time study person before the video taping worker performances.

Since the rating performance could not be restudied at the later date, it was often a source of contention in questioning the standard produced. TherbligA term invented by Frank and Lilian Gilbreth, who assured credit to themselves for their pioneering activity in this area by coining this term. It is Gilbreth spelled backward, except that the T and h of Gilbreth are not rversed (Meyers, 1994). A therblig is the name for the unit of time required for a worker to perform one of a set of fundamental motions while performing a manual operation or task. The set consists of 18 elements, each describing a standardized activity (Niebel, 1993).

These are listed below.

- Search, symbolized by “ S”. This is the basic operation element utilized to locate a needed tool, or part of other object.
- Find, symbolized by “ F”.

Find can be considered a demarcation line, denoting the end of the Search cycle. Even though we may not find frequent or essential use for this

Therblig, it should be kept available, since it may become important in a future application of the system. •Select, symbolized by “ SE”. This is the basic operation element required for choosing between two or more items found by search. •Grasp, symbolized by “ G”.

This is the basic operation element required to take hold of an object and bring it under the control of the operator or other transporting device. •Hold, symbolized by “ H”. This therblig is the one required to retain control of an object, after it has been successfully picked up. •Position, symbolized by “ P”. This is the basic operation element required to prepare the transporting device and or object to be moved for the next basic operation.

•Assemble, symbolized by “ A”. This is the basic operation element required to bring two or more parts into a predetermined relationship and to join them permanently in this relative positions. It is considered as including the converse operation for “ disassembly”. •Use, symbolized by “ U”. This is the basic operation element required for actual processing of a part or a material (exclusive to assembly operations) to convert its form utility.

•Disassemble, symbolized by “ DA”. This motion is essentially the opposite of Assemble, depending on the circumstances. While it could be used where a mistake was made in Assemble, it could also be the act of removing a part from a jig or clamp, which held the part during the Use or Assemble motion.

•Inspect, symbolized by “ I”. This is the basic operation element required for comparing a part with a pre-determined standard – using the fine senses, possibly assisted by an appropriate gauging device.

- Transport loaded, symbolized by “ TL”. This is the basic operation element required to move the hand or other transporting device loaded or moving against resistance.
- Transport unloaded, symbolized by “ TU”. This is the motion of moving the unloaded hand from the point of Release Load, to the next function within the sequence.

It can also be considered the hand motions involved between Select and Grasp, where the eye identifies the object and the hand moves towards it to grasp. This Therblig is a non-productive one, and as such, should be kept to a minimum.

- Pre-position for next operation, symbolized by “ PP”. This is the basic operation element required to prepare the transporting device and or an object to be moved for the next basic operation.
- Release load, symbolized by “ RL”.

This is the therblig employed in relinquishing one’s hold on, and control over an object.

- Unavoidable delay, symbolized by “ UD”. This is the basic operation element represented by a work stop page due to machine breakdown, shortage of raw materials, waiting for work tickets to come from the production control office, or other such causes.
- Avoidable delay, symbolized by “ AD”.

This is the therblig involved when the planned sequence of motions provides no delay, yet a delay occurs.

- Plan, symbolized by “ PL”. This is the basic operation element utilized in deciding on the operating method to be used. Typically, on repetitive work frequently performed, the operator will merely hesitate briefly and then go on.

•Rest to overcome fatigue, symbolized by “ RTOF”. This is the basic operation element required by a worker for recovery from excessive effort. The Therblig is used in the study of motion economy in the workplace. Each of the Therblig units for a process is timed, usually to the millisecond. These can then be compared to documented values for standard workplace tasks, and the results used for optimization of manual labor by eliminating unneeded movements (Mundel & Danner, 1994). Appendix Remarkable Industrial Engineers A.

Frank Gilbreth Frederick Taylor, Father of scientific management, was born on 1865, into an upper class liberal Philadelphia family. At early age Taylor learned self-control and his parents upbringing helped him to avoid conflicts with peers and to resolve disagreements among them. He passed the entrance exams at the Harvard University. He also received honors.

He entered the Labor force as an apprentice machinist. Taylor earned an engineering degree at the Stevens Institute of Technology in New Jersey while holding a full time job. After several years, he explains the four principles of scientific management. B. Lillian Gilbreth Lillian Moller Gilbreth was born on May 24, 1878 in Oakland, California.

Lillian has held an important part in the modernization of industrial management. She worked along with her husband Frank, to develop many techniques that are still used today. She was one of the first women to be able to combine a career and her home life into one unified lifestyle. As an industrial engineer, Lillian and her husband helped companies to improve management techniques and gave them ways to increase efficiency and

production. After they were married, Frank and Lillian Gilbreth began their study of scientific management principles.

Although Frank never went to college, he held a strong interest in efficiency in the workplace. Together Frank and Lillian began their own consulting business. Lillian Gilbreth received her Ph. D. from Brown University.

C. Frederick W. Taylor The origins of industrial engineering can be traced back to many different sources Frederick Winslow Taylor is most often considered as the father of industrial engineering even though all his ideas were not original. Some of preceding influences may have been Adam Smith, Thomas Malthus, David Ricardo and John Stuart Mill. The first evidence of industrial engineering in scientific field of study, when Charles Babbage proposed several management principles.

He also invented a different engine. Industrial engineering holds promising opportunities to factories. D. Lee Iacocca He was born in Allentown, Pennsylvania.

His real name was Lido Anthony Iacocca. In 1946 he joined the Ford Motor Company, where he rose to president. He left the company after a dispute with Henry Ford II and became president and then chairman of the Chrysler Corp. , restoring it through shrewd financial. He left Chrysler in 1992, and is currently working with company making electric bicycle. Iacocca has endorsed John Kerry, in the election on 2004.

The book “ Iacocca: An Autobiography” was the best selling work of Iacocca.

E. Dr. Gerald Nadler Dr. Gerald Nadler received the highest and most

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esteemed honor for his contributions to the posterity of human race in the field of Industrial Engineering. He is a professor and he is lofty qualified in all four areas of criteria for this award: Management; Technical; Innovations, and research.

With his dexterous in Management is one of the evidenced by his contributions at the University of Wisconsin beginning in 1964, amidst and including hi present position as a chairman of Industrial and Systems Engineering at the University of Southern California. In his early days at Jewish Hospital of St. Louis, he pioneered the application of Industrial Engineering in hospitals. The USA Department of Agriculture still used his development of the National Gypsy Moth Pest Management System. Twenty three years senior member of Institute of Industrial Engineering (PIIE), he has been committed to promoting Industrial Engineering on a national and international level.

He has served as Chapter President, Regional Vice-President and Vice-President for education and research. His three years service as President Elected; President and Immediate Past President of the Institute embodies his dedication to IIE. He has a great extent list of contributions and service to the community. F. Thomas Wade Landry Thomas Wade Landry was born on September 11, 1924 in Mission, Texas.

He was former American football player and coach of Dallas Cowboys. In 1960, he became a leading innovator using intricate offensive formations and flexible defensive alignments. He also pioneered in the use of computers to store tests of players' athletic skills and reflexes. In 1949, he became

professional player; he played a year for the New York Yankees and joined New York Giants.

In 1956, he was fulltime defensive coach and in 1960 he became head coach of Dallas. G. Jane Ammons Dr. Ammons is a leader on a number of national boards, visiting committees, and panels, including service on the Army Science Board and the IIE Board of Trustees and past service as Chair of the Engineering Advisory Committee of the National Science Foundation.

Ammons summarize that the ideal production will encompass the total life of product, from manufacture to disposal or reclamation. The industrial engineers have both the responsibility and the opportunity to improve the human condition”, this is the beliefs of Ammons. H. Charles Bedaux Charles Bedaux was born on 1887, in Charenton, Paris and immigrated to America in 1906. He is popularly known for his pioneering work on work measurement.

Charles Bedaux established his company called the “ Charles E. Bedaux Company”. In 1925, it became a millionaire with 19 offices over the world with 600 clients. It is the way to his success in applying his incentives schemes, method improvement and work measurement. He developed the time study or speed up system, from the study of Frederick Taylor. Charles Bedaux introduced the concept of the standard minute value based on the “ speed and effort” rating system.

I. Roger Corman Roger William Corman was born on April 5, 1926 in Detroit, Michigan. He is a director or producer of low budget films. Corman received an industrial engineering degree from Stanford University. In 1953, he became a producer and screenwriter and in 1955 he began directing films.
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Until 1971, Corman retire directing film, but he continues producing films. His fastest film was “ The Little shop of Horrors (1960), which was shot in two days. In 1971, Corman return to directing, and work the film, “ Frankenstein Unbound (1990)”. He also directed the film “ the Intruder”, work of William Shatner.

Based on short story by Charles Beaumont. Glossary Engineering. The scientific use of the forces and materials of nature for human consumption. It is an art, a business and a profession which involves method, materials, money and men. Management.

The ability to do work through other people, skillful, and effective handling of resources. Mass production. Manufacturing process that attains high rates of output at low unit cost, with lower cost expected as volume rises. Material handling. Reducing time spent in handling material. Methods design.

Involves the application of the design process along with the body of knowledge and a group of techniques peculiar to that specialty. The body of knowledge in this case is primarily a collection of general characteristics related to effective integration of the human into productive system. Micro motion. A technique for recording and timing an activity.

It consists of taking motion pictures of the operation with the clock counter.

Motion study. A systematic analysis and improvement of work methods.

Operations research. A research activity devoted to discovering, explaining, and predicting the behavior of man-machine systems operating in natural environments.

Plant layout. A scale model (in two or three dimension) of the plant structure, service, facilities, and production facilities. It is also the planning of plant structure, service facilities, and decision relative to plant location. Production system. Is any system that produces either a product or a service.

Quality. Degree or grade of excellence. Quality assurance. A means of making reasonably certain that the quality of a product is satisfactory.

Usually this involves a system of inspections and other controls. Quality control. The set of operational techniques and activities which sustain a quality of product or service that will satisfy given needs. Scientific Management. Knowledge, techniques and principles concerned with the application of the principles of science to the field of management.

Simo Chart. A basic Motion Time Chart; commonly a Therblig Chart for two – hand work with motion symbols plotted vertically with respect to time. Used to show simultaneous nature of motions. Therblig.

A short manual work segment used to describe the sensory – motor activities or other basic elements of an operation. Therblig Chart. An operational chart with sub-operations broken down into individual motions and all motions designated with their appropriate Therblig symbols. Time study. A wide variety of procedures for determining the amount of time require, under certain standard conditions of measurement, for task involving some human, machine or combined activity. Work Measurement.

The application of various procedures for determining the time for an operator to perform the task satisfactory, using the standard method in the

usual environmental conditions. Work sampling. A Work Measurement technique consisting of intermittent, instantaneous observations of work activity or delays Index Engineering, 2 Industrial Engineering, 1 Management, 5 Mass production, 6 Material handling, 7 Methods design, 6 Micro motion, 9 Motion study, 4, 8-9 Operations Research, 5 Plant Layout, 6 Production System, 5 Quality, 7 Quality Assurance, 7 Quality Control, 7 Scientific Management, 5 Simo Chart, 9 Therblig, 4, 10-11 Therblig Chart, 10-11 Time Study, 4, 8-9 Work Measurement, 6, 8 Work Sampling, 6-7

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