Pakistan Society of Industrial Engineers

Let's build an Efficient Pakistan

PSIE MAGAZINE

January 2014 - Volume I, Issue I

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PSIE soon to work in collaboration with IIE USA regarding multiple projects

Engineers make things...

Industrial Engineers make things better

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MAGAZINE

Editorial Team

Founder's Message

Dear Brothers & Sisters,

During my graduation at University of Management and Technology (UMT) in Lahore I was thrilled to find out about this new field of study called the "Industrial Engineering". Just like you I was not sure what I will become in the future and what my job description would be. What roles I would play in an industry or what kind of business I could start of my own. There were many similar questions that kept haunting me for the first two semesters. It was difficult and very challenging to keep my interest alive.

It was back in 2010 when I first visited the website of Institute of Industrial Engineers (IIE) which is based in Georgia USA. It was not a surprise visit I was intentionally looking for such a phrase of words because I had seen Institute of Electrical and Electronics Engineers (IEEE) working in my university for the Electrical Engineering students providing them awareness programs, competitions, and leadership opportunities so and so forth. I wanted to replicate that but for Industrial Engineering students in my university. That's when I decided to form a student chapter of IIE and by 2012 with Allah's blessings I was proud owner of IIE Gold Award 2012 for the best performing student chapter. Although, my journey with IIE ended there I was not able to quench my thirst to help our fellow students and professional industrial engineers. Once my article in Technology Times magazine got record hits and brought me messages from unknown professionals who demanded that much more needs to be done to raise awareness of Industrial Engineering in Pakistan and I finally concluded that we indeed need something similar to IIE in Pakistan.

On 2nd May 2011, I met Gregory H. Watson who was at that time Senior Vice President International of IIE. We met him at a conference in Lahore and he also suggested me to establish a local organization to gather professionals and students under one platform. His suggestion and my thirst together led to the establishment of the Pakistan Society of Industrial Engineers (PSIE). It is in this spirit that I invite you to consider becoming a PSIE member to educate the masses about what great industrial engineering field really is so that our professionals and students can be intellectually equipped to become the leaders of tomorrow. I dream that one day PSIE may become the largest Industrial Engineering organization in Pakistan and support IEz not only within the country but also those who are residing outside so that we can form a network to share knowledge and expertise.

Thank you, sincerely, and may God Bless you as He has blessed us through our investment in this great cause. Dear brothers & sisters, there is now better return.

With all best wishes and kindest regards,

Azeem Iqbal,

Founder and Chairperson

PSIE News Update

IIE USA (Institute of Industrial Engineers) willing to sign MoU with PSIE (Pakistan Institute of Industrial Engineers). IIE USA develops MoU's with IE societies around the world, partners with them and helps them move best forward

Pakistan Society of Industrial Engineers (PSIE) will set up a training center to provide international IE Certifications. This will not only be beneficial for students but also for the professionals who want to take their career to the next level

PSIE is currently working on developing e-membership system so that interested candidates can easily apply for membership anytime from anywhere

PSIE will establish student sections in universities of Pakistan offering Industrial Engineering Program. It will be a great opportunity to unite young Industrial Engineers of Pakistan and work for the betterment of the profession

PSIE will setup a job and career portal to assist Industrial Engineers get internships, jobs or projects

Industrial Engineering

Industrial Engineering–Creating Future Leaders

Industrial engineering is concerned with the design, improvement and installation of integrated systems of people, materials, information, equipment and energy. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design, to specify, predict, and evaluate the results to be obtained from such systems.

Industrial engineering is about choices. Other engineering disciplines apply skills to very specific areas. IE gives practitioners the opportunity to work in a variety of businesses.

Many practitioners say that an industrial engineering education offers the best of both worlds: an education in both engineering and business.

The most distinctive aspect of industrial engineering is the flexibility it offers. Whether it's shortening a rollercoaster line, streamlining an operating room, distributing products worldwide, or manufacturing superior automobiles, these challenges share the common goal of saving company's money and increasing efficiencies.

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. Why? Industrial engineers are the only engineering professionals trained specifically to be productivity and quality improvement specialists.

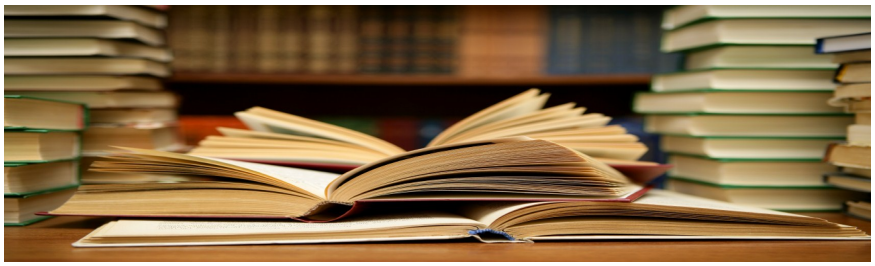
Industrial engineers figure out how to do things better. They engineer processes and systems that improve quality and productivity. They work to eliminate waste of time, money, materials, energy and other commodities. This is why many industrial engineers end up being promoted into management positions.

Many people are misled by the term industrial engineer. It's not just about manufacturing. It also encompasses service industries, with many IEs employed in entertainment industries, shipping and logistics businesses, and health care organizations. IEs make processes better in the following ways:

- More efficient and more profitable business practices
- Better customer service and product quality
- Improved efficiency
- Increased ability to do more with less
- Making work safer, faster, easier, and more rewarding
- Helping companies produce more products quickly
- Making the world safer through better designed products
- Reducing costs associated with new technologies

(www.iienet.org)

IE Major Subjects



Some of the major subjects taught in any Industrial Engineering Program are listed below just to give a general idea of what Industrial Engineer learn about in their 4 year program. (There are other subjects which support the Industrial Engineering Program too but the major one's are focused here only)

Production Planning and Control

The ultimate objective of production planning and control, like that of all other manufacturing controls, is to contribute to the profits of the enterprise. As with inventory management and control, this is accomplished by keeping the customers satisfied through the meeting of delivery schedules. Specific objectives of production planning and control are to establish routes and schedules for work that will ensure the optimum utilization of materials, workers, and machines and to provide the means for ensuring the operation of the plant in accordance with these plans.

Simulation of Industrial Systems

It helps protect your business by analyzing the impact of new, "what-if" business ideas, rules, and strategies before implementation on live customers—offline, without causing disruptions in service.

Industrial Facilities Design

Facility layout and design is an important component of a business's overall operations, both in terms of maximizing the effectiveness of the production process and meeting the needs of employees. The basic meaning of facility is the space in which a business's activities take place. The layout and design of that space impact greatly how the work is done—the flow of work, materials, and information through the system.

Engineering Reliability and Maintenance

Reliability is theoretically defined as the probability of failure, the frequency of failures, or in terms of availability. Reliability plays a key role in cost-effectiveness of systems . Maintenance is applying engineering concepts to the optimization of equipment, procedures, and departmental budgets to achieve better maintainability, reliability, and availability of equipment.

Management Information Systems

Management information system (MIS) provides information that organizations require to manage themselves efficiently and effectively . It refers to the study of how individuals, groups, and organizations evaluate, design, implement, manage, and utilize systems to generate information to improve efficiency and effectiveness of decision making

CAD/CAM

Acronym for computer-aided design/computer-aided manufacturing, computer systems used to design and manufacture products. The term CAD/CAM implies that an engineer can use the system both for designing a product and for controlling manufacturing processes. For example, once a design has been produced with the CAD component, the design itself can control the machines that construct the part.

Total Quality Management

TQM is based on the premise that the quality of products and processes is the responsibility of everyone involved with the creation or consumption of the products or services which are offered by an organization, requiring the involvement of management, workforce, suppliers, and customers, to meet or exceed customer expectations.

Operations Research

OR is a discipline that deals with the application of advanced analytical methods to help make better decisions. It is often considered to be a sub-field of mathematics .Operations Research is often concerned with determining the maximum (of profit, performance, or yield) or minimum (of loss, risk, or cost) of some real-world objective.

Industrial Safety

Industrial safety can be defined as the ability to manage the risks inherent to operations or related to the environment. Industrial safety is not a dislike of risks; rather it is a commitment to clearly identify them in relation to production operations, assess them in terms of quality and quantity, and manage them.

Manufacturing Processes

Manufacturing processes are the steps through which raw materials are transformed into a final product. The manufacturing process begins with the creation of the materials from which the design is made. These materials are then modified through manufacturing processes to become the required part. Manufacturing processes can include treating (such as heat treating or coating), machining, or reshaping the material.

Management of Engineering Projects

The primary challenge of engineering project management is to achieve all of the project goals and objectives while honoring the preconceived constraints. The primary constraints are scope, time, quality and budget. The secondary and more ambitious challenge is to optimize the allocation of necessary inputs and integrate them to meet pre-defined objectives.

Manufacturing Systems

A manufacturing system can be defined as the arrangement and operation of machines, tools, material, people and information to produce a value-added physical, informational or service product whose success and cost is characterized by measurable parameters.

Design of Experiments

Design of experiments (DOE) or experimental design is the design of any information-gathering exercises where variation is present, whether under the full control of the experimenter or not. In the design of experiments, the experimenter is often interested in the effect of some process or intervention (the "treatment") on some objects (the "experimental units").

Engineering Economics

Engineering economics, previously known as engineering economy, is a subset of economics for application to engineering projects. Engineers seek solutions to problems, and the economic viability of each potential solution is normally considered along with the technical aspects.

Work Study and Human Factors Engineering

Work study investigates the work done in an organization and aims at finding the best and the most efficient way of utilizing the available resources (man, material, money and machinery) to achieve best possible quality work in minimum possible time.

Human factors is concerned with the "fit" between the user, equipment and their environments. It takes account of the user's capabilities and limitations in seeking to ensure that tasks, functions, information and the environment suit each user.

Automation Control

Automation is the use of machines, control systems and information technologies to optimize productivity in the production of goods and delivery of services. The correct incentive for applying automation is to increase productivity, and/or quality beyond that possible with current human labor levels so as to realize economies of scale, and/or realize predictable quality levels

Computer Integrated Manufacturing

The term "computer-integrated manufacturing" is both a method of manufacturing and the name of a computer-automated system in which individual engineering, production, marketing, and support functions of a manufacturing enterprise are organized. In a CIM system functional areas such as design, analysis, planning, purchasing, cost accounting, inventory control, and distribution are linked through the computer with factory floor functions such as materials handling and management, providing direct control and monitoring of all the operations.

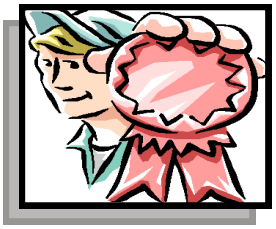
Industrial Engineering Functional Work Areas

IE graduates have careers that take them all over the world and allow them to do all sorts of different things. Like many other areas of engineering, the job outlook for industrial engineers compared to the rest of the workforce is positive. According to the University of Chicago study, the occupation "Industrial Engineer" was in the top 10 of those with the happiest people. Depending on their tasks, Industrial Engineers work both in offices and in the settings they are trying to improve. For example when observing problems, they may watch workers on a factory floor or staff in a hospital and they may be in office at a computer looking at data they or others have collected.

Industrial Engineering functional work areas and the expected involvements (but not limited to) in different organizations/industries are as follows

Product Engineering

Finance



Quality

Project Management

Production Control

Facilities

Factory Operations

Transportation

Training

IE Methods

Tooling

Inventory

Product Engineering
- Team Facilitation
- Product Development

Transportation
- Logistics Planning
- Material Handling

Training
- Course Facilitation

Quality
- SPC/SQC
- DOE
- Supplier Quality
- Queuing Theory
- Six Sigma

IE Methods
- Workstation Design
- Ergonomics
- Methods Engineering

Finance
- Make/Buy Analysis
- Comparison of Alternatives
- Cost Estimating

Project Management
- Resource Planning
- Risk Analysis
- Project Scheduling

Facilities
- Layout Design
- Process Flow Analysis

Production Control
- Job Scheduling
- Expedite procedures

Factory Operations
-Production Simulation
-Theory of Constraints
-Systems Integration
-OSHA Regulations
-Safety Management
-Linear Programming
-Lean Manufacturing

Tooling
-Tool Fab Process
-Tool Offload Procedures
-Tool Repair Process
-Tool Room Procedures

Inventory
-Inventory Management
-Supplier Selection
-Material Requirements Planning
-Supply Chain Management

Activities of an IE at MOL Pakistan

Engr. Muhammad Abid

MOL Pakistan—Materials Engineer,

Contracts and Supply Chain Management

Hi, my name is Muhammad Abid. My job is to manage inventory by adapting a proactive approach, through optimization of key parameters, ensure safe operation, employ standard operating procedures and contribute to the company's social and financial uplift. I ensure to provide support to functional departments throughout material flow process to meet production schedules and customer requirements.

As a material & inventory specialist it is my core responsibility to improve operational efficiency throughout the inventory flow process by standardization of material specifications/descriptions, executing various improvised inventory analysis and reduction exercises using a proactive approach.

The management aspect of this job can become complicated if inventory items start to go missing, because as material specialist I will be held accountable for it unless they can prove where the problem is and who is causing it. This is one area where knowing each and every worker on a personal and professional level can be very beneficial.

For example, when I joined MOL Pakistan, inventory database had a lot of duplications which create serious problems at the time of ordering. So the task assigned to me was to eradicate the duplications and rectify the inventory database.

My typical day has a good balance of engineering work done on the computer where I analyze the BOQ (Bill Of Quantities) received from projects department. This BOQ needs to be comprehend thoroughly and then finalizing which materials will be required for the upcoming projects.

Other activities performed during my day are:

- Responsible for the day to day activities of the Inventory Management functions, which includes controlling effective inventory levels.
- Monitor, review and analyze productivity through generation of reports using MAXIMO (ERP Software) & Crystal writing reports for efficient stock & storage management.
- Optimize storage space through various stock positioning & space layout techniques, and ensure that proper space is arranged before material is arrived at site.
- Similarly coordinating with Finance & Accounts for inventory related issues, and with logistics in order to stay abreast of the arriving shipments.
- Upgradation of physical assets to fulfill operational requirement. Our organization is growing exponentially, so to meet our future requirements efficient planning is required. For that purpose layout for new warehouses & new pipe yards is also my responsibility.
- Monitoring inventory level, generate stock-to-order report within first week of every second month. Evaluate the report, enter and forward Min/Max PRs for approval within five (5) days of receipt of approved STO. (Stock to order report shows us the items which are under their MIN levels which was assigned to it and now it needs to order)
- Performing inventory control analysis i.e. ABC analysis for all the items lying in the inventory.
- Conducting a detailed review of inventory items to Rearrange/Standardize its descriptions as per standard format. Identify and remove duplications from inventory data base.
- Enter Purchased Requisitions in Maximo through processing of BOMs (Bill of Materials) from user departments.
- Forecast standard inventory usage and routinely order appropriate quantities. Facilitate usage of slow moving and obsolete inventory.
- Managing inventory to ensure that there is no over stocking or under stocking providing accurate revenue reports of inventory management decision-making
- Imputing and updating all inventory movements to achieve visibility and utilization of inventory

Industrial Engineering Career Titles

Industrial Engineers can employ their skills and knowledge gained under these titles:

- **Manufacturing Engineer**
- **Industrial Engineer**
- **Process Improvement Engineer**
- **Quality Engineer**
- **Schedule/Planning Engineer**
- **Consultant**
- **Product Developer**
- **Project Manager**
- **Control Engineer**
- **Systems Engineer**
- **Reliability Engineer**
- **Design Engineer**
- **Procurement Engineer**
- **Safety Engineer**
- **Production Engineer**
- **Continuous Improvement Leader**
- **Facility Engineer**
- **Business Improvement Specialist**

Types of Industries IE's Work in

As you might guess, most industrial engineers work in industry for manufacturing or service companies. But since their skills are so versatile, industrial engineers can work in virtually any kind of industry or organization including

- Aerospace & Airplanes
- Aluminum & Steel
- Banking
- Materials Testing
- Medical Services
- Military
- Ceramics
- Construction
- Consulting
- Oil & Gas
- Electronics Assembly
- Energy
- Shipbuilding
- Entertainment
- Forestry & Logging
- Insurance
- State Federal Government
- Transportation
- Education
- And much more.....

IE Institutes in Pakistan

Mehran University of Engineering and Technology, Hyderabad

Website: muet.edu.pk

Contact: +92 22 2771247

University of Management and Technology, Lahore

Website: umt.edu.pk

Contact: +92 42 35212801 10

NWFP University of Engineering and Technology, Peshawar

Website: nwfpuet.edu.pk

Contact: +92 91 9216465

University of Engineering and Technology, Taxila

Website: uettaxila.edu.pk

Contact: +92 51 9047696

University of Punjab

Website: pu.edu.pk

Contact: +92 42 990161214

Dawood University Of Engineering & Technology, Karachi

Website: dcet.edu.pk

Contact: +92 21 99231195

NED University of Engineering and Technology, Karachi

Website: neduet.edu.pk

Contact: +92 21 9261261 68 Ext: 2361

Institute of Business Management, Karachi

Website: iobm.edu.pk

Contact: +92 21 3509 0961 67

PNEC-NUST Karachi

Website: nust.edu.pk

Contact: +92 21 48503043 , +92 21 99240152 , +92 21 48503001

University of Engineering and Technology, Lahore

Website: uet.edu.pk

Contact: +92 42 99029231

Sample IE Projects

Summaries of Final Year Projects

"To Develop a Computer Aided Tool for MRP"

Shahzad Shabab

Inventory is a significant constituent of any industry. Every manufacturing industry has to order for some raw material whereby manufacturing operations are performed to convert raw materials into valuable products. Inventory in any industry exist in many forms; it may be in the form of work in process (WIP) inventory, finished goods inventory, raw material inventory, spare parts and so many others. Hence, to control these various types of inventories is of paramount importance in every industry. Some industries invest profoundly in ordering and procuring of raw materials and processing of all excessive raw materials will result in increased WIP level and also increased finished good inventory. Most importantly too much inventory hides many discrepancies that actually exists in the system.

We selected the project on inventory control because there was very less awareness about inventory control in local industries and most of them are oblivious of the benefits which they could achieve by controlling their inventory to the most optimum level. Furthermore, commercially available tools for material requirement planning (MRP) are very expensive and not easy to afford for many SMEs (Small and Medium Enterprises) existing in Pakistan. This was a driving force for us to develop the MRP tool which is not only effortlessly available but is flexible enough to be implemented in any species of industry

"Multi-Echelon Inventory Control In Supply Chain Management"

Khawar Naeem

Inventory is the lifeblood in an organization. It costs about forty percent of the total organization's assets. Our project was to optimize the inventory in multi-echelon and to decide a trade-off between inventory level and service level of the customer demand. We designed the supply chain starting from raw material receiving from supplier up to the finish good delivery to the customer, integrating every activity. The demand was forecasted, produced and filled using various scientific models. An Expert System, AM (Application Manager) was used to develop a tool named "Inventory Control System" to automate all the addressed activities.

Currently the industry is working on the experience base knowledge of experienced people with being in state of relying on the upper management decision. The thesis provided the recommendation purely based on engineering knowledge. The current situation was critically analyzed and areas of improvement were highlighted. The critical parameters related to Supply Chain were devised. The inventory level at various echelons was reduced which in turn resulted in cost reduction. Further the arrival of raw material was organized using techniques of Economic Order Quantity (EOQ), Safety stock (SS) and Reorder Point (ROP) to have timely production which reduced overall Lead Time. The unmet demand due to the limited capacity of plant was outsourced.

"Rejection Analysis of PET Bottles Company Using Six Sigma Approach"

Yousuf Wasil

The number of rejects in a PET Bottle Industry had to be minimized by selecting the optimal level of input variables of the process. A total of four input variables were first selected through a brain storming session with the production management and quality cell staff of the industry. These variables were statistically analyzed by changing their levels within operating range, and the change in the number of rejects was respectively observed for each variable. The four variables were Injection Pressure, Melting Temperature, Operator line and Raw material Resin Type. Among these three proved to be statistically significant variables which affected the number of rejects.

The second phase of project was then aimed to select the optimal level of each of the selected significant factors that will give the minimum number of rejects. The optimal levels were obtained through the classical model of Design of Experiment which reduced the average of 11.24 rejects per hour to an average of 3.8 rejects per hour. By implementing these levels a financial impact of 0.8 million rupees will be cut down annually.

"Intelligent Scheduling System for Flow Shop and Job Shop Problems in Discrete Manufacturing"

Qurratulain Shakoor

Operations Scheduling at Shop floor is one of the main issues in today's competitive manufacturing environment where responsiveness to the market determines the survival of industries. Most of the operations scheduling of discrete manufacturing system falls under the categories of flow shop and job shop.

In flow shop scheduling the sequence of machines for all the parts to be processed is same. Where as in job shop scheduling the sequence of machines differ for each part.

In this project, a scheduling methodology based on Genetic Algorithms was developed. It took the part sequences for N number of jobs as chromosomes. The chromosomes of given number of population size were evaluated for the given process plan (process constraints) for shop floor scheduling system using an algorithm to sequence the jobs for machine loading. A solution space of the chromosomes was searched through the use of Genetic Algorithm for the best/ optimal chromosome for the minimization of Makespan.

MATLAB was used to code the algorithm which determined the optimal sequence both for flow shop and job shop problems. GUI (Graphical User Interface) was developed for user friendly input data and display for output results in terms of individual machine schedule.

The system was validated through case studies from real world scheduling problems.

"Facility Relocation Analysis"

Usman Dawood Barry

In our Final Year Project we were required to analyze the threats being faced to Reckitt Benckiser Pakistan at its current location, S.I.T.E. and suggest a more feasible location where it would be appropriate to relocate or expand their industry in the future if the need arises. We studied 7 different industrial sectors of Karachi, out of which 4 were shortlisted and studied in detail. These included Korangi Industrial Area (KIA), Landhi, Sindh Industrial and Trade Association (SITE) and Bin Qasim Town. The analysis helped us to choose the Bin Qasim area as the most viable option.

Many different techniques were used in this feasibility study where we applied the concepts of Weighted Average and the Transportation Model to analyze which location is the best

The reason why we chose Bin Qasim was because of the advantage of the continuous supply of water and electricity. It also enjoys ample natural gas supply having terminal of SSGC near it from where the whole Karachi gets its transmission. A stable transportation, communication, secure environment and free from political obstructions gave the Bin Qasim area a sizable advantage over others.

Industry Profile

Sanpak Pvt. Ltd

Sanpak Pvt. Ltd is a joint venture with Japanese Company Sanden. They manufacture Automobile Cooling systems. With over 70 years of Sanden Corporation's technical, management and manufacturing know-how, Sanpak created confidence throughout the region as an OEM supplier capable of meeting stringent technical specifications of some the world's most prestigious automobile manufacturers. Their customer portfolio includes every Automobile Manufacturer in Pakistan such as Honda, Suzuki, Nissan, Toyota and Hyundai to name a few. Their line of products in this field is MFC (Multi-Flow Condensers), Aluminum Heat Exchangers, Compressors, Receiver Driers, HVAC, Coreless Pancake Motors. All Products and of Sanpak are certified by ISO: 9001, TUV CERT, ISO: 14001-2004. They use Nocoloc Heat Exchanger, Hose Crimping Machine, Automatic CNC Bending Machine and Automatic Paint Oven

Industrial engineer's responsibilities at Sanpak are related to "productivity and efficiency enhancement" under Process Engineering Department. Various methods are applied there on improving productivity. The department follows 4M as their top priorities i.e. (Man, Machine, Method and Material). This basically comes in Ishikawa diagrams where causes of events are drawn on simple charts but they help get to the cause of events. In applying Six Sigma they are using DMAIC approach i.e. (Define, Measure, Analyze, Control and Implement). Using these techniques they are keen for productivity improvement. Using these techniques in the manufacturing of Alto and Mehran systems they have achieved 15% productivity enhancement. They also perform Method studies where they are doing process study, motion study and total research. They are also performing Work Measurements where they are calculating Working Hours of their works and dealing with them in Work, Time ratio. Using Kaizen and Lean Manufacturing thoughts they are improving their lines and their efficiency.

Students should be given exposure to industries like Sanpak and other industries where industrial engineering activities take place. A visit to such industries is essential for undergraduate students as these things help student frame their mind to understand their responsibilities that they will be expected from in the future. Industries and Universities should combine themselves together where students should be taken to such places and perform case studies then in their classrooms students should be given tasks to solve problems. In this way understanding of student can reach up to a new level where not only they are learning the techniques they are also at the same time applying them to real world problems.

Reviews

Review of Academic Department Head

Dr Iftikhar Hussain

Chairman, Industrial Engineering Dept

University of Engineering & Technology Peshawar, Pakistan

What was the reason and why did you feel the need to initiate IE program at your university? Do you think the current situation in your IE department is meeting your expectations and the demands of Industry?

Industrial Engineering is a discipline which can contribute a lot towards the optimization and integration of resources, streamlining of processes, eliminating waste, meeting targets and improving quality. With such a powerful combination of various engineering elements coupled with strong management science, it was inevitable to launch an Industrial Engineering (IE) discipline at University of Engineering and Technology (UET) Peshawar to produce right people for our manufacturing and service sectors. The UET Peshawar launched the IE program in September 2006. Our curricula both at the undergraduate and postgraduate levels are rich in contents covering manufacturing, optimization, quality, ergonomics and management.

Yes it is! Working engineers from other engineering disciplines are also opting for industrial engineering because nature of their jobs highly demands for industrial engineering knowledge. Our graduates are successfully serving both in national and multinational organizations.

How do you see the future of IE in Pakistan?

The future prospects of industrial engineers are bright not only in Pakistan but also abroad. They are typically found in organizations responsible for managing operations, manufacturing systems, process engineering, automation, supply chain management, quality control, sales, banking, hospitals, airports etc. Studying industrial engineering is one of the smartest decisions, because it is estimated that demand for these professionals will continue to rise every year. And these engineers are among the best paid professionals.

Although Pakistan is a developing country but it has tremendous potential and opportunities for the industrial activities, which may not be available to many other countries. Our neighboring countries are on the move forward in the engineering sector, and, if we are to catch them, we have to invest, improve and put in right place many things. It is the engineering sector which is considered as a driving force for the economic growth of a country

Include a message for future IE's in Pakistan

Most of our industries use conventional technologies and conventional techniques to manage them with minimum R & D activities. The result is low productivity, low quality, more waste, and comparatively high unit price. With such a performance and output, it is very difficult to compete even with the neighboring countries. At the national level, it is the question of survival of our local industries which are facing competition from China, India, Bangladesh and other countries from Far East. Customers are free lancers. They buy products which are affordable and better in quality, whether these products are made in Pakistan or by any other country. We need to streamline and improve the performance of our industries and at the same time need go for the emerging technologies to compete at the international level to widen the scope and contribute more effectively towards the economy

Graduate Reviews

It was no doubt a very fascinating start and can say it was a challenge, when I sign up as IE; the very frequent questions like fresh student came to mind were what IE is? And what will IE do? etc. After a complete study on net and an ephemeral review from our chairman Dr.Iftikhar Husain, all the equivocal questions got clear and now in the field and so for expediency of field and job are concerned it is as I have got the image of IE. Prominence of IE is predefine and when it came in my knowledge, I just assumed that importance of IE is the second name of my goals but the connection between this is leadership qualities, managerial skills and sound communication skills, here I would like in particular extend my deep thanks to our respected teachers who provide us such an propitious study environment, practical assignments and the platform of Institute of Industrial Engineering made us elegant and that link was built. To be so abridged, I really find my vision very clear.

As for the IE recommendation is concerned I will definitely do, because an IE has the leadership, managerial and well communication skills which are the demands of today's market in the present era. IE's future is very bright and shining because IE has the potential, it is not like that drop who wants to fall on place where it can sheen but like wherever it falls will make sheen that place.

Engr. Basit Khan Yousufzai

Supply Chain Manager

Al-Hafiz Crysoplast

(Graduated in 2012)

Enrollment as an IE graduate was my first encounter with this field. With time I realized it is combination of managerial work along with combination of improvement in every aspect either is human aspect, process and product aspect.IE is a renowned field in world but in Pakistan it's a new field and need new faces to make people more awarded about the help an IE can towards organization objective achievement efficiently. Previously I thought the things are the way they are but now I consider those aspects which can be renovated.

Whenever there comes a need of more output from efficient utilization of resources the need of IE arises.IE emphasize on the improvement, a step by step process towards a better objective achievement. There is a room for improvement everywhere and IE are the best ones for it.

Engr Mahawish Mahmood

(Garduated in 2011)

Initially like every other IE student I was totally unaware of my future and the discipline I had selected as it was quiet new in Pakistan and for the first time launched in UET Peshawar, but gradually and progressively my judgment changed and I am very thankful to my teaching staff who played their vital part in all those positive changes.

Why I chose IE, was because I loved to have an Engineering discipline which can carry both technical & professional aspects of career growth and sure Industrial Engineering is one of them. It has changed my life, now I count myself in professionals and I can take part in discussions and debates related to field. I am totally satisfied with my job and I feel lucky to start my career from such a professional organization. I do Job in MOL Pakistan Oil & Gas CO. B.V. as an Assistant Procurement Officer. I recommend IE for all those who want to serve the society in a more professional way.

I personally believe that IE has got a wide future and very good to see its trend has just started now in every good organization. One thing which is worth mentioning here is that the future of every Engineering discipline does not depend always on its own future and opportunities' but also depends upon individual's performance and presentation.

Engr Shahzad Shabab

Assisitant Procurement Officer

MOL Pakistan Oil and Gas CO. B.V.

(Graduated in 2010)

IE is a white collar job. It turned to tougher when I did internship and found that IE's have to work in assembly lines under harsh conditions. One can find it enjoyable after a field experience of minimum 3 years as IE's have better chances to be promoted. I had my goals before enrollment in IE, but new goals were set by me when I realized the importance of IE now I am on their pursuit. My discipline had really made a great difference in my life, in the way of continuous struggle.

Industrial Engineering, as is comparatively new in Pakistan, so one has to work hard, to get recognition. I am satisfied with my job- Lecturer ship – although the field job market is turbulent for IE's but with a 'never give up' attitude you can make it. I recommend IE. I am optimistic towards its future. If you ask me I say that we are the master of our own destiny. We will bright up our future and ultimately of our nation's. A university and society level promo for IE is the most urgent demand of the time!

I am happy that PSIE is up for the task of spreading awareness about one of the most important engineering discipline that if realized can really make a difference.

Engr. Khawar Naeem

Lecturer

UET Peshawar

(Graduated in 2011)

Words from the Wise

Pakistan– A heaven for Industrial Engineers

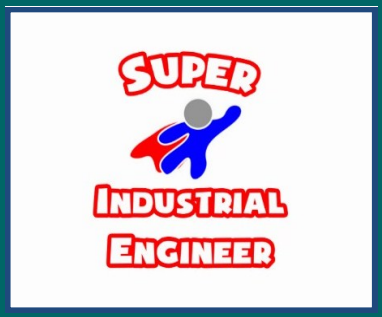
By Engr. Azeem Iqbal
Founder and Chairperson PSIE

IT HAS been a great journey till now and I got to observe the world from a new dimension. Industrial engineering (IE) is really a guru to me in a way that no other engineering discipline could have taught me so well. The characteristic is that it develops a technical and analytic mind into a humane integrated form of an innovator is its endowment to the society.

Having gone through the basic IE education at University of Management and Technology, Lahore, I have become very optimistic rather curious that industrial engineering indeed has a great future in the country. This is a state suffering from inefficiency from upstairs to the downstairs; under developed in virtually every sector of life. It is a place where time studies, process optimizations, operations management, operations research, engineering management, human factors, logistics etc. all at the moment can play a vital role in substantially every section of the authorities.

Government and private departments in Pakistan at the moment are suffering at the hands of corrupt and inefficient leadership. They have made their own illegal processes fast and productive but at the cost of the collapsed native systems. Due to this however, I believe it seems as though government is actually creating job opportunities for industrial engineers in this region; “Seems like we will be having a lot of work to do in the future, ha-ha!”

I have a keen interest in observing processes that I am surrounded with, whether it is to produce a tangible product or to serve in the opposite . In my country, queue lengths which adds a lot of waste to a particular system are so common that an Industrial Engineer



“Pakistan, a heaven for Industrial Engineers!” because there is a lot of work to do and only industrial super engineers can save the world in this region.

can earn a living just by attending them. We have lengthy waiting lines in our hospitals, local zoo, admission offices, car parking, restaurants, shopping centers, banks and now even worse we have it at “Tandoors” (a local cooking service, where “roti” a food made from wheat is baked for the poor at a low cost). Every day I sit and ask myself how could I improve these systems and be able to make them more productive for my society. Especially for the hospitals in my local town, we need a lot of extensive research work and dedication to solve various issues regarding hospital management, patient care, data management, its availability and quality.

Pakistan is the 4th largest cotton producer in the world, according to the “Leading producer countries” in Wikipedia. Our agriculture industry is well known in the world. This region is blessed with four seasons of the world with a good balance for the taste of all, especially the summer. This environment thus produces a huge variety of fruits and vegetables. Having said this, we still suffer because we have a very poorly organized and unproductive supply chain for this food to reach out to our own people. In the local fruit markets, the prices are going up day by day due to the severe lack of supply chain management.

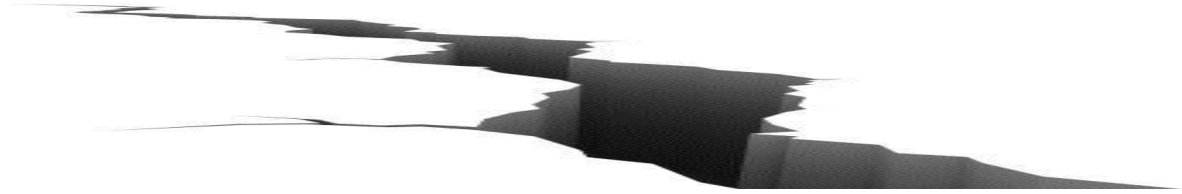
Water waste percentage is very high in the country because the system still follows archaic method of flood irrigation which wastes 50 to 60 per cent of water. The most recent floods were such a big calamity because no one was prepared for them in the first place. Every year statistical analysis and departments of weather tell us that we might have a bigger level of floods next year but still this news goes unheard because I believe we have less “industrial engineers”.

Water logging and salinity is increasingly becoming a source of problem in most parts of the country. Old methods of cultivation and harvesting are the bad source for extensive low yield. These are all in remote areas where there is little or no communication and awareness for the farmer who is the actual person behind the wheels. So, this looks like a job for an Industrial Engineer who is packed with analytical, management and engineering techniques.

Talking about electricity , we are suffering from electricity blackouts which range sometimes from 14 to 16 hours daily. In most of the remote areas we have even total electricity failures this is because our operations are being left unmanaged. The electricity shortages have left the industries jammed. Managers do not have the knowledge today how to schedule the various processes so that it may still be able to cut the loss and be somewhat profitable. Many factories have been subsequently closed down. The role of a super IE does seem very prominent here taking the lead and creating scheduled tasks with ideas and creative solutions to the declining graph of the companies. And I am sure we will!

Lastly, it is not my degree that gave me eyes of an industrial engineer rather it is the membership of IIE that led me to study my world with new spectacles. This view is very different that I had in mind at the time of admission. The new vision has touched my inner human who wants to search out ways to bring out ease for the society by creating a different set using the same elements but arranging them in a more productive way. This is indeed a profession that has the best integration of man, money and machine. And for IIE and all IE community in the world I would say, “Pakistan, a heaven for Industrial Engineers!” because there is a lot of work to do and only industrial super engineers can save the world in this region.

Earthquake Safety – Are You Aware and Prepared?

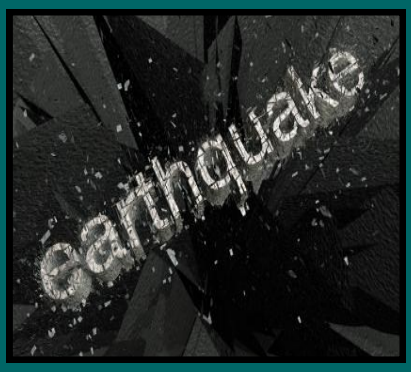


By Engr. Usman Dawood Barry

Head of Health and Safety (PSIE)

It happened yesterday, around 3:40pm. I was working while sitting on a chair when I felt it vibrate. Initially I thought it was some heavy vehicle passing by which causes some of the windows to quiver and tremble of my work place. But no sound of any vehicle was heard and I felt the shaking for a good four five seconds. It was then I realize that this is an earthquake.

Being in the safety field, I immediately found my lacking of what to do when an earthquake strikes. I was unharmed by the grace of Allah, but could have faced dire consequences for not having the knowledge of earthquake safety. And then, even a more disturbing thought came to me: How many of us out there are aware of this? This made me to write the article .



How to be safe during an earthquake

Below are the safe practices that one needs to be aware and follow in order to ensure no personal harm or injury is occurred.

- Pick “safe places”. A safe place could be under a sturdy table or desk or against an interior wall. Move the smallest distance possible to safety; the shorter the distance to move to safety, the less likely you will be injured.
- Keep away from windows and bookcases, or tall furniture that could fall on you.
- Practice drop, cover, and hold-on in each safe place. Drop under a sturdy desk or table and hold on to one leg of the table or desk. Protect your eyes by keeping your head down. Be prepared to move with it until the shaking stops. Practice these actions so that they become an automatic response.

“ Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a result of the ground shaking, or people trying to move more than a few feet during the shaking.”

- Brace yourself in an inside corner away from windows, if you cannot find a table or desk to get under.
- Practice drop, cover, and hold-on at least twice a year. Frequent practice will help reinforce safe behavior.
- Wait in your safe place until the shaking stops, then check to see if you are hurt. You will be better able to help others if you take care of yourself first, and then check the people around you. Move carefully and watch out for things that have fallen or broken, creating hazards. Be ready for aftershocks.

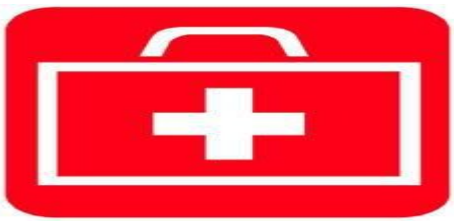
According to OSHA (Occupational Safety & Health Administration), " Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a result of the ground shaking, or people trying to move more than a few feet during the shaking."

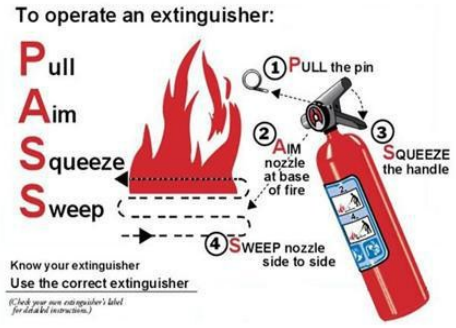
- Be on the lookout for fires. Fire is the most common earthquake-related hazard, due to broken gas lines, damaged electrical lines or appliances. Extinguish all open flames.
- Turn off all appliances and office machines. Check power lines and cords. If problems exist in electrical lines or gas lines the mains should be shut off.

- If you are inside the building, then stay inside and follow step 1. If you must leave a building after the shaking stops, use the stairs, not the elevator.

- If you're outside in an earthquake, stay outside. Move away from buildings, trees, streetlights, and power lines. Bricks, roofing, and other materials can fall from buildings, injuring persons nearby. Trees, streetlights, and power lines may also fall, causing damage or injury. Crouch down and cover your head.

- If you are in a moving car, stop. Stop as quickly as safety permits in the best available space. Stay in your car. Don't stop where buildings can topple down on top of you. A car is an excellent shock absorber and will shake a lot on its springs during an earthquake, but it's a fairly safe shelter from which to assess your situation.
- Get training on first aid and how to use a fire extinguisher



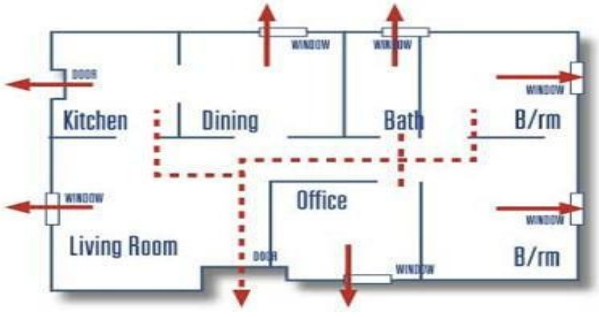


Reducing damages from an Earthquake before it occurs

Vigilance and pro-active approach can reduce the damages that happen when a quake rumbles. In order to keep yourself, your family and your workers safe, it is important that any loopholes and shortcomings are covered and taken care of. The following points list down the small, but essential things-to-do.

- Identify and fix loose, unsecured appliances (like TV, computers), furniture (book shelves, cases, wall hangings, tall cupboards)

- Plan out emergency and evacuation routes. These and assembly points should be known to all



- Include list of suppliers and their contact numbers who provide emergency related supplies
- Have an emergency response kit or disaster kit ready. It should include food, water, flash lights, two-way communication radios, batteries, first aid box, medications, fire extinguishers, etc.

- Make sure that your place (office or home) are as safe as possible. Check for weakened foundations, cracked walls and susceptible plumbing. Have the electrical and mechanical systems checked by a competent person.

Recognise Your Waste! (LEANING OF _____!)

By Dr. Muhammad Azeem Ashraf (Phd)
Six Sigma Black Belt
Cummins Emission Solutions
Cummins Inc, Columbus, Indiana USA

When considering the topic of 'lean-ness', we always consider manufacturing industry. However, leanness, consciousness and elimination of waste is supposed to be in every avenue of life. Often ignored in our society, 'time' is the root of all wastes. I would like to state some quotes from the most influential person, who being the Prophet Muhammad (sallallahu `alayhe wa sallam) in regards of time. It should be noted that using the time for legitimate work, improvement, service for humanity, development and even enjoyment does in no way go against the teachings of Islam. Rather we are encouraged to avoid any kind of waste.

The Prophet (sallallahu `alayhe wa sallam) always demanded that work should start early in the morning. On the authority of Sukhr Al-Ghamidi: "The Prophet said, 'O Allah, bless my nation's early rising.' If he dispatched an army or a division, he did that early in the morning." [Abu Dawud, Ibn Hibban]

'Aisha (RA) reported; the Prophet (sallallahu `alayhi wa sallam) said, " Rise early to earn your living and do your affairs, for it brings about blessing and success." [at-Tabarani]

Fatima, the Prophet's daughter, said that when he saw her still lying in bed one morning, he told her, "My daughter, get up and witness your Lord's bounty, and do not be among the indifferent; Allah distributes daily bread between the break of dawn and sunrise." [al-Baihaqi]

Islam encourages the followers to care for time, to utilize it to the best *legitimate* benefit and not to waste it. Besides, it holds them responsible for their time. The righteous predecessors were aware of that responsibility, so they acted accordingly. Describing their care for time, Hassan Al-Basry said, "I saw those people and how they were more careful about their time than about their Dirhams and Dinars [i.e. their money]." [Abdullah Ibn-Al-Mubarak, "Az-Zuhd" (Asceticism), p.51.]

"I wanted to start this piece as "Lean Manufacturing", but soon realized waste is a problem not limited to manufacturing only - it is in every sphere of life"

An important requirement for a Muslim's life is to be careful about time, to invest it wisely and to benefit from it. In this regard, Ibn-ul Qayyim says, "The highest, most worthy and most useful of reflection is what is intended for Allah and the Hereafter. There are various forms of reflection intended for Allah. One of them is reflecting on time duty and function and focusing entirely on it, for the knowledgeable one is the breed of his time. If he wastes it, all his interests are wasted, for all interests arise from time. If he wastes his time, he can never regain it."

Perspective :

I wanted to start this piece as "*Lean Manufacturing*", but soon realized waste is a problem not limited to manufacturing only - it is in every sphere of life. Hence, I preferred to generalize it. 'Waste' is the arch enemy of productivity, again not limited to industry: office administration, school, hospital, retails, government machinery, religious institutions, judiciary, manufacturing and the list can go on are all places where you abundance of resources wasted.

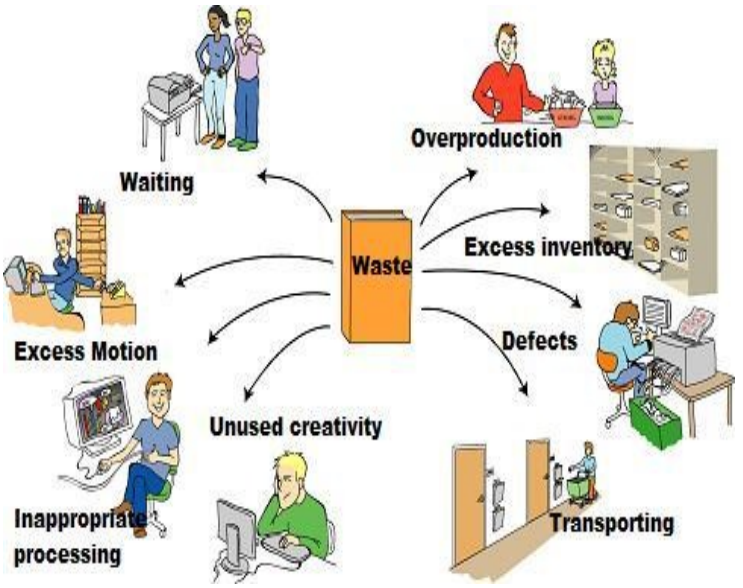
I recall my period of job of with state run mechanical design and manufacturing concern from a decade ago, few of the experiences of that period, I would like to share with the readership of this article - I leave the judgment form industrial engineering perspective of these practices to the readers:

- The manufacturing workshop was equipped with state of art machine tools worth millions, which used to sit idle for days, even weeks producing nothing. In addition, just a kilometer away existed another machine shop with similar level of machine tools sitting redundant. Never understood, when both departments belong to same organization, why duplication of resources?
- We use to produce 3-5mm thick walled aluminum components out of solid 50mm thick aluminum sheets - wasting the machining time of days, and scrap chips of 100's of kilograms. Not to mention the working hours of operators.
- The material store used to house an inventory of raw materials ranging from expensive rods and sheets of nylon, Teflon, Perspex, aluminum, mild and stainless steels - all sitting there for well over 5 years. Again such duplicate stores existed in other sister organizations

These are only few examples pertaining to few machine shops and their associated inventory. There were and are numerous such examples in other departments too. Such attitude is especially wide spread among all the state run institutions. This brings us to the question - are we in collective nature neglecting the resource waste?

The corner stone to alleviate this attitude is realization of what is termed as waste? The concept of 'waste' and 'waste elimination' introduced by *Toyota* manufacturing as methodology to improve productivity is applicable to industrial and non-industrial sector equally.

The Wastes:



The *lean* in lean manufacturing refers to the elimination of all waste. Waste is defined as any activity that creates no value-and value is defined by the end user / customer.
Before we can even talk about waste, we need to define what is value added versus non-value added processes in a manufacturing environment. Value added is any activity that changes the fit, form, or function of a product. This typically is a modification to a products /services performance that enhances its efficiency. The key to value added is that the customer must be willing to pay for these activities.

So, what is non-value added? Non-value added is any activity that does not change the fit, form, or function. The customer is typically not willing to pay for these. These are the costs that must become the focus to be reduced or eliminated.

Lean manufacturing derives much of its direction from the methods used by the Japanese automobile manufacturer Toyota. These methods became internationally recognized as a result of Womack, Jones, and Roo's book, *The Machine That Changed the World* (1990). They studied the practices of 90 automobile assembly plants in 17 countries to learn about Japanese successes in manufacturing. They reported that the hallmarks of lean production are teamwork, communication, and efficient use of resources. The lean approach for manufacturers is to improve their organizations by focusing on the elimination of any and all *muda*—the Japanese word for waste. The approach focuses on continuous system wide improvement, not only in the manufacturing division but business wide, and advocates methods to control the flow of material on the shop floor (Moore and Scheinkopf, 1998).

A few years before *The Machine That Changed the World* was published, Taiichi Ohno, considered by many to be the father of lean manufacturing, published his book, *Toyota Production System* (1988).

Ohno explained the main foundations of lean manufacturing. These principles guided the Japanese companies that were described as "world class" by Womack and Jones (1996). Ohno identified eight categories of muda which cover virtually all of the means by which organizations waste or lose money. As described by Ohno (1988), the eight wastes are as follows ;

1) Defects

Defects are usually due to inspection and rework of defective material in inventory. Some causes of defects are:

- Weak process capability
- Poor quality controls
- Uncontrolled inventory levels
- Poor process documentation
- Misunderstood customer needs
- Design changes
- Poor machine capability

2) Overproduction

Overproduction is making more than is required by the customer , making earlier than is required by the customer and making product the customer does not want.

This is a major flaw that occurs unknowingly with most manufacturers. This waste can tie up significant working capital resources that can be used for other business operations. Some key causes of overproduction are:

- Producing to a forecast
- Misuse of automation
- Long set-up times
- Just-in-case production
- Unclear customer needs
- Engineering changes

3) Waiting Wastes

Waiting waste is idle time that is created when waiting for materials, equipment, product, etc. Some key causes of waiting waste are:

- Unbalanced workload
- Unplanned downtime
- Excessive set-up times
- Poor supplier deliveries
- Poor process quality
- Producing to a forecast

4)Non-Value Added Processing

These are non-value added activities within the process. Causes of processing waste are:

- Poor process control
- Poor document control system
- Misunderstood customer needs
- Poor process communication
- Excessive queue times
- Just in-case logic
- Redundant approvals
- Producing to forecast

5)Transportation Waste

This is the waste incurred by transporting parts and materials around the plant facility. Causes of transportation waste are:

- Poor plant layout
- Misaligned process flow
- Large batch sizes
- Producing to a forecast

6) Inventory Excess

This waste occurs when there is supply in excess of real customer demand. This waste masks real production. Causes of excess inventory are:

- Production buffers
- Unreliable suppliers
- Excessive queue times
- Unbalanced workload
- Producing to a forecast
- Incentive system
- Misunderstood customer needs
- Long set-up times

7) Motion Waste

Motion waste is any movement of people or machines that does not add value to the product or service. Causes of motion waste are:

- Poor layout
- Unplanned downtime
- Unorganized Workplace
- Inadequate process controls
- Poor methods

8) Employee/People Waste

This is the waste of not using people's mental, creative, and physical abilities. Causes of people waste are:

- The Syndromes – "Not Invented Here", "Not in my backyard", "Don't know, don't care"
- Lack of teamwork
- Lack of adequate training
- Poor communications
- Misaligned process flow

Remarks

Lets get out of the box and see around in Pakistan – where can be located these kinds of wastes? This scope of this article is too limited to cite all areas and suggest improvement. I leave this to the readership and their commitment to change!

Pakistan is a predominantly agricultural country – we have massive waste (when saying waste keep in mind it can be any one of the above), in cultivating, processing and even distributing the products.

Our power sector – it is only because of a amalgamate of the above wastes we despite of being capable are trying to survive without at 30-40% of power. What kind of wastes are playing role in ruining the capacity of Tarbela? What kind of wastes are hindering the development of KalaBagh or any other?

Our political system – compare the size of our parliament and the size of similar size countries!

On a final note – we in Pakistan, predominantly being Muslims (equal importance it given to time in all other faiths existing) if realize the importance of time as mentioned in Quran and by Prophet Muhammad (SAW) and utilize it to full honesty can get rid of all wastes and prosper. I reiterate Islamic perspective of time does not mean only to sit in Masjid and pray 24/7/365 – Islamic perspective of time is giving it, it's due:

- By no means respecting time means loitering streets, chanting few verses of Quran, some Na'ats and our duty is done
- If it is pray time – pray to the best
- If it is work time – perform your duty to the best honesty in that time, sitting idle, sipping tea after tea, sifting newspaper, gossiping is waste (*and this is a waste Mr. Ohno forgot to mention since it is totally non-existent in Japan*).
- If it is family time – use it wisely to the best.
- You are the judge now, be aware of the time when you will be judged.

At the time of writing this– I pray the new government realizes their responsibility towards waste in Pakistan. Ameen!

Advice for Graduates in this Era

By Engr. Qurratulain Shakoor
Instructor(College of Engineering),
Alfaisal University, KSA

"What lies behind us, and what lies before us are small matters compared to what lies within us."

(Ralph Waldo Emerson)

"Graduation" is one of the happiest day of your lives. Environment in the university makes you ready for the competitive world outside. After graduation, it's time to pursue the dreams by becoming a productive individual. You have plans and expectations for your career and you're all set to enter into the professional life, which is growing at a fast pace. There is a lot of competition out there, orthodox ways of applying for jobs are not effective in this era, as the recruiters are getting 1000's of CVs of same type. With exception to some lucky ones who get jobs in this way, one needs to be more effective in this world of competition.

There are a lot of ideas to be effective and standout for the job search with getting shortlisted, but in this article I will share one of the way which is very effective these days.

You might have heard about or have an account on LinkedIn but have you ever wondered how to use it proficiently for the purpose of getting a dream job? LinkedIn has become a powerful tool both for recruiters and job seekers. There are plenty of recruiters, headhunters, hiring managers and consultants from different organizations/companies looking out for potential candidates for various positions and it's very easy to find them on LinkedIn.

"Develop your competitive advantage, build your network, and take intelligent risks. If not now, When?"

What you need to do is to;

- Create an impressive profile for yourself
- Find recruiters who specialize in your field. This can be done by the Advanced People Search menu at the top right of LinkedIn page. For example you can type “recruiter” as key-word and specify your interested area and oth-er things (if you want to be specific). You will have a huge list of recruiters related to your search
- Add them to your network, they do accept invi-tations.
- Send them an introductory message that is professional, concise and explains the reasons for the contact and what you’re seeking (target open positions etc.)
- You can also ask them about if there are any other open available positions matching your qualifications because sometimes these re-cruiters know about many open positions within the organization and you might not see those positions on their company websites or news-papers.
- Maintain your contact with the recruiters. Send-ing them a short note through LinkedIn can be a good idea as it will help keep your skills top-of-mind when new sourcing requirements cross the recruiter’s desk.

Through LinkedIn you get a chance to talk directly to the recruiters which is very beneficial both for recruiters and job seekers. So, this era is all about networking. Reid Hoffman, co-founder at LinkedIn has also emphasized on the benefits of networking. I would like to share few words from his point of view too regarding networking;

Reid Hoffman

Co-founder LinkedIn

“In college, you had dorms, student organizations, classes. Building relationships was easy. But in the real world, you have to learn to pro-actively build your network. Relationships matter because every job boils down to interacting with PEOPLE. People control resources, opportunities, and information. Opportunities do not float like clouds in the sky. They're attached to people. If you're looking for an opportunity, you're really looking for a person. You may not think you know the right people. Your exist-ing network is bigger than you think. If you are con-nected to a couple of hundred people on LinkedIn, you’re actually at the center of a network more than two million strong people. In other words, it’s likely that someone you already know, knows someone who could help you. This is the POWER of extended network.”

At some point or the other as a recent grad you might think that with limited work experience you don't have much to offer but trust me your existing assets have value too, you just have to sell yourself by presenting your profile on LinkedIn in an impressive way.

Also see how you can help others around you by asking them and understanding what other people needs are, solve problems and you can change the world. Try not to deny opportunities if even you have to work for free or if they pay less in cash but offer immense learning. This will gradually help you in becoming skillful and to grab better opportunity in future regarding every aspect

So finally, congratulations to the graduates on the efforts for completing the academics by hard work but it's a start of professional journey. It's a world of competition. Each day offers to do more and learn more. Wish you all the best! I shall like to end up the article with some golden words said by Mr. Reid Hoffman;

"Develop your competitive advantage, build your network, and take intelligent risks. If not now, when?"

Women in Industrial Engineering

By Engr. Qurratulain Shakoor
Instructor(College of Engineering),
Alfaisal University, KSA

Engineering was once considered as one of the most underrated profession for women in Pakistan, although there has been an improvement in our society and the way people now think about it but I believe that more needs to be done. There is a lot of space for improvement in educating the mass of Pakistan.

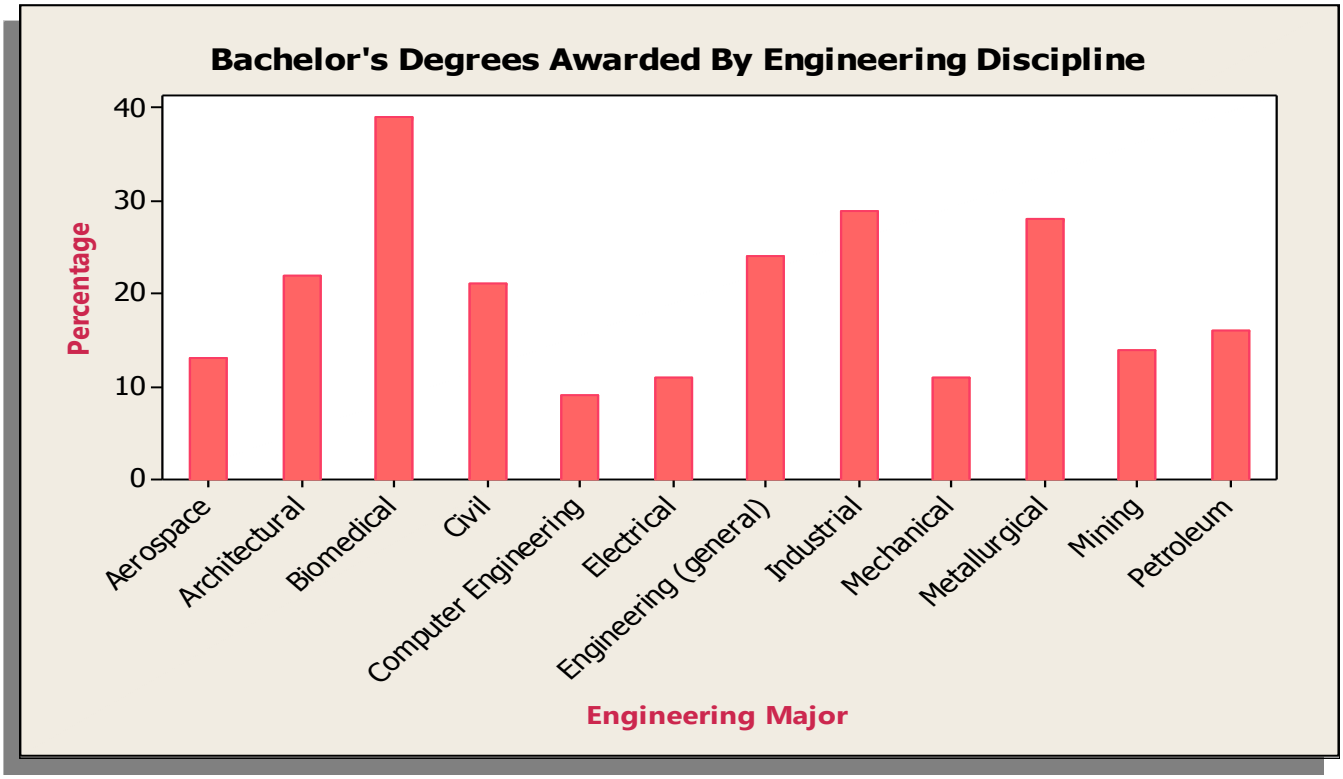
When it comes to Industrial Engineering, the term itself is already misinterpreted (even by males) and in most cases without searching more about this discipline, many drop it out of their list!!! There is no proper medium to educate females about Industrial Engineering before they take admission in Engineering University. However it's the lack of information they have due to which they are unable to see the significance of this discipline and I am sure if they come to know what it really is about, there will be more females in this profession.

Let me start with the concept of what exactly Industrial Engineers do? As an IE you will look at what makes an organization work best by trying to find the right combination of humans, technology, equipment, information and finance. The common objective of all the subjects in the curriculum of Industrial Engineering degree is to make you skillful in "Optimization". Industrial Engineering is considered as one of the fastest growing profession in the world and even in Pakistan the industries/organizations are slowly recognizing the importance of hiring Industrial Engineers because only IE's have those skills to raise the standards and make organizations competent.

Industrial Engineering is considered as one of the most popular engineering disciplines among the females in Europe and some parts of Middle East. According to American Society of Engineering Education (ASEE), the number of bachelor's degree awarded to

Industrial Engineering is "Engineering having fun". You won't be stuck with one kind of job for the rest of your life

females by discipline (in U.S.A and Canadian Engineering Colleges) is given in which it can be clearly seen that a large number of females are drawn to Industrial Engineering and research has shown that this percentage is expected to increase.



Industrial Engineering opens doors for a variety of opportunities. Very technically oriented fields will make your professional life boring and stressed but that's not the case with Industrial Engineering and this is what makes it interesting among females and I will mention the reasons how it is so!

- Industrial Engineering is easy! Yes, the word "Industrial" may give you a first impression of this discipline to be hard and tough whereas in reality it's not that hard. It's not completely filled with all those tough technical subjects. It is a blend of engineering and management subjects. Interesting fact is that the management subjects involved in Industrial Engineering are a bit different than the one's taught in business schools

- It provides you with flexibility which is a positive sign towards enormous career opportunities. You can work in any organization/industry and in any sector of that organization/ industry where improvement is possible. You can have either office job (i-e, handling projects and tasks) or field job (i-e, observing the workers and operations directly).

- Another reason is, it helps you explore your creativity. You will be the one who has to come up with ideas and solutions to the problems that really matter. Creativity is challenging sometimes but its fun and you can learn a lot in return

- Many female engineers face issues of gender discrimination whereas being an Industrial Engineer the percentage of gender discrimination is comparatively less.

- With time and exposure you will realize that your skills are applicable at wide levels which not only make it interesting but will make you the person with most of the knowledge among your colleagues .
- Industrial Engineers are often promoted to leadership positions because of the vast understanding they have about the overall systems, unlike other engineering disciplines that are limited to specific areas only. This is one of the main reasons as well why women will feel mentally satisfied with their jobs as Industrial Engineers.
- In my view Industrial Engineering is “Engineering having fun”. You won’t be stuck with one kind of job for the rest of your life. Industrial Engineering is diverse which is the main cause of attraction for females

I am an Industrial Engineer and just like other IE’s I was also confused at the beginning of my studies but soon with time and exposure I realized that it was the best decision I made for my career and I highly recommend it to the girls out there who are looking for a dynamic career in engineering.

Being an Industrial Engineer requires a certain personality and to promote this field more effectively, certain steps should be taken and one of the steps I believe in can turn very effective is that the universities of Pakistan (those having IE programs) should conduct “Industrial Engineering Open House” and invite high school students to attend it. There should be several IE related activities designed for open house events to help the students understand . Also they will have an opportunity to clarify any questions related to the profession and make their understanding better. These kind of events will somehow give them a sense of comfort from the beginning of their professional studies in future.

Frequently Asked Questions

Q1) What is special about Industrial Engineering?

Industrial Engineering is a diverse discipline with many areas of specialization. Other engineering disciplines apply skills to specific areas therefore making you focus at limited areas but an IE degree will provide you with the skills to work in a variety of businesses .As an IE you learn to make decisions concerning the best use of people, material, equipment and energy in achieving an organization's aim.

Q2) Will I get a job with a degree in Industrial Engineering?

Yes, Industrial Engineers have a bright future and are in high demand in almost all of the countries (Pakistan needs them the most). With a major in IE, many people are serving many organizations and industries and have been the reason for great improvements. IE's can work in almost all of the sectors (for example; aerospace, banking, consulting, entertainment, manufacturing industries, medical services, transportation and the list goes on). They are one of the most highly paid professionals and almost all of them are satisfied with their job roles. IE's end up being promoted to management positions

Q3) Would I like Industrial Engineering?

Do you enjoy knowing how things work? Do you think of new and better ways of doing things? Do you like to figure things out? Do you get good grades in mathematics? Do you take things apart and put them back together with fewer parts?

If the answer to the above all is "Yes" then Industrial Engineering is for you. It's a profession both suitable for males and females.

Q4) What are the areas of specialization?

The major areas of specialization involves Human Factors Engineering, Manufacturing Engineering, Operations Research, Quality Engineering, Simulation Modeling, and Project Management

Q5) Can you give few examples regarding what IE's do actually?

There are a lot of examples; few of them are given below which will give you basic idea of what IE's actually do:

- Reconfigure airport check services to shorten lines and make passengers happier
- Design a more efficient car assembly line to save on manufacturing costs
- Streamline an operating room so that is safer, faster and easier to use
- Determine the fastest way to transport perishable goods cross-country, even during bad weather.

All of these roles share the common goal of saving companies money and increasing efficiencies (in short "improvement")

Q6) What is the difference b/w MBA and Industrial Engineer.

Industrial engineers are engineers (and do tons of maths) - MBA's are business people (who may have done a heap or no math). Industrial Engineers carry technical knowledge which MBA's have little knowledge about. An MBA education offers business education whereas Industrial Engineering education offers the best of both worlds; an education in both engineering and business

Q7) How Industrial Engineering is different from Mechanical Engineering?

Mechanical engineering is mostly related to the technical specifications of machines and their working principles. Industrial engineering is interested in efficiency, correct planning, productivity of sources, supply chain management and fault minimizing etc.
In industrial engineering we deal with 4M's of industry Man, Money, Material and Machines. They also have sound knowledge over mechanical engineering and they can enjoy management as well. They have many career opportunities and wide area of application.

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