



Industrial Engineering is concerned with the analysis, design, improvement, installation and management of integrated systems of human resources, data, finances, materials, equipment, and energy as safely as possible with minimum impact on the environment, delivered within a holistic methodology.

INDUSTRIAL ENGINEERS MAKE IT HAPPEN BETTER

INTRODUCTION TO INDUSTRIAL ENGINEERING(IE) AND INDUSTRIAL ENGINEERS AUSTRALIA(IEA)

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1. Industrial Engineers Australia(**IEA**) is the Australian body dedicated to serving the need of industry for improved productivity by enhancing professional skills of industrial engineers and individuals involved with creating wealth through productivity improvement.
2. Utilising an **Holistic** approach, Industrial Engineers(**IEs**) are able to undertake and deliver optimised management methodologies extremely effectively.
3. In this age of rapid change where business survival depends on the ability to innovate, be agile and to initiate and embrace change to meet the challenges of our time, Industrial Engineers(**IEs**) bring professional engineering methodology to organisational and process change. They address issues such as:
 - Critical analysis of the type and need for change
 - Specify the most appropriate means of achieving change
 - Predict the outcome of change
 - Carry out the implementation of the planned change
 - Measure the results against predicted outcomes
4. The IEA provides a forum for people interested in the advancement of industrial engineering and in optimising the use of increasingly scarce resources to solve modern problems of productivity. It provides members with an opportunity to exchange knowledge and experience. It is concerned with furthering the development and education of **IEs**, and developing, collecting and distributing industrial engineering knowledge.
 - 4.1.1. (At this time the IEA is actively collaborating with various universities in WA and Victoria assisting with the development and upgrading of recently introduced Industrial Engineering Undergraduate and Masters degrees)
5. Through meetings, Internet access(www.iea.org.au), newsletters that incorporate information from like organisations throughout the world with which IEA has reciprocal agreements, members remain abreast of techniques, and knowledge that both facilitate and enhance the quality of services they provide to management. Ongoing education and continuing professional development (CPD) is encouraged through both Engineers Australia(**EA**) and IEA.

5.1.1. The IEA and EA have just concluded a Memorandum of Understanding (MoU) recognising those areas of respective responsibilities within the engineering profession.

6. Services provided to members respond to the specific needs of those members in each division (NSW, QLD, SA, VIC and WA as well as Overseas) and include such support as access to library services, publications, technical papers and activities such as workshops and plant visits.
7. There is an active Events program planned (www.iea.org.au/events/)
8. The IEA's role also includes establishing qualifications and professional standing by setting standards to be met and by maintaining appropriate membership gradings and the award of post nominals. This is undertaken by a Membership Assessment Committee.

9. IEA VISION

9.1. The Institute of Industrial Engineers Australia (IEA) will strive to be the pre-eminent organisation for industrial engineers (IEs) in Australia and the Asia Pacific region. It will represent the views and ideas of its members to government, to EA and to industry. It will be the representative on government committees, government bodies and industry task-forces. The support and attention afforded to individual members, corporate members and clients, will exceed their expectations and requirements and enhance their careers.

10. IEA MISSION

10.1. As a world leader in developing industrial engineering (IE), IEA's mission is to: provide knowledge to, support and enhance the capabilities of those who are involved in or manage industrial engineering related activity
provide by various means, education and training in industrial engineering,
share ideas in industrial engineering,
As the pre-eminent body responsible for industrial engineering in Australia and the Asia Pacific region represent industrial engineers.

10.1.1. The IEA via the IEA Education Subcommittee, is working in an ongoing manner with those universities delivering IE degrees in Victoria and WA to determine:

- The definition of IE which is ever changing
- The Skill Base required by IE's to deliver effectively to organisations
- The various degree units required in order to provide the required IE Skill Base

10.2. The IEA is also actively working with various industries in promoting industrial engineering and employment of industrial engineers.

10.3. These organisations include resource, manufacturing, academic, healthcare, public service, transport and service industries.

11. INDUSTRIAL ENGINEERS(IEs)

11.1. Industrial Engineers(IEs) apply social and physical sciences to improve organisational outcomes, and to predict and evaluate the results of change in an Holistic manner. They have a particular emphasis on the “human” aspects of work.

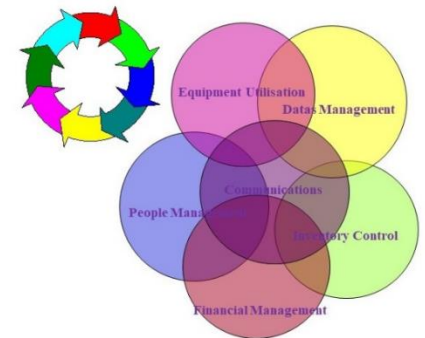
11.2. IEs design and install integrated systems that utilise available resources - human, materials, equipment, energy, information and financial and impact on the environment(circular economy) – to achieve optimum outcomes while ensuring that quality, safety, environment and human needs are suitably met.

11.3. Best known for their role in manufacturing and distribution enterprises, IEs also widely found in manufacturing, data analytics, health care, commerce, transport, mining, and defence and other service industries.

Among the wide range of analytical tools and techniques Industrial Engineers use are:

Traditional analysis tools of Industrial Engineering include:-

- Time and Motion Study/Method Study/Work Study/Standards development
- Game Theory(Consensus Decision Making)
- Operations Research Techniques
- Critical Path Analysis/Project Evaluation and Review Techniques/Project management
- Optimal Data Analysation
- Numerical Methods/Linear Programming
- Scheduling and inventory control/Materials handling
- Business Process Re-Engineering
- Systems and Process Engineering
- Cost Benefit and Value Analysis
- Just In Time(JIT)/Kanban
- Quality Assurance(QA) and control
- Ergonomics/Safety and environmental control
- Process simulation/Logistical systems



Other techniques that are now pursued by Industrial Engineers include:-

- Continuous Improvement Methods
- Computer Aided Design(CAD)
- Computer Aided Manufacturing(CAM)
- Remote Aerial Vehicle(UAV) Solutions
- 3D Printing/Additive manufacturing solutions
- Lean Manufacturing(6 Sigma)
- Agile management
- Circular Manufacturing-optimal impact on the environment

It should be noted that the Lean Manufacturing/6 Sigma processes, Agile Management techniques, are aspects of IE. They draw on the concepts of identifying, focusing, quantifying, analysing, improving, organising and achieving improvements in various business processes by re-engineering.

Reference: IE Handbook- Maynard's Industrial Engineering Handbook (Zandin 2001).

11.4. Organisational changes are generated by managers responding to global competition pressures, changes to the marketplace, and society. Industrial Engineers are well placed to analyse and propose changes, to predict the outcome of change, and to advise on the most effective means of implementation.

11.4.1. It should be noted that in these ever changing work environments, that the only aspect of organisational management that is constant is **change**.

11.5. Industrial Engineers need to teach others the use of appropriate techniques, ensuring that they are used properly while updating techniques they use themselves.

11.5.1. IEs need to continuously develop their capabilities as part of a process of continuous socio-economic change.

12. ORGANISATIONS EMPLOYING INDUSTRIAL ENGINEERS(IE)

12.1. IEs can be found in many varied organisations from:-

• Traditional manufacturing	• Insurance
• Health care	• Building construction and management
• Education	• Consulting
• Aviation management	• Communications
• Transport	• Energy, Oil and Gas
• Digital analysis	• Military
• Financial management, service, banking	• Agribusiness etc.

12.2. A partial list of companies employing IE's include

• 3M	• Infosys Public Services
• Abbott Laboratories	• Ingersoll Rand
• AIG	• Intel
• Alcoa	• Kimberly-Clark
• Amazon	• KPMG
• American Airlines	• MasterCard
• American Buildings Company	• Microsoft
• Apple	• National Institute of Standards and Technology
• Arup	• National University of Singapore
• AT&T	• Pirelli Cables
• BNSF Railway	• PricewaterhouseCoopers (PwC)
• Boeing	• S.C. Johnson & Son
• Boston Consulting Group	• Samsung
• Canada Post	• Sap
• Caterpillar	• Target
• Citibank	• Tesla Motors
• Colgate	• The Kraft Heinz Company
• Cummins	• The Walt Disney Company
• Deloitte	• Thyssenkrupp Presta
• FedEx	• U.S. Navy
• Ford Motor Company	• UPS
• General Electric	• Western Digital Corporation
• HBK Engineering	• Whirlpool Corporation
• IBM	• Yahoo

13. INDUSTRIAL ENGINEERING(IE) ACHIEVEMENTS

13.1. Over the past 2 centuries there have been many beneficial and lasting IE achievements:-

- Agriculture mechanisation(cotton gin)
- Optimised manufacturing(time and motion study)
- Mass production(assembly line)
- Industrial management techniques 18th century to today(people skills)
- Time and Motion Study
- Ergonomics
- Queuing Theory(Serpentine Queues(as in Perth Airport))
- Critical Path Analysis
- Kanban/JIT(work in progress inventory reduction)
- Circular Economy(waste and energy reduction)
- Etc etc



14. HISTORY OF INDUSTRIAL ENGINEERS AUSTRALIA(IEA)

14.1. The IEA had its beginnings in the Australian Methods Engineers Association which was founded when a group of Australian Industrial Engineers got together in 1954. In 1959 this Association was incorporated as the Institute of Industrial Engineers. Later the institute of industrial engineers Australia(IEA)(~2015).

14.2. Since December 1997, following a three-year trial, IEA also became a Society of the Engineers Australia. Since then the Institute has also operated as the Industrial Engineering Society (IES) of Engineers, Australia(EA)

14.3. In December 2020, the IEA signed a Memorandum of Understanding(MoU) with EA.

14.4. The IEA is a registered company limited by guarantee, owned by its members, and managed by a 10 member Board composed of elected delegates from each division.

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15. IEA PROGRAM

15.1. The IEA has a varied and innovative program in all divisions.

15.2. Refer www.iea.org.au/events/

15.3. The program undertakes site visits and technical workshops. The workshops are delivered F2F, hybrid or digitally via webinars.

15.4. IEA members are also able to attend and participate in Engineers Australia(EA) events as well.

16. NEWSLETTER/eZINE AND ARTICLES



16.1. The IEA regularly publishes newsletters and ezines with interesting IE articles submitted by IEA members and industry. www.iea.org.au/resources/journals/

17. IEA MEMBERSHIP AND FEE STRUCTURE(as of 29/01/21)

GRADE	CRITERIA	FEE
Affiliates	Candidates for Affiliate membership are persons who are either actively involved or interested in Industrial Engineering but who do not possess either qualifications or experience for other grades of membership.	\$115.00
Students	Candidates for Student membership are persons currently undertaking a course of study leading to Graduate membership.	\$25.00
Graduates	Candidates must have at least 4 years part time or equivalent full time study, appropriate associate diploma or technical certificate.	\$120.00
Members	Candidates must have at least 5 years Industrial Engineering-related experience since graduation.	\$165.00
Fellow	The Federal Council awards this grade to members who have practiced in Industrial Engineering for a significant period (such as 10 years) and are recommended by the Federal Membership and Grading Committee as having made an outstanding contribution to the profession of Industrial Engineering in Australia. Candidature is by invitation of the Federal Council.	\$175.00
Honorary Members	Awarded to Members or Fellows who have rendered outstanding service to the Institute of Industrial Engineers Australia. Candidature is by invitation of the Federal Council.	No Fee
Retired Members	Members who have been members for more than 10 years and are above the age of 65, can apply for this membership category	\$80.00
Corporate Membership	Organisations that undertake Industrial Engineering activities or employ IEs, are entitled to apply as a Corporate Member. An additional application fee of \$25.00 is applicable	\$300.00

Fee subscriptions are payable from July 1st.

It should be noted that New members joining after 1st December of a calendar year, will be charged HALF the annual fee.

Students will be charged \$0 fee for the remainder of the year.

Fee payment options available are Pay Anyone, Credit Card or by cheque on request.

17.1. The IEA has a Membership Assessment Board which assesses all membership application and upgrades.

18. INTERNATIONAL AND AUSTRALIAN INSTITUTES AGREEMENTS

- 18.1. The Institute has signed international affiliation and co-operation agreements with the European, Indian, Irish, and Japanese Institutes of Industrial Engineering. These agreements provide significant benefits and advantages to Australian IE's seeking work overseas and to overseas organisations seeking industrial engineers with experience to work on short and long term projects overseas.
- 18.2. Affiliated Institutes:
- European Institute of Industrial Engineers (EIIE): <http://www.efps-eiie.com/eiie.asp>
 - Institute of Industrial Engineers, Ireland (IIE): <http://www.iie.ie/>
 - Japan Institute of Industrial Engineering (JIIE): <http://www5.ocn.ne.jp/~jiie/>
 - Indian Institution of Industrial Engineering (IIIE): <http://www.iiie-india.com/>
- 18.3. The IEA also has a Memorandum of Understanding (MoU) with Engineers Australia (EA)
- 18.4. The IEA is actively working with other kindred IE organisations to collaborate (collaborate and compete) in the industrial engineering sphere.

19. IEA CONTACT DETAILS

- 19.1. Email: admin@iea.org.au or www.iea.org.au/contacts
- 19.2. Website www.iea.org.au
- 19.3. Contact: Phone: could be via EA +61 2 6270 6588 ask for Societies.