Session 9 FUTURE OF INDUSTRIAL ENGINEERING

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Definition of Industrial Engineering

In few words I would say that

Industrial Engineering is dealing with the **optimization of systems and processes** (in given circumstances)

General Hipo(thesis)

The basic ideas connected with the IE stays the same-- they are completely the same as the initial ones and no changes in that direction are expected

Brief overview of the IE history (1)

- Non-formal, very early beginnings may be located with the cognitive functioning of the people
- The real beginnings are connected with the **industrial revolution**
- For the first time the term "Industrial Engineering" appears in 1901 in the journal "**The Engineering Magazine**" by **James Guin**
- The fundamental breakthroughs are made by the people like **Taylor** and **Gilbreth**
- First implementation was associated with the **production organizations** and **direct workers**
- In the 70-ies and 80-ies in the last century serious introduction of the mathematical tools occurred – **Operational Research** are becoming a part of every serious course of IE
- First steps toward implementation of IE for **indirect work places** were done, together with the implementation in **service organizations**

New approaches that are now implemented in IE

- ERP (Enterprise Resource Planning)
- CRM (Customer Relationship Management)
- SCM (Supply Chain Management)
- BI (Business Intelligence)
- SD (Systems Dynamic)
- SaaS (Software as a Service)
- …

The future of IE - General Hipo(thesis)

The basic idea connected with the IE stays the same

it is completely the same as the initial one and no changes in that direction are expected

What will be changed is:

- New **methods** that will be applied
- New (non-typical) **areas of implementation**
- New **types of organizations**

New methods

- Future demands
  - Greater accuracy
  - Bigger speed
  - More complex organizations
- Methods with more solid mathematical background
- More intensive utilization of IT

Performance Measurement Systems (PMS)

- Why PMS?

They are the backbone of the continuous improvement which makes them important and connected with several other approaches, like:

  - Enterprise Restructuring
  - TQM
  - BI
  - Simulation
  - etc.

Employment of industrial engineers

Civil engineers	278,
Mechanical engineers	238,
Industrial engineers	214,
Electrical engineers	157,
Electronics engineers, except computer	143,
Computer hardware engineers	74,7
Aerospace engineers	71,6
Environmental engineers	54,3
Chemical engineers	31,7
Health and safety engineers, except mining safety engineers and inspectors	25,7
Materials engineers	24,4
Petroleum engineers	21,9
Nuclear engineers	16,9
Biomedical engineers	16,0
Marine engineers and naval architects	8,50
Mining and geological engineers, including mining safety engineers	7,10
Agricultural engineers	2,70
Engineers, all other	183,

Conclusion on the future of the industrial engineers

- ☐ The demand for this profile will grow (at least in the near future) due to the urging need of the enterprises to optimize their functioning through reduction of costs, increased productivity, etc.
- ☐ This profile will become more complex - additional methods will be encompassed in IE
- ☐ Vocational training and LLL approach will become more important