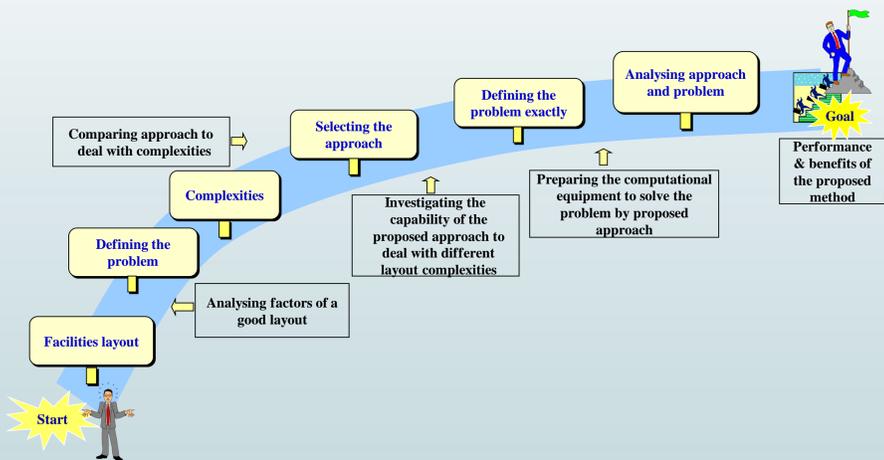


Introduction



Facility layout: The arrangement of everything within and around buildings. factory, hospital, office, we focus on **manufacturing system (factory)**

Basic Objective

- Facilitate a smooth flow of work, material, and information through the system

Supporting objectives

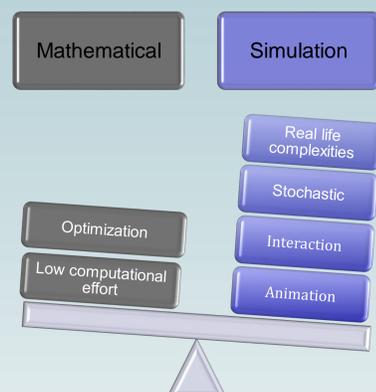
- Facilitate product or service quality
- Use workers and space efficiently
- Avoid bottlenecks
- Minimize material handling costs
- Eliminate unnecessary movement of workers or material
- Minimize production time or customer service time
- Design for safety and security
- Facilitate communication and interaction between workers, between workers and their supervisors, or between workers and customers
- Facilitate the entry, exit, and placement of material, products, or people
- Encourage proper maintenance activities
- Provide a visual control of operations or activities
- Provide flexibility to adapt to changing conditions
- Maximize customer satisfaction
- Improve employee morale
- Improve customer/client interaction

Methods and complexities

Complexities in facility layout



Facility layout approaches



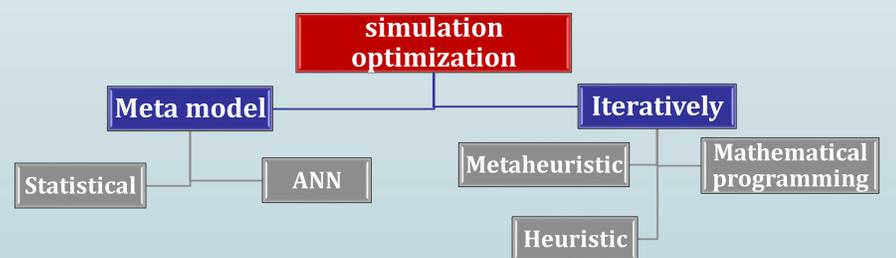
How can we enhance simulation to be able to do

Optimization and reduce its **computational effort** ?

Optimization ?



Simulation optimization (SO) refers to the optimization of an objective function subject to constraints, both of which can be evaluated through a stochastic simulation.



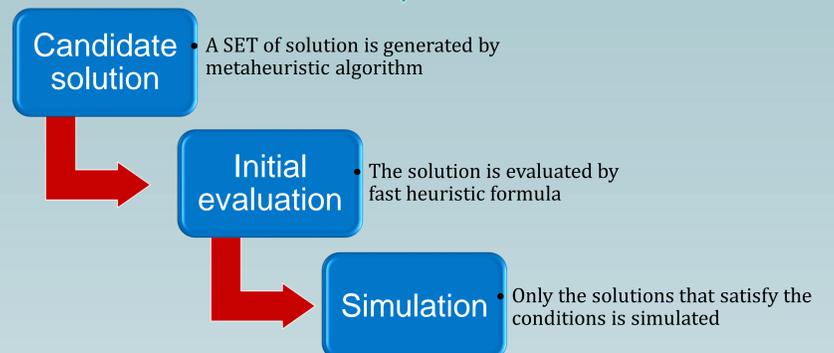
Meta model

- Different type of system configurations are generated in simulation model and run
- 1) Statistical techniques like regression, 2) Artificial neural network technique

Iteratively

- Simulation is called during optimization execution procedures
- 1) Meta heuristic algorithm, 2) Heuristic algorithm, 3) Mathematical programming

computational effort ?



Conclusion

The proposed approach, by solving the weakness of simulation, is able to analyse complex facility layout problems. The optimum layout will be applicable for real manufacturing system specially those are dealing with uncertainty.

Bibliography

- Tompkins, J.A., White, Y.A., Bozer, E.H., Frazelle, J.M.A., Tanchoco, J. (1996). Facilities Planning. Wiley, New York.
 Drira, A., Pierreval, H., Hajri-Gabouj, S. (2007). Facility layout problems: a survey. Ann. Rev. Control 31, 255-267,
 Pourvaziri, H., Pierreval H., 2017, Dynamic facility layout problem based on open queuing network theory, European Journal of Operational Research, 259, (2) 538-553.