



WITTMANN & PARTNER

# *i*GDSS case study new factory setup

## Need / Motivation

- Design and set-up a new modern and flexible production line.





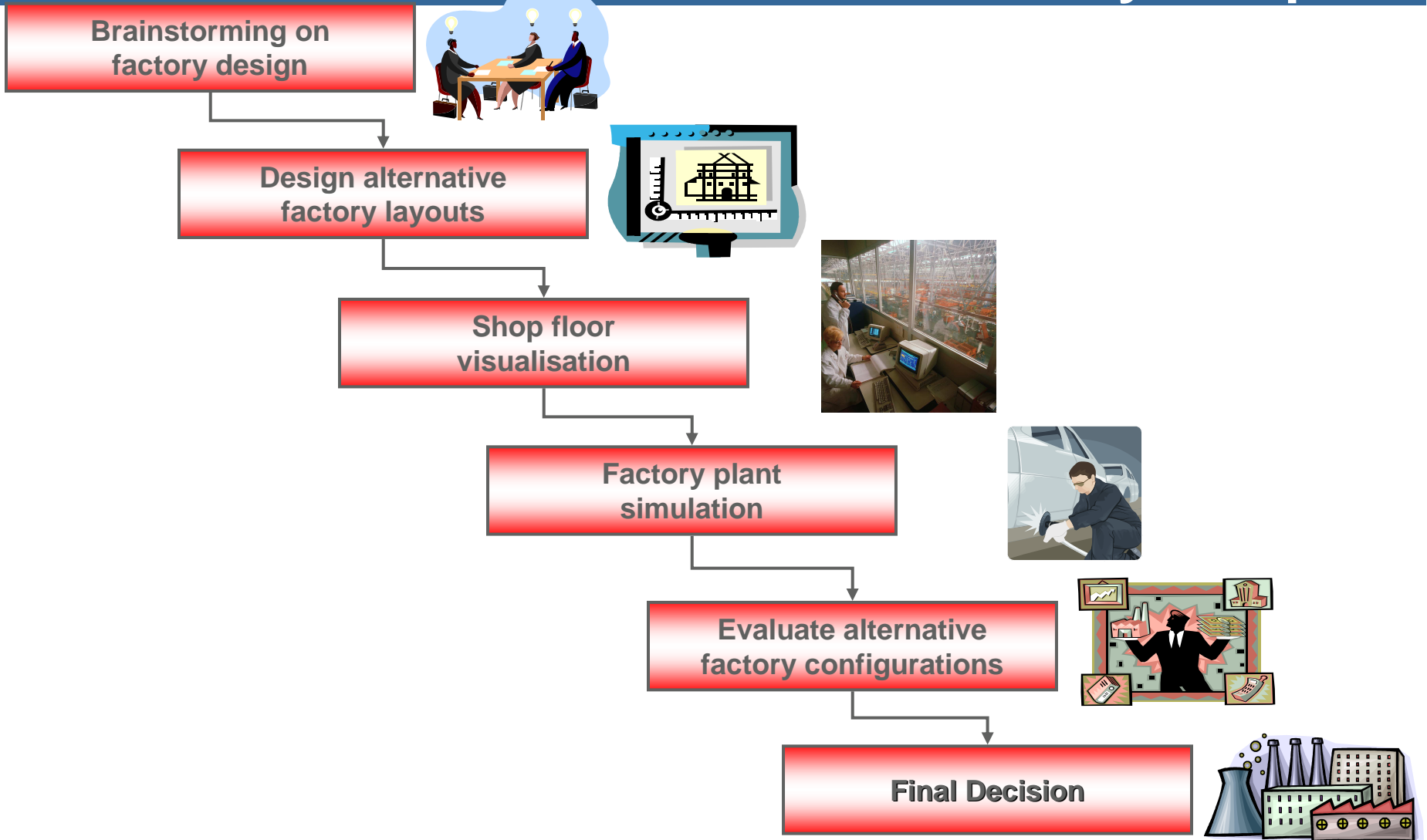
## **Current Status / Situation**

- Brainstorming sessions of the different company work groups.
- Everyone in the factory design process participates, sharing and building on one another's insights and ideas.
- Traditional CAD systems facilitate the activities associated with the factory design and evaluation procedure.



## Identified Problems

- No chance for real-time collaboration among work groups / employees.
- Decisions are not taken collectively.
- The final decision is often different and unclear, due to the different evaluation criteria and background among work groups / employees.
- If the factory layout design is wrong, it can lead to confused flow patterns, inventories, long process times, inflexible operations and high cost.
- Incorrect factory design affects the factory efficiency, quality and costs.





## Brainstorming on factory design

Generate alternative factory configurations, including:

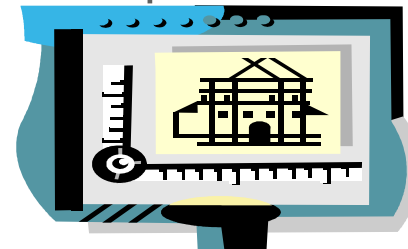
- factory layout
- workflow planning
- material flow simulation



## Design alternative factory layouts

Detail design of 2D/3D factory layouts with respect to:

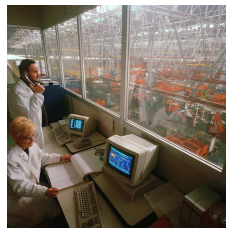
- machines dimensions
- factory area / land planning
- safety regulations





## Shop floor visualisation

- Visualise in 3D/VR/AR the alternatives of arrangement of the facilities / resources of the factory, with respect to:
  - Product configuration
  - Activity layout
  - Human involvement



## Factory plant simulation

- Make use of simulation tools to support “virtual experimental” with respect to several factory design parameters (e.g. material flow, resource utilization, etc.)





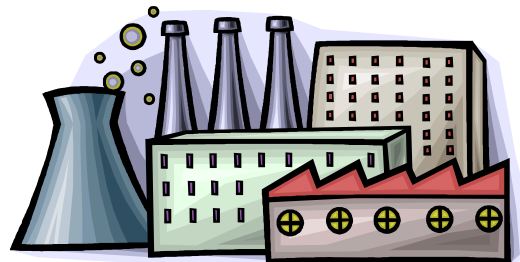
## Evaluate alternative factory configurations



- Criteria-based qualitative and/or quantitative evaluation of alternatives
  - The criteria should be with respect to guidelines and standards related to: production cost, productivity, flow-time, human factors, etc.

## Final Decision

- Rank each alternative based on its evaluation score and select the best ranked solution.





## General requirements (1/2)

- Quick and easy installation
- Provide an alternative web-based mode
- Need to support cross platform / OS (Windows, Mac, etc.).
- The system must be flexible enough so that team members can be added and/or subtracted as needed.
- Accommodate different levels of IT experts and technical backgrounds.
- User friendly GUI so as to avoid special training for system use.



## General requirements (2/2)

- Web 2.0 based and collaborative development and evaluation of process plans and factory layouts.
- The different dispersed key actors should be able to assess online these developments.
- Support group work in order to improve the capability to undertake rapid changes in organizational structure and product requirements.
- Replace physical meetings by on-line collaboration sessions, saving time and money during factory design and evaluation phase.



## Technology requirements

- Group decision-making in the phase of process planning and factory layout modeling.
- Material flow simulation.
- Shop-floor visualization (2D, 3D, VR).
- Multi-criteria quantitative evaluation of factory alternative designs.
- Assessment of human safety and ergonomics in alternative plant layouts.



## Functional requirements

- Generation of factory design alternatives wrt. existing guidelines and standards.
- Evaluation lists of alternative designs (i.e. layouts, process plans, etc.).
- View / save / print / send factory designs.
- Routings and flow diagrams.
- Web conference / instant messaging / chat history.
- Evaluation results documentation & circulation among work groups.



## **Solution – iGDSS**

### **Web 2.0 group decision support system:**

- to integrate and support group decisions anytime and anywhere;
- to allow group meetings and processes for decision making;
- to increase the productivity and efficiency of the decisional process;
- to increase the decision's speed and quality.