Tecnomatix Plant Simulation Training

at the Department of Manufacturing Systems

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ABSTRACT

The article discusses the use of software Tecnomatix from Siemens Product Lifecycle Management Software (CZ) s.r.o. for teaching at the Department of manufacturing systems. Briefly describes deployment options and basic module focusing on Tecnomatix Plant Simulation. Further, point on the other tools and equipment which are used in the education system "EduCom" at the Department of manufacturing systems.

Keywords: Tecnomatix, EduCom, Education system, Simulation, PLM

ABSTRAKT

Článek informuje o využívání nástroje Tecnomatix od firmy Siemens Product Lifecycle Management Software (CZ) s.r.o. ve výuce na katedře výrobních systému. Krátce popisuje možnosti a oblasti nasazení základních modulu Tecnomatix se zaměřením na Plant Simulation. Dále poukazuje na to, které další nástroje a vybavení jsou využívány ve výukovém systému „EduCom" na Katedře výrobních systémů.

Klíčová slova: Tecnomatix, EduCom, Výukový systém, Simulace, PLM

1 DEPARTMENT OF MANUFACTURING SYSTEMS

Department of Manufacturing Systems within the program of computer simulation studies uses a tool of Plant Simulation as the first module of the Tecnomatix package covered in education. That should be further followed by modules of digital factory offered by Siemens company as Process Simulate Human, Process Designer etc. Pilot application of Tecnomatix solution in teaching the consecutive program studies „Mechanical Engineering" branch of „Manufacturing Systems" focus on „Flexible Manufacturing Systems for Engineering Production".

2 PLANT SIMULATION

Plant Simulation is a tool for the material flow optimisation, increasing resources utilization and logistics. It is a very useful tool for mapping and production processes analyses. Already in the stage of creating and validation of simulation model are specified logical patterns and ties in a real process. Only realizing these ties by company workers often very much contributes to significantly progressive work of these employees and their inferior. Simulation analyses significantly contribute to projection, innovation as well as to planning a production process management itself. Plant Simulation find its application creating complex model of a factory, shop or particular production line (Fig. 1).

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Figure 1: Tecnomatix Plant Simulation [1]

2.1 Plant Simulation Principal Outlines

- Complex production system and management strategies simulation
- Possibility of modelling and variant solution analyses
- Charts and diagrams of flow analyses, of sources and bottlenecks
- Extensive analytic tools for autonomous detection or bottleneck, Sankey diagram and Gantt´s chart
- 3D-online visualisation and animation
- Genetic algorithm for automatic optimization of system parameters
- Object oriented, structured, and hierarchic work shop model including operation staff, logistics and production processes
- Object application library for prompt and effective typical scenario simulation modelling
- Facilities for simulations and library for storage of respective partial tasks applicable in other projects
- Open architecture with interface and integration for various programs (ActiveX, CAD, Oracle SQL, XML, Socet atd.)
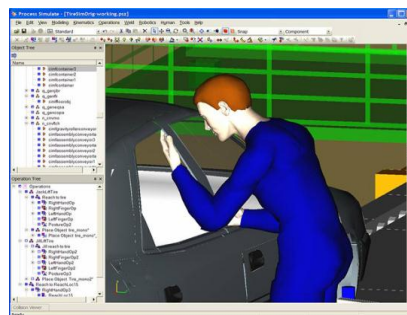

Figure 2 Tecnomatix - Process Simulate Human [2]

3 TECNOMATIX

Tecnomatix line includes several groups of products – to design production and assembly processes, robotized workplaces and lines for production operation simulation, machinery layout and resource management for simulation and optimisation of production operations, material flow, for logistics in general, for quality management, workplace simulation from the point of workers behaviour and load – ergonomy (Fig. 2). It is possible to integrate the products and manage production data systems PDM.

4 FACILITIES OF DEPARTMENT OF MANUFACTURING SYSTEMS

Tecnomatix product line thus systematically completes Department of manufacturing systems facilities. Students thus have chance to learn about further stages of product life cycle. Thus systematically completing their acquaintance with product, tool and manufacturing workplace digitalization (SMS Somet,

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MICROSCRIBE, ATOS II), creating digital prototype CAD (SW PeoE, CATIA), creating material prototype using rapid prototyping (FDM Prodigy tool or Dimension), preparing CAM technology (SW AlfaCAM, EdgeCAM), analyze of Manufacturing systems using simulation (SW Witness, Tecnomatix), product manufacturing itself on the shop-floor (machine tools EMCO, MAZAK integrex), manipulation robots (MITSUBISHI), management and production scheduling (SW Arop, Simcron), quality control and quality management (SW PALSTAT).
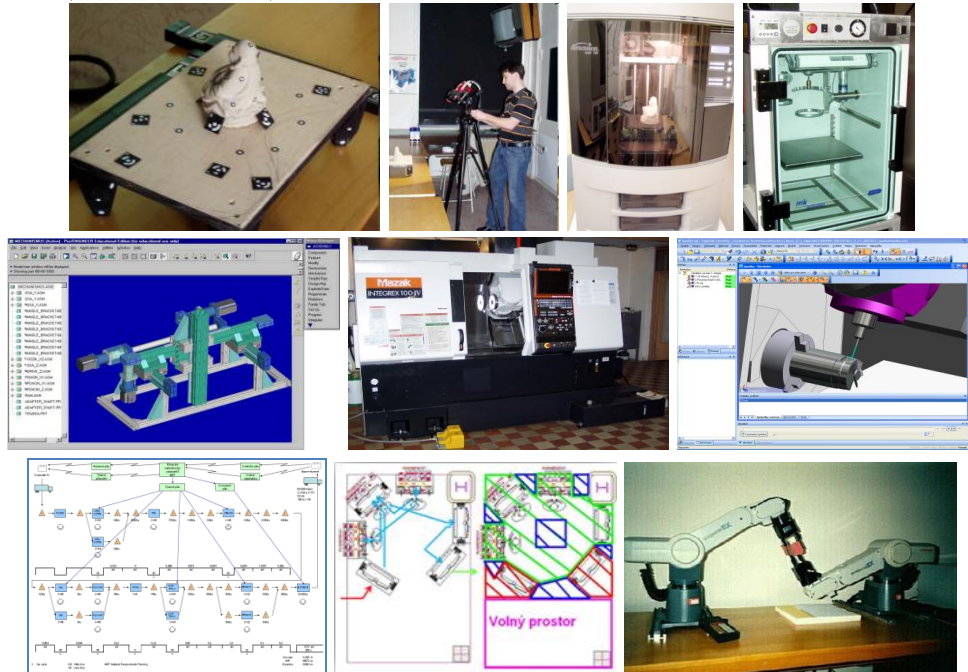

Figure 3: Facilities of Department of manufacturing systems

Quality laboratory equipment of the department is in the context of schooling not only in this field, but also in the area of Industrial Engineering, Production System Automation, Machinery and Appliances Construction etc. (Fig.3)

The Aim of Department of Manufacturing Systems is to introduce systematic training across several program studies within so called „Educational Company" EduCom. Our intention is to clear out the „blind spot" of Czech institute engineering and economy graduates. Leading to inadequate readiness for practice and slower ability to orientate them selves in a company processes. That derogates their performance. Our graduates thus have ahead-off start in their professional career.

Acknowledgements

References

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Reviewer

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