

Introduction

In the current market environment, a number of small to medium size companies find it increasingly difficult to compete with the larger corporation for their customers. Companies have to strike a right balance between proving a high-quality product at the right price with the customer service to ensure that a customer return in the future. For example, some companies started to optimise their factories' layouts in order to achieve improvements in the production area. There are numbers of ways to analyse the factories layout from a pen-and-paper approach to a complex computer simulation model. The larger a production area is the more complex it is to analyse due to greater number of factors that need to be taken into the consideration and their potential impact on the various components of production line. **In this paper:**

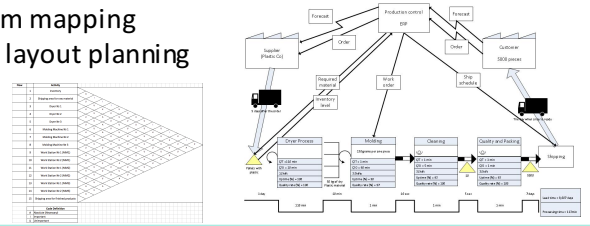
1. The case study of the **Schmidt Technoplast GmbH & Co** company is presented
2. Value stream mapping, systematic layout planning and 5S methods are used to **optimise** the production flow
3. Schmidt Technoplast production area is recreated using the **AnyLogic simulation software** and a detailed **description of the model's** creation is provided
4. Results of the evaluation of a potential production flow, using the simulation software, are presented

1. Case study company

Schmidt Technoplast GmbH & Co company
 Located in Buchen, Germany
 28 employees
 Produce: molded plastic parts
 tools for injection molding machines
 Machines for tools production and 8 molding centers

2. Optimisation methods and tools

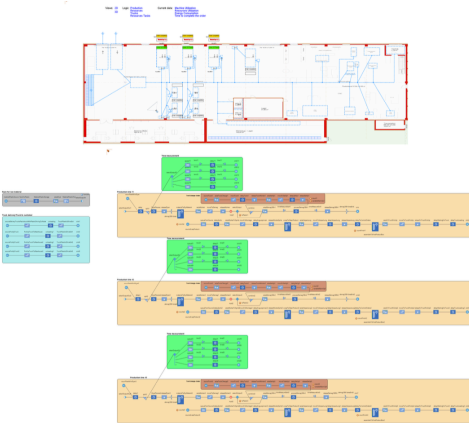
- Value stream mapping
- Systematic layout planning
- 5S



3. Software simulation model

AnyLogic model

3D view

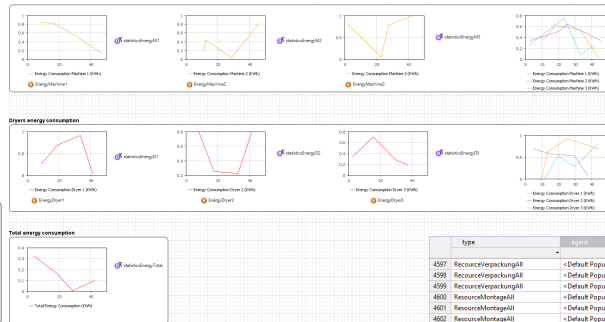
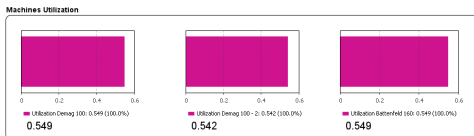


Energy consumption

Advantages of AnyLogic

Utilisation levels

- Easily customizable
- Simple java-based program code
- Connection with external database
- Supports agent-based, discrete event and system dynamic modeling methods



Database

type	agent	total_meters	total_seconds	avg_speed_mps
4597	Resource[VerpackungAll] <Default Population=16>: 5340	638.579	459.777	1.389
4598	Resource[VerpackungAll] <Default Population=19>: 5343	476.221	342.879	1.389
4599	Resource[VerpackungAll] <Default Population=29>: 5353	668.579	481.118	1.389
4600	Resource[MontageAll] <Default Population=18>: 5339	4.148.799	2.987.195	1.389
4601	Resource[MontageAll] <Default Population=177>: 5341	2.991.576	2.153.895	1.389
4602	Resource[MontageAll] <Default Population=22>: 5346	4.178.003	3.008.162	1.389

4. Results

- AnyLogic was adopted to create a detailed model of the production area and visualise all aspects of the production process
- Performance measures compared and evaluated to find out the optimal production flow
- Validation of the improvements, using software simulation, can reduce costs of implementation and expenses of the company
- Possible to measure energy consumption, to find out the best production schedule or create energy patterns

Master Thesis

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