

## Optimization of layout using discrete event simulation

# DAIMLER

### Daimler

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Daimler AG (formerly DaimlerChrysler) is a German multinational automotive corporation. Daimler AG is headquartered in Stuttgart, Baden-Württemberg, Germany. By unit sales, it is the thirteenth-largest car manufacturer and second-largest truck manufacturer in the world. In addition to automobiles, Daimler manufactures buses and provides financial services through its Daimler Financial Services arm.

As of 2013, Daimler owns or has shares in a number of car, bus and truck marques including Mercedes-Benz, Mercedes-AMG, Smart Automobile, Freightliner, Western Star, Thomas Built Buses, Setra, BharatBenz, Mitsubishi Fuso, as well as shares in Denza, KAMAZ, Beijing Automotive Group, Tesla Motors, and Renault-Nissan Alliance. At the end of 2012, the company closed the Maybach marque.

The aim of this project was to create space for a new project by merging production lines Daimler and VW group into a common line. By doing so, a simulation model was compiled in order to confirm the accuracy of evaluation of variants using the multi-criteria method. The advantage of simulations is that it is possible to try many variants of space arrangement without real movement of machines, and when the best variant is found, it is possible to start the real project.

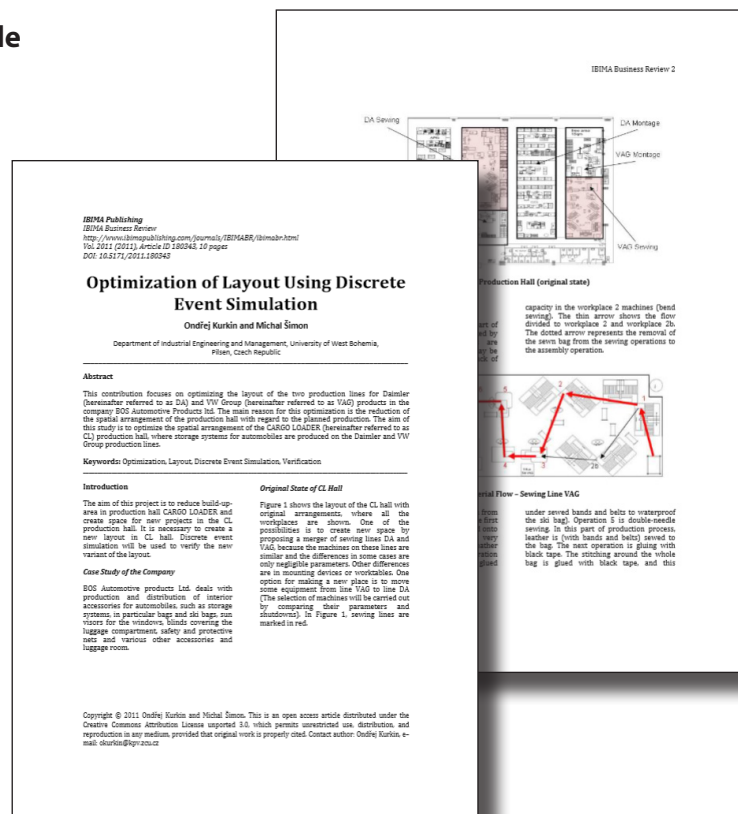
### Simulation and Forecasting Technology role

Evaluation of variants, layout optimization

### Sector

Automotive

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### Optimization of Layout Using Discrete Event Simulation

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**Abstract**  
This contribution focuses on optimizing the layout of the two production lines for Daimler (hereinafter referred to as DA) and VW Group (hereinafter referred to as VAG) products in the company BOS Automotive Products Ltd. The main reason for this optimization is the reduction of the spatial arrangement of the production hall with regard to the planned production. The aim of this study is to optimize the spatial arrangement of the CA800 LINAUCH (hereinafter referred to as CL) production hall, where storage systems for automobiles are produced on the Daimler and VW Group production lines.

**Keywords:** Optimization, Layout, Discrete Event Simulation, Verification.

**Introduction**  
The aim of this project is to reduce build-up areas in production hall CA800 LINAUCH and create space for new projects in the CL production hall. It is necessary to create a new layout in CL hall. Discrete event simulation will be used to verify the new variant of the layout.

**Case Study of the Company**  
BOS Automotive products Ltd. deals with production and distribution of interior accessories for automobiles, such as storage systems, in particular bags and die bags, sun visors for the windows, blinds covering the luggage compartment, safety and protective mats and various other accessories and luggage room.

**Original State of CL Hall**  
Figure 1 shows the layout of the CL hall with original arrangement, where all the workplaces are shown. One of the possibilities is to create new space by proposing a merger of sewing lines DA and VAG, because the machines on these lines are similar and the differences in these cases are only negligible parameters. Other differences are in incoming devices or worktables. One option for making a new place is to move some equipment from line VAG to line DA. (The selection of machines will be carried out by comparing their parameters and standards.) In Figure 1, sewing lines are marked in red.

**Local Flow - Sewing Line VAG**  
under served hands and belts to waterproof the slit bag. Operation 2 is double-needle sewing. In this part of production process, leather is (with hands and belts) sewed to the bag. The next operation is gluing with black tape. The stitching around the whole bag is glued with black tape, and this