

EXAMENSARBETE Diagnostic tool for issue categorization and capability determination

in flexographic printing

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Data visualization for improved print quality

POPULAR SCIENCE SUMMARY **Andreas Vidovic**

Today communication, promotion and transaction of products are key functions of product packaging. The quality of the package print is therefore of great importance and needs to be consistent for large production quantities.

One of the most common technologies for printing on paper or cardboard is flexographic printing. With this technology colors are applied one by one and through their combination new colors arise. However in order to successfully merge the different colors, it is essential that the colors align correctly. The aim of this master thesis was to design a diagnostic tool for a color-to-color register sensor system based on three inline cameras. The system, known as R2-DiToo (ColoR **2** color register **Diagnostic Tool**), is a development project at Tetra Pak with the goal of further improving print quality by combining data from multiple sensors concurrently. The purpose of color-to-color register is to monitor and control the alignment of colors being printed on the package material. If the colors are misaligned the configuration of the printing press needs to be adjusted to avoid printing a distorted image.

The thesis project was initialized with a literature study followed by the implementation of the design process. The design process was based on the user-centric design thinking process and consisted of four distinct phases. With a user-centric design approach users are included in the early stages of design and throughout the design process in order to create a highly usable product.

The final prototype of R2-DiToo includes a workflow to process the raw sensor data. The workflow is combined with a user interface allowing the user to better understand the processed sensor data through interactive visualization (see Figure 1).



Figure 1. The R2-DiToo user interface, developed in Power BI, to visualize color-to-color register data from three inline cameras.

The final prototype was based on the result of usability testing conducted with development engineers at Tetra Pak. The final prototype serves as a proof of concept for the R2-DiToo development project.