Standardization of Testing Services at the Swiss Cobotics Competence Center

The new Swiss Robotics Competence Center (S3C) bridges research and industry to boost robotic applications in Swiss manufacturing. The S3C's main service shall be testing on Cobotic Base Cells (CBCs), validating industrial process with cobotic solutions. In this work, the S3C testing processes and the generated documentation have been designed and validated.

Motivation

The S3C facilitates collaboration between academic and industrial partners, enabling testing of manufacturing processes with adaptable CBCs. It designs and conducts tailored tests based on customer-specific needs, processes, and workpieces

Objectives

The goal of this project was to develop and refine S3C testing processes, specifically tailored for industrial cobotic applications. Templates and documents were to be developed to structure the testing process from input to output. These tools were to be iteratively enhanced through industry-inspired test cases, optimizing both methodologies and outcomes.

Methodology

The current S3C testing process follows an Input-Process-Output (IPO) model. To enhance this structure, Lean Robotics and PDCA methodologies have been integrated (Fig. 1). Lean Robotics optimizes robot integration in manufacturing, while PDCA offers a structured approach to process improvement.

The Input stage, encompassing the Prepare and Design steps, establishes key parameters such as project scope and metrics, and defines both manual and robotic tasks. The Process stage includes the steps Integrate, Operate, and Check . During the Integrate step, the CBC to be used is defined, and pre-testing is done. In the Operate step, the process is initiated, monitored, and data is collected. The Check step involves evaluating the results. Finally, the Act step of the Output stage focuses on process improvement, proof-of-concept, conclusions, and recommendations.

Results and Outlook

Implementing this methodology resulted in two templates and three reports: a customer input form, a process form to guide the testing, and a comprehensive report detailing each phase with insights. These templates were validated with two uses-cases inspired by packaging (Fig. 2) and assembly tasks, helping as a roadmap for the entire process from cobotic cell selection at the S3C facilities to test monitoring. This approach guarantees optimization through iterative improvements, ensuring added value for the customer and facilitating process analysis for tangible results at the S3C.

María José Gomez Lucas
Mechatronics and Automation
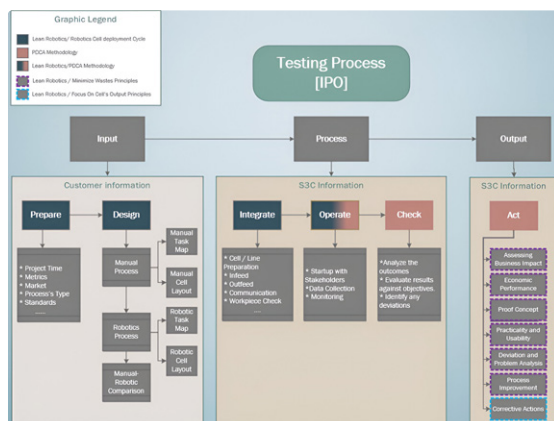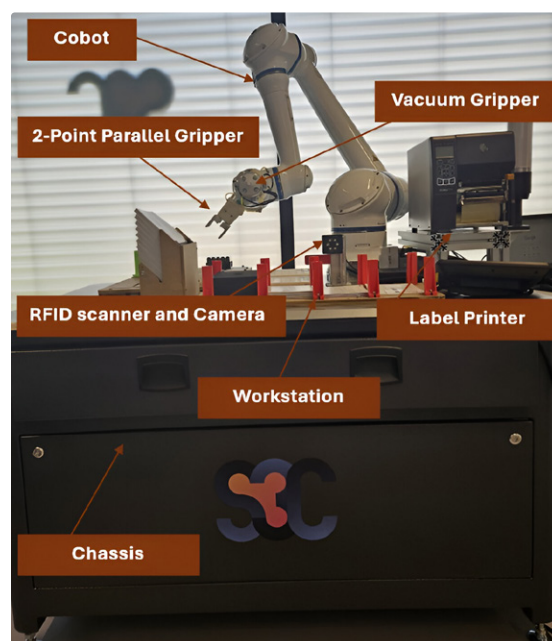076 543 67 24
majitogomez240@gmail.com

Fig.1 Proposed methodology

Fig. 2 Cobotic cell used in the packing process