

Development of Automation Solutions for Pallet Repair Stations

General Background Information

CHEP has requested PAT Industrial Solutions to quote the development of a semi-automatic system to assist in the repair of damaged pallets for their small and medium sized pallet repair sites. The goal is to have a fully functional prototype by mid 2022.

The tasks to automate in the repair process are not yet defined, and their definition is part of the initial stage of this project.

CHEP Development Project

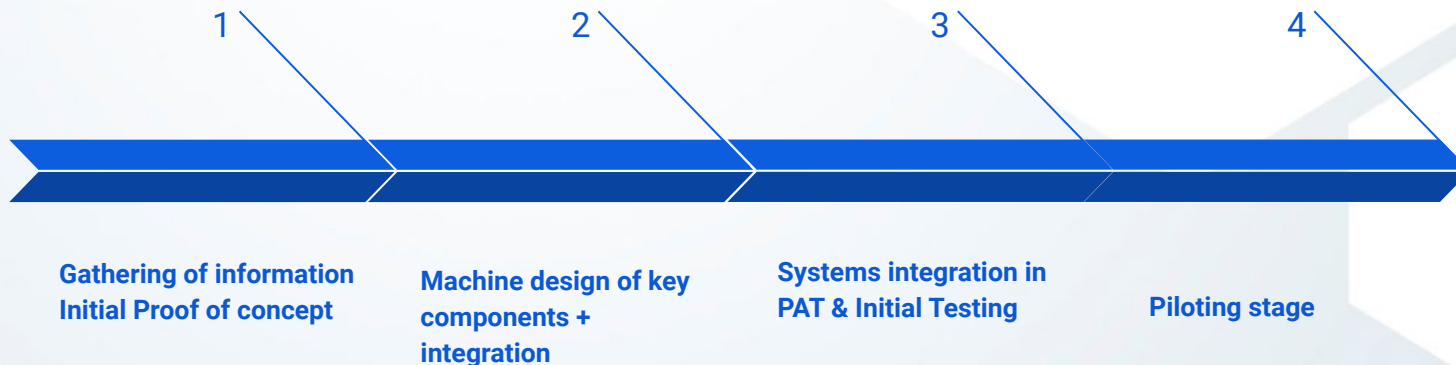
PAT proposes to develop the project in 4 consecutive stages:

Stage 1: Analyze the current process, and propose conceptual automation alternatives

Stage 2: develop all key sub-systems based on results obtained from stage 1

Stage 3: develop a fully functional prototype

Stage 4: Piloting stage on the field



CHEP Project

Time frames proposed by CHEP are tight in relation to other equivalent projects we have developed in the past. Success will depend on several factors, both internal and external.

Some key challenges specific to this project are:

- Many parallel threads that have to be addressed, with no previous technical input or study
- It is critical to develop concepts that work on the “first shot”, or that they require minor development iterations.
- Logistics have proven to be critical in the last 6 months, even for “express” deliveries

Proposed Scope for Stage I

1. Gathering of theoretical information (1 week)
 - a. Collecting and indexing actual process information
 - b. Analyze statistical data of the process (repair times, repair types, costs)
 - c. Coordinate visit schedule to repair plants in Chile, and prepare documentation for data collection.
2. Gathering of on-site information, visiting a real plant in Chile (Planta Izarra or Chillán - 2 day visit)
 - a. Video capture of actual process
 - b. Collect all process information related to the repair
 - c. Collect all tool information (types / brands / weight)
 - d. Measure and register table and equipment dimensions
3. Conceptual design (4 weeks)
 - a. Prepare conceptual solutions, including possible use of mechanical mechanisms to improve the actual condition and/or industrial robotics and/or specific machines.
 - b. Two collaboration workshops with CHEP (to guide the process / solve questions - 2 hours each)
 - c. Prepare final report, with cost estimates / timing of next stages.

Method for Applied R&D Projects

PAT develops applied R&D projects using a proven methodology, consisting on identifying & mitigating higher-risk problems on early stages of the development process. This methodology helps optimizing costs and success rates, as it only develops fully functional prototypes over mitigated risks.

Risks mitigation is generally addressed by developing quick & low-cost prototypes at the beginning of the project, developing specific strategies to control those risks.

Costs

Stage 1

US\$ 23,359


Notes:

- Estimated development time for Stage 1 is 5 weeks,
- Cost only considers human hours, according to the duration of each activity as indicated in the scope. In particular, costs exclude any kind of supply or external service, and excludes all travel expenses required to execute this study, which will be billed as a reimbursable expense.
- Cost excludes any additional working hours not explicitly listed such as non-planned waiting times in plant, or safety trainings required by plant. These costs will be billed separately by the hour.
- Stage 1 requires access to a factory in operation
- Deliverables of stage 1: 1 report

Commercial conditions:

50% down payment

50% after finishing each stage



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