

New equipment to Collect Recycling Bins

Collaboration to develop a more efficient, robust mobile equipment to collect bins

UNIVERSITY KNOWLEDGE TRANSFER



Contact

CIT UPC

Enric Bosa, Senior Industrial Liaison
Officer
enric.bosa@upc.edu
+34 93 405 44 19

www.cit.upc.edu

Main actors

- UPC Technology Center, CIT UPC: commercial interface between the company and the research group.
- Industrial Equipment Design Center (CDEI UPC): the research team actually transferring the knowledge to the company.
- PALVI, S.L: company hiring CIT UPC to solve the technical challenge.

The UPC Technology Center (CIT UPC) and its industrial Equipment Design Centre (CDEI UPC) have worked with the company PALVI, S.L to develop new equipment for collecting recycling bins. The result greatly improves efficacy and cuts the cost of the recycling process.

The mechanical arm in this system has hydraulic axes and can move to either side of the vehicle. It improves efficiency and cuts the time required to collect this kind of containers. Using the old system, operators took between 4 and 5 minutes to complete the collection cycle for each container. Now, this time is reduced to one minute, partly due to the fact that the computer vision system can be used to accurately calculate the path to the container and memorize the movement to put the bin back in the right place once it has been emptied.

The new equipment weighs 20% less than the old system, which means that less energy is used to transport it. As bins are handled precisely and their path to the lorry calculated accurately, they are moved without being knocked, which extends their useful life.

The technology has led to various patents. It forms part of the DULE system, patented by PALVI, S.L and made up of several pieces of equipment including bins and collection and washing systems.

Process Main Stages

STAGE 1 – IDENTIFYING THE TECHNOLOGY

The first main stage was the identification of the technology needs between PALVI, S.L and CIT UPC.

STAGE 2 – PARTNERSHIP ACTIVITIES

Then CIT UPC identified the main research group to do R&D to solve the issue. CIT UPC and CDEI UPC worked together to present the budget. With the acceptance of the budget of PALVI, S.L, the starting point in the development was the state of the art and analyzes the conceptual design of the existing mechanism. During the following 2 years, a team of ten people, including company specialists and researchers from the center, have worked on the design and fabrication of the new device. PALVI, S.L. was highly satisfied with the results of the project.

Touchpoints & Bottlenecks

TOUCHPOINT 1 – FIRST FORMAL MEETINGS BETWEEN ACTORS

On the first stages of the project (identification of the challenge, expertise required, budget, negotiation) several appointments were fixed in order to understand the company's environment, to analyze the issue and define the technical expectations.

BOTTLENECK 1 – REGULAR FACE-2-FACE MEETINGS WITH THE PARTNERS

During the execution phase, face-2-face meetings were held every 15 days between both parties.

BOTTLENECK 2 – VIRTUAL AND DIGITAL COMMUNICATION

Regular e-mail and phone communication was also established between the partners during the whole project.

Success Factors / Barriers

The result of the project was an automated mechanical arm designed to be supported on a lorry. It can collect top-loading recycling bins from the ground on both sides of the street, as well as underground containers. The solution delivered provided substantial reduction in time, weight and costs.

The success factors of this project are: track record (historical relationship of the applied research from CDEI UPC into industrial customers) of CDEI working with industrial clients similar to PALVI. Fluent relationship between both parties during the project. Early definition of the collaborative team from both entities and maintain it throughout the project lifecycle (2 years). Early involvement of design aspects (aligned with company's marketing design strategy) into the project development to avoid later disagreements. Detailed project schedule to close monitoring of project development.

Conclusion

On the identification of the challenge, CIT UPC normally analyzes the lead and customizes the presentation and targets the speech for the specific client and its particular field/technology needs. This involves explaining similar use cases that could be relevant in the company identified. Once it is identified the research team and the budget is presented, CIT UPC usually sets as meetings as needed to convince PALVI, S.L of the success on the proposal. In order to ensure the success, the project may be split in different stages with their associated budgets. After the end of each stage both partners agree on the technical expectations of the following stage, facilitating the monitoring of the whole project. The company may do research on the market environment to calculate the increase in sales and estimate the VAN, TIR, PAYBACK of the investment. Both parties shall agree on the economic conditions, lead times and IPR.

To succeed on the implementation of the project the company specialists and researchers from the center should work together on the project from the very beginning. They must share all the expertise, from the staff of PALVI, S.L: knowledge on the old system and from the research team: knowledge on industrial equipment design).

During the execution phase, face-2-face meetings must be scheduled regularly between both parts. Fluent communication and expectations management is key for establishing successful long-term bilateral relationship between the partners.

DO

- Customize your speech and relevant cases for the target company.
- Make sure both partners agree on the technical expectations, economic conditions, lead times and IPR.
- Schedule regular face-2-face meetings between both parties during the execution phase.
- Communicate fluently and especially about expectations for the collaboration.

DON'T

- Do not keep the expertise and knowledge for yourselves (mechanical, industrial equipment design, etc), parties should work together from the beginning and share their experiences.

