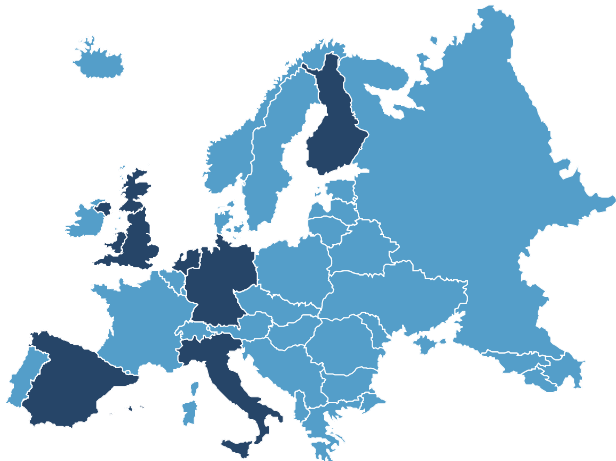


IK4 **TEKNIKER**  
Research Alliance

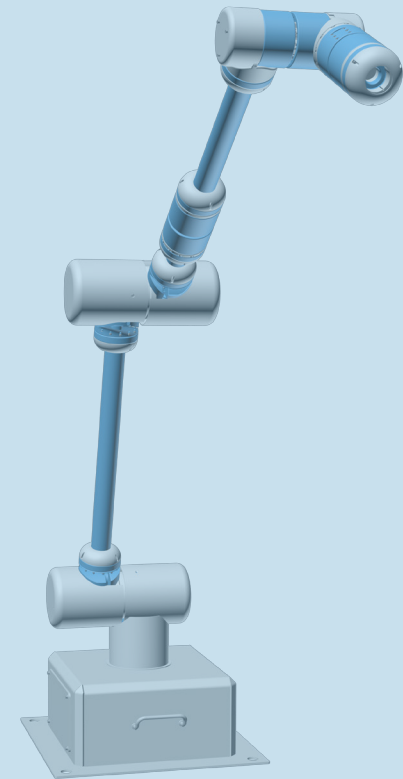


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**FOUR**  
BY**THREE**

IMAGINE HUMANS AND ROBOTS  
WORKING HAND IN HAND



Highly customizable robotic solutions for  
effective and safe human robot collaboration in  
manufacturing applications

This project has received funding from the European Union's Horizon 2020  
research and innovation programme under grant agreement n° 637095

**FourByThree** proposes the development of a new generation of modular industrial robotic solutions. These will be suitable for efficient task execution in collaboration with humans in a safe way and easy to use and program by the factory workers.



**15**  
partners



**36**  
months



**6,9**  
million €



**4**  
pilots

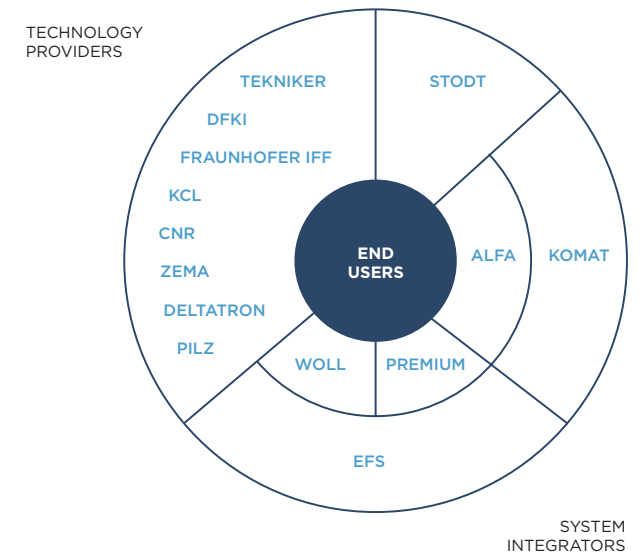
## Starting point

Industrial robots have previously demonstrated their excellence for use in industrial applications requiring dexterity, accuracy and efficiency. This is especially the case for large production batches, repetitive operations, and risky or unpleasant working conditions.

However, when collaboration between robots and workers is required, including working in a shared space, it is often not feasible to use standard robots due to safety concerns. Safe robotic products have appeared on the market, but they lack flexibility (in terms of possible physical configurations) or are prohibitively expensive.

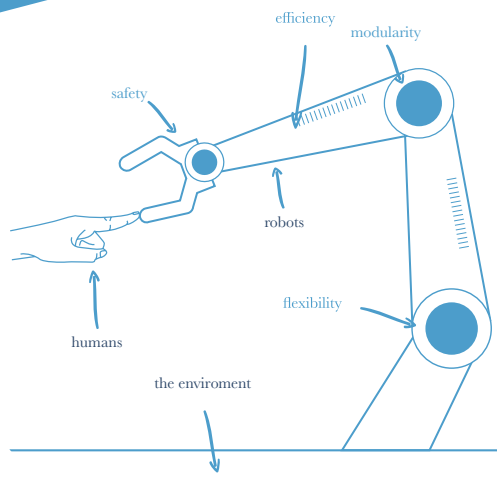
Furthermore, currently available collaborative robots are offered as isolated products. They are limited by fixed, rigid programming mechanisms, and do not come with integrated, rich perception capabilities or adequate responsive behaviours.

## Project structure



**4** features

**3** actors



We had some developments on series elastic actuators and thought they could be used for building a robotic manipulator for use in safe human-robot collaboration. We are bringing decades of research together into one single product.



José de Gea Fernández (DFKI)

We won't just create a new robotic solution that is intrinsically safe. We will generate a new business model that allows system integrators to create custom solutions. We also want to promote the concept of human-robot collaboration among the general public as well as industry stakeholders.



Iñaki Maurtua (IK4-Tekniker)

