



Rossini

RObot enhanced SenSing,
INtelligence and actuation
to Improve job quality in
manufacturing



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This project
miss
Grant

ROSSINI Project:

Making manufacturing within Europe economically viable by adapting large use of robotics in production and assembly.

Investment: €7,978,176.25

Funding: H2020



Main Goal

Develop a disruptive, **inherently safe hardware-software platform** for the design and deployment of **human-robot collaboration (HRC)** applications in manufacturing.



Expected Outcomes

- Spread HRC applications where robots and humans are teammates
- Increase job quality
- Production flexibility and productivity
- Manufacturing sustainability in Europe



The Rossini Platform

Key features that will allow effective and safe Human-Robot collaboration

The Rossini Platform



Sensing



Perception



Cognition



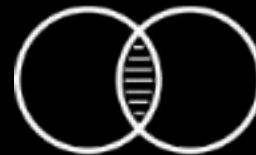
Control



Actuation



Human
Factors



Integration



One
Platform



Sensing Layer

Improve detection

Track capabilities

Monitor the working environment

Safety-graded fusion module for the processing of data





Perception Layer

Generate a Semantic Scene Map

Integrate geometric and semantic information

Create a set of virtual “Dynamic Shells” for safety

Employ artificial intelligence techniques





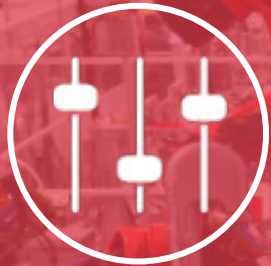
Cognitive Layer

High-level scheduler

Dynamically plan cooperative actions

Update the working environment conditions, through the Semantic Scene Map





Control Layer

Optimize robot
cognitive perception

Generate optimal task
planning

Interpret the high-level
action to execute





Actuation Layer

Develop a Robotic Arm range

Novel built-in safety features

Reduce separation distance between man and operator

Increase freedom for robotic applications design





Human Layer

A framework for
Human-Robot Mutual
Understanding in
collaborative operations

Ensure the inclusion of
human-related factors

Monitor factors
influencing job quality
during robotic
operations





Integration Layer

Provide integrators with tools and guidelines

Ensure inherent safety in design of HRC applications

Speed up application configuration and reconfiguration





One Platform

ROSSINI Layers will be integrated into ONE inherently safe platform for HRC applications development



Challenges



Challenges

1

Safety requirements limiting applications in terms of speed and payload



Challenges

1

Safety requirements limiting applications in terms of speed and payload

2

Need to assess the safety of HRC at the level of application



Challenges

1

Safety requirements limiting applications in terms of speed and payload

2

Need to assess the safety of HRC at the level of application

3

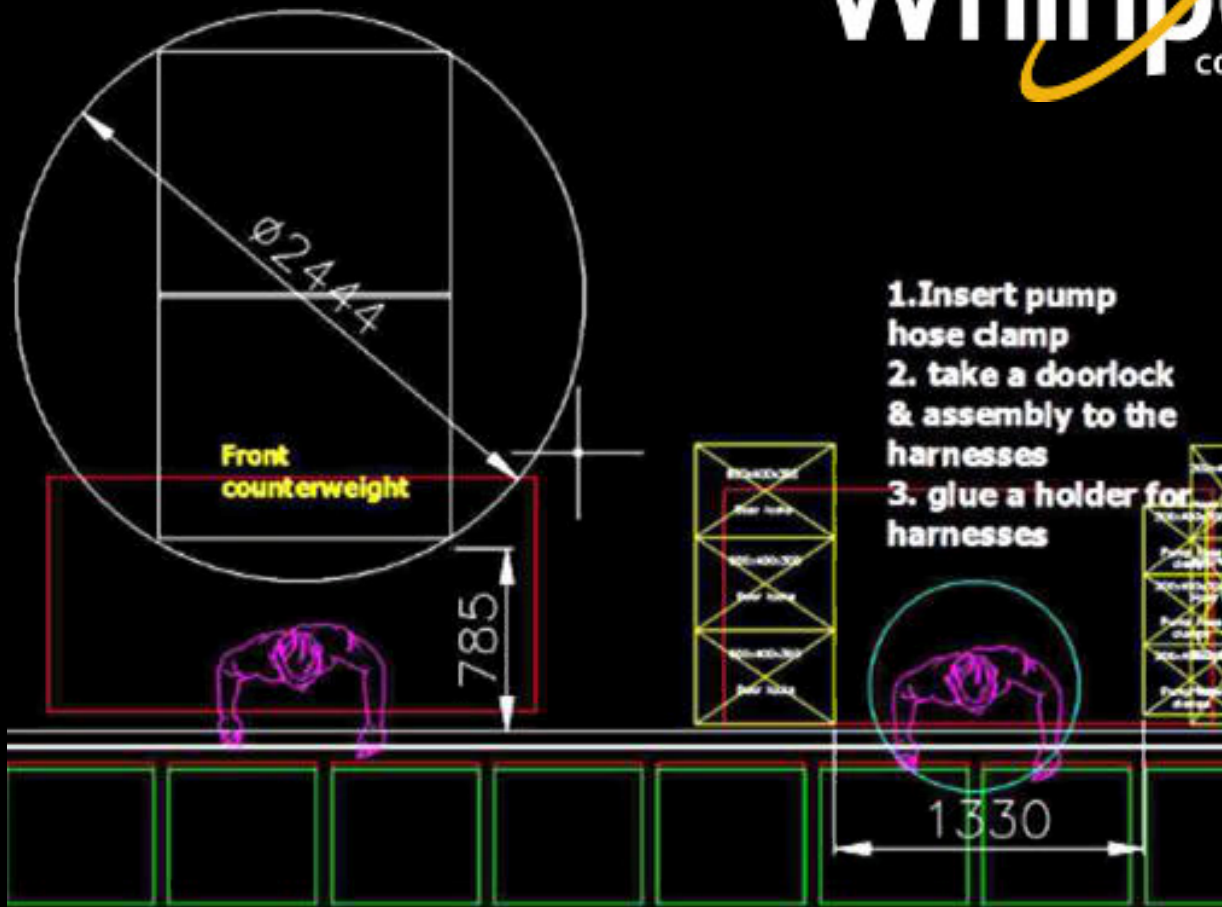
Lack of workforce acceptance in HRC



Use Cases



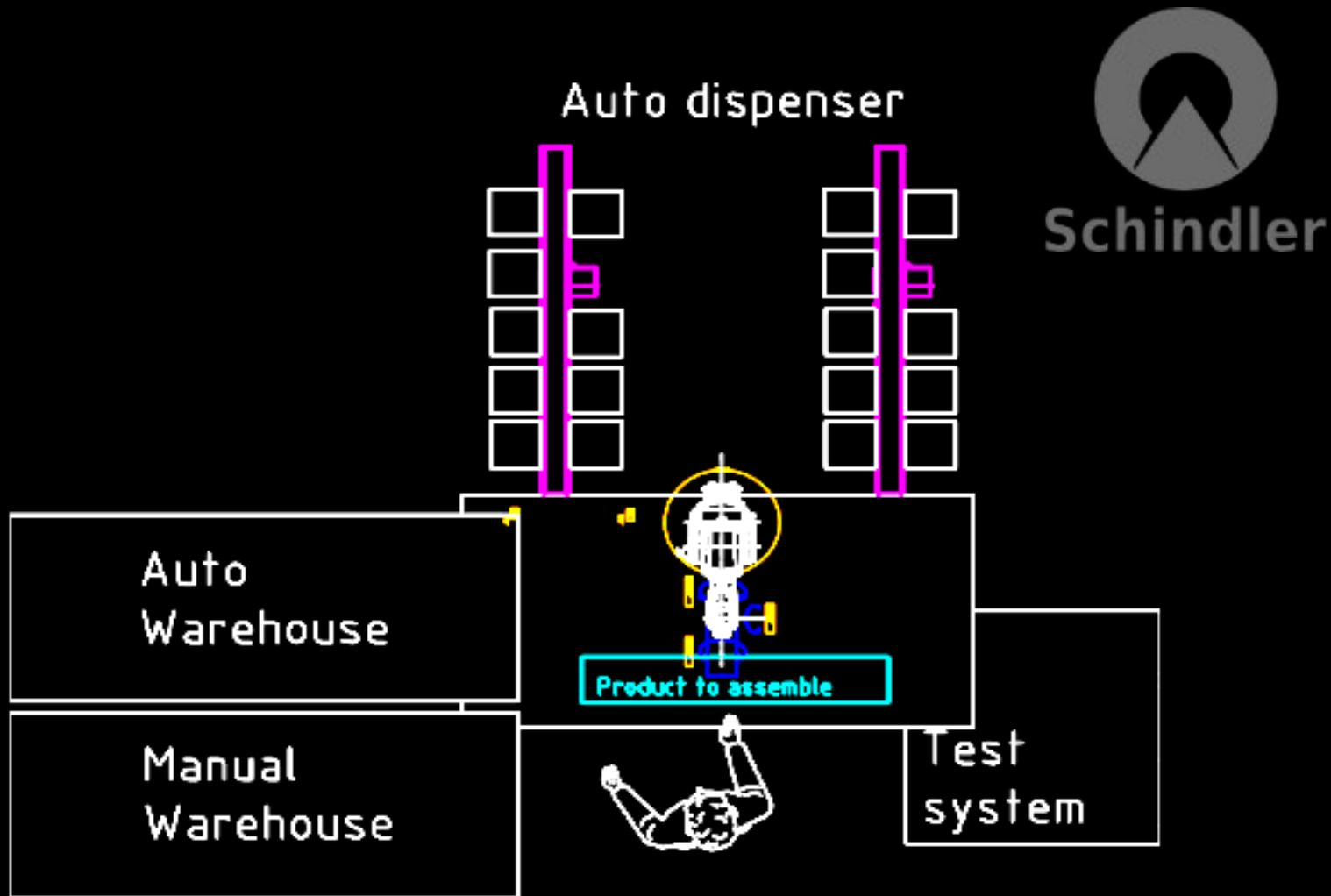
Use case #1: Domestic Appliances Assembly



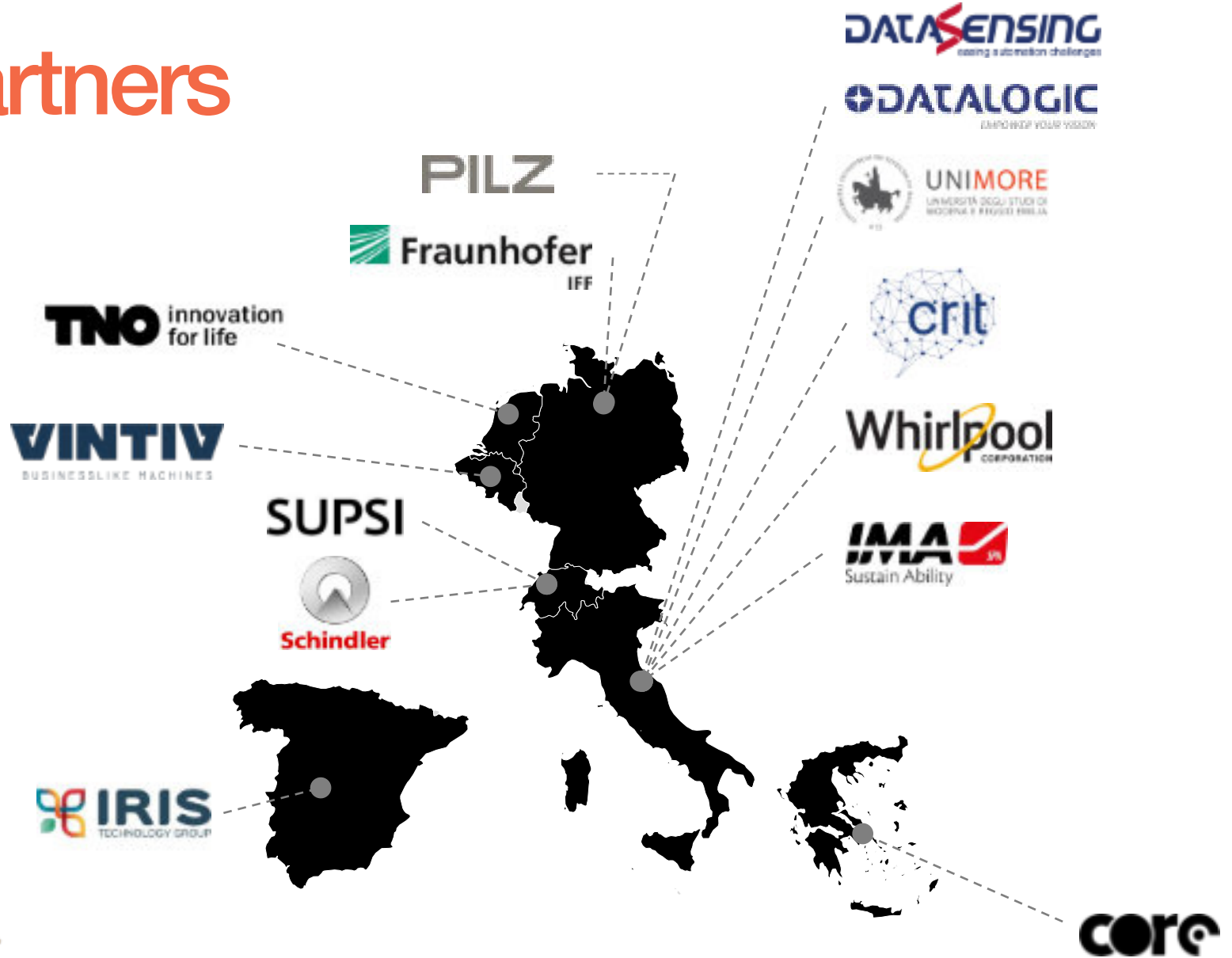
Use case #2: Food Products Packaging



Use case #3: Electronic Components Production



Partners



DATA SENSING
raising automation challenges

DATALOGIC
EMPOWER YOUR VISION

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UNIVERSITÀ DEGLI STUDI DI
MODENA E REGGIO EMILIA

crit

Whirlpool
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IMA
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core



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