



T-REX

INNOVATIVE STRATEGIES FOR RENOVATION AND REPAIR IN MANUFACTURING SYSTEMS



T-REX has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 609005

PROJECT OVERVIEW

T-REX promotes integrated Product-Service Systems and Business Solutions that allow a shift from value in exchange to value in use to satisfy customer needs.

The transition, in the capital goods industries, from the "traditional" Business Models (physical product) to the "new" Service-Oriented Business Models (renting, pay-per-use or pay-per-performance) has been supported with:

- A new **Service-Oriented Business Model Reference Framework**
- An improved design of the products by **Design -for-X (DfX)** approach
- The re-engineering of traditional support services by **Service Engineering (SE)** techniques
- Condition based Maintenance (CbM)** technologies and a **Fleet Management (FM)** platform for increasing availability and reducing Total Cost of Ownership

MAIN TARGET MARKETS

Machinery



Transportation



Automation



EXPLOITABLE RESULTS

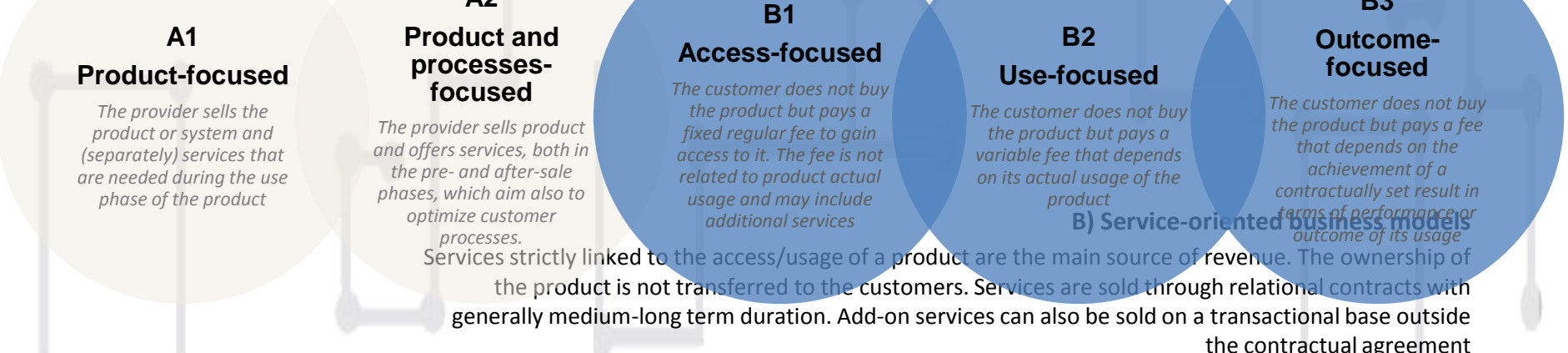
Some of the main project results applied to **Machine Tools**, **Forklift Trucks** and **Robotic Solutions** are listed below:

•**Service-Oriented Business Modelling methodology and platform:** sequential steps, guidelines and practical tools

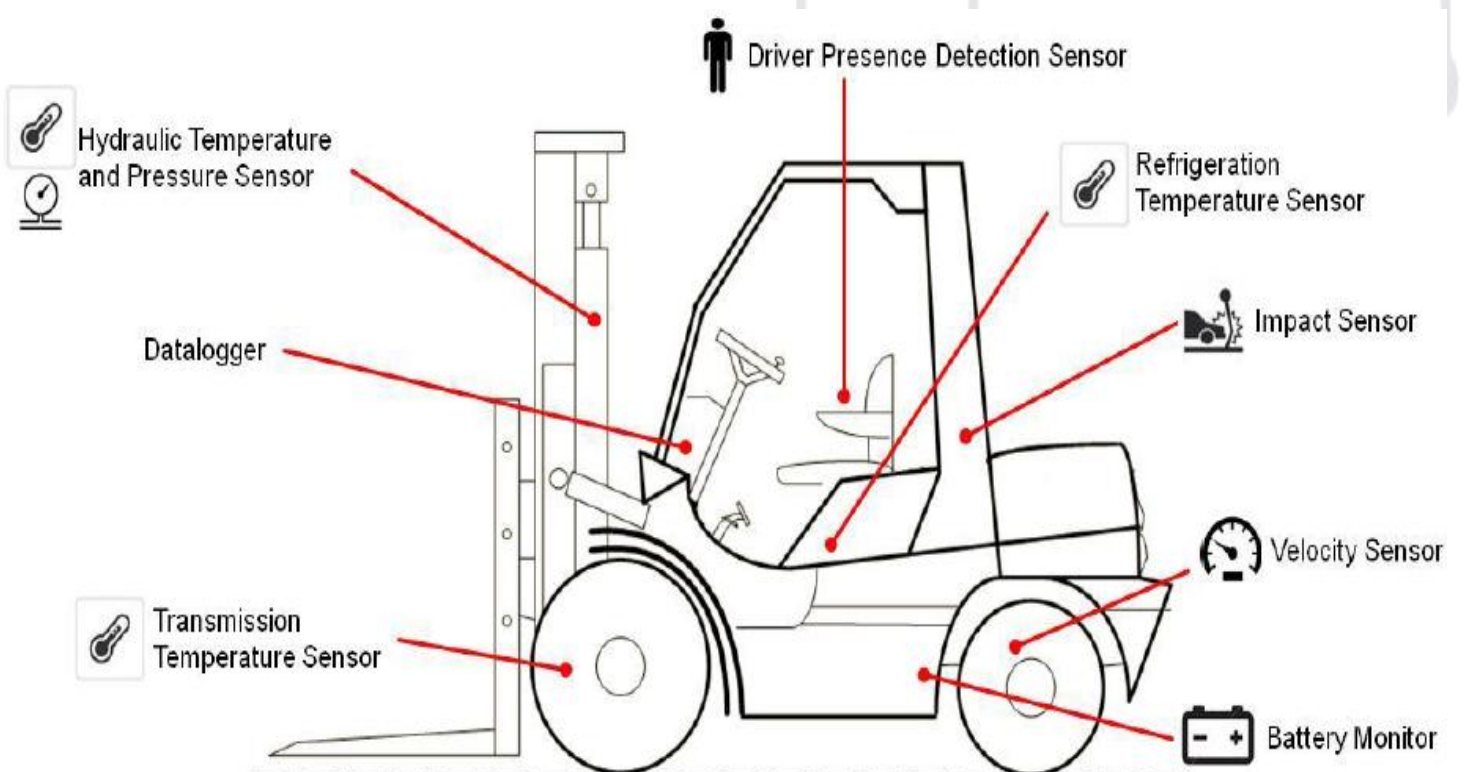
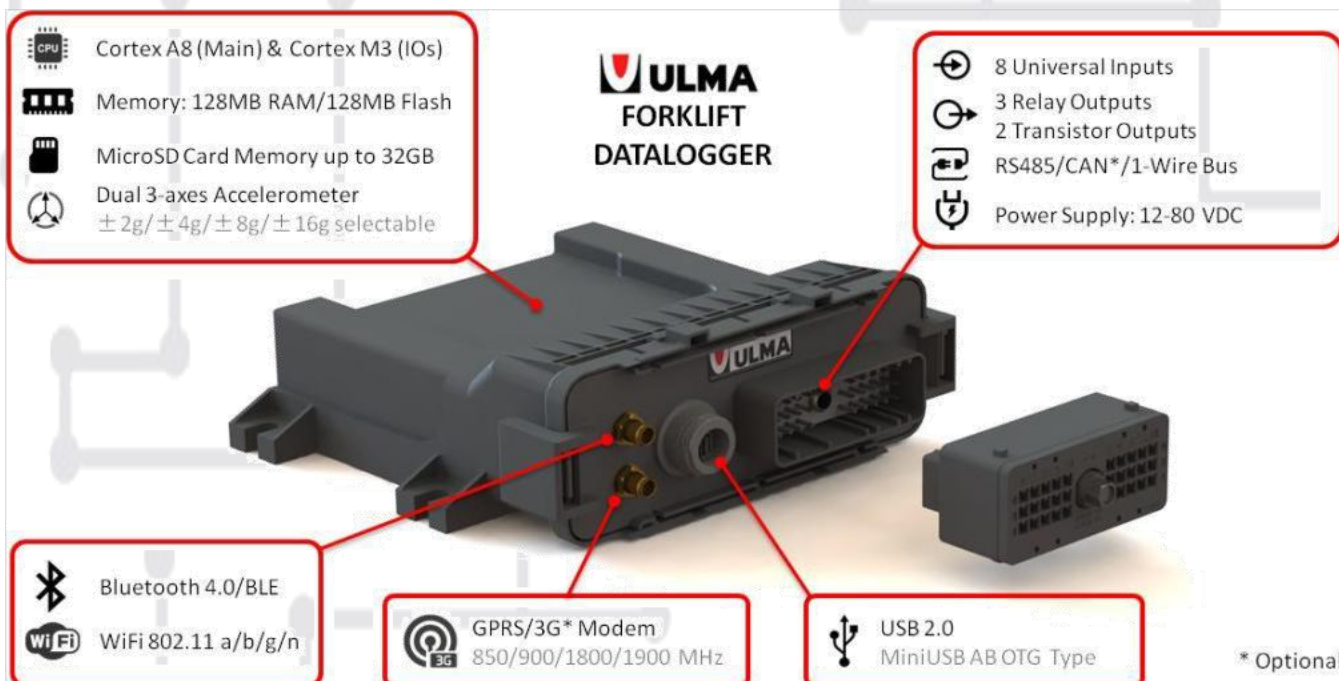


A) Ownership-oriented business models

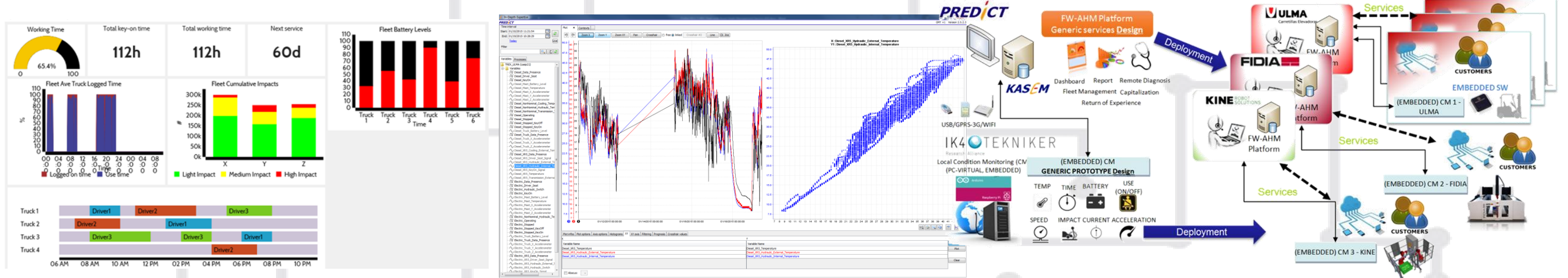
Product sales are the main source of revenue; services are sold as an add-on of the product. Service can be sold both transitionally (e.g. corrective technical assistance without any contractual agreement) and relationally (e.g. maintenance contract).



•**Smart Machine-Tool Electro-Spindles:** Re-design driven by reliability and maintainability concepts, including sensors (temperature, accelerometer, etc.) with feedback to **Machine Tool diagnosis SW tool** on the CNC for Servitization.



•**Smart Forklift Trucks:** Overall solution including a **Smart datalogger for Condition Monitoring** (sensors and internal data processing with remote communication via 3G, WIFI or Bluetooth), a **Smart Pulse datalogger for battery regeneration and monitoring** (desulphation pulse and sensors for temperature, electrolyte, charges, voltage, current, etc. with 3G or Bluetooth), plus an **Integrated Service SW** platform to exploit these information at fleet level: by the dealer (integrated with the ERP) and by each customer, allowing a new Short Term Rental Business Model.



•**Cloud-based Asset Health Management and Fleet Management:** KASEM SW platform for e-maintenance including usage monitoring, failures prognosis, know-how capitalization, trends evolution, indicators comparisons and good practices sharing from fleet-wide dimension, supported by a **Methodology for fast deployment of Predictive Maintenance (PdM)** based on best maintenance strategy identification for customers' objectives and constrains.

EXPECTED IMPACT

- Component re-use increase up to 55-70%
 - Operational maintenance service costs reduced by 15-30%
 - Lifecycle extension in the range of 30-80%
- Resulting in 25% to 30% savings on the Total Cost of Ownership (TCO).

START DATE: 1 OCTOBER 2013
DURATION: 36 MONTHS
TOTAL BUDGET: € 5.1 MILLION
FUNDING: € 3.6 MILLION

10 Partners
5 Countries

