

# Case Design Sheet



## 1. CASE DESCRIPTION

### TITLE: TIPCO – Intelligent traceability for complex products

PARTNER	LOCATION	TIME/DURATION
CIMES	France	2014-2015

The main goal of this project is to offer a new solution to trace complex products, more especially metallic high-temperated products evolving in a complex environment. The strategy is to identify automatically every product and to locate each of them. TIPCO is working on big-sized products. This project answers to the needs of metal transformation industry because these products, dealing with thermal and mechanical treatments all along the process of production, cannot fit with traditional RFID sensors.

## 2. DIGITAL TRANSFORMATION CHALLENGE

### 2.1. BUSINESS TRANSFORMATION

A collaborative approach was chosen to build a global solution to the user: 2 SMEs, one RTO together to answer to the user. The partners merged their knowhow from marking solution to monitoring devices to propose a ready-to-use solution.

### 2.2. CONCEPTUAL TRANSFORMATION

Before the project, products were spread over the plant and workers (fork elevator driver as well as production manager) had often difficulties to know and find the products on time. They looked for them manually all over the plant.

The issue was to mark the product and automatize the reading, to stock datas and acces to them in a monitoring tool.

The transformation deals with digitization (technical solution) and with sharing operational information among the staff for more efficiency in the productive system.

### 2.2. TECHNICAL TRANSFORMATION

- Automatical reading of the codes: it is a question of increasing robustness (any time, all conditions, embarked on vehicles ...). The main objective is to create standard reading parameters in order to make the system as agile as possible,
- Tracking of the carriage carts: The aim is to increase availability by offering an outdoor system that is robust to all conditions (GPS masking, communication disruptions ...). The industrial benefits are major since the validation of the foreseen system will allow access to the vast markets of the metallurgical industry. The system as defined is for any type of industrial having

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to produce or transform parts whose characteristics (volume, mass, temperature, ...) make it difficult to use conventional means by a multi-purpose approach. -technologies.

## 3. SOLUTION

Product marking:

- mobile laser marking
- mobile and robust code reader

Fork lifter solution:

- indoor localization with ultra-wide band (UWB) radio frequency technology
- outdoor localization with GPS
- merging both technologies

Monitoring:

- data acquisition, recording and transmission (low cost and low flow wireless communication)
- uploading in ERP

Other:

- low cost design

## 4. KEY SKILLS AND COMPETENCES

Skills and critical success factors:

- functional expectations analysis ; constraints understanding
- low cost design
- pluridisciplinary team
- support from a RTO on innovative technologies
- innovative SMEs collaboration for integration of solution
- experiments of the embedded solution on an analytical platform (living lab)

## 5. RESULTS

- A full-scale demonstrator in a complex industrial environment.
- The industrialized solution as a whole and extended inside warehouses using indoor location technologies (RTLS-UWB: RFID).
- High-performance software tools for interfacing with any type of application or management.
- A new matrix code reading system implementing a high-resolution industrial camera allowing quick adaptation to the ambient environment (brightness, lighting).

## 6. CONCLUSIONS AND RECOMMENDATIONS

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- low-cost design
- robustification and industrialisation
- human in the loop : added value of worker and safety increased
- technology serves the aim of gains in productivity

## 7. REFERENCES

- Catalogue ViaMéca, fiche projet TIPCO: <https://catalogue.viameca.fr/projets/tipco>
- Patent : BNT220538FR00, 27 Février 2016 «Localisation d'une cible pour robot suiveur»,.
- Scientific article : Jean Laneurit, Roland Chapuis, Christophe Debain, « TRACKBOD, an accurate, robust and low cost system for mobile robot person following », MCG 2016 – 5th International Conference on Machine Control & Guidance “Facing complex outdoor challenges by inter-disciplinary research” Vichy, France, October 5-6th, 2016.

## 8. APPENDICES

All charts, financials, visuals, and other related items can be placed here and referenced in the report.