**SOE3/P2/E0866**

# GT 2 VALUE CHAIN DIGITISATION CHALLENGES AND OPEN INNOVATION

## 3.3. Pilot development

## Pilot Project Plan

**DELIVERBLE 3.3.X**

| | |
|---|---|
| **Title of your project:** | Integrated Production Control powered by Industrial IoT |
| **Acronym:** | IPCIIoT |
| **Applicant Company:** | Textil Olius S.A. |
| **Country:** | Spain |
| **E-mail:** | ras@textilolius.com |

**IMPORTANT INSTRUCTIONS:**

Write your application only in English and use typography: "Times New Roman" size 11. Line spacing: Exact 12 pt.

Before submitting please, eliminate the comments and indications in *grey italics*

# Project summary and objectives

*Project description and its expected impacts, objectives and KPIs*

**Process time accuracy**: we will know our real process times and therefore have the input to optimize our scheduling, provide accurate lead-times and meet customer expectations of service and flexibility.

**Water and energy data collection and exploitability:**

- based on increased data granularity we will be able to compare water and energy consumptions between comparable production batches (and once the pilot is scaled-up, between similar machines) and accordingly detect and aim to correct inefficiencies.
- based on the analysis of consumption data time series we will be able to detect patterns and assess:
    - if we can adapt our consumption profile to take advantage of off-peak time rates.
    - the optimal mix of energy sources and dimension of photovoltaic energy infrastructure.
- based on the link between resource consumption and production data sets we will be able to estimate water, gas and energy used for any given production.

**Digital readiness of our team**: our workforce will be ready to operate successfully in an IoT environment and, generally speaking, will have an easier transition into digitized workflows.

We plan to use these KPIs to assess the success of these levers:

| KPI # | Lever | Description | Formula | Target |
|---|---|---|---|---|
| 1 | Process time accuracy | Reduction of average lead-time | (Average lead-time period post-pilot)/(Average lead-time period pre-pilot)-1 | 7,5% |
| 2 | Energy & water consumption data | Reduction of water consumption | (Monthly average of water consumption period post-pilot)/(Monthly average of water consumption period pre-pilot)-1 | 10% |
| 3 | Energy & water consumption data | Steps of production process providing data | (Number of steps in production process equipped with meters providing data)/(Total number of steps in production process) | 100% |
| 4 | Digital readiness | Digital Maturity level | Taking as a reference ACATECH (https://en.acatech.de/publication/industrie-4-0-maturity-index-update-2020/) | Visibility level |

# System description

With this background in mind, in our next step in the digitalization path we want a solution that can capture data from devices encompassing all our processes and that provides open access to this data. Accordingly, our approach looking forward is to have an accessible IoT platform to which in the future we can add inputs of different nature (production data, energy, environmental conditions) from many different sources.

If we compare the solution we would like to implement (PTC Thingworx) to other IoT applications in the market, the main advantages are:

- Thingworx is an open and transversal solution that can support many different uses (production control, energy consumption, water consumption) and thus avoid the deployment of isolated solutions for each area that would otherwise be more difficult to integrate.
- Thingworx has a powerful capability to connect to a broad set of industrial equipment, which is particularly relevant for us given the very diverse nature, age and origin of our machines.

From a technology perspective, our pilot is based on:

- The industrial IoT platform Thingworx (developed and owned by PTC), which will be leveraged to boost our process digitalization. Even if Thingworx is an off-the-shelf technology, it allows a very high level of customization to deploy the applications to be developed and adopted by our final users.

PTC Thingworx is a software solution that facilitates two approaches to deployment:

a) starting with preconfigured applications bringing important features but limited in their customization.
b) starting from scratch with a modelling of the entities to be managed and customization of the UX/UI. This allows that the different UC (Use Cases) to be delivered to different types of users will fulfil their expectations/needs.

The underlying technology is mature and has a robust background as it has been deployed in numerous companies worldwide. Its development started in 2009 and it was acquired by PTC in 2013 to boost its business in the field of Internet of Things with a focus in industrial companies. The latest version is 9.1 and nowadays it provides a wide range of IoT and analytics services.

- Commercially available sensors/devices providing signals. We will use common devices such as water flow and gas sensors, energy meters, etc.

The approach we are taking in this pilot is to work with commercially available solutions to:

- reduce technical risk.
- get the most out of the budget and avoid devoting resources to non-core development activities.
- have an easier path to scaling up the pilot if successful.

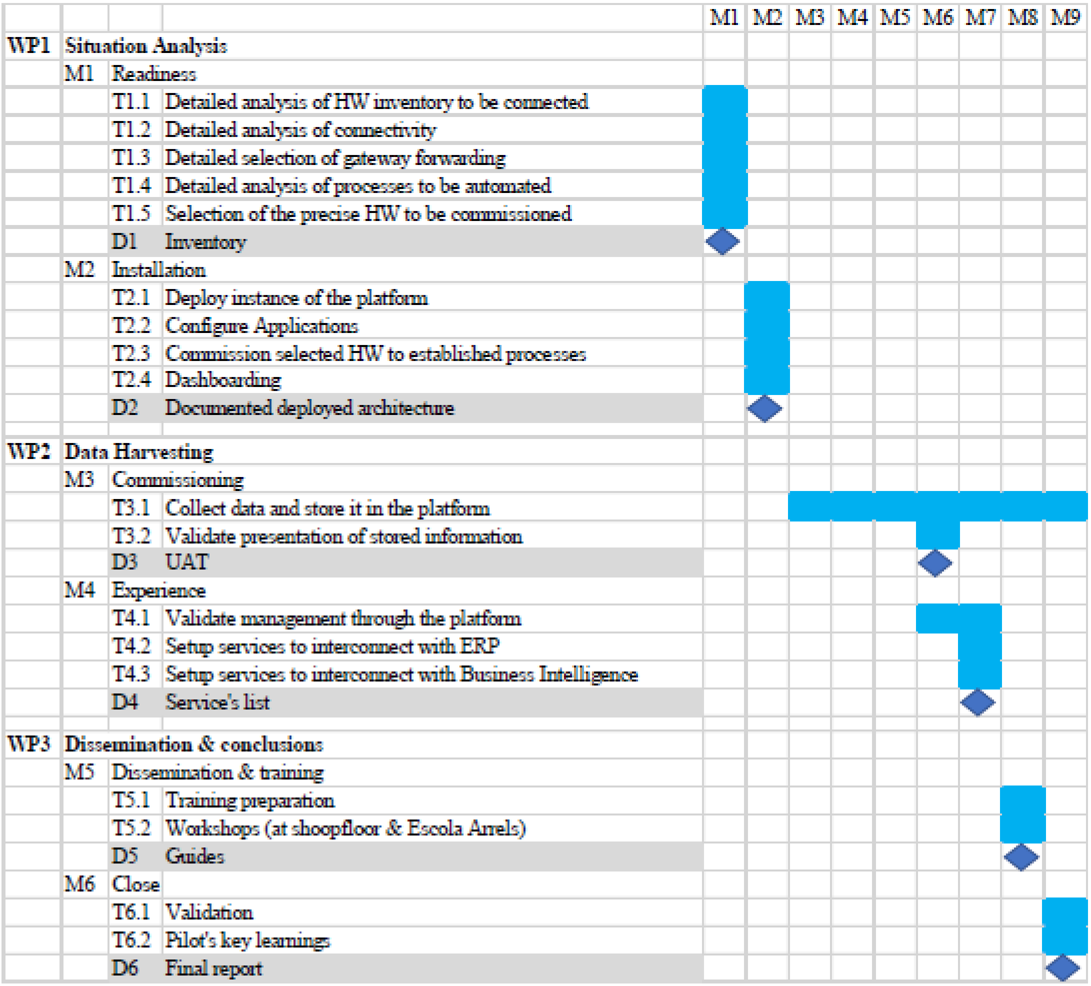
We will only turn to developing customized solutions if commercially available products are not reasonably suitable and in fact, testing whether available technology is sufficient for us will be part of the learnings/takeaways of this pilot.

As a conclusion, we believe the IoT technology we will apply is mature enough to deliver excellent features to perform the following key tasks:

- Extract signals from the industrial equipment and send data to the platform.
- Store collected data in a persistent way.
- Present information to users in a convenient way.
- Analyse behaviour, trends, and get insights and foresights.

## Gantt chart and activities/tasks description

The workplan will be structured in several Work Packages (WP), each Work Package being divided in several Modules (M), and each Module resulting in a Deliverable (D). Resources will be allocated based on this workplan to meet the expectations.




## Risk analysis

*Present your risk assessment for the development of the pilot and the actions and strategies to avoid and mitigate the identified risks.*

Finding hurdles is somehow inherent to any pilot but making a previous risk assessment will help us to be prepared and overcome them. These are the risks we foresee and how we intend to mitigate them:

- Connectivity of the equipment installed in the plant: because two of the machines selected for the pilot are quite old, we might need to setup workarounds to be able to get signals that give us clues about their behaviour. For example, using ammeters to give us indication of the electrical consumption and use this data to extrapolate the level of utilization.

- WiFi connectivity: although there has been a recent installation of a WiFi network covering our premises, it has not been stressed to the point to check if it is capable of supporting the expected traffic and latency. The pilot will allow us to evaluate it and if required, inform the decision to strengthen the network.
- ERP interconnection: our current ERP is being reviewed to migrate to a new version. Since in task T4.2 we expect to setup the mechanism of interconnection with the ERP and by then we will still have our current ERP, once the new ERP has been rolled out we will have some interphases that we will need to rearrange.
- Resistance to change: any alteration to business as usual tends to cause resistance. In this case, technology will be introduced that will alter processes in the factory and will require the adoption of digital tools. Accordingly, digital skills will be required. Even though there is a specific T5.1 task to roll out training and education, resistance to adopt the new technology may still happen and therefore, in the last WP we will need to make the necessary efforts to have successful adoption.

And last but not least, our initial approach is to make sense of the amount of data harvested internally. However, it may be that the support of a trained analytical profile will be required and we might need to incorporate such skills.

| Nº | Risk description | Importance (low/medium/high) | Proposed risk-mitigation measures |
|---|---|---|---|
| 1 | Connectivity of the equipment installed in the plant | Medium | Use ammeters to give us indication of the electrical consumption and use this data to extrapolate the level of utilization. |
| 2 | WiFi connectivity | High | Improve the WiFi network and install WiFi signal repeters and hotspots around the factory. |
| 3 | ERP interconnection | High | Increase the resources and people working in the migration of the ERP to reduce the times. |
| 4 | Resistance to change | Medium | Increase efforts on training workers on digital skills. |