Tracking of material within production facilities
A cable manufacturer decided to embark on a new digital journey via tracking position and weight of its copper coils in real time

The world changes, so does PRAKAB

The challenges PRAKAB faces:

- Significant material losses throughout the production process
- Difficult measurement of the amount of input material in final products
- Insufficient ways of tracking cables within factory
- Excess application of copper in order to maintain quality

Estimated annual loss of copper caused by insufficient tracking of specific wire and cable weights

1,1 mil EUR

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To digitize coils' position in real-time we chose small tracking tags based on the **ultra-wide band (UWB) technology**, which is highly suitable for industrial environments. The tags also feature an accelerometer for movement detection to prolong battery lifetime **up to 10 years**. In the pilot phase we want to **track 54 copper coils**.

As the copper coils undergo various procedures, it was necessary to provide **especially durable housing** for the tags. After a long research phase we embedded the tag in a **high resistance layer of resin** and mounted it by a **strength industrial Velcro** to withstand high centrifugal forces.

In order to locate the coils we set up an interior wireless infrastructure using **22 UWB anchors**. The coil's location is then determined from the closest **4-5 anchors** with **high accuracy**. The set of anchors captures the coil's position **every second**. The tracking technology generates **Big Data in real-time** for further processing.

To measure the exact amount of copper used we plan to place **4 weighing scale** with **readability of 40 g** (850 kg average coil's weight) throughout the production line which will be seated into frames and embedded in concrete. Each weighing scale will have a display signaling operators the weighing process.
Key milestones on the pathway to the digital enterprise

**November 2016**
Initial discussion about the challenges and brainstorming of ideas

**June 2017**
Frames for placement of weighing scales delivered

**September 2017**
Start of data collection on copper coils’ positions and weights

**November 2017**
Application of statistical process control resulting in a change of production line setting

**March 2017**
Final decision made on the tag’s housing and fixation to the copper coils

**August 2017**
Placement of weighing scales into frames and their concreting

**October 2017**
Analysis of a one month data sample and verification of the technology functioning

**May 2018**
Reaping the benefits from exact measurements and its consequent changes in production line settings leading to savings of hundreds of thousands of euros

**Expected savings within first 6 months**
0.5 mil EUR
**Key benefits:**

- Reduction of **copper and aluminum** to required optimum
- Decreased **waste**
- Real-time **inventory of WIP**
- Reduced **WIP and final goods**
- Improved **cash flow**

**Digital Champions**

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