

Validation of zApps in a Multicursor Zero Defects System

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Project Details and Motivation

Furniture manufacturing companies of all sizes, as well as their customers, have identified that one of the key challenges they face is ensuring the quality of paint or lacquer curing (hereinafter – coating). If furniture surfaces are not sufficiently well cured, consumers and end-users may be exposed to unhealthy volatile organic compounds (regulated by eg the European VOC directive) and the lifetime of the products is diminished. Today the standard practice is to conduct curing inspection manually on samples by using methods such as “scratching”, visual checking, temperature measurement or brilliance monitoring of the cured object. Also, quality control is conducted by measuring the energy output from the UV-curing lamps, which periodically must be replaced as they gradually lose power/ potential. However, there is no solution that guarantees zero defects, automated quality control and quality data collection. The manufacturing companies and the coating industry are actively looking for alternative solutions that are cheap, fast and reliable and guarantee the quality of their products. And – very importantly – perform automated measurement on the actual item.

The proposed solution to this problem is proposed by Multicursor – an IoT sensor system that controls and documents the curing quality of individual furniture items in a non-contact way in live production environments. The sensor system identifies curing levels in 3D structures (surface, depth) and consists of a thermographic camera and ultrasound sensor. The system makes production quality control faster, consistent and enables zero-defect manufacturing through real-time monitoring and collection of valuable data. In turn, manufacturers are able to improve the quality control process of furniture production, prevent potential business losses and bring the factories closer to Industry 4.0.

ZDMP Fit

Multicursor’s current aim is to use the zApps as a software for the system to make it possible to integrate Multicursor into production facilities. It is expected to make the system able to inspect defects in real time without any contact, make alerts accordingly, track the defective items and document the whole process. The main benefit Multicursor would expect from this project is the opportunity to complement the current software with standard ZDMP components for collection and processing of data which will be generated by Multicursor, therefore saving costs and time in software development for the sensor system. Additional benefits include funding for the development of the solution, support from the ZDMP network in the development process and exposure to potential partners and clients within the marketplace. In exchange Multicursor will test and validate zApps in a real-world setup (furniture production industry). This testing will bring the selected zApps closer to the commercial level and prepare them as a package of software for further use in different scenarios.

The Multicursor project is taking advantage of the following zComponents and zApps used in the project:

- **Monitoring and Alert (zComponent)** - Monitoring and Alert zComponent will enable fast on-site response to any arising downtimes or errors plus will document these anomalies to our batch production log where this information will be represented in a batch report on the curing level/quality. It is essential to be able to trace back individual items or batches of materials that appear below the threshold curing levels.
- **zMaterialID (zApp)** – In this use case it is important to be able to trace back individual items or batches of materials that appear below the threshold curing levels. For this MaterialID zApp will be used as a crucial part for traceability helping us mark and trace the batches/items in order the cause can be determined and production quality improved.

- **zRemoteQC (zApp)** - Keeping track of materials is quite an important task which is oversaw with the help of MaterialID zApp, but keeping track of deliveries, quality control and other production nuances is also a significant task. The RemoteQC zApp should help with these problems. RemoteQC zApp will be used as an easy-to-use tool for batch documentation, quality control paperwork and management used throughout the whole process to ensure that the traceability is in line with the production steps.
- **DigitalTwin (zComponent)** - will provide data objects describing various aspects of the physical and logical parts of the manufacturing process. In addition, it will include the status of distributed edge nodes and other components of the whole system and setup. It will enable simulation of the future states of the system and production using AI algorithms to perform dynamic virtual representation.

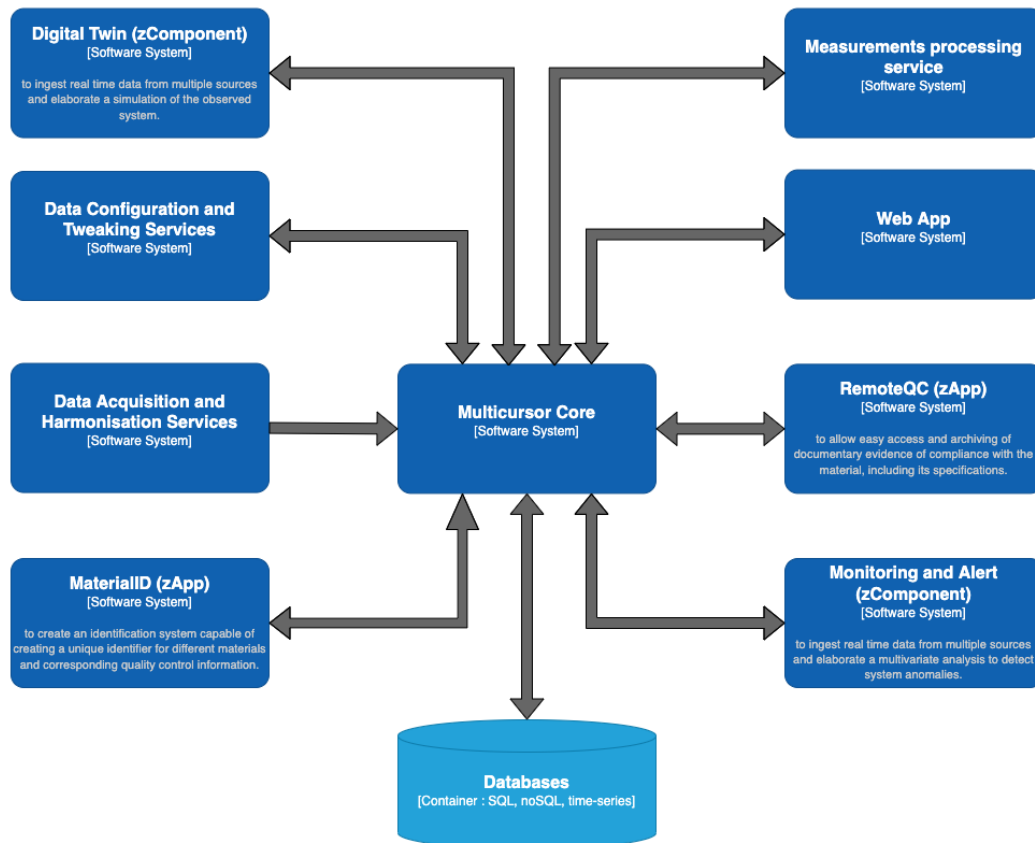


Figure 1. Multicursor system architecture diagram

Participant Details

- **Organisation(s) involved:** UAB MULTICURSOR
 - **Web:** www.multicursor.com
 - **Contact:** office@multicursor.com
 - **Profile:** IOT company specialising in a non-contact lacquer/paint curing level inspection for UV curing technologies. We aim to introduce a new inspection technology to a currently manual and tiresome coating/finishing process in furniture production industry which in return is also hazardous for human health. By digitising this process we will not only get closer to zero defect manufacturing, but will also improve the final product quality and remove potential human health risks.

ZDMP Details

The ZDMP – Zero Defects Manufacturing Platform – is a project funded by the H2020 Framework Programme of the European Commission under Grant Agreement 825631 and conducted from January 2019 until December 2022. It engages 31 partners (Users, Technology Providers, Consultants and Research Institutes) with a mission to “Provide the platform, components, services, and marketplace to achieve the right product, at the right time, with the right conditions using the right resources.”. Further information can be found at www.zdmp.eu. ZDMP channels 3.2M€ of SME orientated funding to subprojects, such as this one to both facilitate SMEs with their innovations and increase the value of the ZDMP ecosystem,

Links

● Sub project website/blog	https://www.multicursor.com/zdmp
● Architecture Component(s)	https://www.multicursor.com/zdmp
● ZDMP Website	www.zdmp.eu