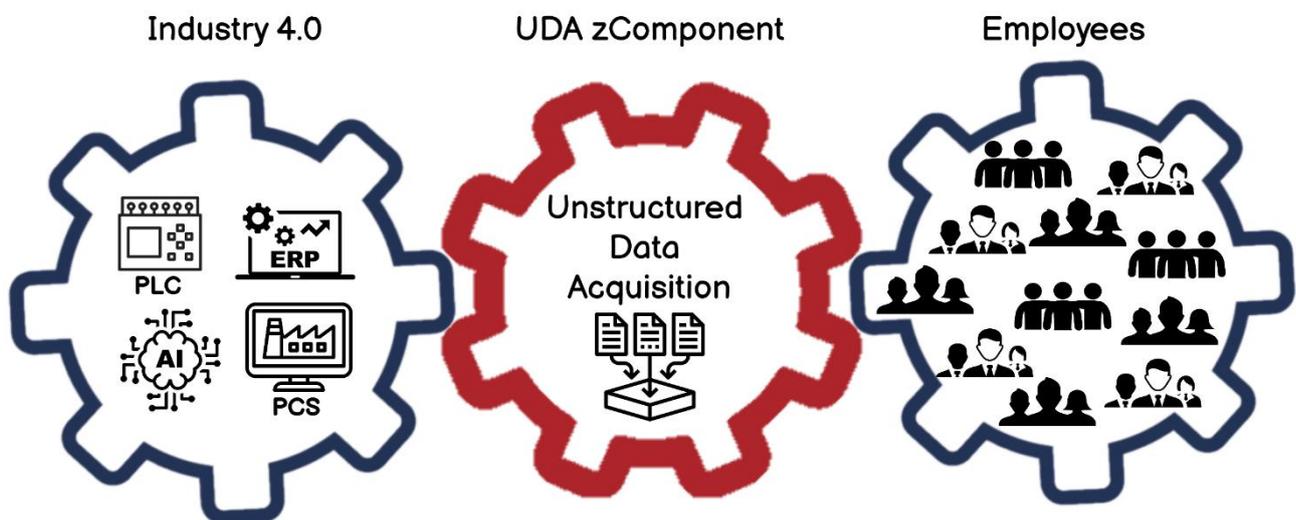


## “Unstructured Data Acquisition” – An API and user interface for the acquisition and processing of unstructured data in manufacturing

By Marco Lewandowski, Joshua Coordes and Andre Buß - SWMS Consulting GmbH (SWMS)

### Project Details and Motivation

Factories transforming to Industry 4.0 require the involvement of employees in production processes. This makes the employees a key resource for manufacturing companies as they possess much knowledge gained through years of experience. This valuable information is currently inaccessible to any system including other zComponents, PLCs, PCS, machinery, ERP/SCADA or MES-software as well as ML and AI algorithms.



*UDA zComponent as an interface between Industry 4.0 and Factory personnel*

The Unstructured Data Acquisition (UDA) zComponent aims to enable the utilisation of data arising through employees involved in the manufacturing process. It will do this by providing an API allowing external systems to send an information request to be distributed to relevant employees through dynamically created user input forms provided in a mobile app. The results are converted into a semantic structure and returned to the requesting system and platform by means of a smart processing algorithm. In short, the UDA zComponent links external systems to the employees involved in their respective physical processes combining the two previously separated environments.

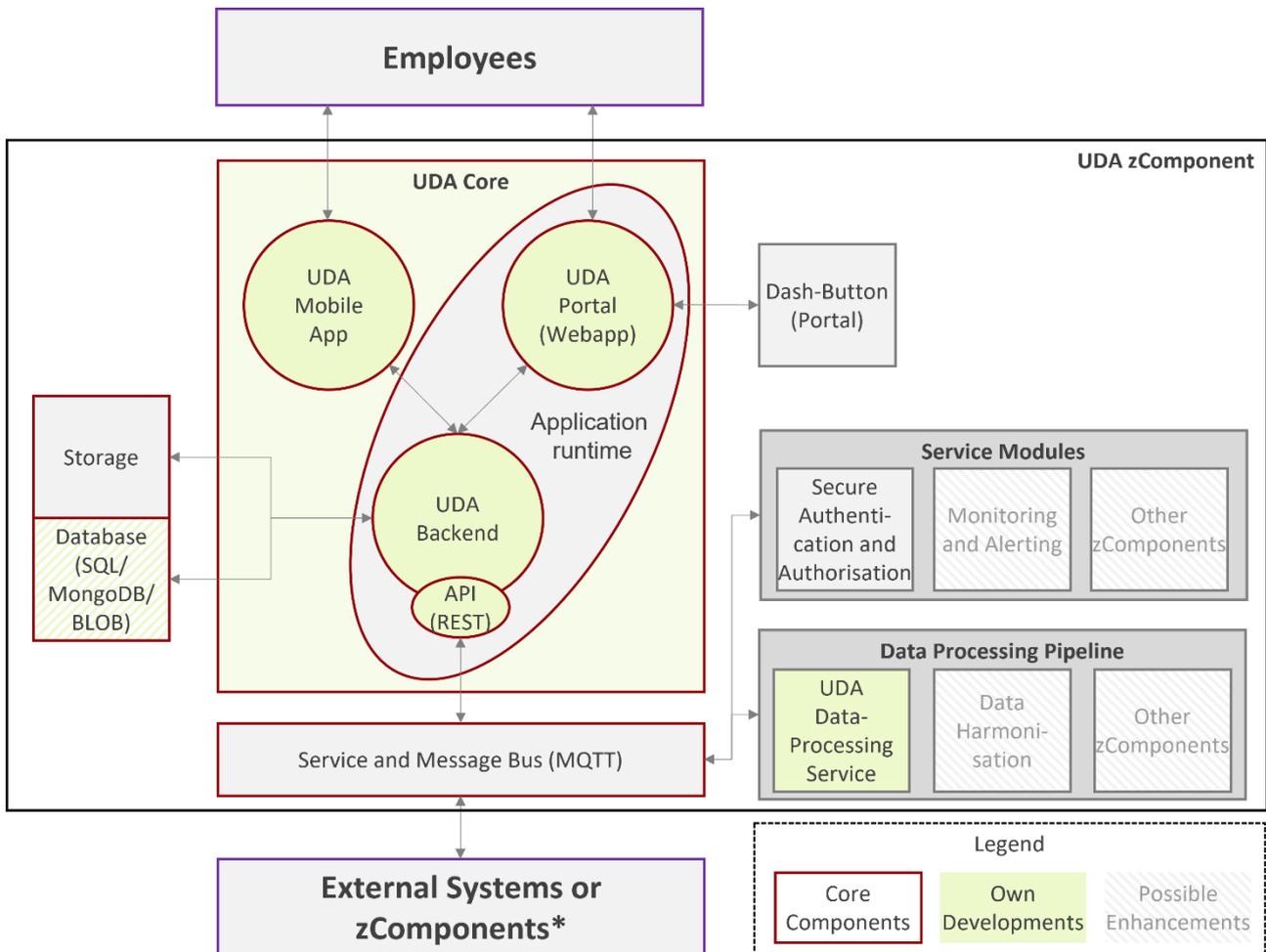
Furthermore, the UDA zComponent can be used to optimise recurring tasks for employees by providing a solution to fill out checklists quickly and digitally as well as provide a medium through which information could be enquired from other employees through the manual creation of such checklists.

### ZDMP Fit

ZDMP aims to provide an extendable Industry 4.0 platform for developing zero-defect solutions reducing errors in manufacturing environments and ensuring outstanding product and process quality. By making previously unutilised information available, the UDA zComponent enhances technical systems by allowing for the recognition and systematic processing of (recurring and historical) problems. Therefore, the UDA zComponent is a contribution to the creation of a digital record of

operations by capturing information from the physical world and allowing for advanced analytics. This enables the optimisation of processes and thus contributes to the zero defects goal by increasing product quality.

The UDA zComponent will enable other zComponents and external systems to utilise unstructured data arising through employees involved in manufacturing processes. This previously unavailable information can be used for analytics and thus improve results and extend the functionality of existing and future zComponents and systems. These characteristics make the UDA zComponent a valuable tool for all information-dependent systems and enable broad usage in the future ZDMP ecosystem.



UDA System Architecture

The functionality of the UDA zComponent will primarily be managed by the UDA mobile app, the UDA backend with its API and the UDA Portal. In addition to these components, the Application runtime, the Service and Message Bus as well as the Storage zComponents are considered core components because they are used to perform vital tasks. To further integrate the system into the ZDMP ecosystem, the dash-button of the Portal zComponent will be implemented in the UDA Portal.

This system architecture enables the UDA zComponent to easily expand its functionality by integrating service modules (eg Secure Authentication and Authorisation, Monitoring and Alerting, etc) or data processing modules (eg UDA Data Processing Service, Data Harmonisation, etc) with the Service and Message Bus. The latter also acts as the central communication interface for external systems or zComponents requesting to use the UDA zComponent and to communicate results back to the requesting systems. The UDA mobile app is the main interface for data input by employees, while the UDA Portal is primarily used for administrative tasks.

## Participant Details

### Organisation(s) involved:

- **SWMS:**
  - **Web:** <https://swms-consulting.de>
  - **Contact:** [lewandowski@swms.de](mailto:lewandowski@swms.de)
  - **Profile:** SWMS supports companies, mainly SMEs from the manufacturing and service industry in making optimal decisions regarding software and technologies. The basis for this is a detailed creative process in which digital business strategies are individually developed and then transferred into technology-oriented concepts, use cases and solutions. SWMS uses modern technologies to design and develop open and expandable solutions and software that help customers in their operational processes. SWMS is also committed to research, to further develop technologies and their possible applications, both in the context of proof of concepts with customers and through the participation in research projects, eg, in the field of digital twins and cyber-physical systems.



## 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](http://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

• <b>Sub project website/blog</b>	<a href="https://swms-consulting.de/zdmp/">https://swms-consulting.de/zdmp/</a>
• <b>Architecture Component(s)</b>	<a href="https://www.zdmp.eu/documentation">https://www.zdmp.eu/documentation</a>
• <b>ZDMP Website</b>	<a href="http://www.zdmp.eu">www.zdmp.eu</a>