



# OXILATE

## Actionable insights from raw data

The ITEA project OXILATE (Operational eXcellence by Integrating Learned information into AcTionable Expertise) transforms raw data into actionable knowledge through a combination of technologies like generative pre-trained transformers (GPT), machine learning (ML) and knowledge graphs. The resulting blueprint for multi-level knowledge sharing will allow companies from any domain to utilise their operational data more effectively and intuitively.

As traditional manufacturing gives way to end-user solutions, companies increasingly require solutions to improve the monetisation of corporate knowledge. A key factor will therefore be their ability to continuously optimise their processes to provide added value at each phase of a product's lifecycle. However, this knowledge is dynamic and distributed across various (un)structured data sources, including the minds of experts. This presents difficulties in domains like insurance tech, in which 25% of experts have retired since 2018.

In meeting this demand, OXILATE had two main goals: the empowerment of professionals in their business activities (such as marketing, field service support and after-sales) and the leveraging of products developed via the exploitation of operational data throughout the product lifecycle. This resulted in innovations along four broad lines: (1) coordinated platforms to connect (business) operations in all lifecycle phases/ disciplines, (2) knowledge mobilisation and exploitation of insights to expand service offerings and improve user experience, (3) digital user assistance, integrating expert knowledge and user interaction data to provide autonomous, expert-level support, and (4) proactive service diagnostics, enabling non-experts to realise proactive alerting and root cause/resolution identification for field issues.

### Technology applied

The technological basis for OXILATE is the use of different technologies, such as Python libraries like Beautiful Soup and Scrapy, for web scraping of sources such as social networks, articles and blogs. Captured data is categorised and placed into knowledge graphs, to which GPT and technologies such as ML and natural language processing (NLP) are applied to make this information useable from an end-user perspective.

and unifying solutions from different architectures, this blueprint is modifiable, expandable and adaptable to systems outside of the OXILATE consortium.

Within the consortium, the use-cases fall under two main areas: improved maintenance in facility management and digital assistants that provide insights and expert knowledge for companies. In the former, for example, Insta Advance Oy has developed a cloud-based tool for optimising the maintenance and services of an electricity transformer or its components, utilising Azure services for knowledge acquisition from the transformers, a structured query language (SQL) database for data storage and Microsoft's Power BI software for data visualisation. In the



GPT serves as a frontend for the other technologies, allowing users to write in human language and receive a response. Instead of a common architecture, these innovations form a blueprint for multi-level knowledge sharing based on all use-cases, stakeholders and internal/external parties. In combining, generalising

latter category, Atostek has created a maintenance support chatbot that uses a data lake and ML to find the best answers to user questions. Ultimately, such use-cases will provide ways to train models and display information on a frontend without the need for expert involvement.

## Making the difference

Within the ITEA framework, knowledge sharing between partners has provided the opportunity not only to create a blueprint that can be used and tested across multiple domains but also for the consortium to gain a clear understanding of how these technologies can be used to improve their system lifecycles and tools. One major achievement is the capacity to train models and then remove experts from the loop. Although their models differ, the use-cases by Concatel/TyP and Türk Traktör have each resulted in a 100% decrease in the time needed to train new personnel after three years. Semantik, meanwhile, can train models to understand texts in English and Turkish with >85% accuracy after three years versus a starting point of zero.

In terms of business, the consortium intends to exploit OXILATE via improved insights into company service portfolios (thereby expanding digital transformation-related service offerings) and enhancements to consulting, development and solution portfolios. The key benefits of actionable knowledge include increased proactivity and effectiveness and greater (international)

market competitiveness. Insta Advance Oy, for example, is aiming for a 30% annual growth rate in export revenue and over 50% of this is expected to come from repeatable and scalable OXILATE-related services by 2023. In the insurance domain, SII Concatel also expects a 30% increase in annual turnover by extending their portfolio and accessing new competitive advantages within the sector.

OXILATE is now in the process of dissemination, having published 11 research articles and five master's theses so far. This will build up recognition among partners in the same sectors as the consortium as a basis for future expansion. In the longer term, the project's results could open up new research themes such as predictive expert systems and proactive service diagnostics, as well as enable companies to be more socially responsible in their decision-making via the capacity to convert data into actionable knowledge with a sustainable base. Overall, the project has provided an excellent means to preserve, improve and utilise expert knowledge which once would have easily been lost.

## Major project outcomes

### Dissemination

- > 11 research articles and five master's theses focused on topics such as digital twins, data-driven decision-making, knowledge graphs and energy efficiency. These publications cover a range of fields including computer and information science, engineering, and business information processing.
- > A website, together with a LinkedIn (including interviews) and media campaign, designed to reinforce the visibility of commercial results. With 20% of the views coming from decision makers in companies, and more than 60% of the views coming from end-users in the targeted sector.

### Exploitation (so far)

- > **Smart Insurtech Lifecycle:** automated knowledge graph generation and GPT-based chat interaction for data validation, providing an easy access to corporate intelligence, that is: a second brain for any corporation.
- > **Studio Inspector:** digital user assistance for CAE software integrating custom knowledge graphs, question-answering module, and live coding support to provide expert-level support.
- > **Digital Twin Software:** a low-budget solution for process control management and automation for SMEs, featuring real-time and historical data monitoring, anomaly warning, and digital twin building process support.
- > **M-Files and ESRI ArcGIS Integration:** two-way integration of M-Files and ESRI ArcGIS solutions, providing relevant information in a familiar UI for primary users.
- > **M-Files Smart Metadata:** machine learning-based metadata suggestion for M-Files document vault, automatically extracting information from documents to enrich content.

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### Partners

#### Belgium

- > Octinion
- > Siemens Industry Software NV

#### Finland

- > Atostek Oy
- > Insta Advance Oy
- > M-Files
- > University of Oulu
- > Valmet Automation

#### Spain

- > Saint Patrich Technology S.L.
- > SII Concatel S.L.

#### Türkiye

- > Ind Yazilim Bilism Teknolojileri Sanayi Ve Ticaret A.S.
- > Semantik Ar-Ge
- > Turk Traktor ve Ziraat Makineleri A.S.
- > Turkgen

### Project start

March 2020

### Project end

February 2023

### Project leader

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### Project website

<https://itea4.org/project/oxilate.html>



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