CASE STUDY

Pimser's Drone Water Leakage Prediction Project

Water scarcity is no longer a distant threat—it's a reality reshaping economies and ecosystems. In Europe alone, ageing infrastructure and climate pressures result in up to 50% of water lost before it reaches consumers. For project managers tackling large-scale environmental challenges, the question isn't just what to solve but how to manage solutions across technical, bureaucratic, and geographic divides. Pimser Proje Elektronik A.Ş.'s Water Leakage Prediction Project is an interesting case of merging drone technology with the efficiency of the P3.express project management to tackle environmental challenges.

About Pimser

Founded in 2003, Pimser Proje Elektronik A.Ş. has evolved from an electronic security systems provider into a multidisciplinary engineering powerhouse. Headquartered in Ankara with offices in Istanbul and Izmir, the company holds impressive certifications, including NATO Facility Security and Turkey's Defense Industry Presidency EYDEP. Its portfolio spans R&D, system design, and large-scale infrastructure projects, positioning it uniquely to address complex, cross-sector challenges like water conservation. The company has launched its Water Leakage Prediction Project to address one of Turkey's most pressing natural resource challenges. This initiative leverages drone technology and advanced image processing to combat water loss before reaching end users.

The Water Leakage Prediction Project

Water is one of our most precious resources, yet ageing infrastructure and inefficiencies across Europe and Turkey lead to staggering losses—up to 50% of water never reaches the tap. The Water Leakage Prediction (WLP) Project, launched in October 2024, aims to completely change how we detect and address underground water leaks. The project's use of drone technology and advanced image processing is a big step toward sustainability. "Every drop of water saved is a step toward a more sustainable future," says Sırrı Selim Kalaç, project manager of the Water Leakage Prediction Project. "But to make a real impact, we must move beyond reactive fixes and into predictive solutions."

The WLP project develops solutions based on a three-step process: data collection, image processing, and leak detection.

1. Data Collection - Drones fly over designated areas, capturing high-resolution images using thermal, near-infrared, and visible-spectrum cameras. These overlapping images are geotagged with precision GPS systems to ensure accuracy.
2. Image Processing - The raw images are stitched together into orthophotos—detailed, distortion-free maps providing a comprehensive terrain view.
3. Leak Detection - A proprietary algorithm analyses the orthophotos, calculating a "water stress index" based on thermal anomalies and changes in vegetation density. These indicators help identify potential underground leaks.

"The technical side is only half the complexity," explains Kalaç. "The real challenge is aligning everyone around a common goal." The project can only succeed with good stakeholder coordination, which can be tricky. While the technical aspects—

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such as acquiring high-resolution drone imagery and processing data—are essential, the engagement and collaboration with diverse stakeholders are sometimes even more complex. This project requires cooperation between many different municipal authorities to secure access to necessary data and validate the findings. Municipal authorities are responsible for water distribution and play a vital role in guaranteeing that the project adheres to regulatory and local standards. Their collaboration is essential for obtaining necessary permits, maintaining data accuracy, and facilitating on-the-ground verification of detected anomalies. The project must also cooperate closely with The Scientific and Technological Research Council of Türkiye (TUBITAK), which funds the project. Additionally, balancing the expectations and communication styles of technical experts, regulatory bodies, and community representatives demands a robust yet flexible management approach.

Using P3.express as project management methodology

For Sırrı Selim Kalaç, selecting a management framework was as critical as the technology. "We needed a system that could scale with technical complexity but wouldn't kill the team with processes," he explains. After evaluating different methodologies, P3.express was our clear choice.
By design, P3.express offers a streamlined, step-by-step approach to project management that focuses on essential processes, minimizing the need for extensive training and administrative overhead. Its minimalist approach equips the team with a concise set of tools—including a clear project description, a deliverables map, a health register, and a follow-up register—that ensure a robust, no-nonsense approach. The framework facilitates clear communication and efficient decision-making without the tons of paperwork many team members and engineers often

associate with project management. Essentially, P3.express empowers the team to concentrate on innovation and problem-solving while maintaining the rigour required to manage complex, multi-stakeholder environments.

P3.express's four core artefacts—project description, deliverables map, risk register, and follow-up log—eliminated debates over "how" to manage, freeing teams to focus on "what" to deliver. "In a project with this many stakeholders, including municipal governments and TUBITAK, clarity is survival," says Kalaç.

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Another critical element of the P3.express methodology is its integrated peer review process. While peer reviews are common in software development, they are less common in actual project management practices. In this project, they have already proven very valuable. By encouraging regular peer reviews, the framework facilitates a fresh pair of eyes on key moments in the project without imposing significant additional time commitments. This approach helps catch potential issues early and fosters a culture of learning from each other. In complex projects with high technical demands and stakeholder coordination, the added insight from peer reviews provides quality assurance for the project management activities themselves, which is often forgotten.

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A drop in the bucket or a wave of change?

The first results of the Water Leakage Prediction Project are expected in 2026. While this project alone cannot resolve global water loss issues, it represents a significant step toward more proactive and data-driven water management. With municipalities and policymakers looking for practical solutions, initiatives like this can serve as a valuable tool for reducing waste in water distribution.

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