

Fieldlabs@Scale Article Series - Part 1

Where Innovation Becomes Tangible: Fieldlabs

Conversations with SPARK Campus, the Smart Tiny Lab, and Fieldlab Zephyros

Across the Netherlands, field labs are playing an increasingly important role in developing and testing innovations to address major societal challenges. But how exactly do field labs work, why are they important, and what do they need to be both effective and future-proof? In this series of articles, we explore these questions through a practical lens. Through conversations with various field labs, we'll map out what they do, the challenges they face, and the lessons this yields for the Fieldlabs@Scale project.

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pioneering



When people hear the term “**fieldlab**,” they often think of a testing environment, a pilot project, or an innovation lab. But the reality is more nuanced—and, above all, much more practical. In the Netherlands, you’ll find field labs of all shapes and sizes: from a hall full of machines where startups run their first prototypes, to a Tiny House where facade panels and heat pumps are tested, to a real wind turbine in a warehouse where new technologies for offshore wind are being tested.

Field labs play a crucial role in mission-driven innovation, but one question keeps coming up: Why do some field labs succeed in actually developing innovations into successfully implemented products, services, or methods, while others disappear after a pilot phase?

That question is at the heart of the Fieldlabs@Scale project, in which four regional hubs, six knowledge institutions, and dozens of field labs are collaborating to understand how scaling up innovations works and how field labs can contribute to both social and economic value creation.

This series of articles follows that process—not from a theoretical perspective, but from a practical one. Each article zooms in on a single theme from the world of field labs, drawing on interviews with people at the heart of the field lab ecosystem. For this first article, we start with the basics: What exactly is a field lab?

We spoke with three field labs: [SPARK Campus](#), het [Smart Tiny Lab](#) en [Fieldlab Zephyros](#). These conversations showed just how different field labs can be. And yet they share the same core purpose: they make innovation tangible and visible.

"Grote maatschappelijke opgaven, [...], vragen om experimenteren en samenwerking buiten de normale structuren."

Why a fieldlab?

Field labs often emerge in places where organizations get stuck in traditional structures. Major societal challenges, such as the energy transition, materials transition, digitalization, and climate adaptation, require experimentation and collaboration outside of normal structures.

“The systems we’ve built aren’t always designed for iterative work,” says Emile Quanjel of SPARK Campus. Iterative work—testing, learning, and adjusting step by step—is essential for innovation, but difficult to organize within existing organizations.

Fieldlabs therefore create a necessary space in between: outside the existing system, yet close enough to have an impact. Companies can work there on products and processes that don’t get off the ground within their own walls; educational institutions find realistic learning environments there; and governments discover what works—and what doesn’t.

In this way, fieldlabs form a bridge: between research and application, between experimentation and market introduction, between vision and implementation.

What does a field lab do?

Three examples

1. SPARK Campus — the space where transitions take shape

SPARK Campus in Den Bosch began as an Open Innovation Environment but has grown into a regional field lab for both technical and social innovation, specifically focused on biobased, circular, industrial, and digital construction.

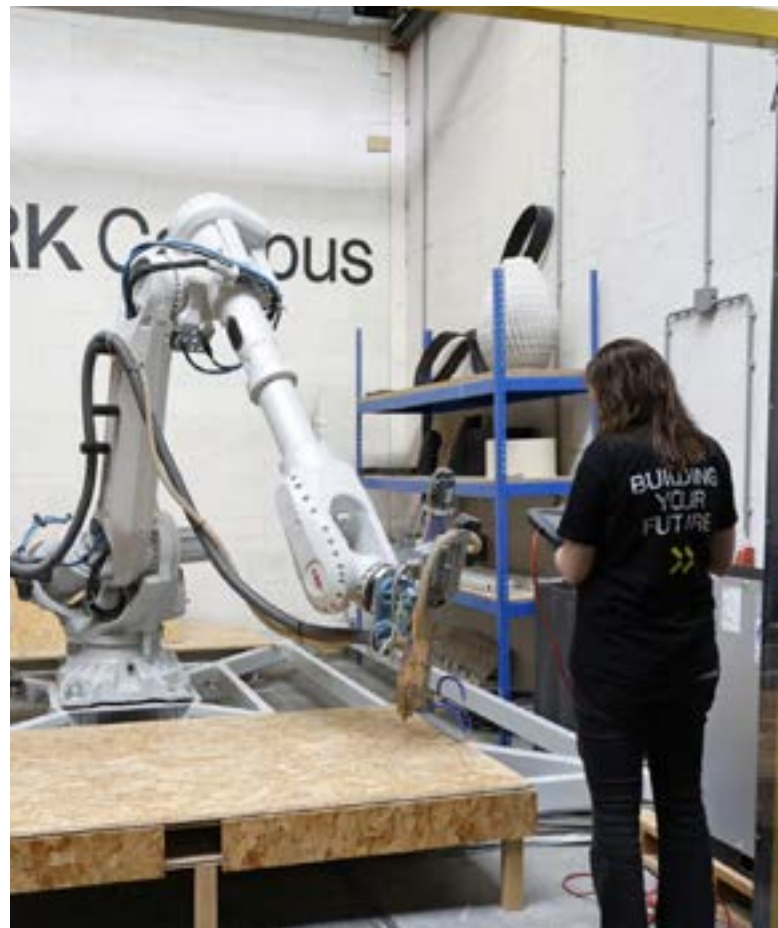
“We facilitate technical innovation for companies, governments, and knowledge institutions,” says Emile Quanjel. “We are a neutral space where you can experiment with new working methods, (industrial) machinery, materials, and prototypes.”

SPARK deliberately operates outside the system. Educational institutions are often inward-looking, companies have limited room to experiment, and governments operate within political cycles that hinder innovation. SPARK offers both physical space and development space where all these parties can collaborate.

One example of a program SPARK runs is the [LLO course Biobased Circular Construction](#). In collaboration with partners, SPARK develops practical modules on circular and biobased construction, demountability, and circular procurement. Through this, SPARK supports the professionalization of a sector that is in the midst of a major transition.

In addition, SPARK collaborates with companies on product innovation, such as in the [Art-co for Airco project](#). Here, network partners are developing new housings for heat pumps and air conditioners, where sustainability and design go hand in hand. By designing and prototyping together with various companies, new applications of industrial and digital technologies are created that can be put into practice immediately.

In doing so, SPARK demonstrates that field labs are not just about technology, but also about social factors: new forms of collaboration, governance, and regional development.





2. Smart Tiny Lab — a tiny house that measures everything

In Enschede stands a small house with big ambitions. The Smart Tiny Lab (STL), part of Saxion University of Applied Sciences, serves as a realistic test bed for energy and construction innovations. Various types of facade systems are being tested on the exterior; inside, heat pumps, buffers, and sensors run non-stop experiments to measure the performance of new building products.

According to lecturer Christian Struck, the STL is a testing ground “for practical application” but was not originally designed as a field lab. Yet it meets all the criteria of a field lab: a flexible environment where companies can characterize, test, and validate their innovations before bringing them to market.

In addition, Christian is collaborating with his [Sustainable Building Technologies research group](#) on several other field labs, including: [Fieldlab Efficiënt Bouwen met Hout](#), a consortium of 15 partners working on a 14-story wooden residential tower. And [Fieldlab Digitalisering Energietransitie Twente](#), focused on joint digitalization projects with vocational, higher vocational, and university-level education institutions.



What stands out in his story is that the success of field labs lies not only in the product they deliver, but also in the collaboration among participants. “Collaboration requires trust,” he says. “Because the parties meet regularly within the field labs, they also find it easier to connect outside of them.” Field labs are thus also social systems—learning environments where relationships, a shared language, and long-term collaboration take shape.

3. Fieldlab Zephyros — the wind turbine that enables innovation

In a warehouse in Vlissingen, a 70,000-kilo-gram turbine and its blades have been set up to test inspection, sensor, drone, and robot technology for offshore wind.

“Our bold ambition is: ‘Unmanned offshore maintenance,’” says program manager Ferry Visser.

Current maintenance of wind farms is labor-intensive, risky, and dependent on good weather. People rappel down 80-meter-high blades, often in challenging conditions. Fieldlab Zephyros develops and tests alternatives: drone inspections, robotic arms, sensors, and resident robots that are permanently present in the wind farm.

The field lab has grown into an internationally recognized testing site. Educational institutions use the turbine to train students for a sector where technology is becoming increasingly central, and companies from all over Northwest Europe come there to conduct tests. Fieldlab Zephyros demonstrates how a field lab centered around a single physical infrastructure can accelerate an entire sector.



What Makes Fieldlabs Unique

Fieldlabs may vary in form and structure, but the three practical examples and the context of Fieldlabs@Scale paint a consistent picture of what makes them unique.

1. Fieldlabs are experimental environments

Fieldlabs provide a space to experiment with new ideas, technologies, or working methods in a realistic or simulated context. This can be a physical lab, but also a virtual, digital, or network-based collaboration. It revolves around the ability to test and learn outside the constraints of the regular system.

2. Fieldlabs are neutral and connective

Fieldlabs occupy a unique position between education/research, government, and entrepreneurs. They provide an independent and safe environment where parties with different goals, interests, and rationales can collaborate. This neutrality was explicitly mentioned in all three interviews as a crucial success factor.

3. Fieldlabs are both technical and social

Although many fieldlabs are technically driven, they are also about building relationships, trust, and interaction. Fieldlabs form communities where new ways of working, languages, and practices emerge. In doing so, they create (often without explicitly intending to) the social infrastructure necessary for innovation.

What are the challenges of fieldlabs?

Field labs form an important foundation for mission-driven innovation, and that is a challenging position to be in. They are often seen as places where innovation arises naturally, but in practice, many field labs encounter persistent obstacles. These challenges determine not only their effectiveness but also their ability to grow, become sustainable, and scale up.

1. Different paces and levels of knowledge among partners

Partners in a field lab not only operate at different paces but also possess varying levels of knowledge. Christian: "Everyone wants to succeed, but everyone starts from a different point."

These differences in pace and knowledge base make it challenging to make decisions, manage expectations, and develop together. Field labs must therefore constantly switch between accelerating, slowing down, explaining, and translating.

2. Uncertainty about roles and responsibilities

What begins as a collaborative initiative full of energy and focus can lead to fragmentation, delays, or even stagnation. For example, when the field lab grows, changes course, or brings in new partners. When a field lab collaborates with many partners and operates over a longer period, there is a risk that it is not always clear who is responsible for what. Field lab coordinators often act as catalysts, but the actual development and implementation depend on specific partners. Clear governance and a well-defined division of roles are therefore essential, but they must also be dynamic, and thus remain a constant focus in practice.

3. Limited and project-based funding

Many field labs rely on temporary grants or project funding.

This creates uncertainty about continuity, because without funding, how do you keep your facilities running? And how do you ensure coordination and program management?

This vulnerability makes it difficult to achieve long-term impact. Ferry calls this an ongoing challenge: “The trick is to keep finding new resources to continue developing.”

4. Context-specific results that are difficult to transfer

What works in one region, sector, or organization does not automatically work elsewhere. Many innovations that emerge in field labs are deeply intertwined with the local infrastructure, partners, culture, or market.

5. Slow change processes in the broader system

Even when a field lab achieves promising results, the question remains: how does the innovation tested here move forward?

Market acceptance, regulations, procurement procedures, funding streams, and educational curricula do not move at the same pace as the experiments. As a result, field labs often run ahead of a system that has not yet adapted.

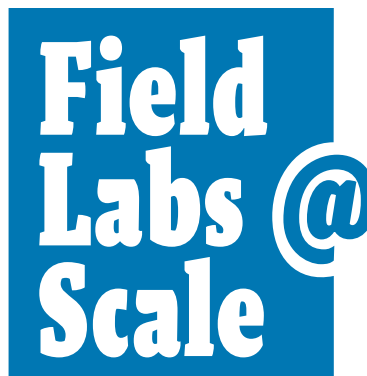
Scaling up, the central theme of Fieldlabs@Scale, is therefore not a straightforward step, but a complex process full of interdependencies

Tangible Future-Makers

It’s impossible to define a field lab in a single sentence. And that is precisely its strength. Field labs are places where technology, collaboration, and social ambitions converge. They are temporary yet forward-looking. Physical yet relational. Technical yet social.

Spark, STL, and Zephyros represent three facets of the same movement. In field labs, the future is not only conceived but also made truly tangible.

In the following article, we delve deeper into one of the challenges of field labs: *How does collaboration between the triple helix work in field labs? And why does it sometimes cause friction?*



Fieldlabs@Scale is working with an interdisciplinary consortium to explore ways to scale up mission-driven innovations in sectors such as smart industry, healthcare, agriculture, and infrastructure. The goal is to further expand the innovations—which are difficult to scale up—that emerge from field labs and to strengthen their impact on societal returns.

Read more about the project [here](#).