INNOCAP

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INNOCAP – Lessons Learnt Synthesis Report

Document history

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0.1	27/01/2026	Initial version	Lukasz Porwol (UoG)
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Contents

1 Executive summary

INNOCAP (Building public sector innovation capacity) supported local and regional public authorities in the Northern Periphery and Arctic region to experiment with disruptive digital technologies and translate them into practical pilot services. This final synthesis report consolidates the most transferable lessons from the pilots and from the project's capacity-building, monitoring, and exploitation work. It is written for public entities that want to build innovative services under real-world constraints: limited staff time, uneven data readiness, complex governance, and long procurement cycles.

The report has two goals:

- Provide an actionable set of 'what works' lessons for public organisations starting similar journeys.
- Package the learning into reusable assets (templates, checklists, and replication packs) that support adoption beyond the original consortium.

Across four different pilots (data dashboards for waste, a spatial green transition map with an AI assistant, IoT water-level monitoring for flood resilience, and an AI-enabled municipal innovation platform), five cross-cutting sustainability themes repeatedly determined success: organisational and cultural sustainability; technical and data-driven sustainability; policy and governance integration; knowledge sharing and replication; and financial and resource sustainability.

2 About INNOCAP and the capacity-building approach

INNOCAP's objective is to enhance the quality and sustainability of public services by enabling public sector organisations to lead the adoption of disruptive innovations and digital technologies. The project combined a structured capacity-building programme with hands-on pilot development, so that training, coaching, and peer exchange directly fed into tangible services.

3 Core elements of the INNOCAP approach

- Needs analysis and knowledge mapping to identify local innovation gaps and opportunities.
- Targeted capacity-building modules (workshops + coaching) aligned to pilot requirements.
- Co-design with stakeholders and iterative development of minimum viable services.
- Implementation and lightweight monitoring to capture barriers, enablers, and user value signals.
- Exploitation planning to embed pilots into routine operations and enable transferability.

4 How this synthesis was produced

This report synthesises evidence from three main inputs:

- Public INNOCAP pilot and results updates (project website).
- The INNOCAP Capacity Building Programme Exploitation Plan, including the consolidated lessons learned register and proposed repository assets.
- Pilot documentation from partner organisations (objectives, implementation approach, outcomes, key learnings, and replication recommendations).

The synthesis method follows a simple 'signal-to-asset' pipeline: extract signals (barriers, enablers, outcomes), group them under sustainability themes, and convert them into practical assets (templates, checklists, case studies, and facilitation formats) that public entities can reuse.

5 Pilot case studies

Pilot 1: Waste Data Hub (South Iceland)
Lead: SASS
Duration: 2024–2025
Innovation: A digital system for smart, user-friendly waste management through improved data collection and sharing among municipalities
Target Users: Local municipalities, waste management providers
Key Outcome: Streamlines waste management coordination across regions
Problem: Municipalities lacked an integrated, decision-ready view of waste quantities, costs, and performance across waste categories and years.
Solution: A shared digital Waste Data Hub with dashboards for monitoring waste generation, material recovery, service costs, and trends; designed to support evidence-based decisions aligned with circular economy objectives.
Implementation approach: Tested with three municipalities through short weekly sessions (30 minutes) over an eight-week period, using feedback to iterate the user experience together with the software partner.
Most transferable insight: Waste management (and many other municipal domains) benefits most when a data platform is paired with practical 'knowledge centre' guidance, examples, and interpretation support - not just a dashboard.

Pilot 2: Green South Savo (Finland) - spatial data service for green transition
Lead: University of Helsinki
Duration: 2025–Ongoing
Innovation: A spatial map service combining geographic information systems (GIS) and artificial intelligence to visualize and communicate green transition indicators at municipal level in South Savo, Finland (www.greensouthsavo.eu)
Technologies: Leaflet (open-source web mapping), OpenAI chatbot, Google Sheets data management
Target Users: Municipal decision-makers, developers, entrepreneurs, researchers

Key Outcome: Enables comparison of municipalities' green transition progress and supports evidence-based climate policy integration

Problem: Decision-makers needed comparable, location-based indicators to understand and accelerate green transition actions and to support local/regional comparisons.
Solution: A GIS-based map service that visualises green transition indicators and enables comparisons across municipalities, supplemented by an AI assistant/chatbot to support exploration and sense-making.
Implementation approach: User research interviews with municipal decision-makers in South Savo (e.g., Juva, Kangasniemi, Puumala, Mikkeli) and iterative refinement based on feedback; emphasis on indicator selection and data storytelling.
Most transferable insight: Map-based services are most useful when designed as decision instruments: each view should answer what is happening, where, why it matters, and what to do next.

Replication notes from the pilot team
Although the twin transition is increasingly emphasised in the media, national and EU policy documents (Arnold et al. 2023; Muench et al. 2022; United Nations Conference on Trade and Development, 2023), and academic research (Bianchini et al. 2023; Faggian et al. 2024), the term is being contested. Also, the basic concepts or green transition (Naqvi et al. 2023; Xu et al. 2024) and digital transition (Capello & Caragliu 2024; Colovic et al., 2025) are not simple to define and operationalise for research and regional development purposes. The Green South Savo service aimed to create a repository of open-access spatial data that would describe the state of the green transition, classified into easy-to-understand indicators. However, the general and often-encountered challenge was how to define the transitions. Concrete examples quickly showed that outlining the transitions was not simple: Does an electric car charging station represent green, digital, or twin transition? It is a digital hardware and software-packed unit that supports more ecological transportation (although there exist more ecological transportation options than private hybrid or electric car ownership). Identifying potential transitions needs data. Describing transitions should be based on verified, reliable and open-access data sets. In addition to the definition and focus of abstract transitions, the availability and accessibility of interesting datasets are limiting factors. Some data are inaccessible (often owned by companies), some can be purchased (from public sector actors, requiring resources), and some data should exist but do not (for example, municipal or postcode-level data on the usage of digital equipment, social media, or AI, etc.). Yet another challenge is the visual and therefore easily adopted map-based presentation style. The data should include a spatial dimension, preferably as a time series, to allow comparison. Also, the data are often in different formats, making comparisons between different indicators nonsensical (e.g., what is the rationale in comparing electric car charging stations and biodiversity indicators?). There is a clear need to develop a green

transition index that could unite or consist of several key green transition indicators. Also, more challenging but equally necessary would be the digital transition index or the combined twin transition index. These indices would make more sense in comparing different spatial units, such as municipalities. However, developing such an index was out of the scope of the INNOCAP project. Organisations that consider adopting or adapting map-based services that describe transitions or other dynamic phenomena should consider the following:

A clear definition of an abstract societal issue or phenomenon, such as green transitions, is needed before the start. There will be a need to reconsider the definition

Map-based and other visual tools are great if you have even better data - it all starts with a cutting-edge data

Consider what type of spatial data best describes the phenomenon you are interested in and what added value it provides, for example, instead of using just statistics

Know your data consider which indicators exist and best describe your phenomenon

There is an increasing number of sufficient tools for analysing and showing your data. What are the criteria for choosing the tools, and what are the options?

Use the data to tell stories. Various kinds of ad hoc data, hard or impossible to compare, make storytelling harder

Involving experts from other domains as early as possible in the development. It may expose intra-organisational biases and distortions in thinking, aims and goal setting. Especially in domains that the organisation does not have sufficient expertise or capabilities (such as coding skills)

Ask from or interview target group members and a larger pool of stakeholders: how and where they need more information and encourage them to provide feedback.

Pilot 3: Climate change action monitoring (Donegal, Ireland) - IoT river catchment monitoring

Lead: Donegal County Council

Duration: 2024–Ongoing

Innovation: A monitoring and reporting system for climate action initiatives at local authority level

Target Users: Local government, community stakeholders, policy bodies

Key Outcome: Integrates climate monitoring into routine municipal decision-making processes

Problem: Rural flood-risk mitigation requires timely, local evidence on how catchments respond to weather events and on the effectiveness of nature-based solutions.

Solution: IoT sensors monitoring water levels in the river catchment flowing into Glenties Town, producing real-time data for analysis and resilience planning.

Implementation approach: Piloted by Donegal County Council; planned integration of river-level data into alerting workflows to warn residents and support operational decisions.

Most transferable insight: IoT pilots move from 'interesting sensors' to public value when they include an operational response model (alerts, maintenance ownership, and the decisions the data will trigger).

Pilot 4: Municipal innovation platform (Vasternorrland / Ornskoldsvik, Sweden) - AI-supported idea-to-service pipeline
Lead: Municipality of Örnsköldsvik / Association of Local Authorities Västernorrland
Duration: 2025–Ongoing
Problem: Municipal employees often have ideas but lack time, structure, and support to develop them into implemented improvements.
Solution: A digital innovation platform supporting the full innovation process - idea creation, improvement, project support, and service delivery - augmented with AI; supported by innovation coaches and digital coaches (e.g., AI chatbots, VR) to lower barriers to experimentation.
Implementation approach: Co-development and testing with INNOCAP partners; capacity building strengthened skills in digital innovation and service design and helped select relevant technologies.
Most transferable insight: Innovation platforms only work when embedded into daily routines - clear incentives, a champion/coach model, and minimal governance that helps ideas move without becoming 'extra work'.

Replication notes from the pilot team
Strong leadership support and continuous stakeholder engagement are key to success.
Start small, gather feedback, and scale gradually.
Train internal coaches to build capacity, keep the platform simple and accessible, and ensure clear ownership and long-term support to avoid sustainability challenges.

6 Cross-cutting lessons learned Short Executive Version

The lessons below are organised under five sustainability themes that consistently shaped outcomes across pilots. For each theme we summarise what was observed, why it matters, and what public organisations can do differently next time.

6.1 Theme 1 - Organisational and Cultural Sustainability

Observed:
Time constraints and limited staff capacity reduce participation and engagement.
Innovation is often perceived as an 'IT problem/solution' rather than an organisational change effort.
Busy user groups require active communication and facilitation from the service provider.
Why it matters: Without roles, routines, and incentives, pilots remain side projects and fade after initial enthusiasm.

What to do:
Create a champion/coach model and clarify roles (service owner, data steward, coach, sponsor).
Timebox participation and make it easy for officers (short sessions, clear asks, prepared materials).
Embed light-touch innovation routines into normal work (e.g., monthly idea review; quarterly service health check).
Suggested reusable assets:
Champion playbook
Department engagement plan template
Minimum viable governance checklist
Participation tracking sheet

6.2 Theme 2 - Technical and Data-Driven Sustainability

Observed:
A proper data pipeline is needed (collection, validation, updates, monitoring).
Maintenance and currency of data are ongoing burdens; data literacy and stewardship are essential.
Data availability constraints shape scope; public-private data sharing can be challenging.
Data storytelling and UX are as important as technical implementation - the 'story of the dashboard' must be immediately apparent.
Some domains (e.g., digital transition indicators) lack open, granular datasets, which can force a pivot in scope.
Why it matters: Dashboards and maps fail when data ownership, update cadence, licensing, and stewardship are unclear.
What to do:
Define the data pipeline early: sources, agreements, quality checks, and an update cadence that fits decision cycles.
Assign data ownership and stewardship (RACI) and plan for long-term maintenance before scaling.
Design 'story-first' UI: start from the decisions users need to make, then choose indicators and views.
Suggested reusable assets:
Data inventory template
Update cadence and ownership template
Data governance RACI template
UX checklist and story-first dashboard canvas

6.3 Theme 3 - Policy and Governance Integration

Observed:

Pilots can remain 'islands of innovation' unless embedded into strategic plans and governance processes.

Communicating innovation to policymakers requires alignment with their narratives and decision cycles.

Interactive services (maps/dashboards) can support decision-making better than large written reports when paired with a clear decision narrative.

Why it matters: If decision-makers cannot see how the service changes decisions, long-term adoption and resourcing are unlikely.

What to do:

Translate indicators into decisions: clarify 'what does this change tomorrow?' and 'who decides what?'.

Use short policy narratives and demo scripts tailored to the governance process (committees, budget cycles, statutory plans).

Run a 'strategy-to-actions' workshop to turn high-level plans into concrete service-supported actions.

Suggested reusable assets:

Policy narrative 1-pager template

Decision-maker demo script

Strategy-to-actions workshop facilitation guide

6.4 Theme 4 - Knowledge Sharing and Replication

Observed:

Replication requires structured documentation, not only working software.

Portability can be reduced by proprietary cloud choices, unclear licensing, or vendor lock-in.

Replication is easier when pilots ship with reusable templates, datasets, and a clear process roadmap.

Why it matters: Without replication packs, the project produces isolated successes rather than a reusable approach.

What to do:

Create a standard replication pack: how-to, datasets, roles, costs, pitfalls, and lessons learned.

Run an open-source/portability and vendor lock-in assessment before committing to key platforms.

Publish case studies in a consistent format and include 'what we would do differently' sections.

Suggested reusable assets:

Replication pack template

Open-source and portability checklist

Vendor lock-in assessment checklist

Case study format (2-4 pages)

6.5 Theme 5 - Financial and Resource Sustainability

Observed:

Scaling requires continued funding and clear ownership after project end.

Blended funding (EU/national/local) often enables continuity; strong storytelling improves support.

Pilots that cannot articulate costs, benefits, and ownership struggle to survive procurement and budgeting cycles.

Why it matters: If long-term ownership and resourcing are not planned, services risk obsolescence even when pilots are technically successful.

What to do:

Build a service sustainability canvas early (benefits, costs, ownership, risks, funding routes, scaling plan).

Link the service to statutory duties, climate targets, and budget lines so it fits existing resourcing mechanisms.

Prepare a lightweight business case and cost-benefit narrative for decision-makers and funders.

Suggested reusable assets:

Service sustainability canvas

Funding options checklist

Business case / cost-benefit template

7 Cross-cutting lessons learned Extended

7.1 Theme 1: Organisational & Cultural Sustainability

Key Lessons

Lesson 1.1: Time Constraints and Staff Capacity Limit Participation

A consistent finding across all four pilots is that municipal employees and organisational partners face significant time constraints and competing priorities. Workshop attendance declined when activities were perceived as "additional work" rather than integrated into daily routines. Pilot partners expressed that:

- User groups are busy and require proactive, low-burden engagement from service providers
- Innovation activities must be timeboxed and require clear incentives for participation
- Champions and internal coaches reduce the burden on individual staff members[1]

Lesson 1.2: Innovation Is Often Framed as an "IT Problem" Rather Than an Organisational Change Effort

A critical misconception emerged in several pilot contexts: innovation is positioned as a technology deployment exercise ("we need new software") rather than as an organisational capability and cultural shift. This framing leads to:

- Underestimation of change management requirements
- Insufficient end-user involvement in technology selection

- Sustainability failures when technology implementation outpaces organisational readiness
- Missed opportunities for embedding innovation into routine decision-making

Lesson 1.3: Lightweight, Embedded Support Outperforms Ad Hoc Initiatives

Pilots that succeeded in sustaining engagement used a "minimum viable governance" model:

- Embedded champions or coaches within departments (not external to organisations)
- Structured but light-touch touchpoints (e.g., monthly 30-minute innovation check-ins)
- Clear roles and accountability for innovation activities
- Incentive structures aligned with existing performance metrics

Supporting Evidence

From pilot monitoring (D2.3.1):

- Final users could have been more involved in deciding technological implementation
- User groups' time availability fluctuated, affecting attendance and engagement
- Pilots that designated internal champions showed higher sustained engagement

From exploitation workshop:

- Workshop participants consistently noted that "innovation was perceived as an add-on, not core work"
- Successful pilots embedded innovation support into existing team meetings and workflows

Recommendations for Capacity Building

Enhanced Module: "Innovation in Daily Routines"

A new capacity-building module should equip pilot lead organisations with:

- **Role clarity frameworks:** Who is the innovation champion? What is their mandate? How much time is allocated?
- **Timeboxing strategies:** How to design innovation activities to fit existing workloads (e.g., 2-hour monthly sessions vs. intensive workshops)
- **Incentive design:** Linking innovation participation to performance metrics, career development, or recognition programs
- **Minimum viable governance:** Lightweight decision structures, approval pathways, and escalation procedures

Toolkit: Champion/Coach Playbook

A practical guide including:

- Job description template for internal innovation champions
- Coaching conversation frameworks and templates
- Common barriers and how to overcome them
- Quick reference "champion tip sheets" on specific technologies or processes

7.2 Theme 2: Technical & Data-Driven Sustainability

Key Lessons

Lesson 2.1: A Proper Data Process and Pipeline Is Essential

The Green South Savo pilot and Waste Data Hub both encountered data pipeline challenges:

- Data collection must be systematised (not ad hoc spreadsheets or manual updates)
- Data governance responsibilities must be assigned and documented (who collects? who validates? who updates?)
- Update cadence must be explicit and sustainable (weekly? monthly? annually?)
- Data availability and quality constraints directly shape service scope and user expectations

For example, the Green South Savo service initially aimed to visualise both green and digital transition indicators. However, no open-access digital transition data existed at municipal level, forcing scope reduction to focus on the green transition alone. This lesson applies to any data-driven service: **define your data strategy before design.**

Lesson 2.2: Data Maintenance and Currency Are Ongoing Operational Burdens

A common pitfall is treating data as a "set it and forget it" deliverable. In reality:

- Datasets go stale and lose credibility (municipalities noted that "official data tend to lag")
- Updates require ongoing resource allocation (staff time, systems, budget)
- Data literacy and stewardship responsibilities must be embedded in team roles
- Stakeholder trust depends on perceived data currency and accuracy

The Green South Savo pilot mitigates this by using Google Sheets for data administration, enabling system administrators to manage data dynamically. However, this approach requires ongoing institutional commitment and clear ownership.

Lesson 2.3: Data Storytelling and User Experience Are as Critical as Technical Implementation

A surprising but consistent finding: how data is presented is as important as the data itself.

- Dashboards and maps that don't immediately communicate their purpose are abandoned
- Interactive features (e.g., split-screen municipality comparison in Green South Savo) significantly increase engagement
- Users value visual storytelling (maps, charts, narratives) over raw data or written reports
- The AI assistant in Green South Savo was perceived as valuable but struggled with technical performance issues (response lag), demonstrating that even innovative features fail if user experience is poor

Supporting evidence from monitoring: "Data should be used for storytelling; indicators/ad hoc data may be passed as irrelevant." "Interactive map service can support decision-making better than large written reports."

Lesson 2.4: Data Availability and Open-Access Constraints Are Real Barriers

Organisations implementing data-driven services must navigate:

- **Proprietary data:** Often held by companies, inaccessible or expensive
- **Sensitive data:** Subject to privacy regulations or security restrictions
- **Missing data:** Important indicators that don't exist or aren't measured (e.g., municipal-level digital equipment usage, AI adoption)
- **Format heterogeneity:** Indicators in different units, time periods, or spatial scales are difficult to compare meaningfully

The Green South Savo pilot notes: "It is a clear need to develop a green transition index that could unite or consist of several key green transition indicators."

Supporting Evidence

From pilot monitoring (D2.3.1):

- "Careful consideration is needed for what spatial data to display and whether it is available"
- "No openly available spatial data/indicators of the digital transition limited scope"
- "Data should be used for storytelling; indicators/ad hoc data may be passed as irrelevant"

From Green South Savo pilot documentation:

- Initial design aimed to show both green and digital transitions; this was narrowed due to data unavailability
- 10 interviews with municipal decision-makers confirmed that spatial comparison was "interesting and useful" and allowed spotting "pioneers" of green transition advancement
- The AI chatbot component experienced user satisfaction challenges due to response lag and technical performance

Recommendations for Capacity Building

Enhanced Module: Data Readiness & Pipeline

New training content addressing:

- **Data source mapping:** Where does your data live? Who owns it? Is it accessible?
- **Data governance frameworks:** RACI (Responsible, Accountable, Consulted, Informed) matrix for data stewardship
- **Update cadence and ownership:** Clear assignment of collection, validation, and update responsibilities
- **Data quality criteria:** How do you verify data accuracy and relevance?
- **Legal and access requirements:** GDPR, data-sharing agreements, open-data compliance
- **Contingency planning:** What if critical data becomes unavailable? How do you adapt service scope?

Enhanced Module: Dashboard Storytelling & UX

New content focused on:

- **Visual narrative design:** How to use maps, charts, and interactive features to tell compelling stories
- **User research methods:** Interviews, usability testing, feedback loops
- **Accessibility requirements:** Ensuring dashboards are usable by diverse audiences (varying digital literacy, disabilities, languages)
- **Performance optimisation:** Ensuring interactive features load quickly and function reliably
- **Metrics and analytics:** How to measure whether users understand and act on the information presented

Toolkit: Data Readiness Checklist

A practical framework to assess:

- [ ] Data sources identified and accessibility confirmed
- [ ] Data governance roles and responsibilities assigned
- [ ] Update cadence defined and resource-estimated
- [ ] Data quality standards documented
- [ ] Legal/privacy/access requirements addressed
- [ ] Contingency plan for data loss or unavailability
- [ ] User feedback mechanisms in place
- [ ] Dashboard/visualization design reviewed with target users[1]

7.3 Theme 3: Policy & Governance Integration

Key Lessons

Lesson 3.1: Pilots Remain "Islands of Innovation" Unless Embedded in Strategic Plans and Policy Frameworks

A critical observation across pilots: successful innovation is not about technology per se, but about embedding it into strategic decision-making and policy processes.

- Pilots that operated independently (disconnected from municipal strategies or climate plans) had limited sustainability
- Services that aligned with existing policy priorities (e.g., EU green transition targets, municipal climate commitments) received higher stakeholder support
- Integration into strategic planning processes (e.g., municipal strategy development, multi-year action plans) significantly increased likelihood of sustained adoption

For example, municipalities in South Savo confirmed strong commitment to national climate targets and EU green transition goals in their strategies, yet "nearly all interviewed representatives mentioned that integrating green and digital transition activities has not been considered before."This indicates a critical gap: ambitious policy exists, but operational implementation (service design, tools, workflows) is disconnected.

Lesson 3.2: Communicating Innovation to Policymakers Requires Alignment with Their Narratives and Decision Cycles

A persistent challenge: framing innovation in terms that resonate with policymakers' priorities and timelines.

- Policymakers prioritise outcomes ("What does this change tomorrow for citizens?") over features ("The system uses machine learning")
- Policy narratives are often 12–24 months in advance of operational implementation
- Decision cycles and budget approval processes follow predictable (if slow) timelines
- Interactive, visual demonstrations of innovation impact are more persuasive than technical reports[1]

Supporting evidence: "Interactive map service can support decision-making better than large written reports." "Strategies/policies are rarely refined into concrete actions; services can keep issues actively discussed.

Lesson 3.3: Capacity Building Must Extend Beyond Technology into Communication, UX, and Policy Translation

Successful service adoption by policymakers requires:

- **Policy translation skills:** Converting indicators and data into actionable decisions
- **Storytelling competency:** Framing innovation benefits in policy language
- **Visualization and UX:** Demonstrating impact through interactive, user-centred tools
- **Timing and narrative alignment:** Launching pilot results when policy narratives are receptive (not in advance or too late)

Supporting Evidence

From pilot monitoring (D2.3.1):

- "Strategies/policies are rarely refined into concrete actions; services can keep issues actively discussed"
- "Interactive map service can support decision-making better than large written reports"
- Several pilots noted that policymaker engagement peaked when services aligned with known policy priorities (climate commitments, strategic objectives)

From Green South Savo interviews:

- Interviewees noted that the service "could be used in the development of the municipal strategies or other brainstorming or ideation phases in municipality development"
- Spatial representation "could make it easier to grasp the phenomenon, which was considered very abstract from the perspective of running the daily routines or developing the activities of a municipality"

Recommendations for Capacity Building

Enhanced Module: Policy Translation

New training addressing:

- **Policy landscape mapping:** What are the key policy frameworks and priorities in your region? (EU targets, national strategies, municipal plans)
- **Indicators to decisions:** How do you translate data and indicators into actionable policy decisions?
- **The "so what?" test:** For each data point, articulate the policy implication
- **Narrative development:** Framing pilot benefits in policy language (not technical jargon)
- **Policymaker engagement:** When and how to involve decision-makers in service design and testing
- **Timing and launch strategy:** Aligning pilot results with policy decision cycles and budget processes

Toolkit: Policy-Facing Communication Assets

Practical templates including:

- **Policy Narrative Brief:** Single-page summary of service benefits aligned with specific policy priorities
- **Decision-Maker Demo Script:** 10-15 minute guided walkthrough designed for C-suite and elected officials
- **Strategy-to-Actions Workshop Format:** Facilitation guide for translating policy objectives into concrete service requirements and success measures

7.4 Theme 4: Knowledge Sharing & Replication

Key Lessons

Lesson 4.1: Pilots Must Translate into Sustainable Services; Replication Requires Structured Documentation

A central risk: pilots exist as time-limited experiments, never transitioning to operational services. Barriers include:

- Unclear ownership post-project (who maintains the service?)
- Lack of business case or funding model (should it be free? cost-recovery?)
- Insufficient documentation for other organisations to understand and adapt the solution
- Technology lock-in (solutions built on proprietary platforms or expensive cloud infrastructure

Successful replication requires:

- **Replication pack:** Comprehensive documentation including service logic, technical architecture, datasets, process roadmaps, and lessons learned
- **Case studies:** Real-world examples of how and why the service was developed, specific challenges overcome, and recommendations for adaptation
- **Open-source commitment:** Clear articulation of what is open-source, what requires licensing, and how dependencies (libraries, data, platforms) are managed

- **Sustainability runway:** Explicit plan for who owns the service, how it's funded, and what happens if funding ends[1]

Supporting evidence from pilots: "Ensure pilots translate into actual services; replication needs structured documentation and case studies."[1]

For the Green South Savo pilot specifically: "The functioning of the Green South Savo service is secured for five years (2/2025–2/2030) and is open to all interested in further development. Potential partners for adopting the service after the service contract are searched for." This proactive approach to sustainability and transferability is a model for other pilots.

Lesson 4.2: Open-Source and Transferability Must Be Verified Early; Cloud Platforms May Scale but Reduce Portability

Technology decisions have long-term replication implications:

- **Open-source advantage:** Open-source components (e.g., Leaflet mapping library used in Green South Savo) are easier to maintain, modify, and transfer to new operators
- **Proprietary risk:** Reliance on proprietary platforms (e.g., expensive AI services, cloud-only infrastructure) can create vendor lock-in and limit replication opportunities
- **Cloud scalability vs. portability trade-off:** Cloud platforms scale easily but may be geographically limited, expensive for smaller organisations, or subject to service discontinuation

The Green South Savo pilot mitigates this risk: it uses Leaflet (open-source), OpenAI (widely available but proprietary for AI), and Google Sheets (simple, no-cost alternative). The service is therefore moderately portable; another municipality could replicate it by setting up similar infrastructure, though the AI component involves recurring OpenAI costs.

Lesson 4.3: Capacity Building Sessions Support Technology Selection, but End-User Involvement Can Be Improved

From monitoring: "Capacity-building sessions supported technology selection; however, more end-user involvement could improve decisions."

Implications:

- Involve end users (not just IT leads and project managers) in technology selection criteria
- Test prototype technologies with real users before committing to platform decisions
- Document why specific technologies were chosen (trade-off analysis), informing future decision-making

Supporting Evidence

From pilot monitoring (D2.3.1):

- "Need to evaluate long-term sustainability: maintenance, obsolescence, ownership"
- "Capacity-building sessions supported technology selection; however, more end-user involvement could improve decisions"

From Green South Savo documentation:

- Service uses open-source mapping (Leaflet), simplifying replication for other municipalities
- AI assistant uses OpenAI API, introducing ongoing operational costs and potential platform dependency
- Clear 5-year sustainability plan (2025–2030) is a strength; transition plans post-2030 are in development

Recommendations for Capacity Building

Enhanced Module: Replication Pack Development

New training addressing:

- **Service documentation standards:** What information is essential for another organisation to understand and adapt the service?
- **Technical architecture diagrams:** How to document system components, data flows, and integration points
- **Process roadmaps:** Step-by-step guidance for implementation timelines, resource allocation, and risk mitigation
- **Lessons learned documentation:** Systematic capture of barriers overcome, enablers leveraged, and recommendations for adaptation
- **Dataset and data preparation:** How to package and document data requirements for replication
- **Maintenance and ownership frameworks:** Clear articulation of post-project sustainability responsibilities

Toolkit: Open-Source and Portability Checklist

Assessment framework to evaluate technology decisions:

- [ ] Core components are open-source or widely available (no proprietary lock-in)
- [ ] Dependencies and third-party services documented with costs
- [ ] Technology selection rationale documented (why this tool over alternatives?)
- [ ] Vendor lock-in risks identified and mitigated
- [ ] Data portability ensured (data can be exported, not trapped in platform)
- [ ] API standards used where possible (JSON, REST, OAPI)
- [ ] Community support available for key technologies (active GitHub repos, Stack Overflow presence)
- [ ] Migration pathways documented if platform is discontinued[1]

7.5 Theme 5: Financial & Resource Sustainability

Key Lessons

Lesson 5.1: Scaling Requires Continued Funding and Clear Ownership Post-Project

A fundamental risk for pilot projects: time-limited funding creates a "cliff" when the project ends. Sustainable scaling requires:

- **Explicit ownership assignment:** Who will operate and maintain the service post-project? (Municipal department? Regional entity? Third-party provider?)

- **Funding diversification:** Combining multiple funding sources (EU programmes, national innovation funds, local municipal budgets, user fees if applicable)
- **Business case development:** Clear articulation of service benefits, cost structure, and revenue/savings model
- **Long-term commitment:** Budget and staffing plans extending beyond the initial funding period

Supporting evidence: "Need to evaluate the accessibility, maintenance, and long-term sustainability of a service; who will 'own' it and long-term benefits.

Lesson 5.2: Multiple Funding Streams Increase Sustainability; Connect Pilots to Climate and Local Innovation Funds

A strategic finding: pilots that position services as addressing multiple policy agendas (EU green transition, national digital transformation, local climate action) can access diverse funding streams:

- **EU funding:** Horizon Europe, LIFE programme, Digital Europe Programme
- **National innovation funds:** Government digitalization budgets, green transition initiatives
- **Regional and local funding:** Municipal innovation budgets, regional development funds
- **Thematic alignment:** Services addressing climate targets, circular economy, digital skills can tap dedicated funding streams[1]

For example, the Green South Savo service aligns with:

- EU Green Deal and climate targets
- Finland's national digital transformation strategy
- Regional climate action commitments in South Savo municipalities

This multi-level alignment strengthens the case for sustained funding beyond the INNOCAP project.

Lesson 5.3: Storytelling and Narrative Effectiveness Directly Influence Funding Body Support

A consistent observation: funding bodies are influenced by how effectively organisations communicate impact:

- **Quantified benefits:** Reduction in process time, citizen satisfaction improvements, cost savings
- **Narrative framing:** How the service addresses known policy challenges (climate action, digital skills, civic engagement)
- **Visual demonstration:** Use of dashboards, interactive maps, and user testimonials to convey impact
- **Alignment with funder priorities:** Explicit connection to the funding body's strategic objectives

Implication for capacity building: organisations need support not just in service design but in **impact communication and funding narrative development**.[1]

Supporting Evidence

From pilot monitoring (D2.3.1):

- "Need to evaluate the accessibility, maintenance, and long-term sustainability of a service; who will 'own' it and long-term benefits"
- "Scaling requires continued funding and clear ownership post-project"
- "Combine EU/national/local funding; connect pilots to climate targets and local innovation funds"

From Green South Savo sustainability plan:

- Service operation is secured for 5 years (2025–2030) through Ruralia Institute commitment
- AI assistant component is funded for 2 years with explicit evaluation plan
- Post-2030 transition plans are being developed, considering partner adoption models

Recommendations for Capacity Building

Enhanced Module: Sustainability & Funding Strategy

New training addressing:

- **Business case development:** Clear articulation of value proposition, cost structure, and benefits
- **Ownership and governance models:** Options for service stewardship (in-house, partnership, public-private, spin-off)
- **Funding landscape navigation:** Mapping available EU, national, and local funding streams
- **Grant writing and funding pitches:** Developing compelling proposals aligned with funder priorities
- **Financial sustainability planning:** Multi-year budgets, scenario planning, contingency strategies
- **Impact measurement:** Defining and tracking metrics that demonstrate value to funders[1]

Toolkit: Service Sustainability Canvas

A strategic planning tool (visual canvas format) for organisations to map:

- **Value proposition:** What problem does the service solve? For whom?
- **Stakeholders:** Who benefits? Who must support it? Who pays?
- **Cost structure:** What are the key cost drivers? (staff, technology, data, infrastructure)
- **Revenue/funding sources:** What funding exists today? What could be available? What are gaps?
- **Key success factors:** What must go right for the service to survive post-project?
- **Risks and mitigations:** What threatens sustainability? How can you reduce risk?
- **Transition plan:** What happens when project funding ends?[1]

Toolkit: Funding Options Checklist

Comprehensive mapping of potential funding sources:

- Horizon Europe (digital, green, social innovation calls)
- LIFE Programme (climate and environment projects)
- Digital Europe Programme (digital skills, digital services)
- National innovation and digitalization budgets

- Regional development funds and Interreg programmes (ongoing opportunities)
- Municipal and local authority innovation budgets
- Climate and green transition funds (EU and national)
- Thematic funding (water, waste, energy, biodiversity)
- Private sector partnerships and sponsorships
- User fees and revenue models (where applicable)
- Philanthropic foundations and impact investors

8 Cross-Cutting Findings and Synergies

Beyond individual themes, several cross-cutting insights emerged during synthesis:

8.1 Integration of Themes

The five sustainability themes are deeply interconnected:

- **Organisational readiness (Theme 1)** determines whether technical excellence (Theme 2) translates to sustained use
- **Policy integration (Theme 3)** provides the strategic rationale for long-term funding (Theme 5)
- **Knowledge sharing approaches (Theme 4)** amplify organisational learning and replication across peers
- **Funding mechanisms (Theme 5)** enable the capacity building and documentation (Themes 1–4) required for replication[1]

8.2 The Capacity-Building Programme as a Catalyst

A key finding: structured capacity building (workshops, peer learning, hands-on support) accelerated pilot progression but only when:

- Tailored to specific pilot needs (not generic technology training)
- Delivered iteratively alongside implementation (not front-loaded only)
- Connected to policy and organisational contexts (not technology-centric)
- Supported by skilled mentors with both domain and technology expertise

The Digital Innovation Platform pilot, for example, benefited from close collaboration with University of Galway researchers who provided strategic guidance on technology selection, process design, and governance frameworks.

8.3 Regional Variation and Context Sensitivity

While core themes are consistent, regional contexts shape specific priorities:

- **Finland (Green South Savo):** Strong policy momentum on green transition; key challenge was data availability and policy translation
- **Sweden (Örnsköldsvik):** Focus on internal innovation culture and change management; key challenge was embedding innovation into routine work
- **Iceland (Waste Data Hub):** Coordination across distributed municipalities; key challenge was inter-organisational data governance
- **Ireland (Climate Monitoring):** Alignment of diverse stakeholder interests; key challenge was governance integration and sustained engagement

Implication: Replication should adapt frameworks to regional policy priorities, governance structures, and stakeholder ecosystems.

9 Actionable Recommendations for Public Sector Organisations

9.1 For Local Authorities and Public Sector Organisations

1. **Start with organisational readiness, not technology selection**
    - Define roles and assign internal champions before piloting new technologies
    - Build consensus on the organisational change that innovation requires
    - Create explicit time and resource allocation for innovation participation
2. **Develop a data strategy before service design**
    - Map existing data sources and identify gaps
    - Assign data governance responsibilities (collection, validation, update)
    - Establish clear update cadences aligned with decision-making cycles
3. **Embed innovation into strategic plans**
    - Connect pilot services to municipal climate plans, digital transformation strategies, or other policy priorities
    - Involve policymakers in service testing and refinement
    - Frame service benefits in policy language, not technical jargon
4. **Plan for replication and transferability from day one**
    - Use open-source technologies where possible
    - Document service logic, processes, and lessons learned systematically
    - Develop business cases and sustainability plans aligned with available funding streams
5. **Build funding resilience through diversification**
    - Identify multiple funding sources (EU, national, local, user fees)
    - Develop compelling narratives that align with funder priorities
    - Plan for the post-project transition explicitly
    -

9.2 For Regional Development and Interreg Programmes

1. **Integrate capacity building into pilot support**
    - Pair technology development with structured training on emerging technologies
    - Provide mentoring on governance, policy translation, and sustainability planning
    - Foster peer learning networks among pilot sites
2. **Emphasise process documentation and replication**
    - Require pilots to document not just outcomes, but implementation processes and lessons learned
    - Create accessible repositories and case study libraries
    - Support pilot sites in translating their experiences into resources for peer organisations
3. **Support multi-level funding navigation**

- Help pilot sites identify complementary funding streams beyond the initial project
- Facilitate connections to national and EU funding bodies
- Document successful funding narratives for peer learning

4. **Ensure policy alignment and stakeholder engagement**
   - Facilitate dialogue between pilot teams and policymakers from project outset
   - Integrate policy translation skills into capacity-building curricula
   - Support pilots in embedding innovation results into policy cycles and strategic planning

9.3 For Research and Academic Institutions

1. **Conduct longitudinal evaluation of innovation adoption**
   - Track service sustainability post-project (maintenance, usage, financial status)
   - Measure policy impact and governance integration outcomes
   - Identify conditions that enable or inhibit replication to new contexts
2. **Develop replicable frameworks and tools**
   - Translate pilot-specific lessons into generalizable models suitable for diverse regional contexts
   - Create open-access toolkits and templates for peer organisations
   - Publish findings in academic and practitioner outlets to extend reach
3. **Investigate transferability and adaptation**
   - What aspects of successful pilots are context-specific vs. universally applicable?
   - How do organisational readiness, policy alignment, and governance structures influence replication outcomes?
   - What role do regional networks and peer learning play in scaling innovation?

10 The INNOCAP Innovation Framework: Implications and Adaptations

10.1 Core Framework Principles

Building on the lessons learned, the INNOCAP framework offers public sector organisations a structured approach to innovation. Four key dimensions were identified through analysis of 32 regional case studies across NPA countries:

Dimension	Definition	Relevance to Pilots
Digital Solutions	Emerging technologies and tools (GIS, AI, VR, IoT, APIs)	Green South Savo (GIS+AI), Örnsköldsvik (VR+APIs), Waste Data Hub (digital coordination)
Procurement of Innovative Solutions	Flexible, adaptive purchasing processes enabling experimentation	Key barrier: rigid traditional procurement; INNOCAP pilots used agile, iterative vendor partnerships
Delivery Models	How services are designed, deployed, and maintained (in-house, partnership, cloud-based)	Green South Savo (partnership with Mindhive); Örnsköldsvik (municipal-led with university support)
Skills	Digital literacy, emerging technology competency, and change management capacity	Capacity building across all pilots; identified as critical enabler

Table 1: INNOCAP Framework Dimensions

10.2 Adaptation Pathways for Other Regions

Regions seeking to replicate INNOCAP's approach should:

1. **Assess regional readiness across four dimensions**
    - Which technologies are most relevant to regional policy priorities?
    - What procurement reforms could accelerate innovation adoption?
    - What service delivery models align with regional governance structures?
    - What are the skills gaps and how can they be addressed?
2. **Tailor capacity building to regional context**
    - Identify high-priority policy challenges (climate, digital inclusion, waste management, etc.)
    - Select technologies and service models aligned with these priorities

- Embed capacity building into pilot development from the outset

3. **Build multi-stakeholder engagement**
   - Convene policymakers, practitioners, technologists, and researchers
   - Create peer learning networks among pilot sites
   - Foster dialogue between regional and national funding bodies
4. **Plan for sustainability and scaling from the beginning**
   - Establish clear ownership and governance models
   - Identify diverse funding streams aligned with policy priorities
   - Document processes and lessons learned for peer replication

11 Conclusion: From Pilots to Sustained Innovation Ecosystems

The INNOCAP project has demonstrated that disruptive innovation in peripheral public sectors is possible when three conditions align:

1. **Rigorous Capacity Building:** Organisations need more than technology; they need support in change management, policy translation, data governance, and sustainability planning
2. **Pilot-to-Service Translation:** Time-limited projects must transition to sustained services through clear ownership, diverse funding, and documented replication pathways
3. **Multi-Level Integration:** Innovation must embed into strategic plans (policy level), organisational processes (institutional level), and team routines (operational level)

The four INNOCAP pilots, Green South Savo's spatial innovation service, Örnsköldsvik's cultural innovation platform, the Waste Data Hub's coordination system, and Ireland's climate monitoring, each illustrate different aspects of this model. Their success provides proof of concept; their challenges (data availability, time constraints, funding transitions, policy integration) provide a roadmap for future innovation initiatives.

12 Practical playbook for replication

This playbook provides a lightweight path for public entities to replicate the INNOCAP approach. It is designed for teams with limited capacity and assumes an iterative journey from a minimum viable service to a scaled service.

1. Define the service challenge

Clarify the problem, target users, and success criteria; avoid starting with technology.

2. Map stakeholders and decisions

Identify who will use the service and what decisions it should influence; write a decision statement.

3. Check data readiness

Inventory required datasets, ownership, quality, licensing, and update cadence; agree stewardship responsibilities.

4. Build the minimum viable service (MVS)
Prototype the smallest service that can demonstrate value; prioritise usability and clarity over feature completeness.
5. Co-design and test in short cycles
Use weekly/biweekly feedback loops; keep sessions short and structured; track changes and decisions.
6. Integrate into operations
Assign an owner, define maintenance routines, set response workflows (e.g., alerts), and align to existing processes.
7. Plan for sustainability
Complete a service sustainability canvas: benefits, costs, ownership, risks, funding routes, and scaling plan.
8.Package for replication
Document as a replication pack: what it is, how it works, costs, datasets, and lessons; publish to a shared repository.

A minimal replication checklist

- Named service owner and sponsor (who keeps this alive after the pilot).
- Decision statement agreed (what decisions will change, for whom, and when).
- Data inventory completed (sources, licensing, quality, update cadence).
- User feedback loop scheduled and resourced (short sessions, clear recruitment plan).
- Operations plan defined (maintenance, incident response, escalation, communications).
- Sustainability canvas completed (costs, benefits, risks, funding and scaling route).
- Replication pack created and published (how-to, datasets, templates, lessons).

13 Final Reflection

Innovation in the public sector is not a technology problem; it is an organisational, cultural, and policy challenge. INNOCAP's contribution lies not in any single technology or service, but in demonstrating a repeatable, learnable model for building innovation capacity in regions facing persistent structural constraints. As peripheral and Arctic regions navigate the green and digital transitions demanded by EU policy, the INNOCAP approach offers a proven pathway: start with people and processes, embed innovation into strategy, invest in sustained capability, and share learning generously with peer organisations.

14 Annexes

Annex A: Pilot snapshot table

Pilot	Technology focus	Primary users	Most transferable lesson
Waste Data Hub (Iceland)	Data integration + dashboards	Municipal waste managers, decision-makers	Treat data + guidance as one product (dashboard + knowledge centre).
Green South Savo (Finland)	GIS + indicators + AI assistant	Municipal decision-makers, managers, researchers	Design map views around decisions and comparisons, not just layers.
Glenties IoT monitoring (Ireland)	IoT sensors + real-time data	Local authority teams; potentially residents via alerts	Pair sensors with an operational response model and ownership.
Municipal innovation platform (Sweden)	AI-supported innovation workflow	Municipal employees, coaches, managers	Embed innovation into daily routines with champions and minimal governance.