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Mapping the Future of Industry 4.0 in the Western Balkans

A Diagnostic Tool for Evidence-Based Policy Design

Three emerging observations from regional research insights

Dimension 1
Skills

Dimension 2
Ecosystem

Dimension 3
Government

TOOL IN DEVELOPMENT — Pilot Case: Western Balkans

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Developing a Diagnostic Tool

The Challenge

Digital and industrial readiness at the firm level remains largely unmapped; most existing tools operate at the macro-level

The Tool

UNIDO is developing a diagnostic tool to support firm-level assessment and evidence-based policy design

The Pilot Case

Western Balkans: 200+ survey respondents I 6 focus groups | 6 economies | 3 actor groups

WORK IN PROGRESS:

The tool is under development. Survey/focus group data are being consolidated, and dashboard functionality is being enhanced. Following finalization and validation with partners, the tool will be piloted to support policy advice in the WB.

EMERGING OBSERVATION:

Today I will share three insights from the pilot data – early tendencies firm responses that point to emerging trends.
Once validated, the tool will support policy design and implementation.

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The Diagnostic Tool

Conceptual Framework: Three pillars of digital and industrial transition

Skills • Institutional Enablers • Knowledge Linkages

D1: Skills SME Questionnaire	D2: Ecosystem BSO Questionnaire	D3: Government GOV Questionnaire
• Workforce capabilities • Firm technology stages	• BSO capacity • Knowledge linkages	• Government bodies • Policies & strategies

Value Added:

• Complements macro-level indicators (UNIDO Digital Readiness Dashboard) with firm-level evidence
• Uses DESI 2024 for benchmarking • Three coordinated questionnaires and 6 focus groups enable ecosystem-level analysis

PRELIMINARY INSIGHT :

The tool helps identify:
1. existing capacities,
2. gaps and priority areas, and
3. opportunities for more effective resource allocation.

Pilot data from the Western Balkans already reveal patterns that can inform regional policy once the tool is validated together with partners.

→ *NEXT: Dimension 1 — Tendencies observed in Skills data*

DIMENSION 1

Skills: The Binding Constraint

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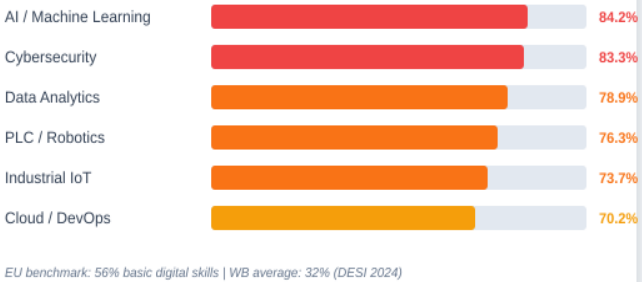
WB Industry 4.0 Readiness Dashboard

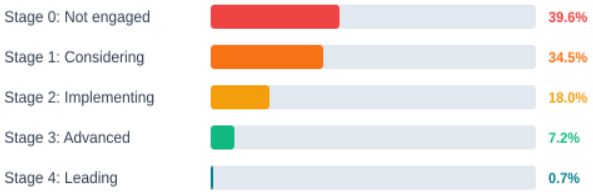
DIMENSION 1: SKILLS

D1.1 Workforce Capabilities: % at Beginner Level



EU benchmark: 56% basic digital skills | WB average: 32% (DESI 2024)

D1.2 Firm Technology Implementation Stages



74.1% at foundational stages (0-1)

Capability building is sequential. Firms cannot skip stages.

KEY MESSAGE: Human Capital Crisis, Not Technology Crisis

- Skills investment must precede technology investment — training before equipment
- The Peerally-Santiago sequential model is validated: firms cannot leapfrog stages

In the live dashboard: Click any bar to see economy-level breakdown | Filter by sector | Export data

D1: SKILLS | D2: ECOSYSTEM | D3: GOVERNMENT | CROSS-CUTTING

EMERGING OBSERVATION

Survey responses indicate a clear pattern: **the main constraint is human capital, rather than access to technology.**

The diagnostic tool helps map a **digitalization pathway** by identifying the stage each firm is at and the corresponding investment needs.

Implications for **WB policy**:

1. Design support measures that meet firms where they are
2. **Prioritize skills development** as a foundation for effective technology investment

→ NEXT: Dimension 2 — Tendencies observed in Ecosystem data: why support exists but isn't reaching firms

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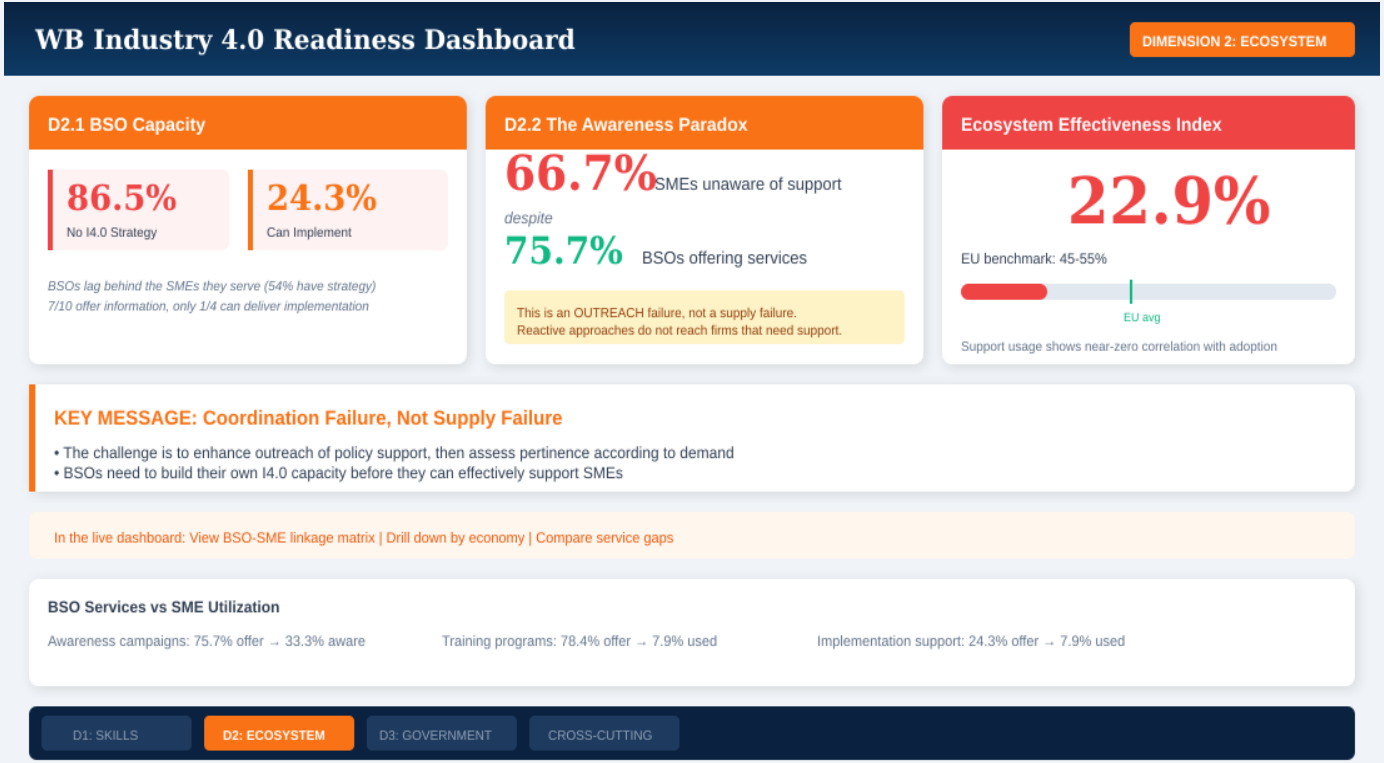
Ecosystem: Coordination Challenge



EMERGING OBSERVATION

Survey responses indicate a consistent pattern: the main gap appears to be in outreach and awareness, rather than in the availability of support.

The tool assesses ecosystem performance using the Ecosystem Effectiveness Index (EEI), which helps identify how well support services reach and respond to firms.

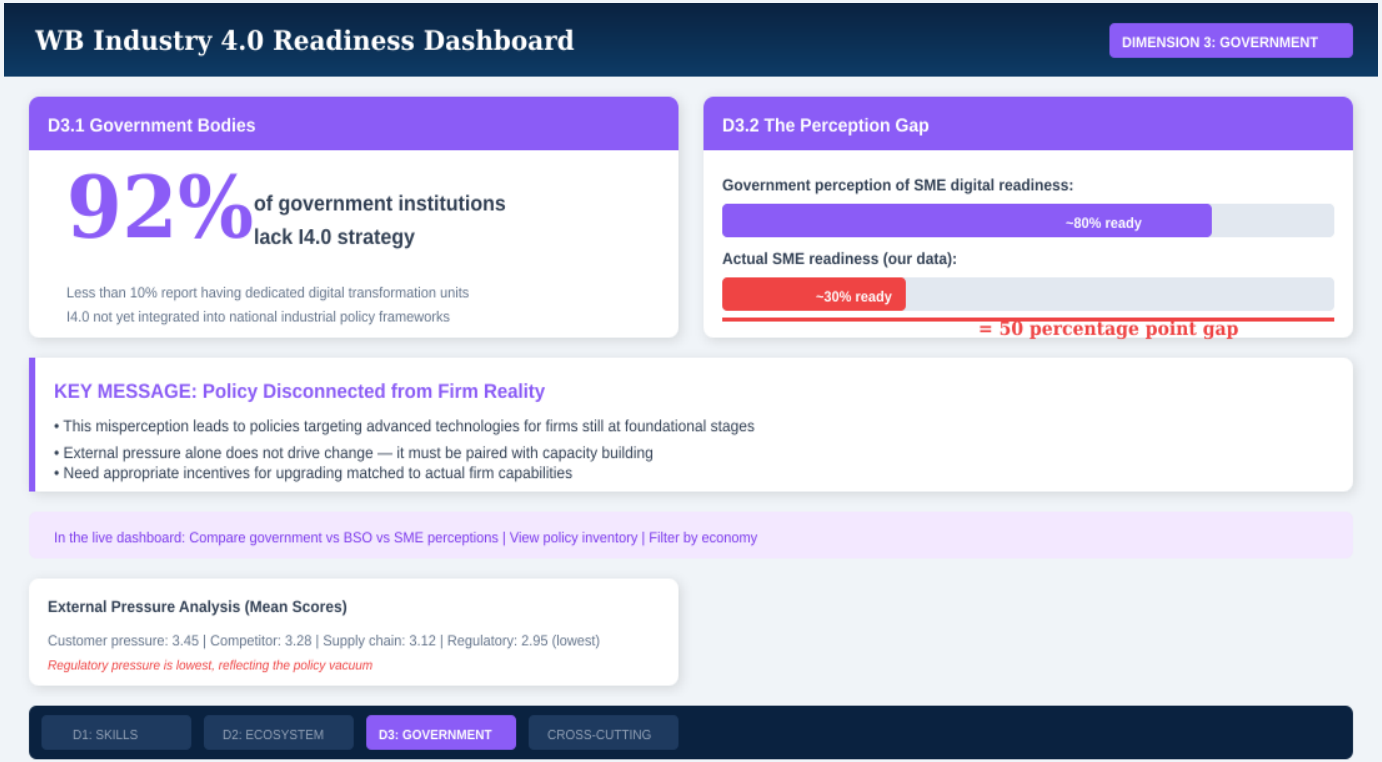
Implications for WB policy:

1. Strengthen outreach and engagement with firms (more proactive approaches)
2. Align support services with actual demand and firm needs

→ *NEXT: Dimension 3 — Tendencies observed in Government data: the perception gap*

DIMENSION 3

Government: Perception Gap



EMERGING OBSERVATION

Survey responses reveal a significant **perception gap - of roughly 50 percentage points - between perceived readiness and actual firm capabilities.**

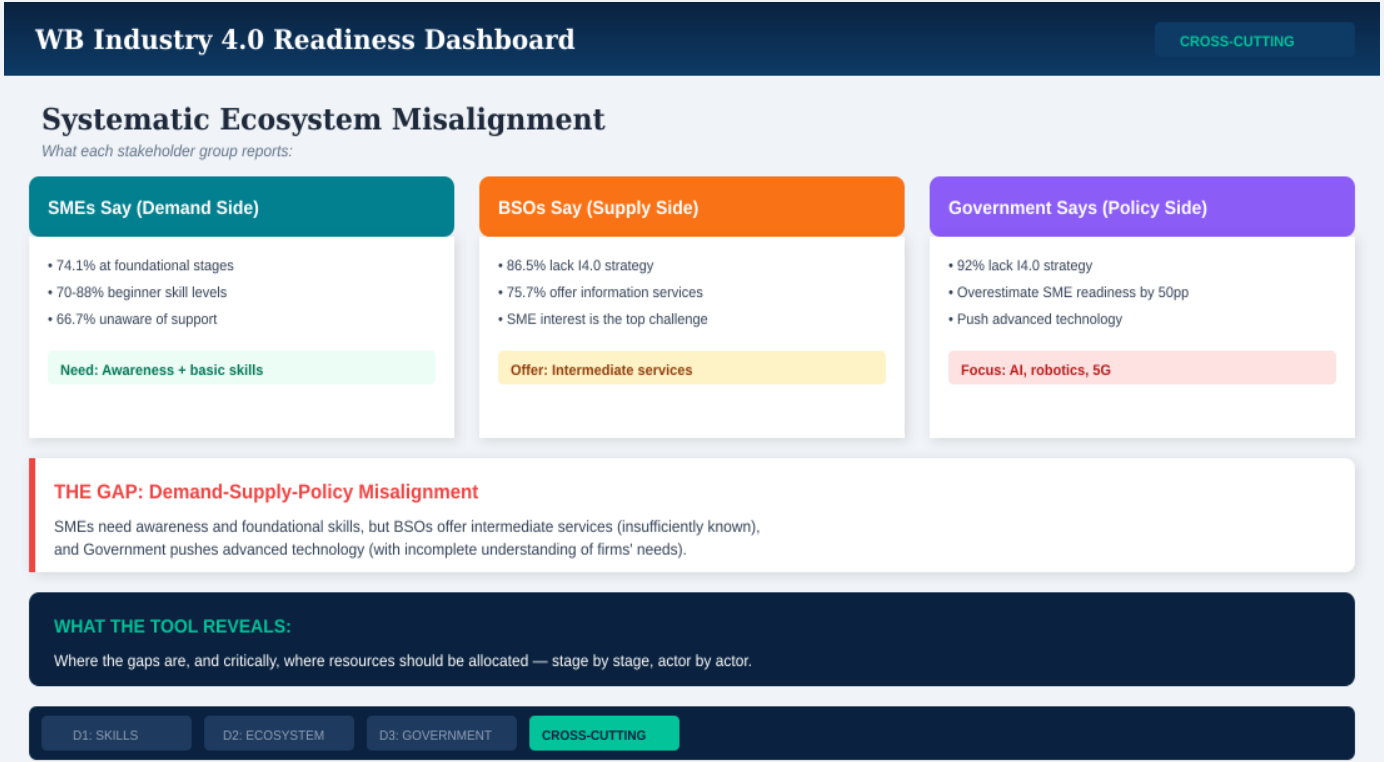
The diagnostic tool helps **bridge this gap with firm-level evidence**, enabling more accurate policy targeting.

Implications for WB policy:

1. **Align policies with actual firm capabilities and constraints**
2. **Combine external incentives with capacity building**, as pressure alone is unlikely to drive sustained

→ NEXT: Cross-cutting — bringing the three Dimension together

Bringing the Three Together



EMERGING OBSERVATION
What the tool can reveal:

The pilot data points to systematic **ecosystem misalignment.**

The tool can reveal WHERE the gaps are and WHERE resources should be allocated — stage by stage, actor by actor.

Implications for WB policy (following validation of the tool): **the right support, to the right firms, at the right time.**

→ NEXT: Path forward — developing and validating the tool together

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Developing the Tool for the Western Balkans, Together

THE TOOL IS A WORK IN PROGRESS

Survey/focus group data being updated • Dashboard functionality being improved • Stakeholder validation is ongoing

Phased Development

February 2026 — **NOW**

Emerging Tendencies

Today: pilot data from WB case

Coming Months

Tool Development

Validation with WB stakeholders

After Validation

Policy Piloting

A tool to support WB policy advice

EMERGING OBSERVATION:

The Western Balkans is the primary focus and core use case for the tool's development. Following finalization and validation with stakeholders, the tool will be **piloted to support policy advice in one Western Balkan economy and subsequently scaled across the region**.
Your engagement today directly shapes the tool's development.

What we ask from you:

1. **Validation of the tool's approach** — does the framework reflect the WB context in your economy?
2. **Feedback on emerging tendencies** — do these observations align with the trends you observe in specific cases across the region?
3. **Partnership in tool finalization** — your input will help shape the tool for Western Balkans policy piloting

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EMERGING TENDENCIES FROM THE PILOT DATA:

1. Human capital challenge, not technology crisis - **skills investment may need to precede technology**
2. Outreach challenge, not supply failure - **support appears to exist but may not reach firms**
3. **Perception gap may drive policy mismatch** - evidence can bridge the apparent 50pp gap

Thank You *Questions?*

- **Q. When will the tool be ready?**
  - A: The tool is in development. We are updating the data, improving dashboard functionality, and validating the approach with stakeholders. After finalization and validation with you, we will pilot it for Western Balkans policy advice.
- **Q. Can you speak to the results for specific economies?**
  - A: Yes, the pilot data can be filtered by economy. These are emerging tendencies. Once the tool is validated, we can provide a more detailed analysis.
- **Q. Can this be scaled beyond the Western Balkans?**
  - A: The Western Balkans is the pilot case. After validation and policy piloting here, the tool can be scaled to other UNIDO regions.
- **Q. How does this relate to the UNIDO Digital Readiness Dashboard (DRD)?**
  - A: The Digital Readiness Dashboard (DRD) was developed by UNIDO Industrial Policy and Research (IPR) and provides a macro-level assessment. Our tool complements this by adding micro-level firm dynamics and ecosystem analysis.
- **Q. What is the Peerally-Santiago framework, and why does it matter here?**
  - A: It is a capability-building framework adapted for digitalization. It shows that firms build capabilities sequentially; they cannot skip foundational stages. This, in turn, determines investment needs.

UNIDO is developing the Tool as a policy advice instrument for the benefit of the WB economies.

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