Predictive Skills Intelligence Methodology for the Space sector

Building Future-Ready Space Innovation through Education-Enterprise Synergies

Space Vantage

Co-funded by the European Union

Co-funded by the European Union (No: 101246589). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

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Introduction

In a context of dynamic, rapidly evolving and complex labour markets, such as the Space market, gathering intelligence on current and emerging skill needs can support better matching of training, education and jobs, which is of significant importance for the European economy. In recent years, better understanding of labour market needs and skills matching have been high on the European and national policy frameworks, driven by both rapid technological advances and global competition.[1,2] Anticipating and building competencies for the future, is essential in rapidly changing labour markets because skills shortages can produce adverse social and economic consequences on development and employment.

Skill needs prediction relies on various methods and tools that summarize labour market information to analyse skill shortages. They are often forward-looking and can be combined to provide a more detailed and multifaceted picture of the labour market. Anticipating skills and competences provides the means to identify future imbalances, brings together key actors in addressing them, and informs the public about the future skills demand and supply.

The proposed Skills Intelligence methodology, moves beyond conventional skills assessment that provide periodic and rapidly outdated snapshots of labour market conditions. Instead, it establishes a dynamic and iterative skills intelligence system capable of monitoring change, detecting early indications of emerging skills demand, anticipating potential shortages, and supporting timely responses by education providers, VET organisations, employers, sector associations, and policymakers.

Design principles and methodological framework

The methodology is guided by several core design principles: It is continuous rather than one-off, combines multiple sources and analytical methods, is specifically adapted to the characteristics of the downstream space sector, incorporates forecasting and foresight methods, uses weak-signal detection and Early Warning Indicators, aligns skills and occupations with European frameworks, and is designed to be useful, simple, modular, transparent, and sustainable beyond the lifetime of the project.

The methodological framework consists of four interconnected phases (***Figure 1***). **Phase 1**, ***Continuous and Multi-Source Data Collection***, establishes the evidence base through desk research, skills needs surveys, structured interviews, workshops, and other stakeholder-engagement methods. **Phase 2**, ***Data Processing, Extraction of Key Information and Insight Creation***, transforms raw data into structured and comparable skills intelligence. This phase includes data-quality checks, identification of skills needs and shortages, classification and clustering of skills, integration and harmonisation of evidence, and mapping to European frameworks. This enables the findings to be translated into occupational profiles, learning outcomes, curricula, qualifications, and training

[1] *The Draghi report: A competitiveness strategy for Europe (Part A), 2024*
[2] *The Draghi report: In-depth analysis and recommendations (Part B), 2024*

interventions. **Phase 3**, ***Analytical Frameworks***, introduces the predictive and anticipatory dimension of the methodology. It combines descriptive and conceptual analysis, horizon scanning, weak-signal detection, impact assessment, Early Warning Indicator development, and the Delphi method. **Phase 4**, ***Validation, Updates and Recommendations***, ensures that the results are reviewed and validated by experts of the space ecosystem. Expert validation helps distinguish robust signals from temporary noise, improve forecasts and indicators, and translate the findings into recommendations for curriculum development, micro-credentials, reskilling and upskilling programmes, workforce planning, and policy action.

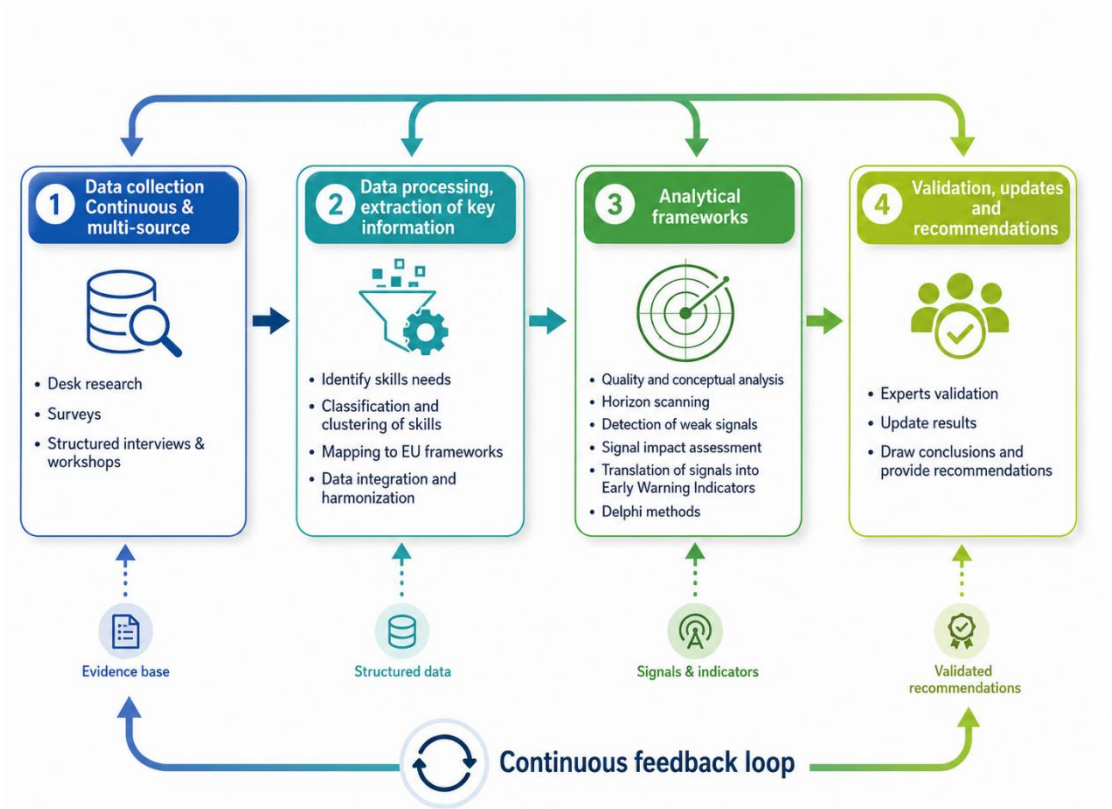

Figure 1: Schematic illustration of the proposed predictive skills intelligence methodology.

Overall, this study provides a practical framework through which the European downstream space ecosystem can move from static skills assessment towards continuous, forward-looking, and action-oriented skills intelligence. Its application will support stronger education–industry alignment, earlier responses to emerging skills gaps, more responsive curricula and training provision, and the development of a resilient and future-ready European space workforce.