

The Career Bridge: mapping job transitions and skill gaps with big data from the web

 **Lightcast**
Professional Services

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Brussels, 1st April 2025

Using data from the web to shape next-generation labour market and skills analysis



Introduction

To support effective VET and upskilling, we compare real-world job transitions with skill-based opportunities from online postings.

We ask: **Are workers moving into roles their skills prepare them for?**

We will present a new **cohesion metric** measures the alignment between observed mobility and skill-based pathways.



Transitions

To what extent do observed career transitions align with those suggested by employer demand and skill similarity?



Careers Bridges

Which occupations function as bridges across the labour market, and which remain isolated due to limited skill overlap or structural barriers?



Policy

What are the practical implications for policymakers?

Where we get data

SOURCES



LABOUR MARKET INFORMATION

18b+ data points from Government Sources



ONLINE PROFILES & RESUMES

1m+ global online profiles and resumes from all over



ONLINE JOB POSTINGS

Over a 3 billions current and historical job postings

COVERAGE



GLOBAL COVERAGE

>160 COUNTRIES



COMPANY INFORMATION

9.4M Company Profiles and 10M Executive Contacts

What are Online Job Postings?

A job posting is a **digital advertisement** published by employers to attract candidates for open positions.

Online Job postings contain detailed text describing required skills, qualifications, and tasks.

Lightcast online job postings

- 285+ million online job postings
- European countries
- from 2019 through February 2025
- continuously updated

Industry	Occupation	Type of employment
Geography	Time	Skills
Job Title	Wage	Experience
Education required or preferred	Certifications	Employer

Online Social profiles

Lightcast's Social Profile data includes hundreds of millions of global individuals' employment and education profiles by company, job title, alma mater, and skill set.

Lightcast collects Social Profile metadata from publicly available profile sources as well as partnerships with resume and profile databases.

Lightcast online job postings

- 125 million individual profiles
- European countries
- updated at February 2025
- Quarterly updated

Industry	Occupation	Gender
Geography	Time	Skills
Job Title	Wage	Experience
Educations	Certifications	Employer

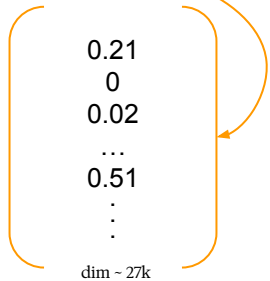
Methodology (1) - Applying AI to compute Career Pathways using job postings data

We modelled occupation similarity using the skill content of millions of job postings. Each occupation was transformed into a vector of skills, weighted by their relevance using the **Revealed Comparative Advantage (RCA)**. Using vector similarity, we ranked occupations by how closely their required skills overlap.

$$rca(o_i, s_l) = \frac{sf(o_i, s_l) / \sum_{j=1}^p sf(o_i, s_j)}{\sum_{k=1}^m sf(o_k, s_l) / \sum_{k=1}^m \sum_{j=1}^p sf(o_k, s_j)}$$

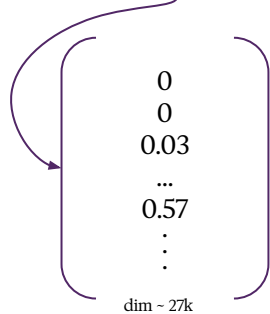
Software Architect

['.net', 'agile methodology', 'git', 'microservices', 'microsoft c#', 'sql', 'software development', 'visual studio', 'devops']



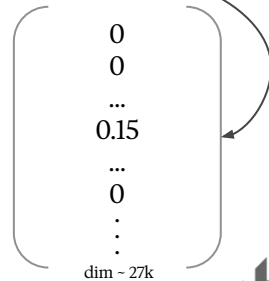
Software Engineer

['.net', 'agile methodology', 'git', 'javascript', 'c++', 'sql', 'software development', 'visual studio', 'linux']



Accountant

['account adjustment', 'accounting', 'ad hoc reporting', 'balance sheet', 'bank reconciliation', 'cost accounting', 'financial reporting', 'spreadsheets']



Cosine Similarity
0.96

Cosine Similarity
0.35



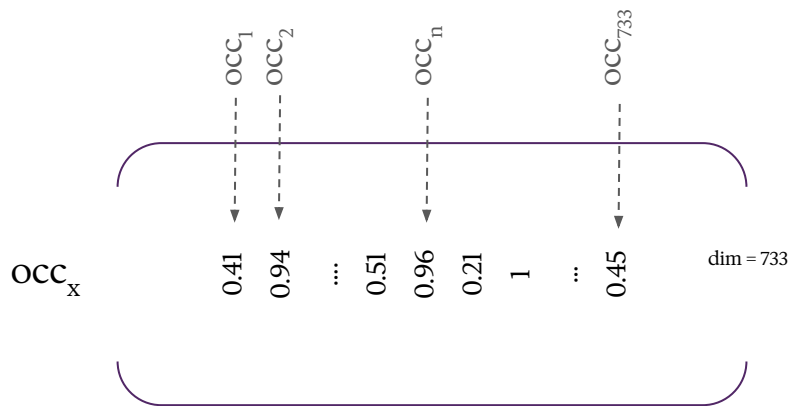
Methodology (1) - Applying AI to compute Career Pathways using job postings data

Occupation (From)	Occupation (To)	Similarity ¹⁰
Data Scientist	Mathematician	99.86%
	Statistician	98.35%
	Chief Information Officer	94.31%
Business / Management Analyst	Business Continuity Planner	100.00%
	Chief Executive Officer	93.96%
	Logistics / Supply Chain Analyst	62.72%
	Program Manager	50.65%

For Data Scientists, the closest roles are Mathematician (99.86%) and Statistician (98.35%), indicating a strong overlap in analytical and modelling skills. Interestingly, even Chief Information Officer scores a high 94.31%, suggesting potential upward mobility into leadership positions with shared technical foundations.

For Business / Management Analysts, the strongest match is Business Continuity Planner (100%), reflecting overlapping competencies in strategic analysis, planning, and risk assessment. Other viable transitions include Chief Executive Officer (93.96%), while roles like Logistics / Supply Chain Analyst (62.72%) and Program Manager (50.65%) suggest broader functional mobility.

Methodology (2) - Leveraging social profiles to compute career Transition Frequency



We reconstructed individual career paths by **chronologically sequencing job roles** from social profiles.

Transitions were ranked and linked to map mobility patterns, retaining only meaningful progressions based on occupational hierarchy defined in the Lightcast taxonomy.

Each occupation was then assigned a vector representing **transition frequencies** to all other roles, allowing us to calculate how often workers move from one occupation to another.

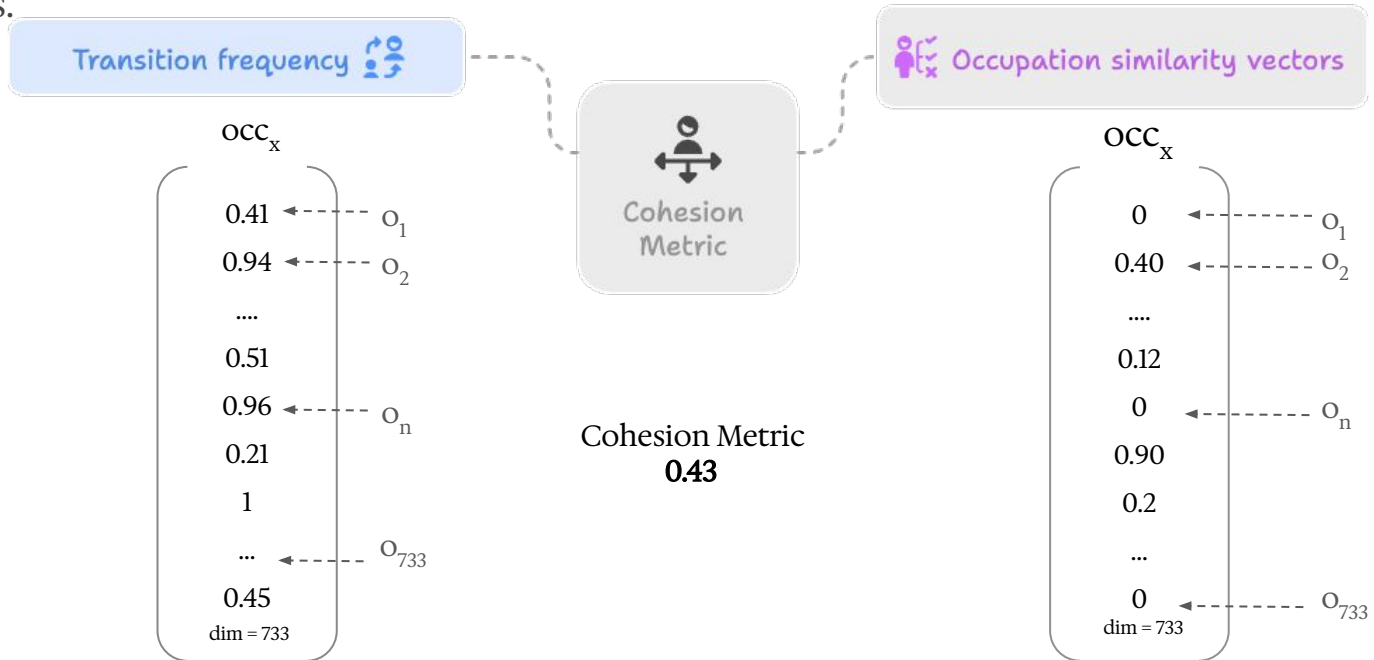
Occupation (From)	Occupation (To)	Transition Frequency
Data Scientist	Research Associate	48.91%
	Chief Executive Officer	6.33%
	Product Manager	5.55%
	Medical Scientist	4.94%
	Natural Science Research Manager	4.51%

Methodology (3) - Cohesion Metric: assessing transition frequency and career pathways

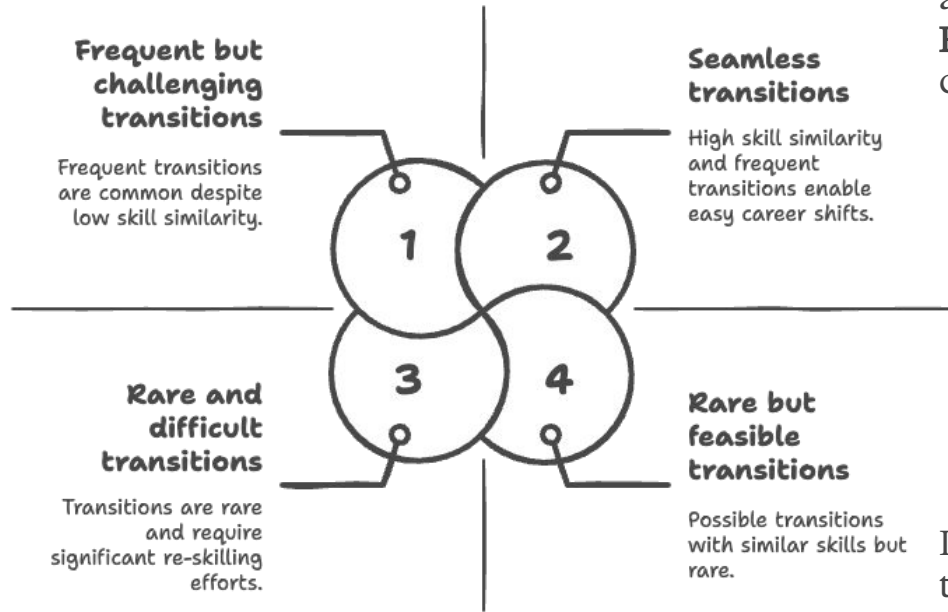
The cohesion metric measures how closely real-world job transitions align with those suggested by skill similarity in job postings.

A high cohesion score means career moves follow employer-demanded skills; a low score indicates transitions driven by other factors (e.g. soft skills or networks or other economic factors).

It helps identify which roles are well-connected and which may require targeted policy or training interventions.



Career transition dynamics quadrant



To understand how workers navigate job changes, and where frictions, mismatches, or hidden opportunities arise, we introduce and apply a **Career Transition Feasibility Matrix**. This quadrant-based framework compares two core dimensions of career transitions:

- **The x-axis represents the number of occupations that are similar to a given role, based on skill similarity computed from job postings.** This shows how many roles are theoretically close and “reachable” in terms of shared skill requirements.
- **The y-axis measures the number of observed transitions from that occupation to others, as derived from worker social profiles.** This captures how many different occupations people in a given role end up in, in the real world.

In other words, the matrix compares the potential for job transitions (based on occupational similarity inferred from required skills) with the actual mobility observed in labour market trajectories.

Career transition dynamics quadrant



AI & Digital
Finance, business & sales
Green
Healthcare



Seamless Transitions (Q2) : Roles like Nurse Practitioner and IT Project Manager show high skill similarity and frequent mobility, well-aligned with employer demand.

Rare & Difficult Transitions (Q3) : Occupations like Water Treatment Specialist face both low similarity and mobility, often structurally isolated and at automation risk.

Frequent but Challenging Transitions (Q1) : Jobs like E-Commerce Analyst rely on soft skills or networks, with high mobility but low skill overlap.

Rare but Feasible Transitions (Q4) : Roles such as Web Developer show strong skill similarity but low observed mobility, highlighting untapped career potential.

Career transition dynamics quadrant - Finance, sales & Business Sector



High transition activity: Most occupations in the sector show frequent career transitions, especially in the upper chart area, indicating broad mobility.

Finance roles well-connected: Roles like Financial Operations Specialist show both high similarity and high cohesion, reflecting many clear, skill-based pathways.

Business roles rely on soft skills: Occupations like Business Development / Sales Manager display frequent transitions despite lower similarity, hinting at the role of tacit factors (e.g., networks, leadership).

Some high-similarity roles lack coherence: Even with many options, roles like CFO and Financial Quantitative Analyst follow less skill-aligned transitions, reducing cohesion.

Career transition dynamics quadrant - AI & Digital occupations



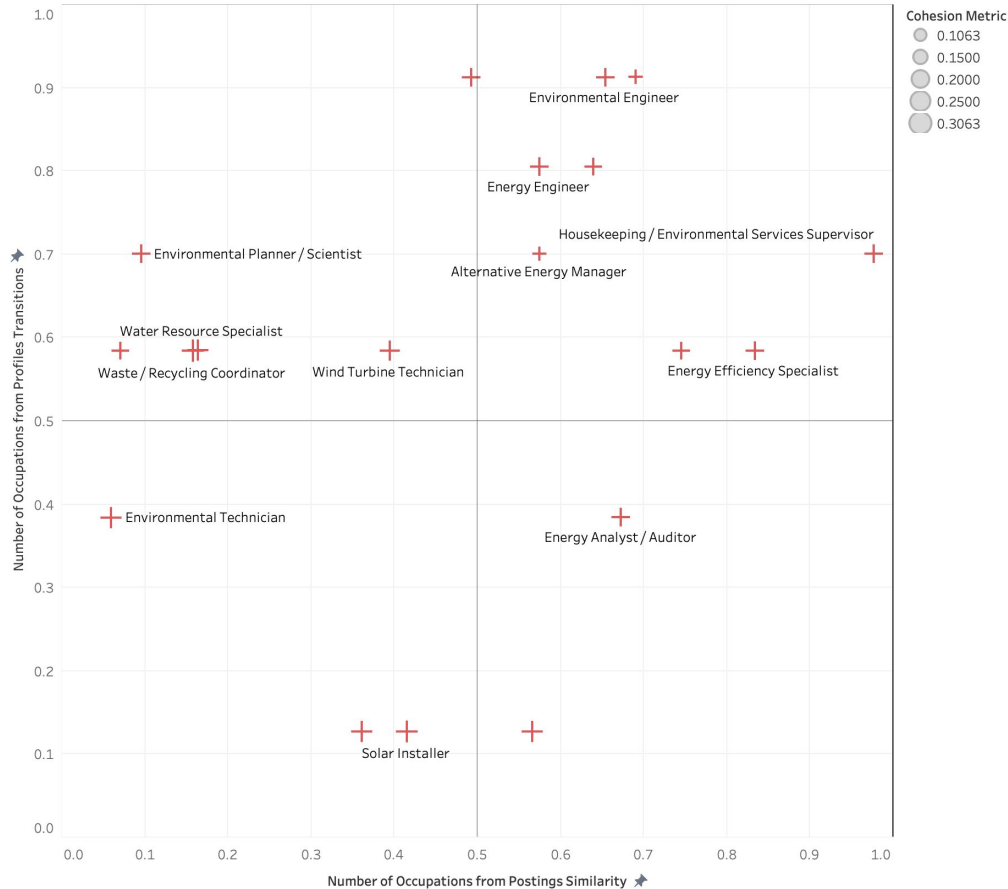
High mobility and skill similarity: Most AI and digital roles cluster in the upper-right quadrant, with many potential pathways and frequent transitions.

Mixed cohesion: Despite strong opportunities, actual transitions don't always align with employer-defined skill structures.

Hidden drivers: Career moves may be influenced by factors beyond job posting skills, like specialisation, experience, or informal learning.

Opportunity to improve pathways: Enhancing cohesion could help workers navigate clearer, skill-aligned transitions in this fast-evolving field.

Career transition dynamics quadrant - Green



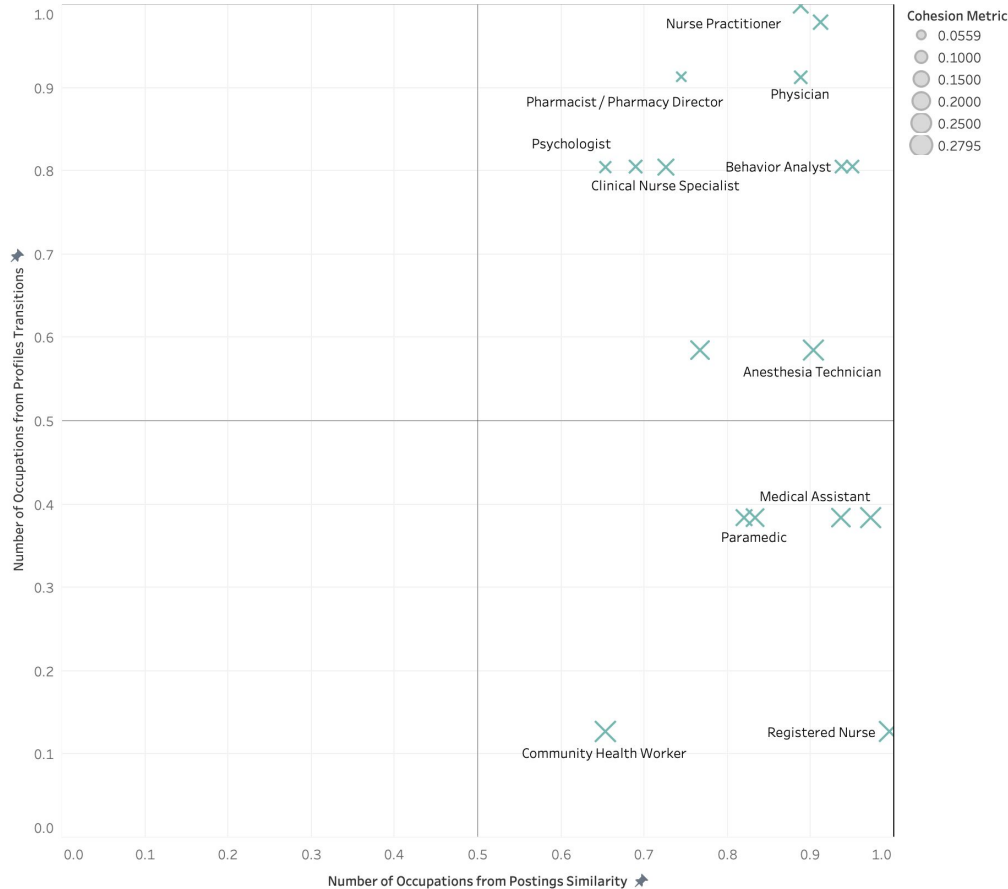
Scattered transitions: Green roles are spread across all four quadrants, indicating mixed mobility patterns and varying skill similarities.

Moderate-to-high cohesion: Most occupations show alignment between transitions and skill-based opportunities.

Isolated roles at risk: Occupations like Solar Installer and Environmental Technician face limited mobility and fewer adjacent roles.

Policy focus: There's a need to strengthen career pathways and unlock transitions for under-connected green jobs.

Career transition dynamics quadrant - Healthcare



High skill similarity: Healthcare roles show strong occupational proximity, with many clear career progression paths.

Cohesive mobility: Workers tend to move in line with skill-based opportunities, reflecting structured and regulated pathways.

Limited dynamism in some roles: Jobs like Medical Assistant and Registered Nurse exhibit low mobility despite having similar skill profiles.

Implication: Policy efforts could focus on unlocking mobility for entrenched roles through upskilling and credential portability.

Conclusion and key findings

- 1) Career opportunities and actual career choices vary by occupation - both in terms of volume and in terms of cohesion
- 2) In terms of volume - AI & digital, and healthcare sector present the most occupations where there are a lot of skill similarities. However, it isn't always the case that workers take all these opportunities
- 3) Business, sales & finance, and green have more of a mixed picture, with some roles not having even many options and presenting rigid pathways
- 4) Feasible career pathways and revealed career pathways do not always match - suggesting a number of other tacit or implicit factors beyond technical skill sets drive workers career mobility
- 5) Overall, operational roles tend to have better cohesion in career pathways, while managerial roles show less cohesion

Thank you!



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