

Path.lu

AI development paths for professionals

Bridging the Gap Between Talent and Opportunity in Luxembourg

A comprehensive AI-powered platform that transforms fragmented employment pathways into seamless, personalized career journeys for migrant professionals and their families. Path.lu addresses Luxembourg's critical skills shortage by unlocking the potential of 6,000+ underutilized migrant professionals.

Technical Documentation for Judging Panel

Luxembourg's Labor Market Reality

A migrant-dependent economy facing critical skills shortages

Key Labor Market Facts (2024-2025)	
Total Workforce	525,000
Foreign-born Residents	259,000 (50%)
Non-national Workers	131,000
Cross-border Workers	230,000
Frontier Workers (% of employees)	47%
Declared Unemployed	18,000


Skills Shortage Crisis	
Unfilled Job Positions	6,000+
Shortage Sectors	IT, Finance, Healthcare, Social Work

50%

of Luxembourg's population is foreign-born, yet the country faces critical skills shortages in key sectors

The Migrant Employment Gap

Migrant spouses and secondary workers have employment rates significantly below their potential, despite being highly qualified

 The Core Insight

6,000 unfilled jobs + highly-skilled underemployed migrants = massive untapped economic potential. The system doesn't give them a clear path from arrival to employment in shortage occupations.

The Core Problem: Five Key Barriers

Why highly-educated migrants remain underemployed

1 No Integrated Assessment

Migrants arrive with diverse qualifications, language levels, and professional backgrounds, but there's no centralized system to map their skills comprehensively.

3 Language Barriers

3 in every 4 formal job vacancies require French; many also require English, German, or combinations thereof. Language proficiency is a critical blocker.

5 Disconnected Institutions

POLICY makers, educators, private training providers and companies operate in silos without integrated data or coordinated pathways.

2 Diploma Recognition Gaps

Foreign qualifications require complex validation processes with unclear timelines, requirements, and recognition pathways.

4 Lack of Career Guidance

Migrants don't know which occupations are in shortage, which training is most valuable, or how long the path to employment takes.

The Reality Gap: System Failure and Outcome

Highly-educated, under-employed or inactive non-EU spouses and migrants are stuck 16-22 p.p. below their potential employment rate because the system doesn't give them a path.

Why This Happens: Systemic Fragmentation

The five barriers don't exist in isolation—they compound each other. A migrant faces **simultaneous obstacles**: no one assesses their full potential, their diplomas aren't recognized, they lack language proficiency, they don't know which jobs are in shortage, and the institutions that could help them don't communicate.

The Outcome: Underutilization and Mismatch

Highly-educated professionals end up in **random job roles just to "fit in,"** often in positions far below their qualifications. A software engineer from Portugal becomes a warehouse worker. A nurse from Brazil takes a cleaning job. A teacher from Romania works in retail. They're employed, but **massively underutilized**.

The Double Impact

This systemic failure creates ***both individual and national consequences:***

Individual Level: Talented professionals are trapped in jobs that don't match their capabilities, leading to underemployment, wage loss (often 30-50% below their potential), and reduced economic contribution.

Path.lu Solution Architecture: Four Core Pillars

1 Intelligent Data intake

Comprehensive profiling of the primary worker, spouse, and adult children (15+)

- Skills & professional history
- Languages & proficiency levels
- Diplomas & credentials (upload + OCR)
- Assessment of transferable skills
- Credential recognition needs

2 Latent Talent Mapping

AI-driven identification of transferable skills and career opportunities

- Skill analysis & transferability
- Cross-reference with 22 shortage occupations
- Visualization of skills gaps
- Language proficiency mapping
- Certification requirements

3 Personalized Development Plans (Mini-PDI)

Automated recommendations for training and career progression

- Training module recommendations
- DLH, universities, MOOCs, language courses
- Prioritized sequencing
- Cost & duration estimates
- Time-to-employability projections

4 Real-Time Progress Tracking & Support

Continuous engagement and system-level insights for improvement

- Chatbot check-ins (WhatsApp/web)
- Deadline & application tracking
- Interview preparation support
- Progress monitoring & adaptation
- Anonymous system-level reporting



Integrated System

All four pillars work together seamlessly, creating a unified pathway from arrival to employment in Luxembourg's shortage occupations.

The platform integrates with DLH, ADEM, and training provider databases for real-time, coordinated support.

Impact Metrics and Success Indicators

Primary KPIs (Year 1-2 Pilot)
Engagement Rate % of newly arrived migrants using Path.lu within 6 months of arrival
Progression Rate % of users completing recommended training pathways
Employment Rate % of users securing employment in shortage occupations within 12-18 months
Wage Impact Average salary progression for users vs. control group
Spouse Participation % of migrant spouses engaged and employed

Secondary Metrics
Training Completion % of recommended modules completed by users
Credential Recognition Timeline Average time from assessment to diploma recognition
Language Proficiency Gains Measurable improvements in language levels (A1→B1, etc.)
Job Satisfaction User satisfaction with employment outcomes and career progression
System Insights Anonymized data on barriers, training gaps, and policy recommendations

Expected Outcomes				
20%	5,000+	70%	60%	€50M+
Migrant Adoption Rate	Active Users/Year	Training Completion	Employment in Shortage Sectors	Annual Economic Contribution

Three Tiers of Expansion: From Luxembourg to Global Scale

Tier 1
Local Pilot
Luxembourg

Timeline
6-12 months

Target Users
5k newly arrived migrants
18k unemployed

Scope
Full DLH/ADEM integration, all
shortage occupations

Tier 2
EU Expansion
Regional Scale

Timeline
Year 3-4

Target Users
50M+ multilingual adults

Scope
Belgium, France, Germany,
Portugal (initial wave)

Tier 3
Global Scale
OECD & Beyond

Timeline
Year 5+

Target Users
281M+ multilingual adults

Scope
OECD countries & multicultural
metropolitan areas

Alignment with Hackathon Criteria (Part 1)

✓ Quality

- ▶ Multidisciplinary team expertise (AI/ML, EdTech, labor economics, UX, regulatory)
- ▶ Proven technology stack using industry-standard tools and frameworks
- ▶ Regulatory alignment with existing Luxembourg employment and education systems
- ▶ User-centric design based on extensive research with migrants and employers

✓ Relevance

- ▶ Directly addresses Luxembourg's skills shortage crisis (6,000 unfilled positions)
- ▶ Solves the spouse employment gap (16-22 p.p. penalty despite qualifications)
- ▶ Aligns with EU inclusion and employment goals (Inclusion in Education and Training theme)
- ▶ Timely: Immigration and skills shortages are critical policy priorities

✓ Originality

- ▶ Unique family-centric, integrated pathway system (not just job matching or training)
- ▶ AI-driven skill transferability engine identifying hidden talents and cross-sector opportunities
- ▶ Systemic integration bridging fragmented DLH, ADEM, and training provider systems
- ▶ Measurable belonging & opportunity quantifying economic integration impact

Alignment with Hackathon Criteria (Part 2)

✓ Feasibility

- ▶ Standard technology stack with no novel AI or experimental approaches required
- ▶ Existing data sources already available (DLH, ADEM, Statec databases)
- ▶ No regulatory barriers: operates as guidance tool, not credential issuer
- ▶ Clear MVP path with pilot deployment in Year 1-2, measurable outcomes

✓ Sustainability

- ▶ Multiple revenue streams (B2G, B2B, B2C, data insights)
- ▶ Long-term economic impact: reduces skills shortage, increases tax revenue, improves social cohesion
- ▶ Scalable model: 90% universal platform, 10% local adaptation enables rapid expansion
- ▶ Institutional partnerships ensure durability and deep integration with government systems

✓ Transferability

- ▶ Replicable across 10+ OECD countries with similar labor market challenges
- ▶ Proven localization model: 90% universal platform, 10% local adaptation
- ▶ Scalable to 5-10M users across EU (44.7M foreign-born) and globally (281M multilingual)
- ▶ Policy-relevant insights support evidence-based immigration and employment policy

🎯 Comprehensive Alignment

Path.lu demonstrates strong alignment across all six evaluation criteria, combining technical feasibility, market relevance, innovative design, and sustainable business model. The solution is ready for pilot deployment in Luxembourg with clear pathways to EU and global expansion.

Timeline to Impact and Vision Statement



Timeline to Measurable Impact

- Month 6** **MVP Ready** – Functional platform with DLH/ADEM integration, pilot recruitment begins
- Month 12** **1,000+ Active Users** – Initial engagement metrics, language proficiency gains measurable
- Month 18** **Employment Outcomes** – 60% of users in employment, wage impact measurable, spouse participation data available
- Month 24** **Full-Scale Deployment** – 5,000+ users, EU expansion planning, policy recommendations published



Our Vision

Path.lu transforms how Luxembourg integrates migrant talent. By creating a seamless, AI-powered pathway from arrival to employment in shortage occupations, we unlock billions in economic value, reduce skills shortages, and ensure that every migrant—regardless of background—can contribute their full potential to Luxembourg's future.

Technical Implementation and Feasibility

Technical Implementation and Feasibility			
<div>Technology Stack</div> <div>AI Engine</div> <div>Large Language Models (LLM) for skill assessment, matching, and recommendations</div> <div>Data Integration</div> <div>APIs with DLH, ADEM, and training provider databases</div> <div>Frontend</div> <div>Web and mobile-responsive interface with chatbot integration</div> <div>Backend</div> <div>Secure cloud infrastructure with GDPR compliance (EU-recognized)</div> <div>Data Security</div> <div>Encryption, anonymization, and role-based access controls</div>	<div>Data Sources (Available)</div> <div>ADEM Database</div> <div>Shortage occupations list, job market data, training information</div> <div>DLH Records</div> <div>Training programs, certification requirements, language standards</div> <div>Credential Recognition</div> <div>Existing frameworks for foreign diploma validation</div> <div>Labor Market Data</div> <div>Statec employment trends and salary benchmarks</div>	<div>Integration Points</div> <div>DLH Portal</div> <div>Embed Path.lu as module education/training portals</div> <div>ADEM Systems</div> <div>Link to job matching and employment tracking</div> <div>Training Providers</div> <div>API connections for real-time course availability and enrollment</div> <div>LMS Integration</div> <div>Connection with Moodle and existing educational platforms</div>	<div>✓ Regulatory Alignment & Feasibility</div> <div>No Regulatory Barriers</div> <div>GDPR Compliant</div> <div>Existing Frameworks</div> <div>Proven Technologies</div>

Thank you

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