

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 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.

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**.

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%

Migrant Adoption Rate

5,000+

Active Users/Year

70%

Training Completion

60%

Employment in Shortage Sectors

€50M+

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

Technology Stack

AI Engine

Large Language Models (LLM) for skill matching, and personalized recommendations

Data Integration

APIs with DLH, ADEM, and training provider databases

Frontend

Web and mobile-responsive interface for the App integration

Backend

Secure cloud infrastructure with GDPR compliance (EU-required)

Data Security

Encryption, anonymization, and role-based access controls

Data Sources (Available)

ADEM Database

Shortage occupations list, job market information

DLH Records

Training programs, certification requirements, language standards

Credential Recognition

Existing frameworks for foreign diploma validation

Labor Market Data

Statec employment trends and salary benchmarks

Integration Points

DLH Portal

Embed Path.lu as module in DLH training portals

ADEM Systems

Link to job matching and employment tracking

Training Providers

API connections for real-time course availability and enrollment

LMS Integration

Connection with Moodle and existing institutional LMS

✓ Regulatory Alignment & Feasibility

No Regulatory Barriers

GDPR Compliant

Existing Frameworks

Proven Technologies

Thank you

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