



blockchain skills for Europe

Forecasting the Evolution of Blockchain Skills Demand and Supply

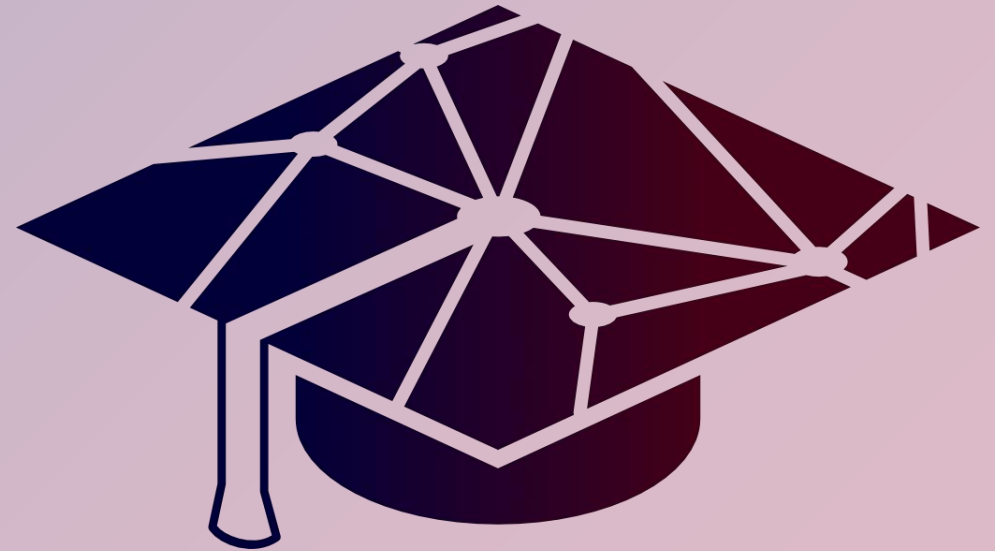
YPEPTH

ATHENS, 07/04/2022



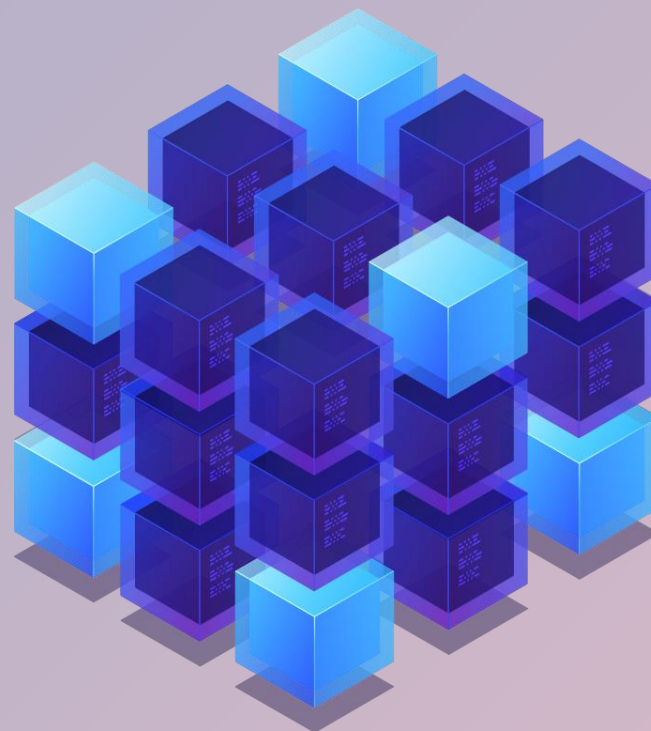
About the project

The core mission of the CHAISE project is to **tackle blockchain skill shortages** & to respond to the current and future **skills needs of the European Blockchain workforce** by developing a **strategic approach** on blockchain skills development for Europe and **delivering future-proof training solutions**



The CHAISE partners





Introduction

Introduction

○Aims:

To set up a collaborative model and method for the anticipation of future skill demand and supply

- **acting as an early warning information mechanism to mitigate possible labour market imbalances, and**
- **supporting E&T and labour market actors in making evidence based decisions**

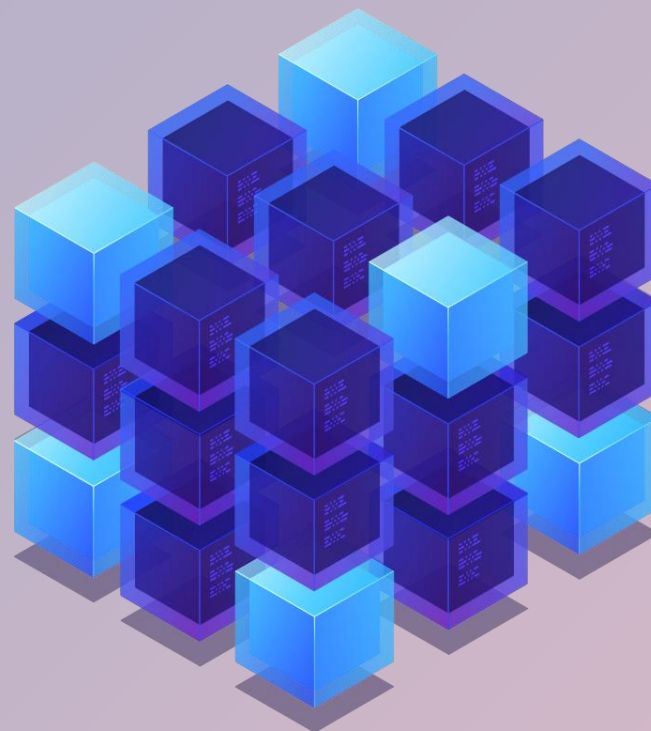
Introduction

○ Objectives:

- 1. Model Blockchain demand and supply**
- 2. Collect a sufficient volume of Blockchain labour market data to perform the time series analysis**
- 3. Engage external experts in the development of scenarios and the verification of forecasting results**
- 4. Develop annual skills forecasts for the European Blockchain Sector**

Introduction

- Performance Indicators
 - ❑ 14 experts from different EU countries **participating as members** in the Expert Advisory Board
 - ❑ 20 sectoral stakeholders, experts and E&T providers engaged in **consultation sessions** regarding global & sector-specific trends (yearly)
 - ❑ Forecasting **results validated** by 500 stakeholders from at least 12 EU countries on an annual basis
 - ❑ 3 annual **Blockchain skills forecasts**



Developing the CHAISE Forecasting Model

Blockchain Skills Demand

- To link demand for blockchain skills to an **occupational framework** suitable for forecasting purposes we identify occupations with high blockchain content
- To achieve this we scrape approximately 6,500 Blockchain related jobs from popular jobs advertisements sites (e.g. LinkedIn) and map them to specific occupational categories International Standard Classification of Occupations (ISCO) ...where Blockchain skills are a dominant feature
- We find that the following five ISCO categories contain the majority (85%) of Blockchain employment:
 - Software developers, Database and network professionals, ICT Service managers, Business services admin managers, Legal professionals

Forecasting Blockchain Skills Demand

- Once we have identified the relevant blockchain occupations, the demand for blockchain skills can then be forecasted using standard occupational forecasting approaches.
- To forecast Blockchain skills demand we utilise CEDEFOP (Ευρωπαϊκό Κέντρο για την Ανάπτυξη της Επαγγελματικής Κατάρτισης) occupational and employment forecasts
- CEDEFOP skills forecasts incorporate: Eurostat population forecast; Short-term macroeconomic forecast produced by DG ECFIN (Economic and Financial Affairs - European Commission) Future trends in employment by sector of economic activity/occupational group
- We also incorporate employment outcomes at a national level by utilising EU-LFS (European Union Labour Force Survey - Access to microdata ...) improve the accuracy of our forecasting results

Forecasting Blockchain Skills Supply

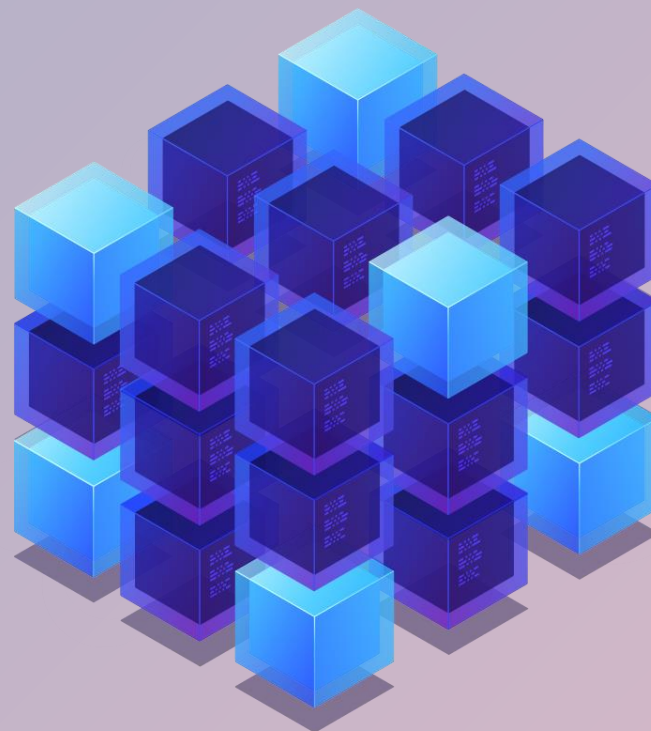
- To forecast Blockchain skills supply we aim to utilise graduate information from Blockchain specific higher education courses across Europe
 - However, such information is currently unavailable
- Therefore, we estimate the proportion of Blockchain graduates from total graduates in blockchain-related fields of study, such as Information Communication Technology (ICT)

Forecasting Blockchain Skills Supply

- To forecast Blockchain skills supply we initially forecast ICT graduates from 2020 to 2026 for each European member state using linear trends sourced from 2015 to 2019 Eurostat data and information provided by CHAISE consortium.
- CHAISE partner supplied estimates of Blockchain-specific graduates enable us to estimate the share of total ICT graduates that graduated from Blockchain specific courses.
- We find that on average 1.4% of total ICT graduates in Europe come from Blockchain-specific courses.

Forecasting Methodology

- The forecasting methodology for blockchain skills supply and demand is fully dynamic
- When the process is regenerated on annual basis, changes in occupation categories and predictions will allow us to capture changes over time
- Also, changes to data gathering techniques and graduate information can be considered for the next forecasting period



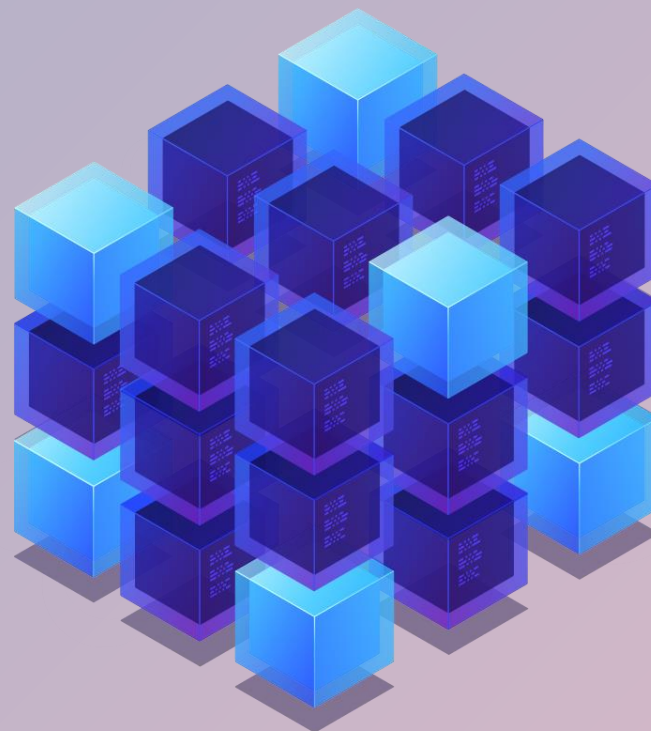
Blockchain Skills Intelligence Gathering

Intelligence Gathering

- Our forecasts of Blockchain skills demand and supply are accompanied by detailed examination of current and future Blockchain sectoral development trend and training and education provision
- 22 Education & Training providers and educational authorities are interviewed to discuss trends in training provision, student's enrolment, and qualifications, as well as changes in VET & Tertiary systems
- 5 organisations in the Blockchain sector provide insights on sectoral development trends, market characteristics and opportunities

Intelligence Gathering

- 500 Blockchain stakeholders are currently surveyed to validate our forecasting results and provide feedback on our approach
- Yearly evidence on Blockchain relevant online job vacancies is collected to detect and analyse labour market developments, changes in workplace tasks that are in demand, tasks likely to disappear, and future knowledge and skills requirements in the Blockchain sector.
- These insights are used to improve the forecasting model and subsequent results



Forecasting Results

Forecasting Blockchain Skills Demand

Forecasted Blockchain Demand by Blockchain-Relevant ISCO occupations, 2021-2026												
	Software and Applications Developers and Analysts (ISCO 251)		Database and Network Professionals (ISCO 252)		Information and Communications Technology Service Managers (ISCO 133)		Business Services and Administration Managers (ISCO 121)		Legal Professionals (ISCO 261)		Other ISCO Categories	Total Forecasted Additional Blockchain Jobs 2021-2026
Country	Total Demand	Blockchain Demand	Total Demand	Blockchain Demand	Total Demand	Blockchain Demand	Total Demand	Blockchain Demand	Total Demand	Blockchain Demand	Blockchain Demand	
Total	197,177	10,235	39,297	1,655	19,373	1,427	125,090	5,928	134,398	2,042	3,309	24,595

Note: 23 EU countries examined. Appropriate EU-LFS Data missing from Bulgaria, Slovenia, Malta and Poland

Forecasting Blockchain Skills Supply

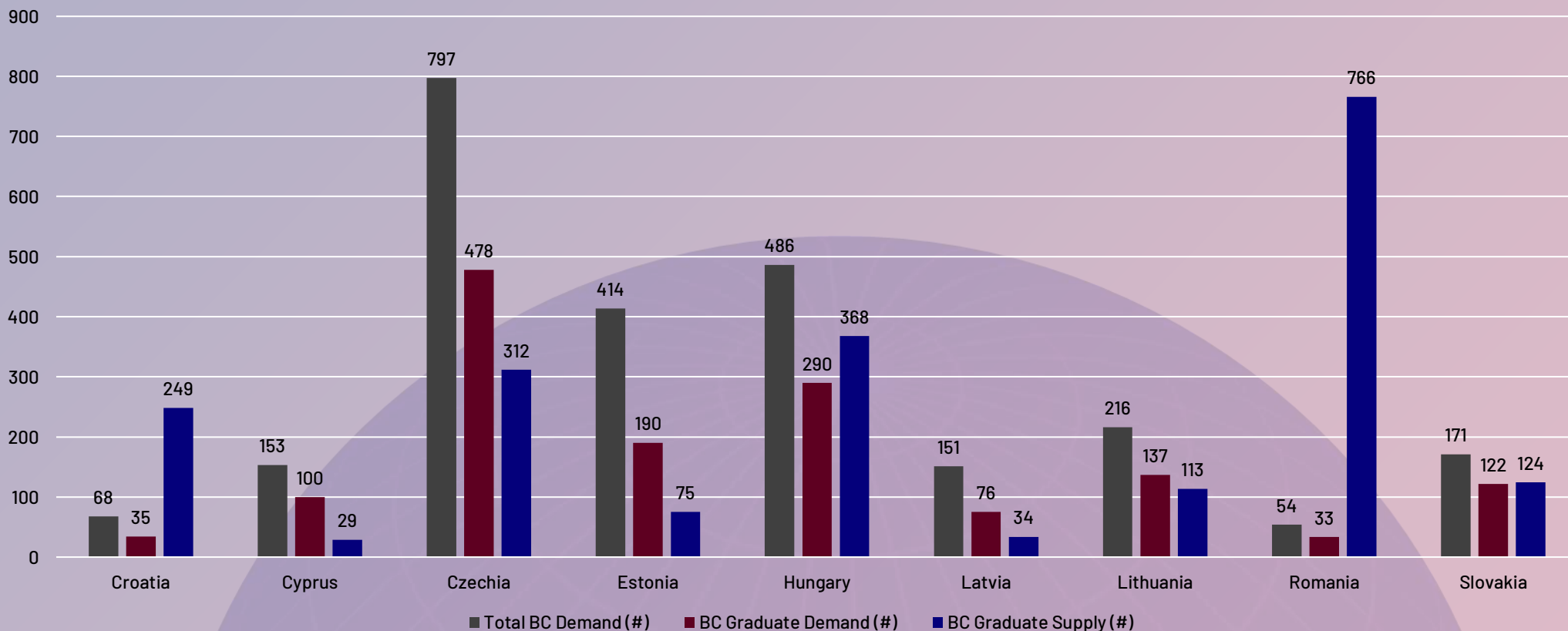
Forecasted ICT and Blockchain Graduates by Country, 2020-2026									
Country	2020	2021	2022	2023	2024	2025	2026	Total Forecasted ICT Graduates: 2020 - 2026	Forecasted Blockchain Graduate Supply
EU Total	141,939	147,918	153,960	160,003	166,045	172,087	178,129	983,372	14,161

Forecasting Blockchain Skills Supply and Demand: Comparison

Forecast Summary for Demand and Supply, 2020-2026					
Country	Total Blockchain Demand (#)	Blockchain Graduate Demand (%)	Blockchain Graduate Demand (#)	Total ICT Graduate Supply	Blockchain Graduate Supply
EU Total	24,593	48.70%	11,977	983,374	14,161

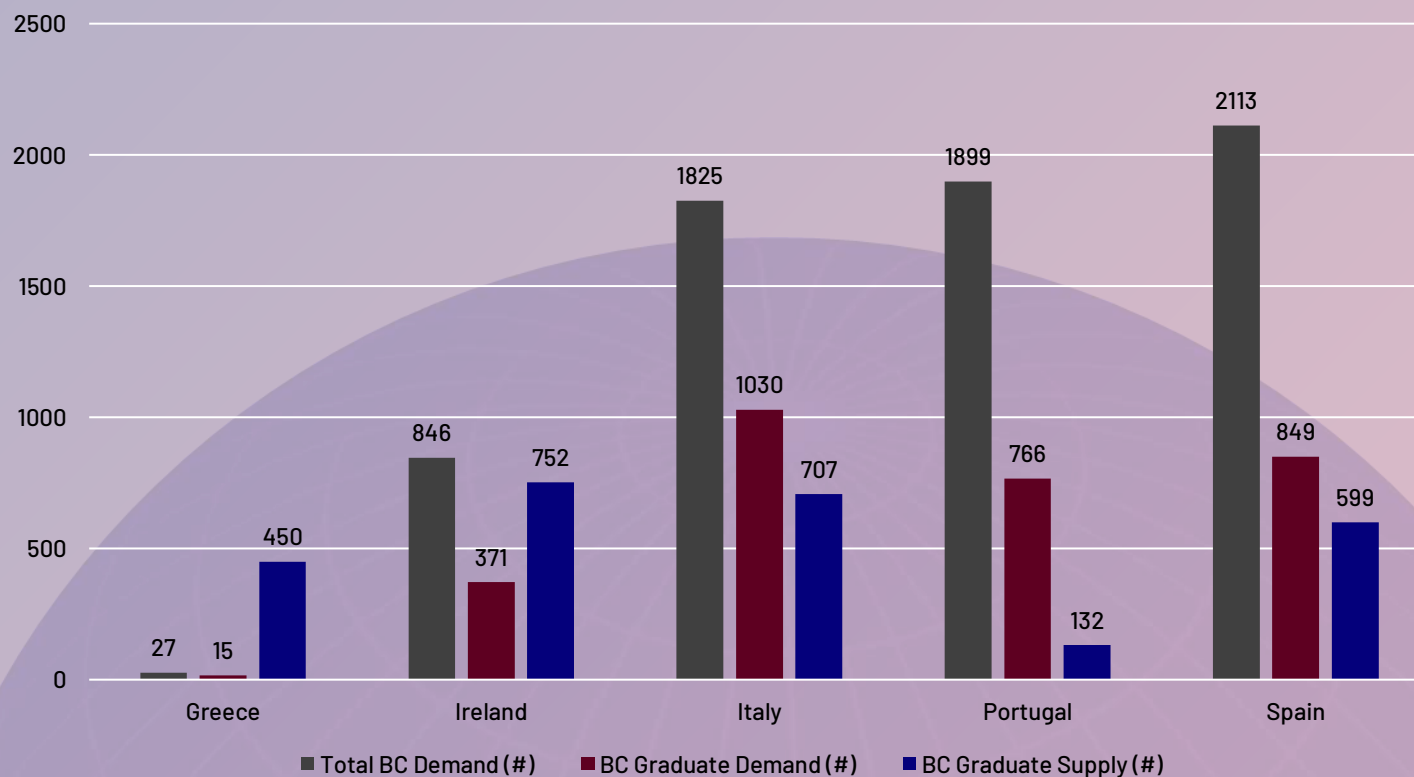
Forecasting Blockchain Skills Supply and Demand: Comparison

Blockchain Skills Demand and Supply Forecasts 2021-2026, Eastern EU Countries



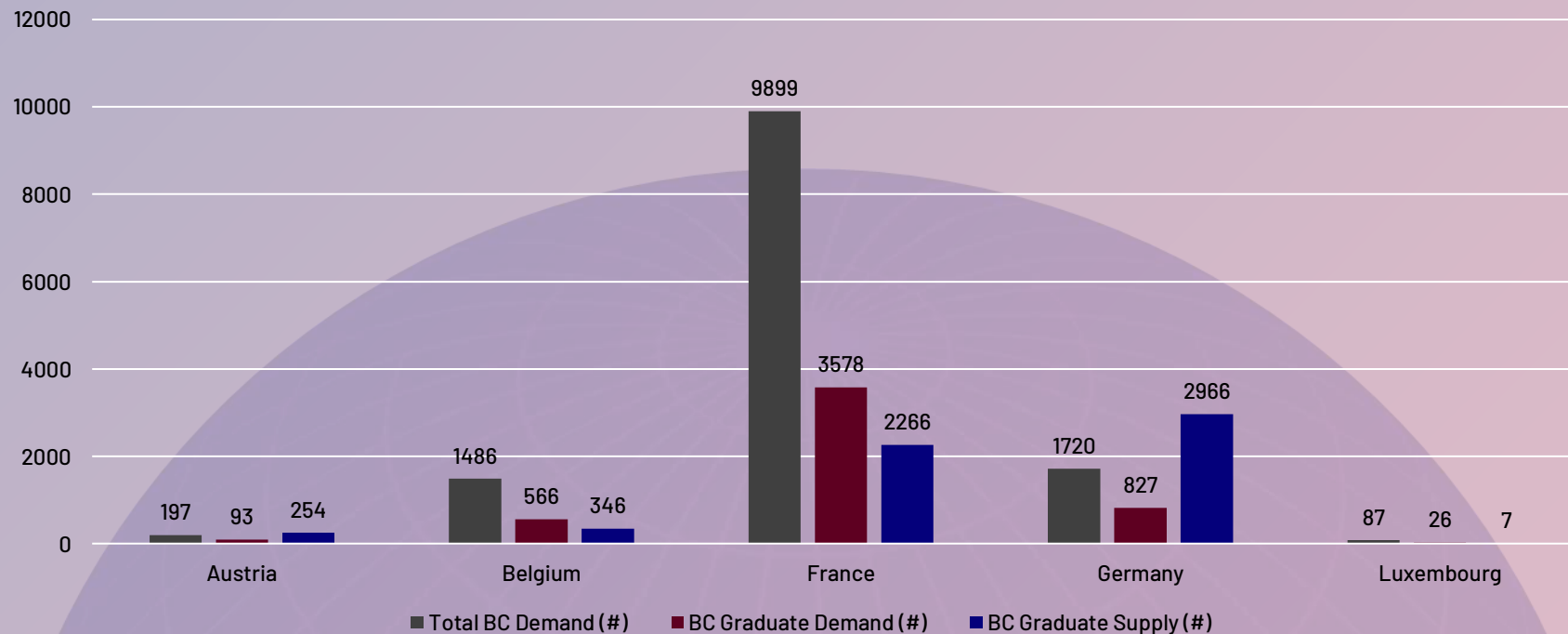
Forecasting Blockchain Skills Supply and Demand: Comparison

Blockchain Skills Demand and Supply Forecasts 2021-2026, Peripheral EU Countries



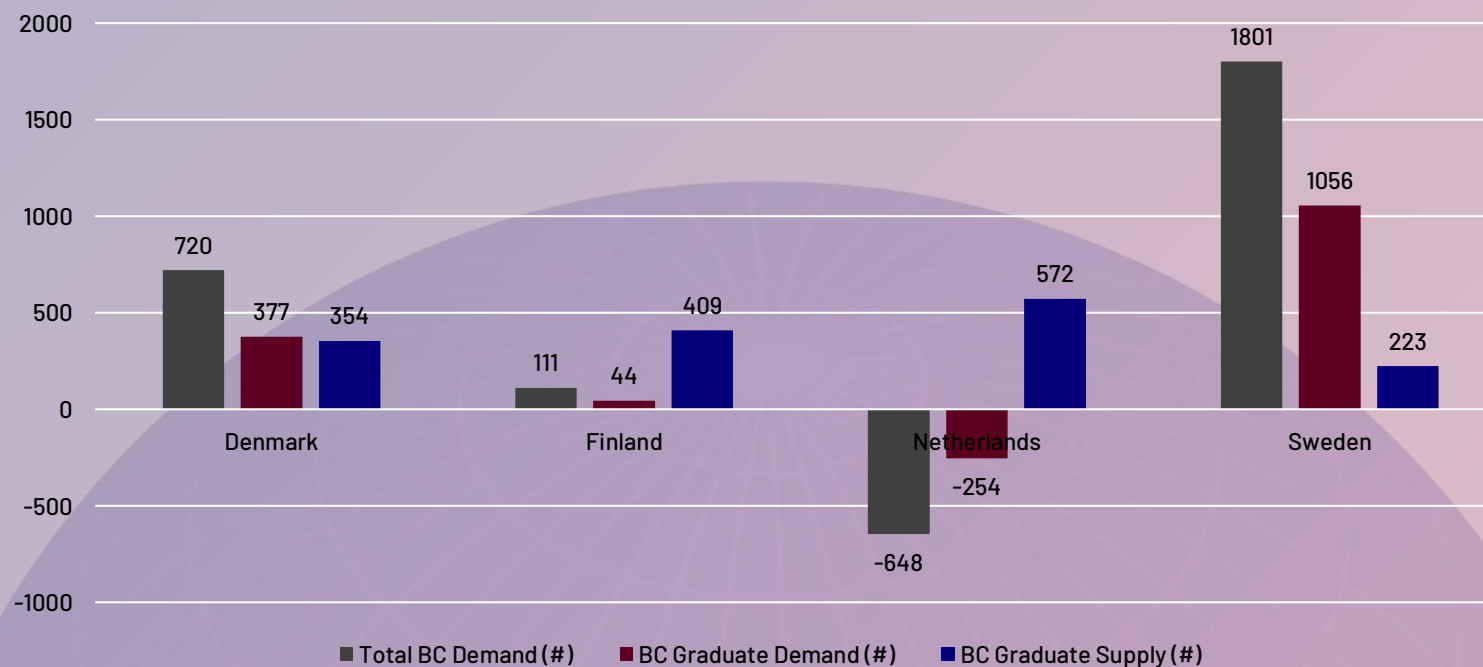
Forecasting Blockchain Skills Supply and Demand: Comparison

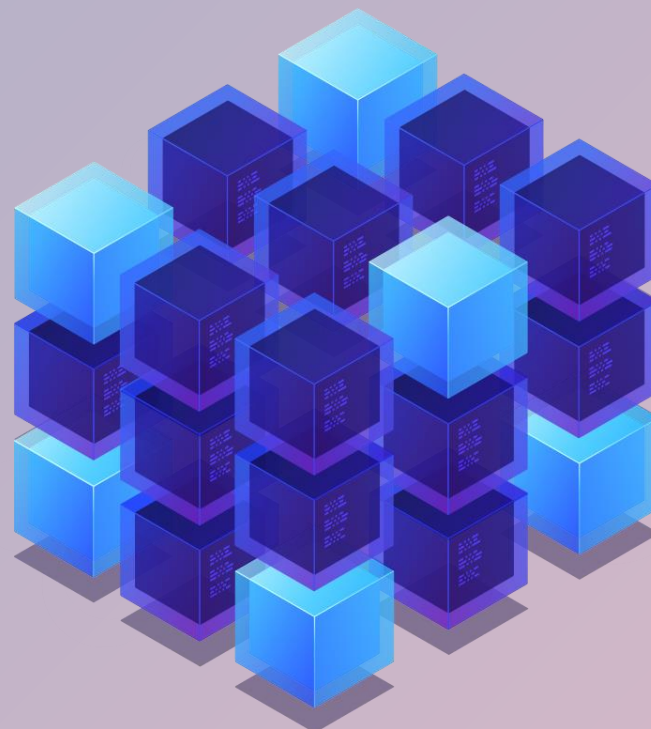
Blockchain Skills Demand and Supply Forecasts 2021-2026,
Central EU Countries



Forecasting Blockchain Skills Supply and Demand: Comparison

Blockchain Skills Demand and Supply Forecasts 2021-2026, Northern EU Countries





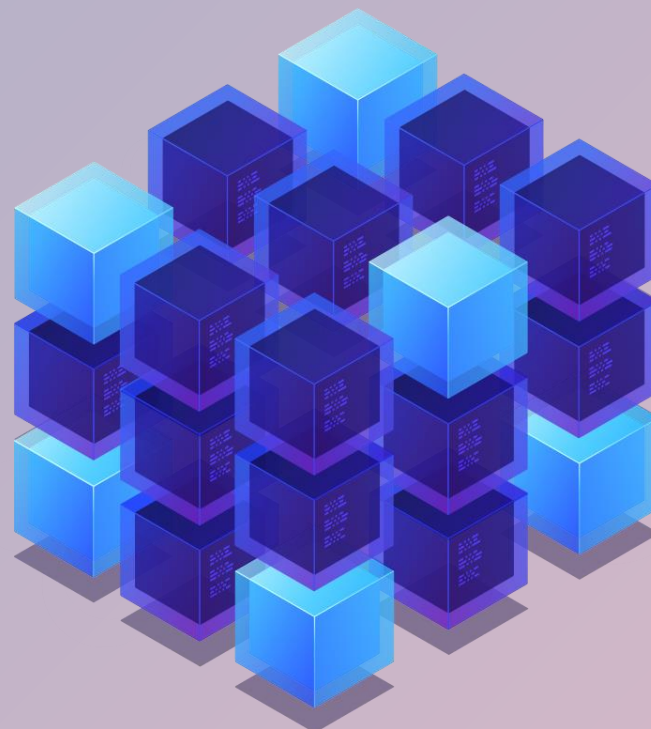
Intelligence Gathering Results (Labour Market)

Analysis of The Blockchain Labour Market

- The ICT sector is found to be the larger employer for BC professionals, accounting for over half of all job advertisements. Other Blockchain intensive industries are financial services and gaming.
- Over a third of jobs appear to be open to new, or inexperienced, labour market entrants with either no, or between 0-3 years of experience.
- About 60% of cases, the employer/recruiter did not specify a minimum educational requirement or stated that no formal degree was required.

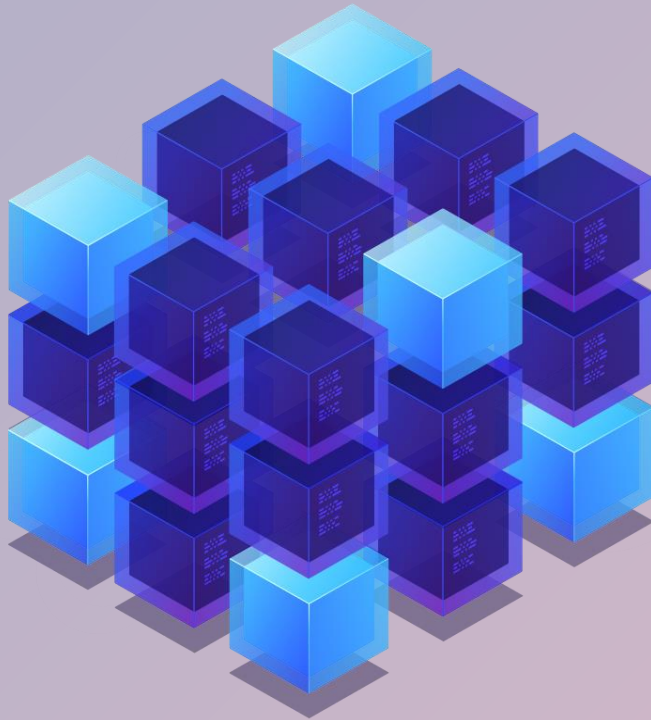
Analysis of The Blockchain Labour Market

- The technical skills mostly mentioned in Blockchain related online job ads are "Coding", "Blockchain Solutions Design", and "Decentralised Application Development".
- The business skills most frequently mentioned in Blockchain related online job ads are "Use Cases development", "Product Management" and "Product Development".
- The most popular transversal skills requested by employers are "cooperation", "self-determination and autonomy", and "communication".
- Employers are looking for a combination of technical and non-technical skills in the Blockchain workforce.

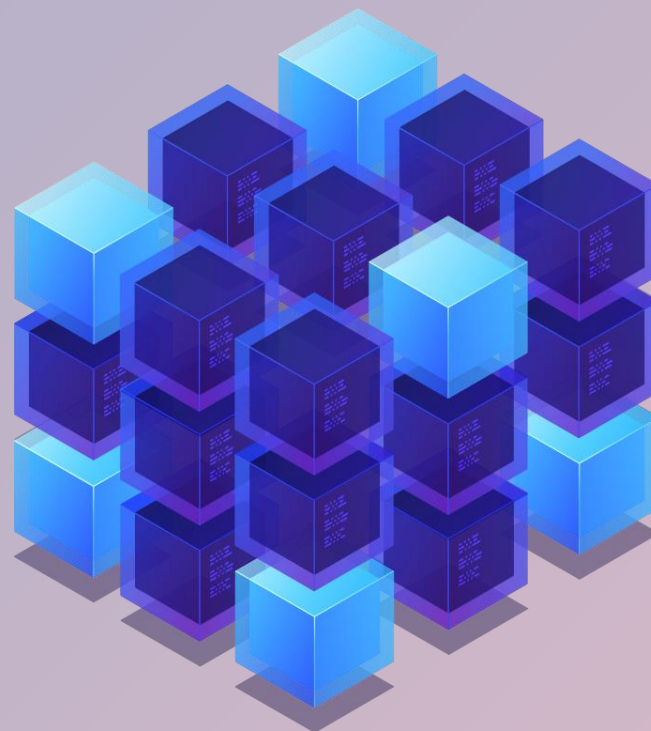


Intelligence Gathering Results (Sectoral Developments)

Sectoral Development Trends



- Blockchain technology is used and growing in almost every EU country.
- Regulation can accelerate adaptation of blockchain technology.
- Strong European Blockchain ecosystem continues to bring together all stakeholders.
- The main challenges for the sector include lack of standardisation, privacy and security risks, crime, and misconceptions about the technology



Intelligence Gathering Results

(Education & Training Provision)

Trends in Education and Training Provision

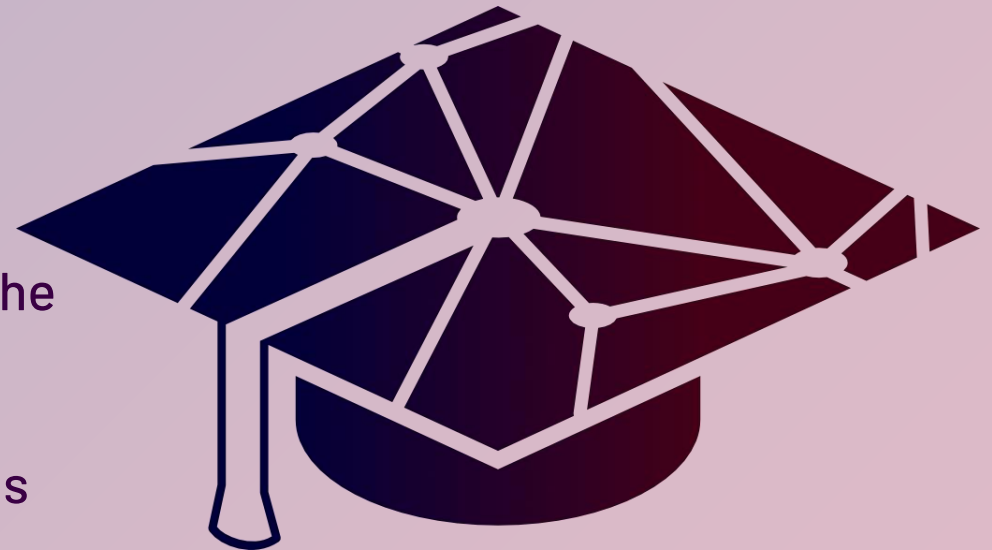
○ Interviewee Profiles

Occupation of interviewees	Freq.
Professor / lecturer / doctoral	12
Head of department / study program	4
Team Lead	1
Researcher	4
Director	1
Other	0
Total	22



Trends in Education and Training Provision

- **Key findings:**
- Growing demand for Blockchain skills from educators and the jobs market
- Seminars and modules in Blockchain technology are offered to meet this demand.
- There are fast and noticeable changes happening in the Blockchain and curriculums need to stay up to date
- Teaching needs to focus technical Blockchain skills as well as business application aspects
- It is important to educate not only developers of Blockchain technology but also users of this technology





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