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ADVANCED DIGITAL SKILLS

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Advanced Digital Skills: Demand Mapping Challenges

LeADS Consortium

20th November 2023

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Agenda

- 16:00-16:10 Introduction to LeADS (Brendan Rowan)
- 16:10-16:30 Demand Assessment Methodology & Outcomes (Leonardo Freitas)
- 16:30-16:40 Q&A
- 16:40-16:45 Closing Statements

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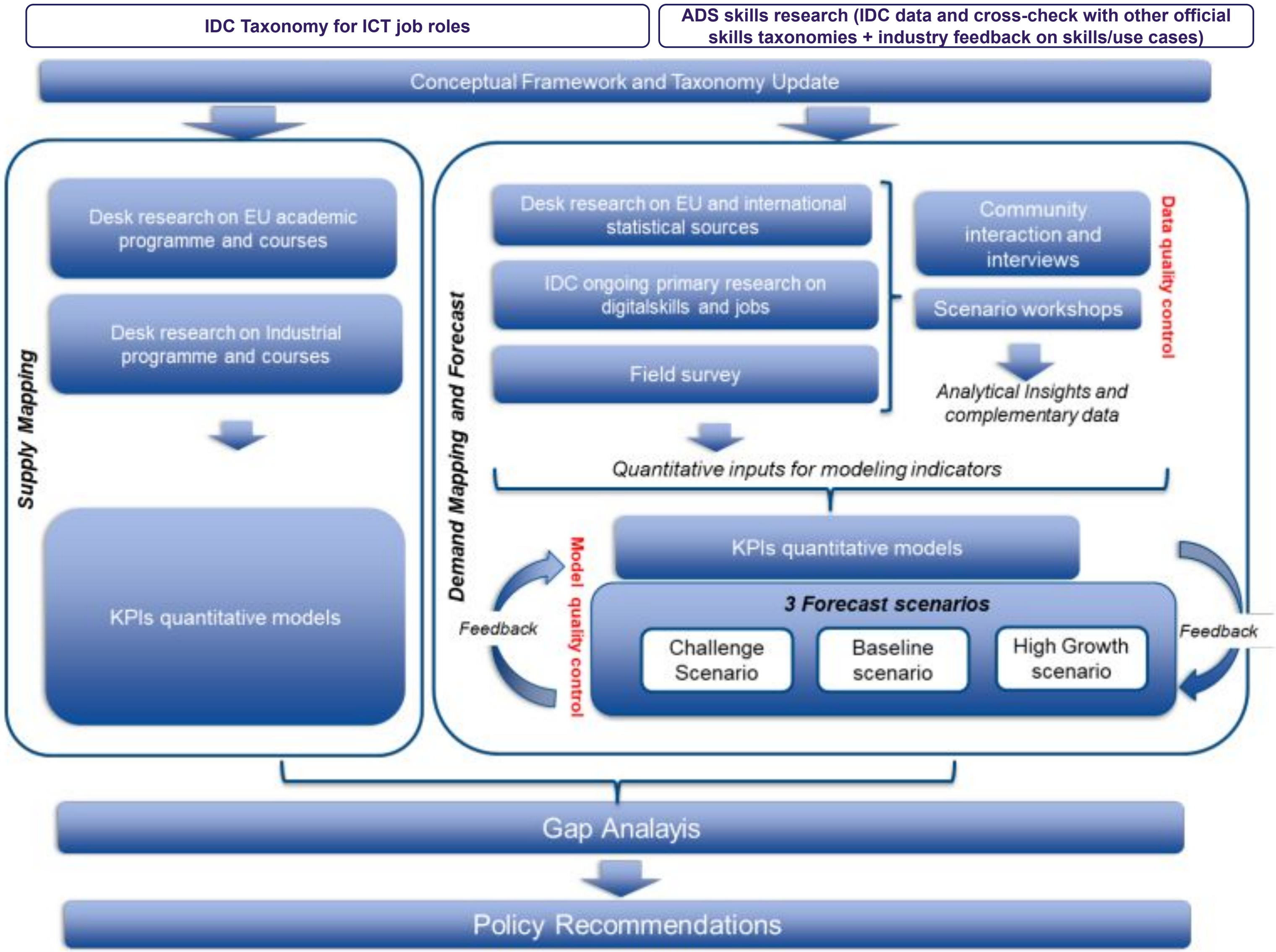
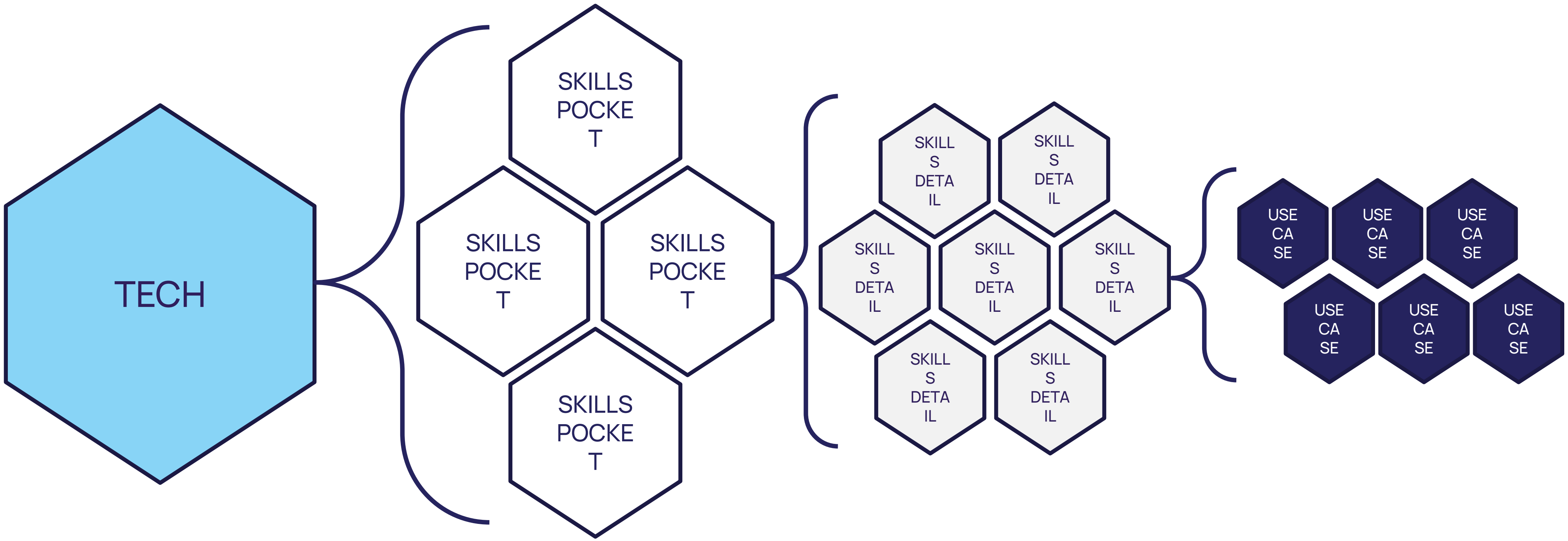
Methodology

- **IDC data** - Different datasets from IDC (proprietary data) on expenditure levels by use case for technology areas, job role forecasting by ICT occupation and
- **Desk research on EU and international sources** such as Eurostat, OCDE and publicly available company statistics to understand the key trends of tech adoption and skills demand in the continent.
- **LeADS survey** with over 800 IT/HR professionals and decisionmakers to feed the demand and forecast assessment model (results due on 21st April).
- **Expert Feedback** through workshops and roundtables to confirm trends, perform data quality controls and define key scenarios for final analysis.



DEMAND MAPPING FRAMEWORK



6	30	80	150
Tech Areas	Pockets	Details	Use Cases

Key components – Selection Criteria

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Skills Groups/Pockets

- **Need for consensus** so it can be cross-checked and referenced to represent real tasks in the industry
- **Usability –** Needs to be generic enough to match data collection of WP2 and detailed enough to be specific and measurable
- **Ability for further depth and variety** so the different skills groupings/details can be re-grouped depending on application purposes for different industries
- **Technology driven** The skills identified are all technology related (hard skills) and qualify as advanced (difficult to develop, and where the assumption is that the gap between demand and supply is the largest, and where thus research and mitigation activities are the most important).

Jobs Roles

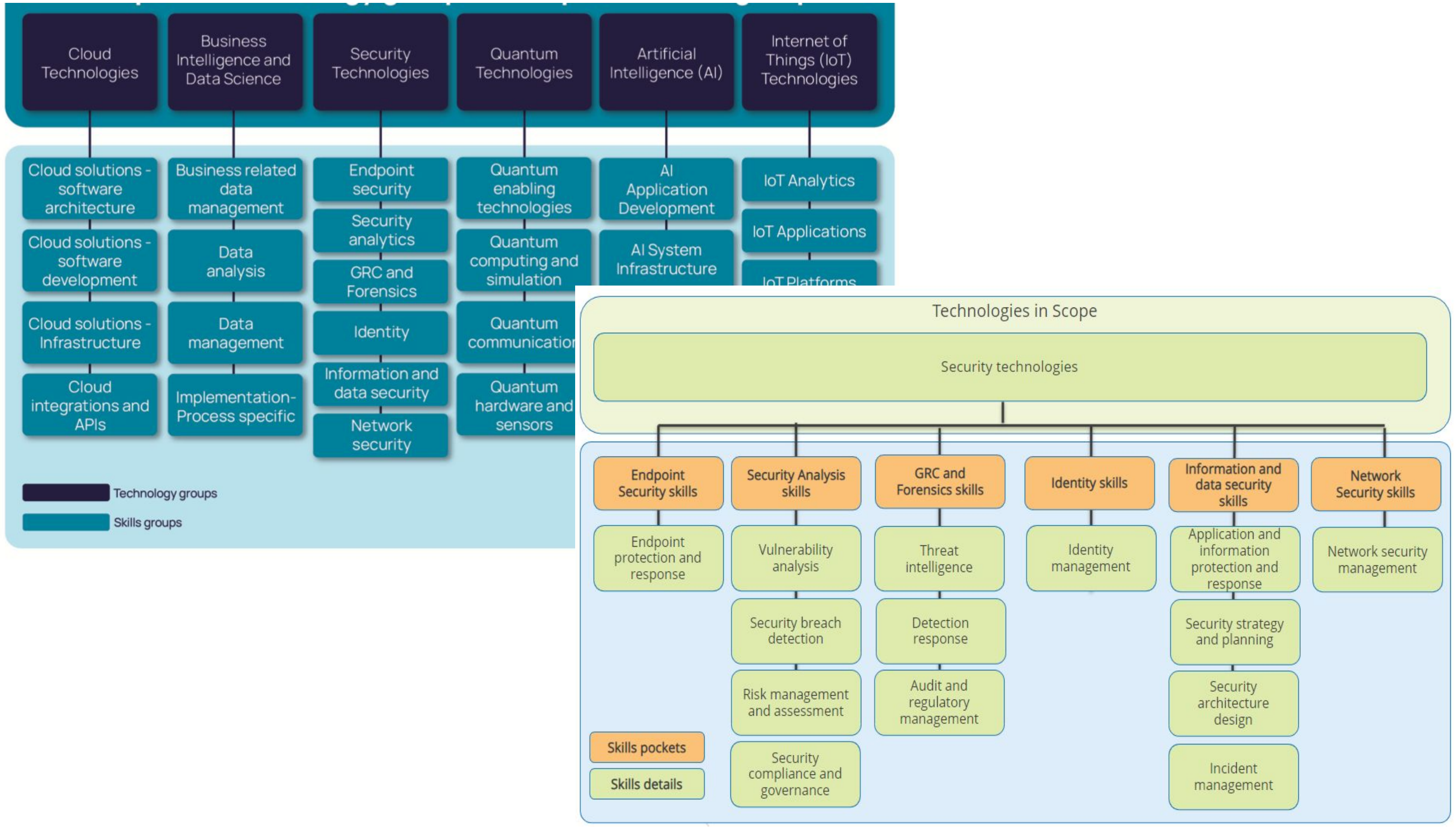
- **Describes the function, objective, and skills required to perform a specific job**. It defines the process, including activities and job results, objective and authority, and relationship with others in task interdependency and communication.
- The LeADS base layer of job roles has helped us to **relate job roles that are used in industry with the associated skills**, therefore providing a **link for the quantification** of the demand for Advanced Digital Skills.

Defining scope - Skills

- The LeADS project currently covers 6 technology areas, 30 different skills pockets and over 80 skills details.
- The layered coverage of skills for the LeADS framework enables the project to have a more detailed quantitative approach by linking spend trackers and use cases directly related to these capabilities (using IDC's proprietary data).
- The need for different levels of coverage was also necessary so WP1 efforts can better align with data collection conducted on WP2 (supply of ADS skills) for the GAP analysis.

Layered approach for ADS skills - the three levels (Example for Cybersecurity)

1- Technology areas
2- Skills pockets
3- Skills details



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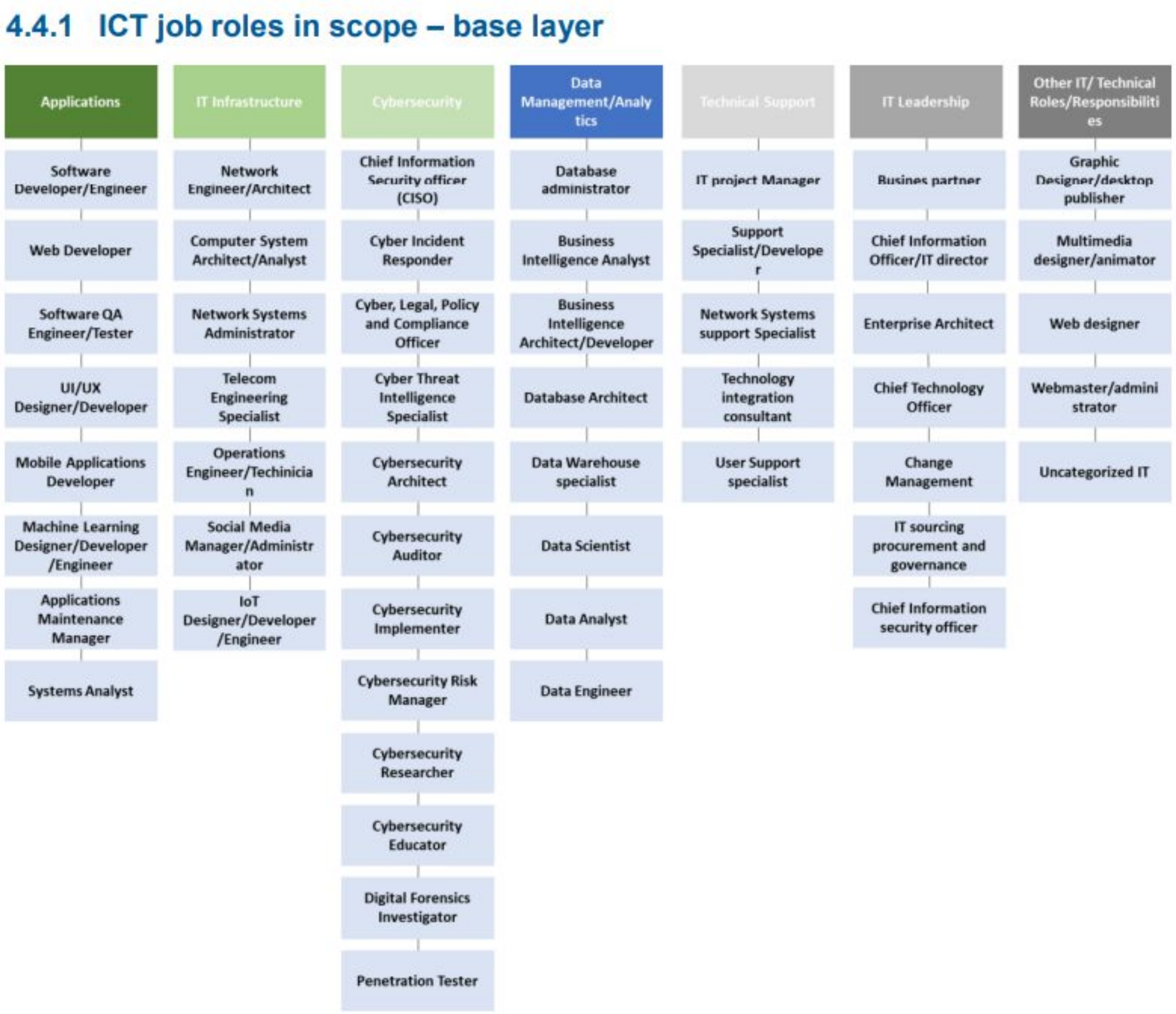
Defining scope – Job Roles

ICT job roles have numerous representations – For LeADS, we consistently cross-check the IDC taxonomy to ensure we are in line with other taxonomies such as:

- BLS
- ENISA
- ISCO & ESCO
- ESSA
- e-CF

Although the focus of LeADS is to map advanced digital skills (which mostly currently pretrain to the ICT sector, a chapter explaining the relationship of ADS skills and non-ICT job roles has been included in the final deliverable

LeADS job role taxonomy



4.4.1 ICT job roles in scope – base layer

Applications	IT Infrastructure	Cybersecurity	Data Management/Analytics	Technical Support	IT Leadership	Other IT/ Technical Roles/Responsibilities
Software Developer/Engineer	Network Engineer/Architect	Chief Information Security officer (CISO)	Database administrator	IT project Manager	Busines partner	Graphic Designer/desktop publisher
Web Developer	Computer System Architect/Analyst	Cyber Incident Responder	Business Intelligence Analyst	Support Specialist/Developer	Chief Information Officer/IT director	Multimedia designer/animator
Software QA Engineer/Tester	Network Systems Administrator	Cyber, Legal, Policy and Compliance Officer	Business Intelligence Architect/Developer	Network Systems support Specialist	Enterprise Architect	Web designer
UI/UX Designer/Developer	Telecom Engineering Specialist	Cyber Threat Intelligence Specialist	Database Architect	Technology integration consultant	Chief Technology Officer	Webmaster/administrator
Mobile Applications Developer	Operations Engineer/Techinician	Cybersecurity Architect	Data Warehouse specialist	User Support specialist	Change Management	Uncategorized IT
Machine Learning Designer/Developer/Engineer	Social Media Manager/Administrator	Cybersecurity Auditor	Data Scientist		IT sourcing procurement and governance	
Applications Maintenance Manager	IoT Designer/Developer/Engineer	Cybersecurity Implementer	Data Analyst		Chief Information security officer	
Systems Analyst		Cybersecurity Risk Manager	Data Engineer			
		Cybersecurity Researcher				
		Cybersecurity Educator				
		Digital Forensics Investigator				
		Penetration Tester				

Use cases overview

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- IDC produces over 100 different Spending Guides & trackers for technology investments on both a worldwide level and regional splits (e.g., European Union level).

- Spending Guides and trackers provide the current and forecasted expenditure in ICT by use case level for most technology areas covered in LeADS.

- By linking different needed skills with real market use cases, we can use spend/investment growth as a proxy to understand technology adoption and subsequently the increase in skills demand for these areas.

- Based on the current approach, the LeADS consortium has linked over 130 different use cases with ADS skills across 6 technology areas to reach the baseline estimates of demand growth for the project.

Technology area	Skills grouping	Skills detail	Use cases mapped with market forecasting data for the correspondent skill detail	Use case definition
Internet of Things (IoT)	IoT Applications skills	Healthcare - IoT implementation	Bedside Telemetry	IoT systems that support hospitalized patients whose physiological status requires close attention. In this use case these patients can be constantly monitored using IoT-driven, noninvasive monitoring. This type of solution employs sensors to collect comprehensive physiological information and uses gateways and the cloud to analyze and store the information and then send the analyzed data wirelessly to caregivers for further analysis and review. Provides a continuous automated flow of information. In this way, it simultaneously improves the quality of care through constant attention and lowers the cost of care by eliminating the need for a caregiver to actively engage in data collection and analysis.
			Health and Wellness	The Health & Wellness use case bridges healthcare payer and consumers with IoT technology that monitors an individual's physical condition. By allowing access to health indicators such as heart rate, glucose levels, blood oxygen concentration, or movement (e.g. footsteps), healthcare payers incentivize participants e.g. increasing price discounts/lower monthly insurance premiums. Devices can be activity based wearables such as fitness trackers or smart watches. Or devices can be medically oriented such as mobile glucose monitors, CPAP machines or pacemakers/auto-defibrillators that are Internet connected. Health coaching empowers patients to better manage their health and make healthy decisions involving exercise, diet, personal care and life style choices. As part of this industry, this use case includes Healthcare providers' spending on these solutions for providing these devices to their patients as part of their healthcare assistance and service. It differs from Remote Health Monitoring (Healthcare Provider) as it excludes devices for chronic diseases.
			Hospital Asset Tracking	Hospital asset tracking is a solution that locates high value medical assets within a medical facility enabled by pervasive wireless LAN (WLAN) networking and beacons or active RFID (RTLS) associated with each piece of equipment, person or tracked item (i.e. high value inventory like medicine...or a baby!). The solution typically integrates with ERP, hospital inventory management and work management. Capabilities are used to create intelligence for the central maintenance and tracking (audit) of high value assets to improve quality of patient care, reduce costs, and improve service quality. Active tags can integrate any number of sensors to produce info on temperature, humidity, equipment orientation, movement and general time in operation through built in analytics software capabilities.
			Remote Health Monitoring	Home or remote healthcare that uses the IoT technology platform to improve quality of life and care through accurate and focused medical home monitoring. Typical devices considered are glucometers, blood press cuffs, oximeters, and data gateways.

Use Case Validation With Experts

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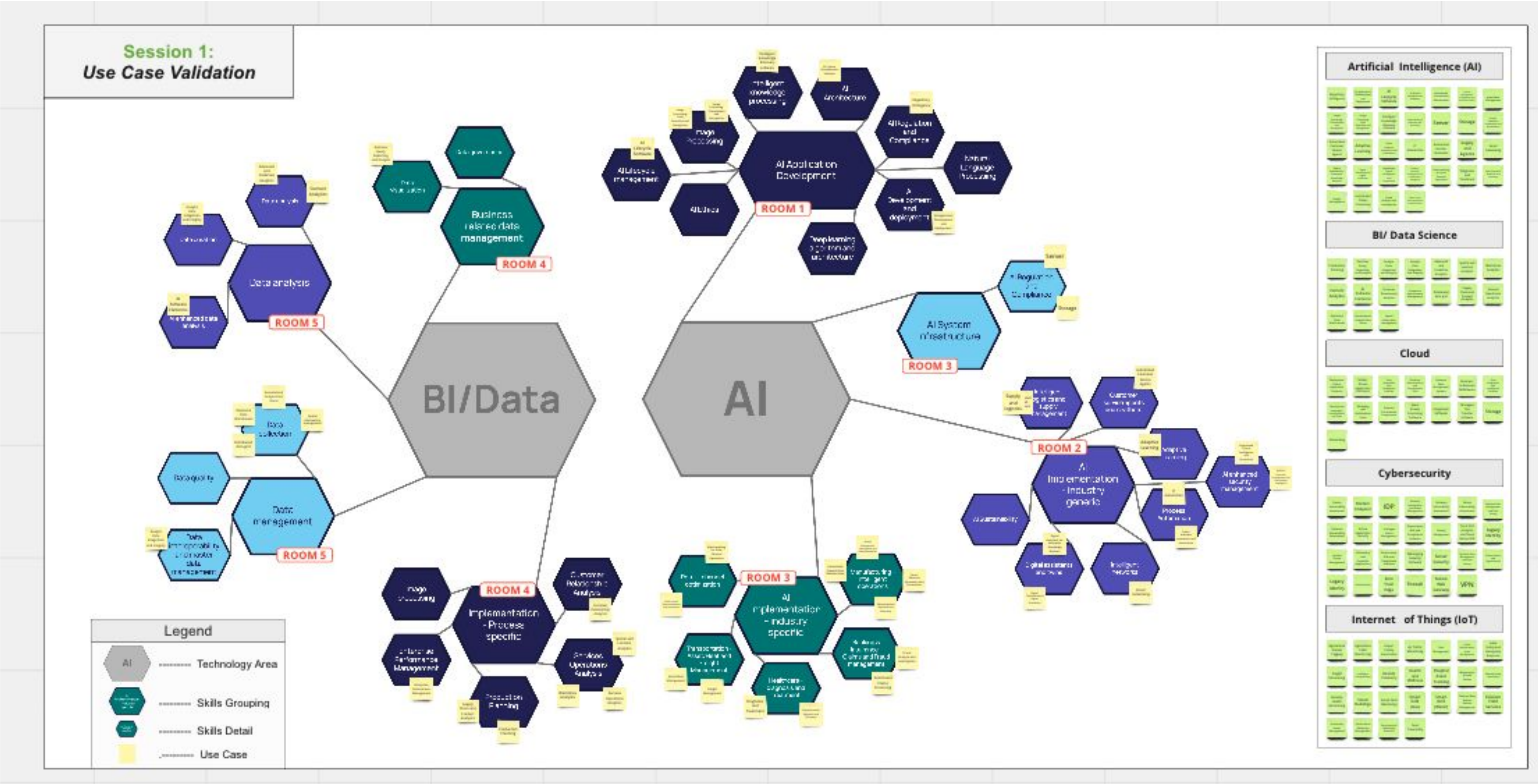

Market Scenarios

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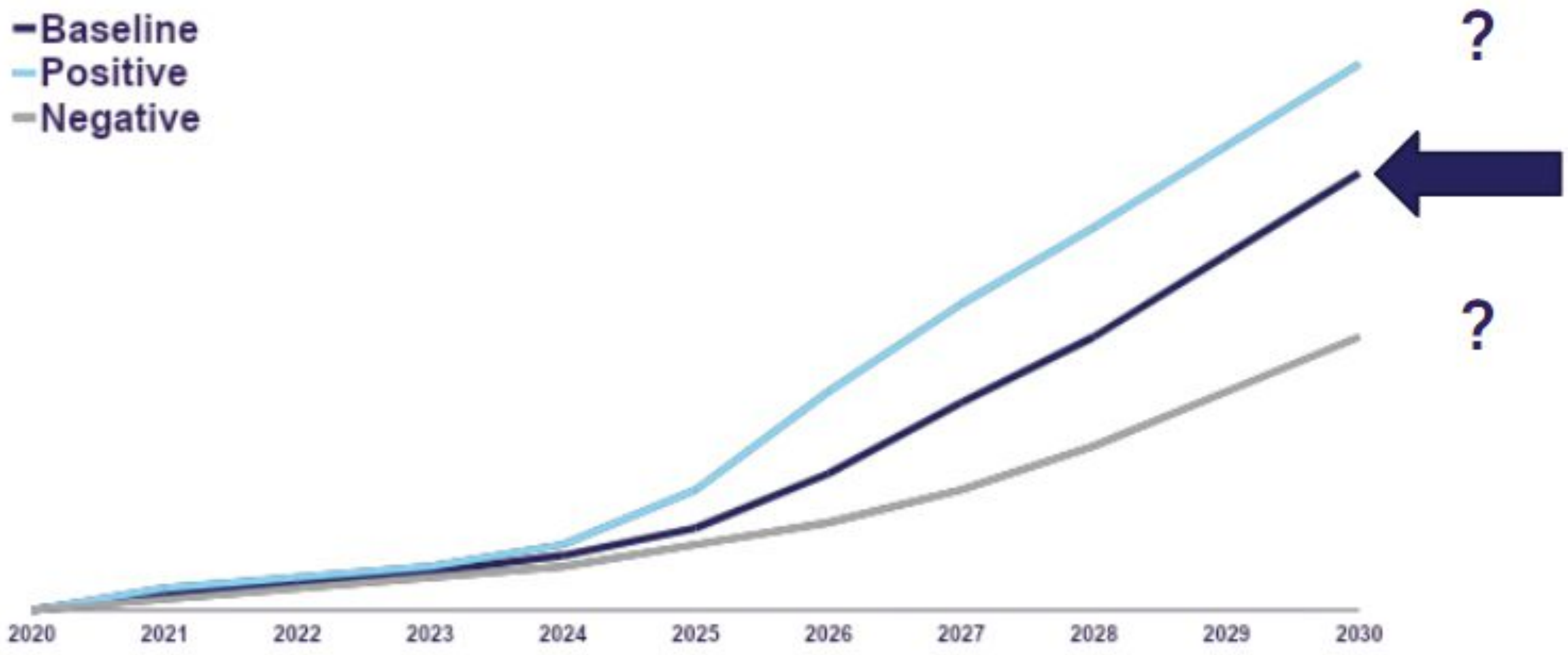
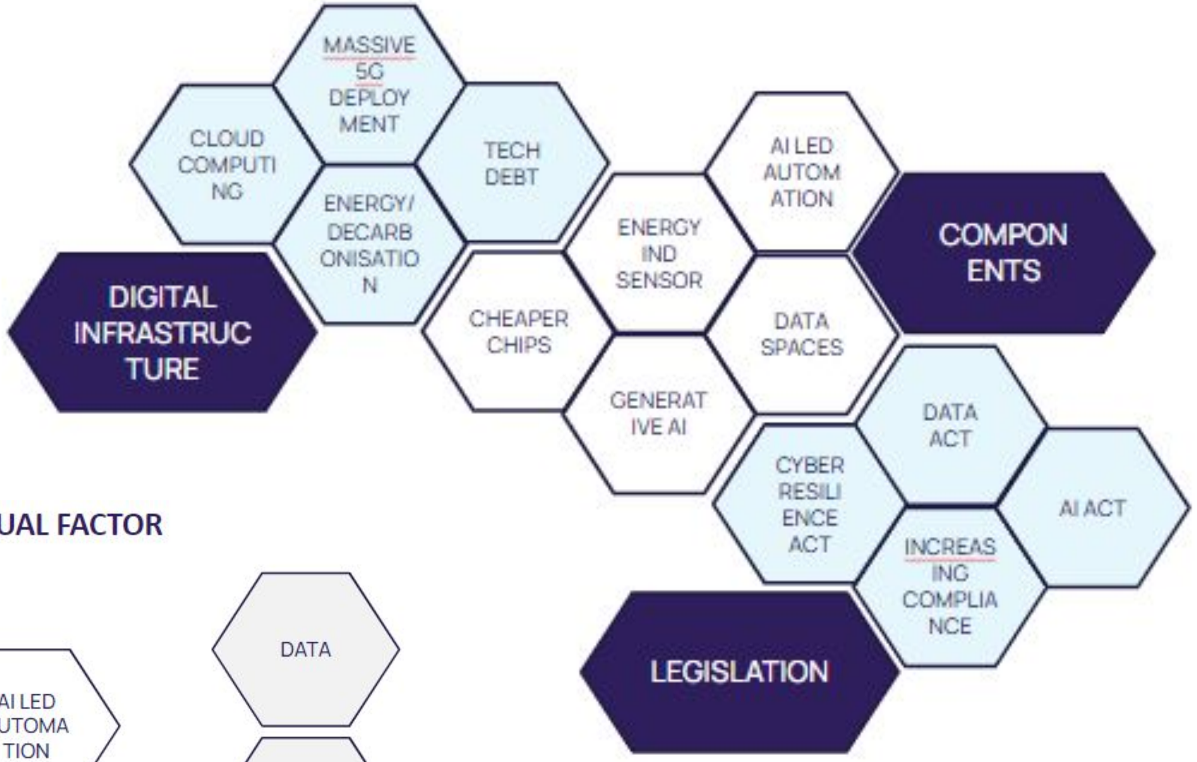


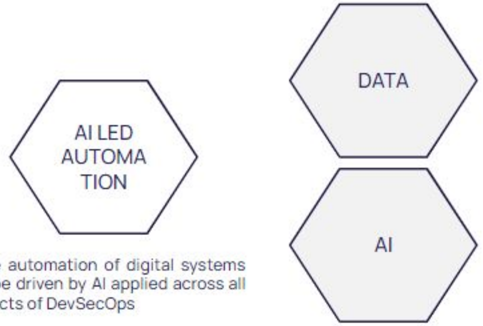
Scenario Building Factors

OVERARCHING FACTORS

SPECIFIC FACTORS – TECHNOLOGICAL



INDIVIDUAL FACTOR



More automation of digital systems will be driven by AI applied across all aspects of DevSecOps

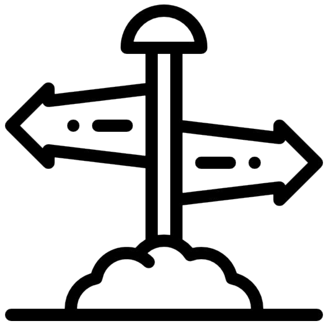
Scenario Building Validation

AI Application Development	FACTOR	RELEVANCE		MAGNITUDE OF IMPACT	
	Massive 5G deployments		0 5		0 5
	Cloud computing		0 5		0 5
	Energy		0 5		0 5
	Cybersecurity		0 5		0 5
	General legislation		0 5		0 5
	Cheaper sensors		0 5		0 5
	Energy independent sensors		0 5		0 5
	Data Spaces		0 5		0 5
	Generative AI		0 5		0 5
	AI and automation		0 5		0 5
	Data Act		0 5		0 5
	AI Act		0 5		0 5
	Cybersecurity Resilience Act		0 5		0 5
	Legacy Systems/Technological Debt		0 5		0 5

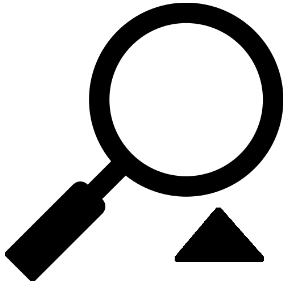
Magnified view

Key Outcomes

A new advanced skills framework with common denominators used to assess not only the industry demand but also supply of skills in the EU Education sector

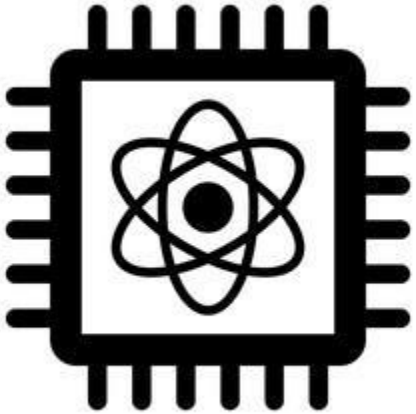


Skills forecasting – Establishing a direction of travel for advanced skills demand on a more granular level

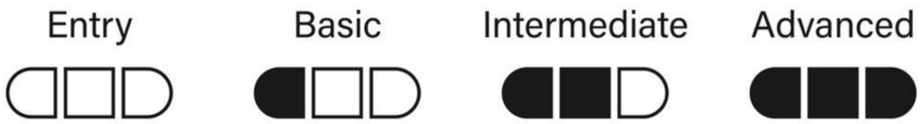


High relevance with industry development through the use case approach

Key Challenges & Limitations



Measuring the Quantum Computing Skills Market



Establishing the level of proficiency of needed skills on a tech spending perspective

Thank You! Q&A

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