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UNLOCK-CEI

# EU Demand Side Radar

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# D5.4 – EU Demand Side Radar

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|---|---|
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| Task | T5.2 \| EU Demand Side Radar |
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| X | PU: Public |
| | CO: Confidential, only for members of the consortium (including the Commission) |
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| 0.2 | 11/04/23 | Maria Giuffrida (Trust IT), Claudio de Majo (Trust IT) | Additions to sections 2 and 3 |
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# Glossary of terms

| Item | Description |
|---|---|
| CEI | Cloud-Edge-IoT |
| DoA | Description of Action |
| EU | European |
| EUCloudEdgeIoT | Short Name to refer to The European Cloud, Edge and IoT Continuum, an inter-project umbrella initiative of which UNLOCK CEI is a member |
| IoT | Internet of Things |
| KPI | Key Performance Indicator |
| VCA | Value Chain Adopter |
| WP | Work Package |

# Keywords

Cloud-Edge-IoT; Computing; Continuum; Demand-Supply Dialogue; Communication; Engagement, Demand Side Radar

# Disclaimer

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# Executive Summary

This deliverable describes the EU Demand Side Radar and the activity of its designing and implementation. The online radar visualises use cases and demand scenarios based on CEI technologies, vertical sectors and readiness of implementation. Following the introduction the document describes the steps taken to specify the design, collect the information and develop the EU Demand Side Radar. The core part of the document shows the latest development of the radar and the visualisation dashboard available on www.eucloudedgeiot.eu. In the last chapter of the document, we describe the planning and the next steps of the EU demand side radar until the publication of the first official version.

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# 1. Introduction

The EU Demand Side Radar is the outcome of Task 5.2 within the Work Package (WP) 5 on Communication and Dissemination. The task is led by IDC ITALIA SRL (IDC) and its goal is to design and develop an interactive and automated online overview on the Cloud-Edge-IoT demand landscape. The type of this deliverable is "OTHER" and this section provides an overview of the deliverable.

T5.2 contributes to the following objective of Work Package 5:

**Objective 5.2 Deliver a CEI demand-side readiness radar and web platform** that visualises and charts the evolution of the landscape including vertical sectors and technologies and market pathways. The platform will be delivered to the European Alliance for Industrial Data, Edge and Cloud at the end of the project as an online asset.

## 1.1 Purpose of this document

The purpose of the EU Demand Side Radar of UNLOCK-CEI is to provide a bird's-eye view of the demand-side landscape based on results stemming from the WP1-4: WP1 CEI Demand Landscape, WP2 Market Scenarios and Guidance, WP3 Value Chain Adopter Groups and WP4 Community Engagement.

In this document, we describe the activity of the designing and implementation of the radar. The online radar visualises use cases and demand scenarios based on CEI technologies, vertical sectors and readiness of implementation. The use cases can be either collected from the industrial field (i.e. via WP1, WP2 and WP3 activities) or from the research and innovation portfolio of projects (as part of WP4 activities). In its later evolutions, the radar will also be linked to a commercial feasibility tool aimed at assessing commercial readiness of use cases coming from research projects.

## 1.2 Link to other deliverables

This document is connected to the following project deliverables:

- **D.1.1** Cloud-Edge-IoT Demand Landscape and subsequent iterations (**D1.2** and **D1.3**): outcomes of the market landscape, survey efforts and industrial use cases presented in these deliverables are fundamental to feed the content of the radar and the other preliminary visualisation tools developed as part of T5.2 and later detailed in section 3
- **D5.1** Communications, dissemination and engagement plan and subsequent iterations (**D5.2** and **D5.3**): The radar is an important element of the engagement strategy and fully supports its objectives
- **D5.5** Updated EU Demand side radar: D5.5 represents the evolved version of this document and will provide proof of the achievement of the actions planned in the present deliverable

## 1.3 Structure of the document

The document is structured as follows:

- **Method and Planning:** Following the introduction This chapter describes the steps taken to specify the design, collect the information and develop the EU Demand Side Radar.
- **Current Status and Tool Used:** This chapter shows the latest development of the demand side visualisation dashboards and the status of the radar which is available for external users on www.eucloudedgeiot.eu
- **Conclusions and Next Steps:** In the last chapter of the document, we describe the planning and the next steps of the EU demand side radar until the publication of the first official version.
- **Annex:** The Annex includes the visual version of the demand landscape available on Cloud-Edge-IoT Landscape - EUCloudEdgeIOT.

# 2. Method and Planning

Task 5.2, which is responsible for the delivery of the Demand side radar, officially started its activities in November 2022 (M06) and consisted of the following milestones.

- In the **initial phase** (November 2022 – January 2023),regular meetings were scheduled and held between IDC (Task Leader) & Trust-IT (WP5 leader and task contributor) to initiate discussion on the possible features of the radar and the desired visualisation needs. Main highlights and decisions were shared with all the other partners during the second physical Consortium meeting in Prague (24th November 2022) and during the other online monthly meetings, when necessary.
- After the first three months, at the end of **January 2023 (M08)**, a first technical meeting was organised with IT experts (partner COMMpla) to validate the implementation needs and the sources and platforms needed for the technical realisation of the tool.
- At the end of **February 2023 (M09)**, a preliminary version of the demand landscape visualisation dashboards was produced. These are useful to represent the main market trends in an attractive way. The trends were identified in WP1 and are complementary to the use case information that will be included in the radar tool. The outcome of this activity is described in chapter 3 and was also presented at the UNLOCK-CEI preliminary review held in Brussels on the 9th of March 2023. On that occasion, the plan for the deployment of the radar was consolidated and approved by all consortium partners. As shown in the Figure below, the plan consists in three major releases until M18. It is designed based on the timeline of the outputs that will be generated through other WPs of the project to ensure the on-time launch and gradual improvement of the radar. The plan consists of three main phases and a continuous update:

1) **Phase 1 - Market trends dashboard:** The main output is the realisation of market trends dashboards (relying on D1.1 results), whose characteristics are detailed in section 3.2 of this document.
2) **Phase 2 - Updated market trends dashboard:** The second main output consists in the release of additional and updated dashboards (relying on D1.2 results) showcasing recent market trends. These dashboards will be hosted on the same website section as the ones already published and created with the same tool. They will be made public within a few weeks from the submission of this deliverable and D1.2 (main source for the dashboard) which are both being submitted at the same time.
3) **Phase 3 - First release of radar with the first set of use-case:** The third main output will be the proper radar-shaped tool showcasing CEI use cases across relevant industries, as detailed in section 4 – next steps.
4) **Continuous Update:** The radar will be updated on a regular basis until the end of the project by adding new use-cases and input from other WPs. This activities' Key Performance Indicator (KPI) is to have over 60 use cases and feasibility entries in the CEI Demand-side readiness radar by the end of the project.

*Figure 1 – EU Demand Side Radar (version 1) Realisation steps*

# 3. Current status and Tool used

The first visual demonstration of the Cloud-Edge-IoT Landscape was published on the official website (https://eucloudedgeiot.eu/) of the project on the 28th of February 2023. External users can browse through the interactive platform and see the results coming from D1.1 – Cloud-Edge-IoT Demand Landscape.
Cloud-Edge-IoT Landscape - EUCloudEdgeIOT

## 3.1 Tool used

The data visualisation tool used to produce the market trend graphs is Infogram. This tool can be used by subscribed members – Trust-IT has an account for its use – and is designed to enable researchers to create visually appealing and interactive graphics, charts, and infographics. It offers a wide range of customisable templates and design elements. One of the primary reasons for selecting Infogram for this task was its versatility and range of customisation options which allow to efficiently align the graphs to the project branding. Furthermore, Infogram offers a comprehensive range of chart types. This variety enabled us to represent different types of data accurately and choose the most appropriate visualisation method for each specific research objective. The tool also allowed us to import data seamlessly from various sources, including spreadsheets and databases, ensuring a smooth and efficient workflow. Collaboration and data sharing were also largely facilitated using Infogram, as this platform allowed team members to collaborate in real-time with other partners, making it easy to collect feedback and incorporate changes swiftly. Additionally, Infogram provided options for embedding graphics into our Wordpress website, also ensuring responsiveness and compatibility across different devices and screen sizes. Our visuals were automatically optimised for various platforms, including desktop computers, tablets, and mobile devices, guaranteeing a consistent user experience regardless of the viewing medium. A preview of the main dashboards produced with Infogram is offered in the Annex.

## 3.2 Cloud-Edge-IoT Market Trends from secondary data

The first release of the demand side radar visualises the information of D1.1 on the Cloud-Edge-IoT Demand Landscape.
Cloud, Edge and IoT represent three major, interconnected technology trends enabling the digital transformation of European organisations and economies. Via the dashboards and infographics published on the following website Cloud-Edge-IoT Landscape – EUCloudEdgeIOT users can learn more about the key findings and the most interesting data from our CEI market analysis.
The dashboards follows the following structure:

**I. Overview of CEI**

Cloud, edge and the Internet of Things (IoT) represent three major, interconnected technology trends. Together, they are forming a foundation of data collection and processing upon which a new generation of solutions can be developed to transform operations and prepare European organisations for the next decade of innovation.

**II. CEI Market Forecast**

- **Cloud:** The European public cloud market is estimated to reach $109.5 billion in 2022 and forecasted to grow to over $232 billion by 2026, with a five-year compound annual growth rate (CAGR) of 21.8% for 2021-2026.
- **Edge:** According to a 2021 survey on emerging technologies, one in three European organisations are implementing edge computing solutions in their daily business, with this number expected to double over the next two years.
- **IoT:** European organisations across all verticals understand IoT and are committed to utilising IoT within their organisations.

III. **Use Cases**

In addition to the introduction and the detailed analysis of the CEI market, the dashboard provides an overview of the initially identified use cases. It shows the most common use cases observed in the key verticals of the CEI, highlighting some of their typical requirements that might lead to various decisions about the cloud-edge compute continuum. The selected use cases are the following: manufacturing, energy and utilities, transportation, healthcare, agriculture.

This is followed by the drivers and barriers for the adoption of the CEI-technologies:

- **Cloud:** European companies reach out to cloud for multiple reasons focusing on both optimizing current operational models as well as seeking tools to drive new business value creation such as the need for agility and flexibility or increased energy efficiency. The challenges in cloud adoption are related to security and governance.
- **Edge:** Edge market's development in Europe is driven by tremendous benefits and business goals the technology brings on various organisations that want to unlock more value from data and achieve greater business outcomes. The three major barriers that organisations face in their adoption journey of edge are related to the lack of funding, difficulties in adapting established processes to new technologies and lack of adequate IT infrastructure.
- **IoT:** Organisations utilise IoT for many reasons. For example, to increase productivity and efficiency, improve customer experience or improve product quality. IoT remains a relatively new technology space, with an emerging ecosystem that is working to develop and simplify the technology, integrate components, develop best practices, and standardise solutions for key use cases. Some of the challenges that remain in the adoption of IoT are related to cost, security, privacy and unclear return on investments.

## 3.3 Updated Cloud-Edge-IoT Market Trends from UNLOCK-CEI survey

The visual landscape is updated in M12 based on the results of the UNLOCK-CEI survey conducted in WP1. The survey was conducted to provide deeper understanding of the adoption of CEI technologies and the drivers and barriers to adoption. It includes a sample of 700 businesses across selected EU Member States. The sample is intended to reflect the diversity of EU members' economies, societies and priorities. The respondents are selected from the five vertical industry segments described above due to the high relevance of these sectors for the European CEI market. The main topics investigated in the survey are:

- CEI usage
- CEI maturity
- CEI adoption drivers and barriers
- Most relevant use-cases
- Workloads
- Types of CEI used

Based on the results of the survey, the visual landscape is updated. In particular, the main updates are related to:

- CEI usage by industry and business size
- Attitudes to use CEI in industry and business size
- Planned location of Edge
- Current and planning IoT use-cases by industry
- Key CEI use-case
- Main drivers and barriers for CEI adoption (overall and by industry)
- Key technologies associated with CEI
- Location of sensitive data

# 4. Conclusions and next steps

The next steps in the evolvement of the radar will be to demonstrate visually the use cases per sectors on an interactive platform (see the figures below as illustration). The final expected release of the radar is planned for M18 of the project.
The readiness level of the use cases will be illustrated on a colour scale (see on the left side part of the figures below) starting from a grey to pink. Grey showing a lower level of readiness while pink a higher level of readiness.
The use cases will be divided into the sector defined and agreed in the UNLOCK-CEI project. It will include the following:

- Manufacturing
- Agriculture
- Health
- Energy
- Transportation
- Cross domain

On the radar, the use cases will appear according to their corresponding sector and the colour of the bullets or circle will correspond to the readiness level scale as described above.
The interactive tool will give the possibility to the user to gain more information (i.e short description, country, company type and technology) about the use cases, by pointing the cursors on the specific use case.

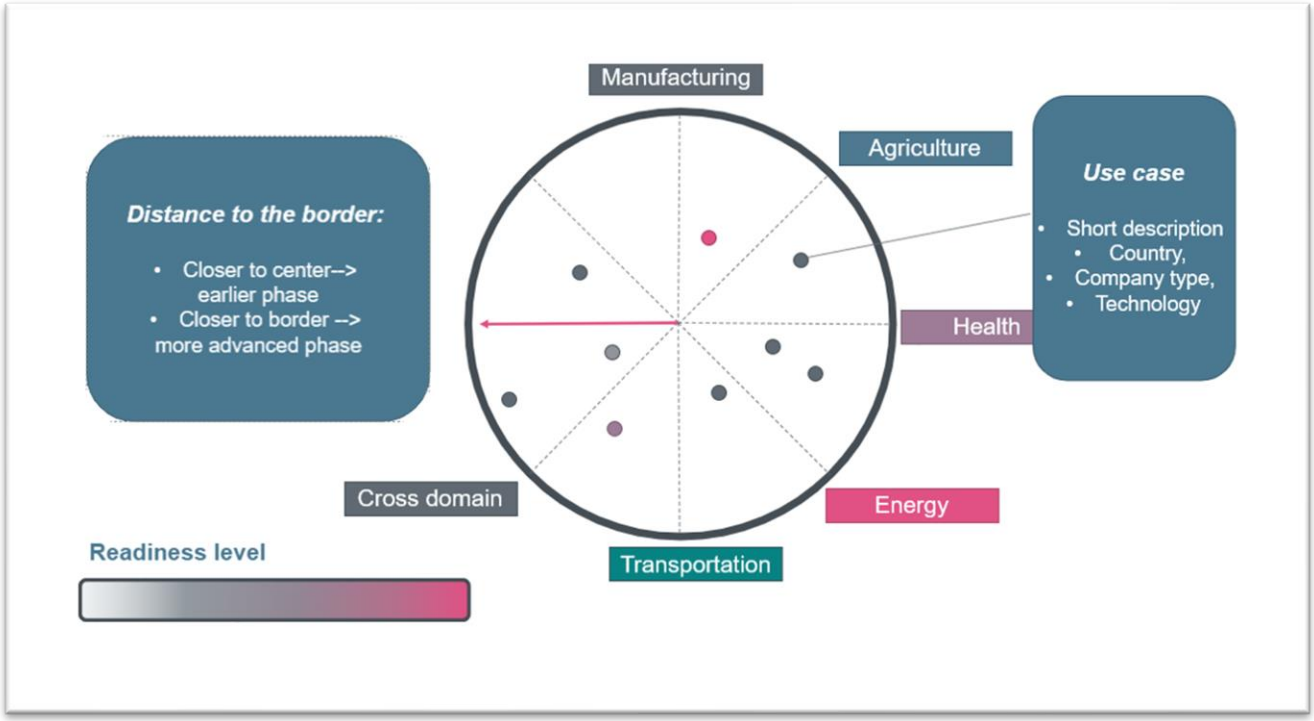



*Figure 2 - EU Demand Side Radar Version 1*

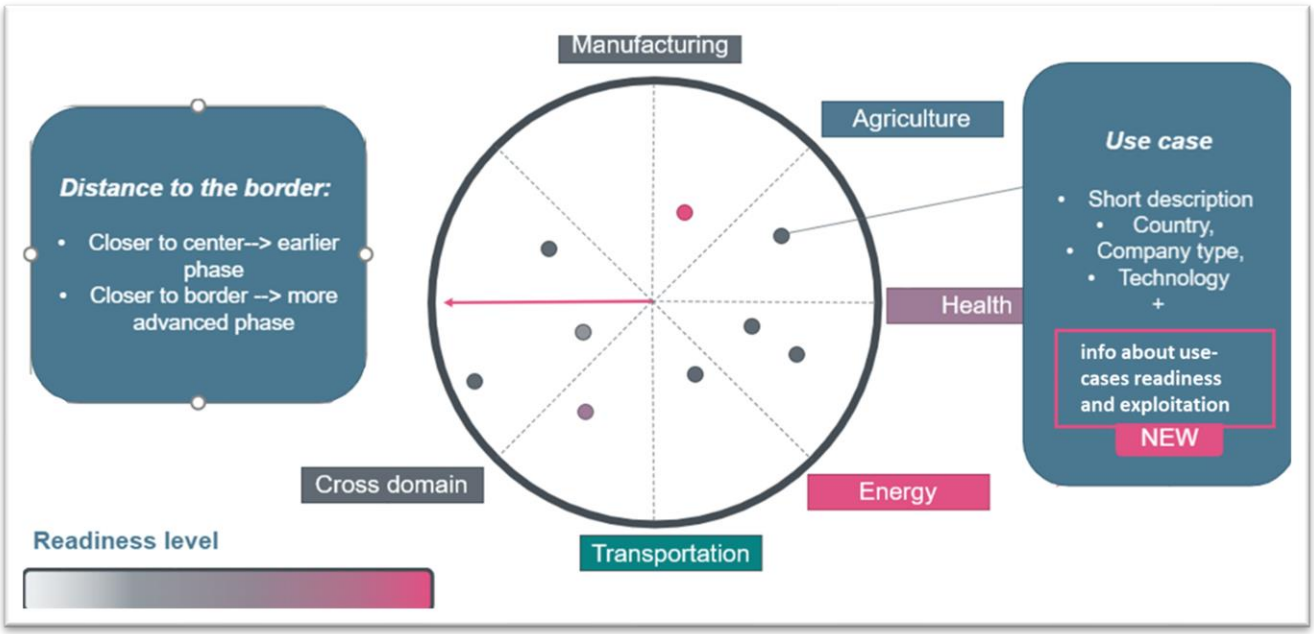



*Figure 3- EU Demand Side Radar Version 2*

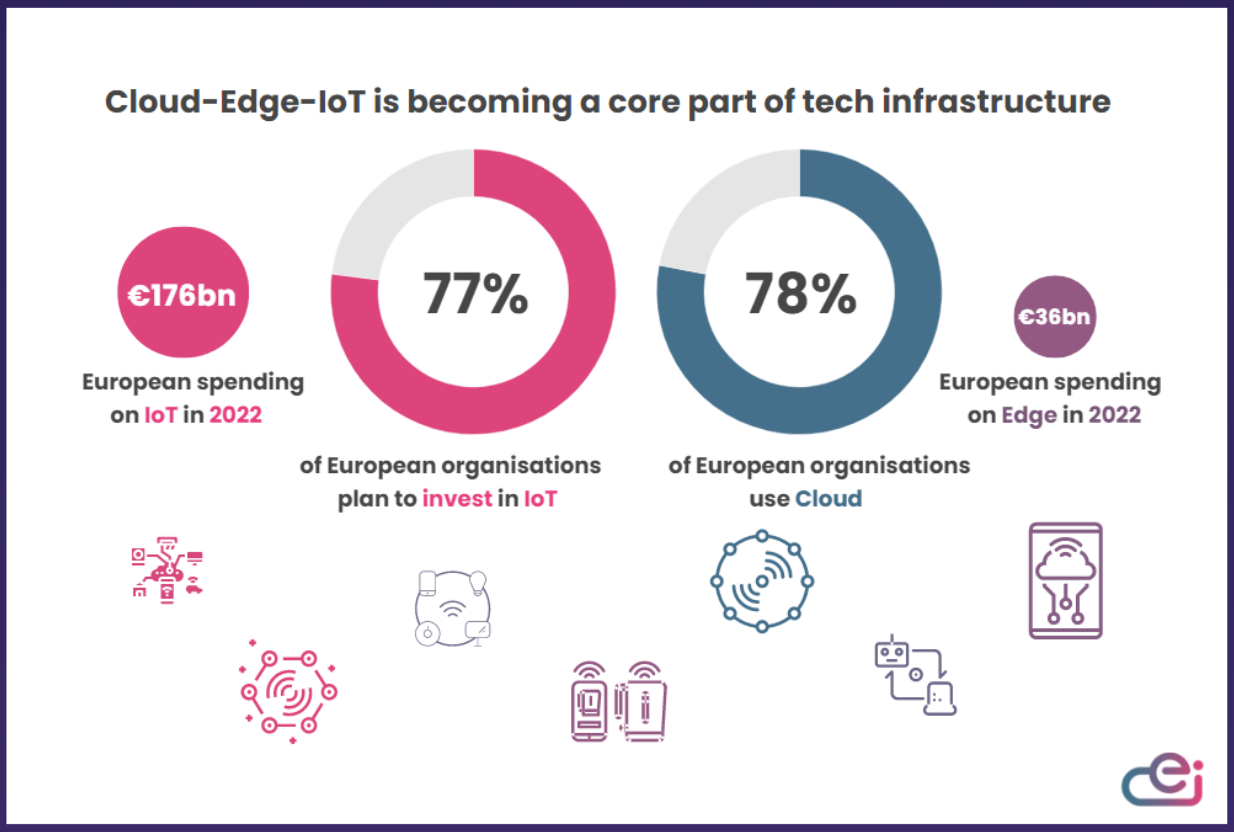
# Annex

The interactive version of the Cloud-Edge-IoT landscape is available online via this link, while the pictures below depict the main dashboards as of 31 May 2023

## Cloud-Edge-IoT Landscape

Cloud, Edge and IoT represent three major, interconnected technology trends enabling the digital transformation of European organisations and economies. Via the dashboards and infographics below you can learn more about the key findings and the most interesting data from our CEI market analysis.

### Overview on CEI



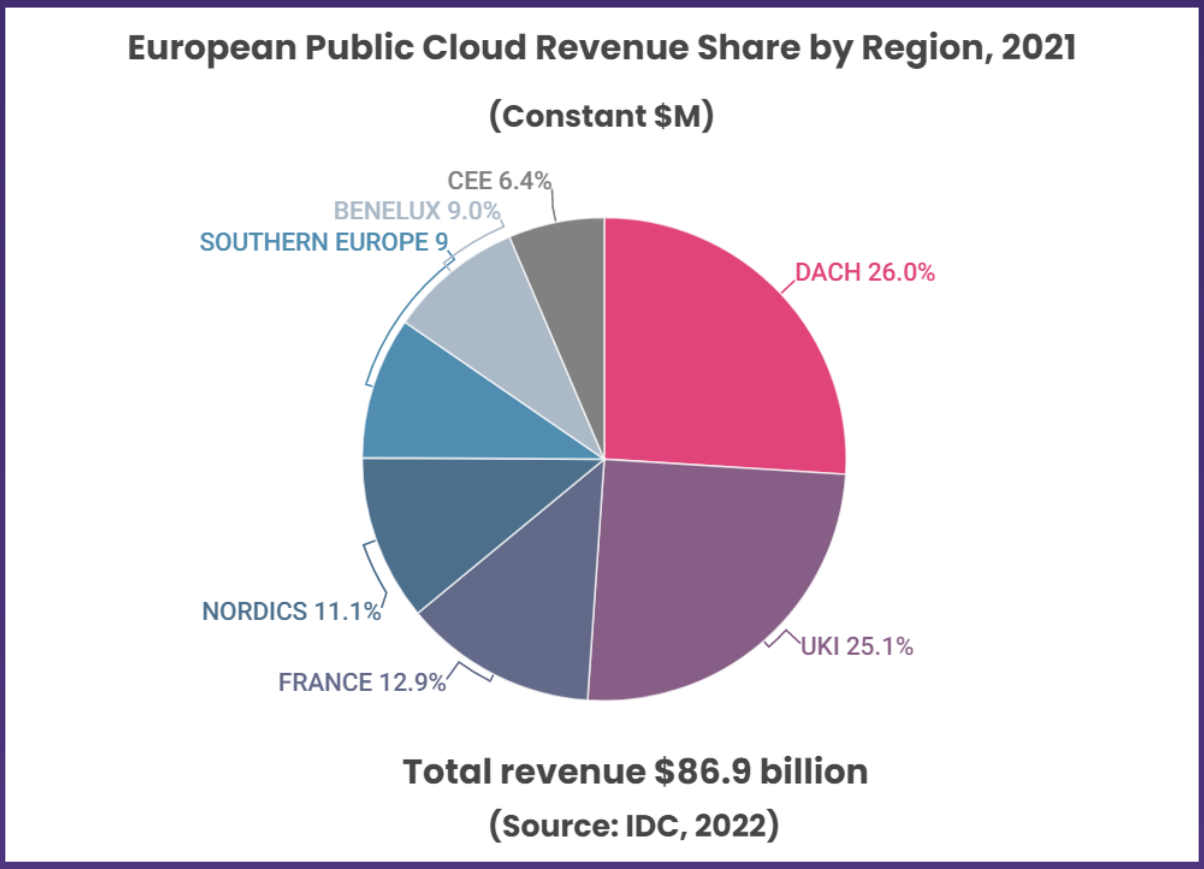

Cloud computing emerged as a way to enable multiple applications and even organisations to use and share centralised computing resources more efficiently. As a result, it has steadily become a core part of the modern technology landscape.

Organisations are utilising a combination of cloud, edge and IoT to enable a wide range of new solutions to transform processes, automate operations, and launch new products and services.

Creating this CEI environment—a continuum of data collection, storage and processing from edge to cloud—will be essential to a globally competitive, secure and dynamic data-agile economy in Europe. European organisations must adopt and deploy these technologies to maintain economic leadership, increase our economies' and societies' security and resilience, and achieve sustainable development objectives. The graph above gives an overview of the current CEI environment in Europe.

## CEI Market Forecast

### *Cloud*




In 2021 the European public cloud market reached $86.9billion.

From a geographic perspective, the DACH region (led by Germany) is leading in cloud demand, accounting for 26.5% of the total public cloud market in 2021, and is projected to reach 27.5% by 2025. The U.K. and Ireland (UKI), the second-largest region in Europe, is the only region in Western Europe whose share is predicted to decrease from 23.9% to 22.6% in 2026. Conversely, the share of France, the third-largest region, is expected to slightly increase from 13.1% in 2021 to 13.4% in 2026. The Nordic region also has a significant share of 11.2% and will remain relatively steady over the next five years. Finally, Benelux and southern Europe are the smallest Western European subregions, with 9.5% and 9.1% shares in 2021, respectively. The Central Eastern European (CEE) region is the most negligible (6.7%) in Europe and with the slowest growth (18.9%).

### *Edge*

Looking ahead at the edge market landscape in Europe, there are significant developments that will drive the edge spending in the region:

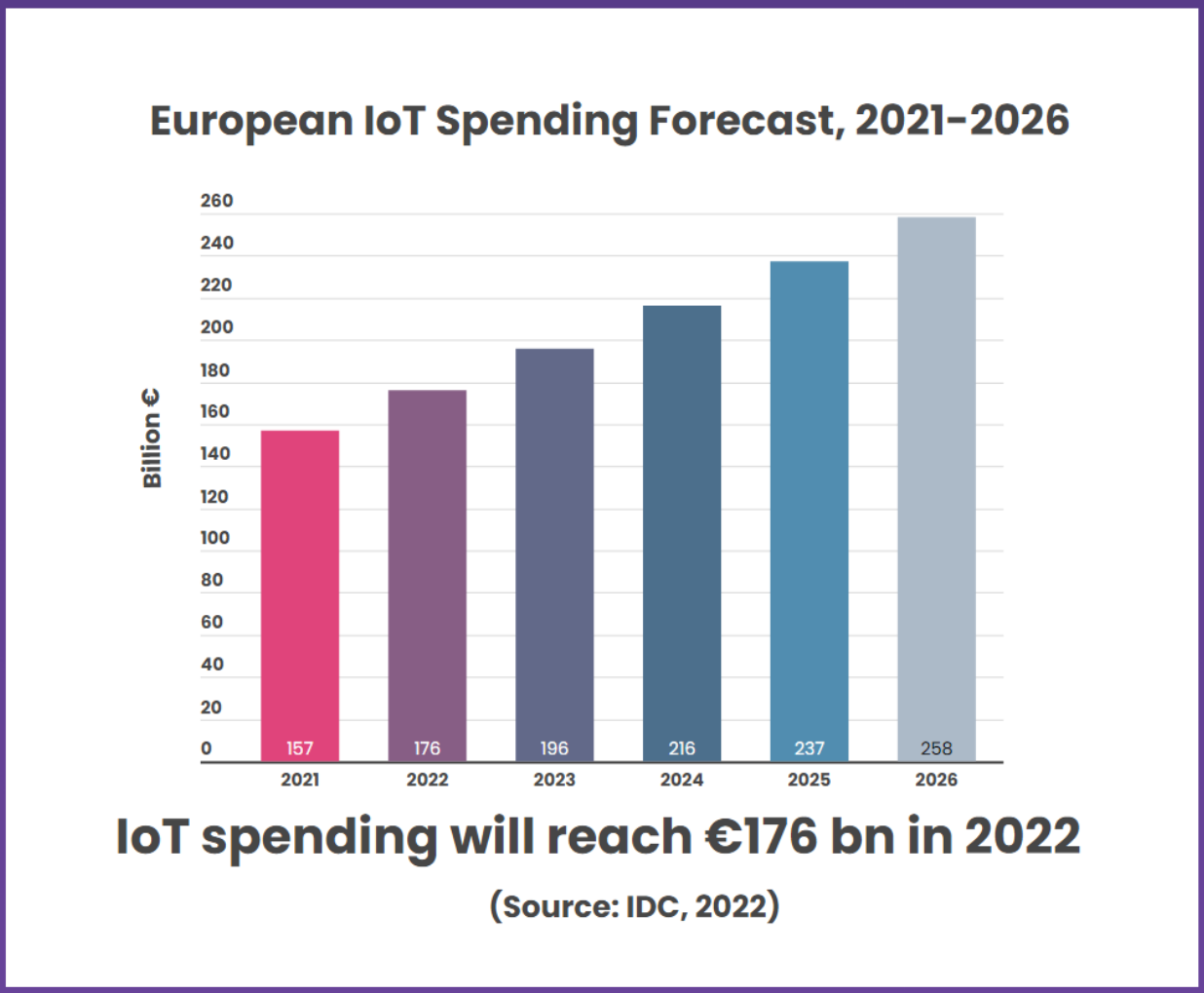
European edge spending will grow from nearly $38 billion in 2021 to $75 billion in 2026, with a five-year compound annual growth rate (CAGR) of 14.6%. Edge is one of the key technologies organisations rely on to unlock new digital capabilities for innovation and performance.

Compared with Central and Eastern Europe (CEE), Western Europe sees a more established and developed edge scenario. Nevertheless, edge adoption in CEE is expected to gain traction over the forecast period, despite being impacted by the ongoing crisis in Eastern Europe, albeit at a slower pace than in Western Europe.

*IoT*

IoT is being widely embraced throughout European organisations. However, the market is still early in its development. Many more organisations are expected to add IoT projects. Furthermore, many already using IoT are expected to add more projects and scale their projects more widely within their organisations.

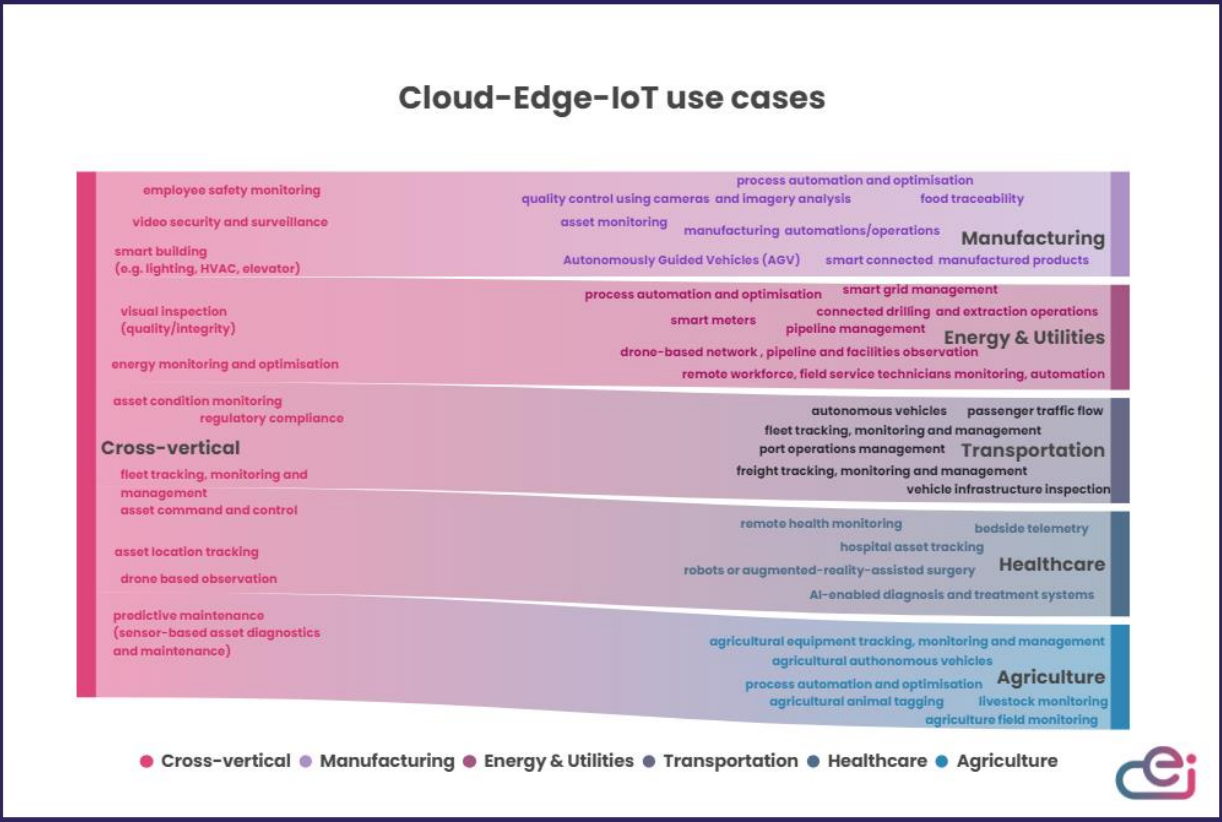
The expected growth in IoT adoption, deployment and scaling is reflected in forecasts of European spending on IoT. According to IDC, European IoT spending will reach EUR 176 billion in 2022. That figure will grow at a compound annual growth rate of 10.0% to 2026, reaching EUR 258 billion.




See use cases

# Use cases, adoption drivers and barriers

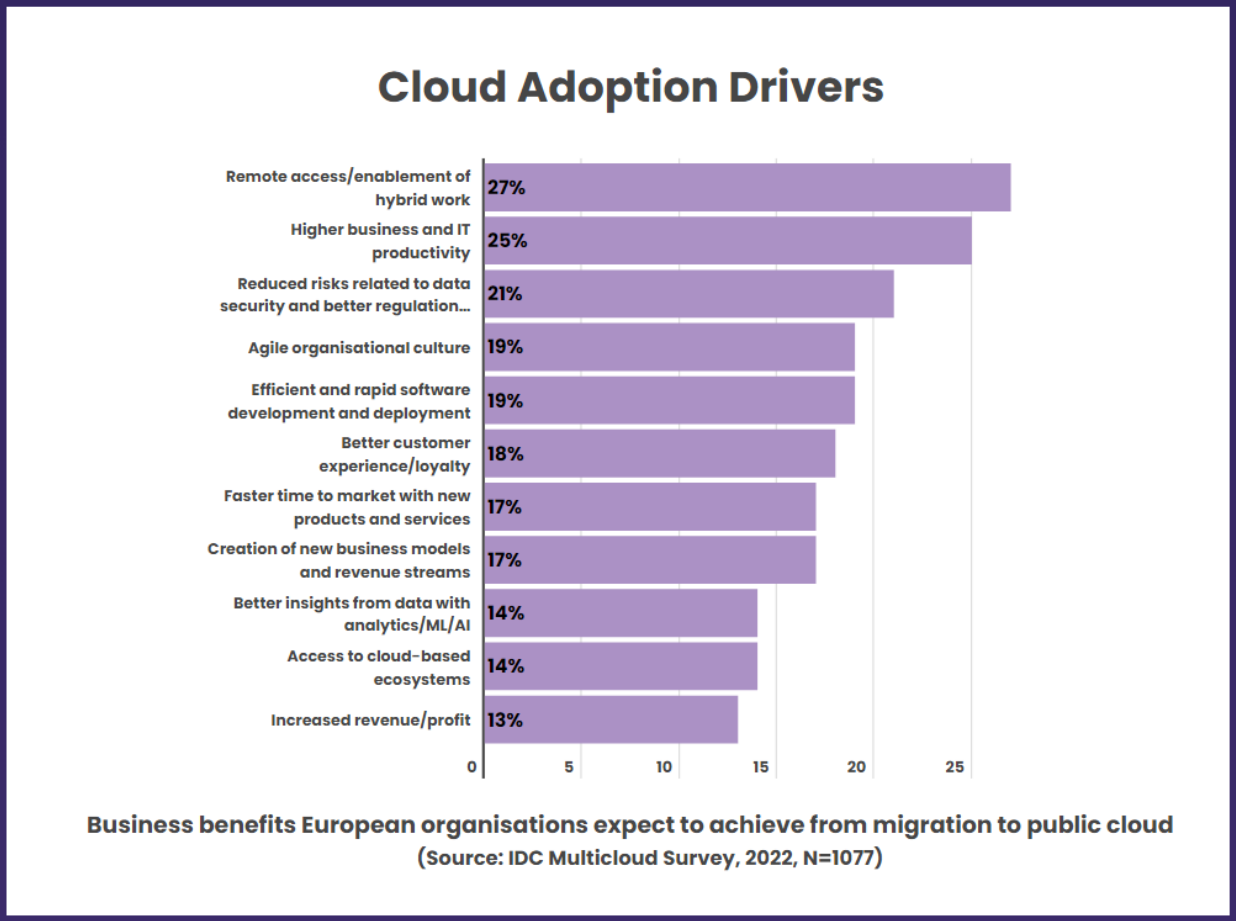
The section below presents the most common use cases observed in the key verticals of the CEI. This section highlights selected use cases and some of their typical requirements that might lead to various decisions about the cloud-edge compute continuum.



# Drivers and Barriers for The Adoption of CEI

## Drivers

**Cloud:** European companies reach out to cloud technologies for multiple reasons, focusing on optimising current operational models and seeking tools to drive new business value creation.




**Business benefits European organisations expect to achieve from migration to public cloud**
**(Source: IDC Multicloud Survey, 2022, N=1077)**

**Edge:** The edge market's development in Europe is driven by tremendous benefits and business goals the technology brings on various organisations that want to unlock more value from data and achieve greater business outcomes.

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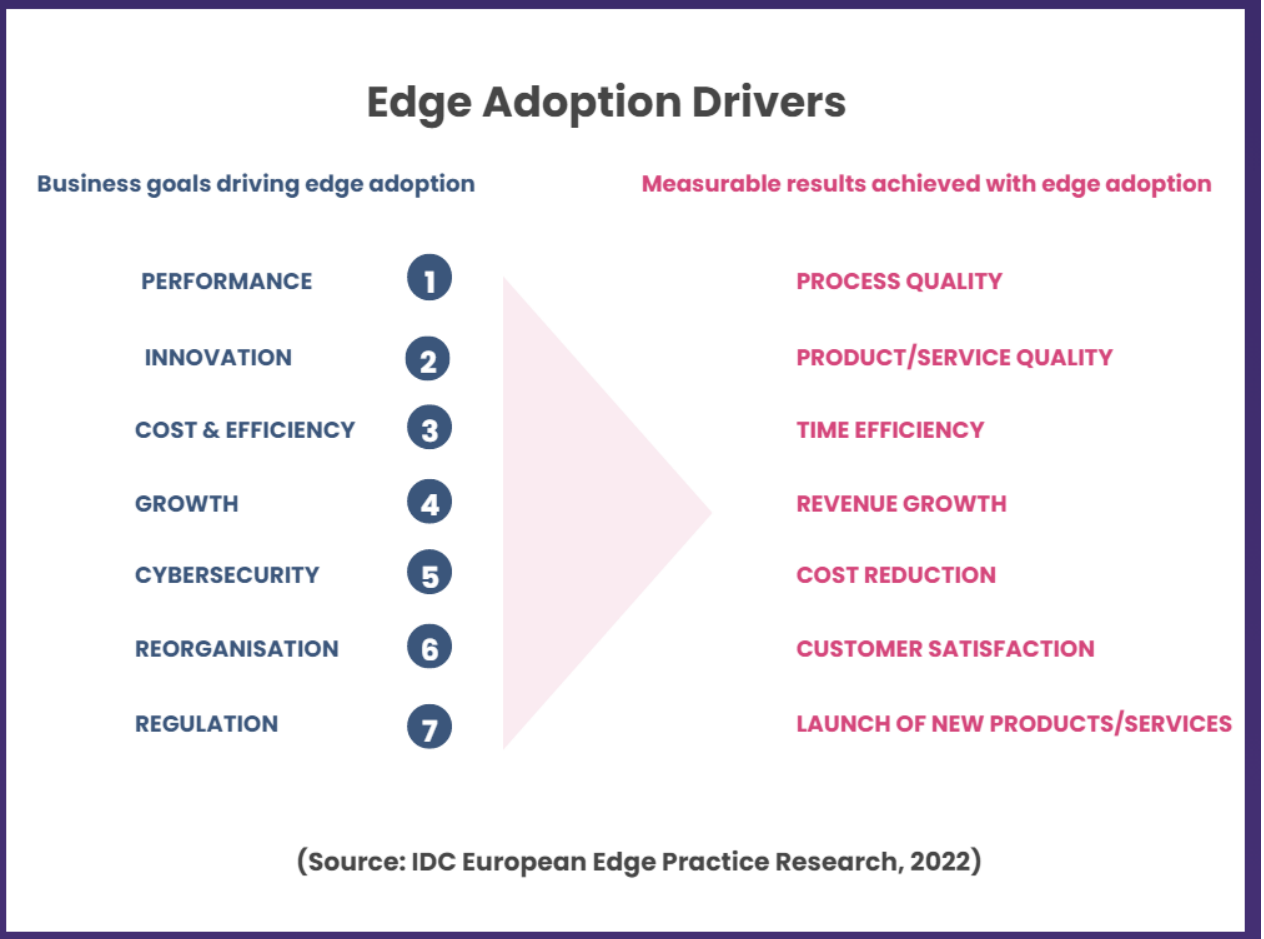
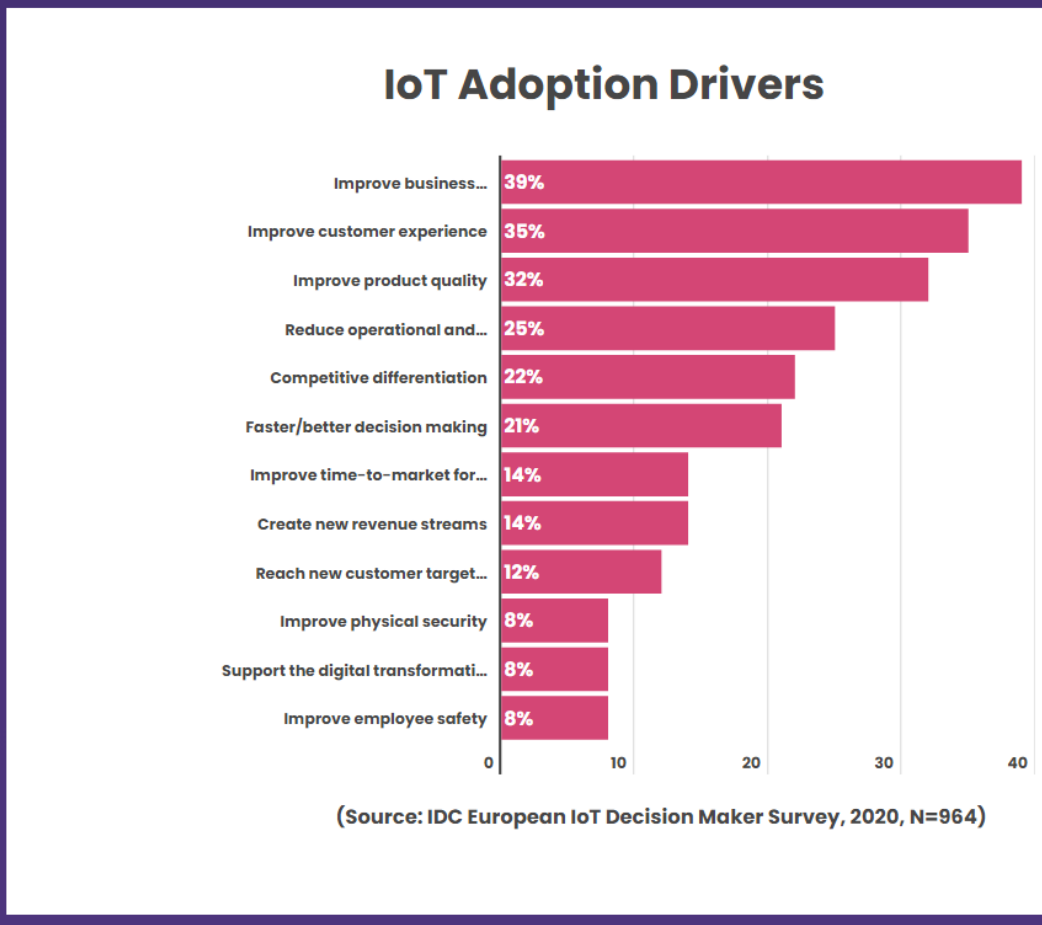


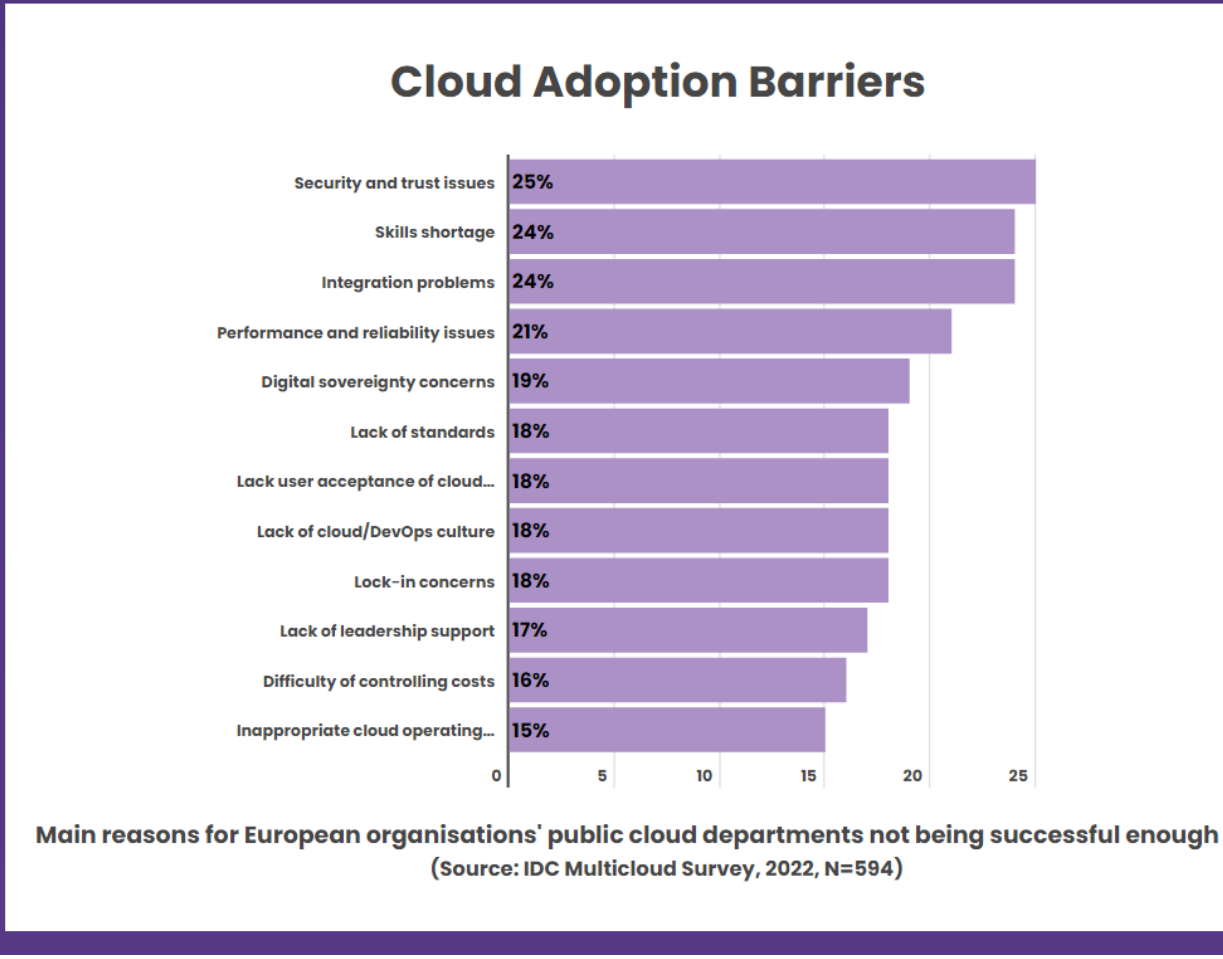

(Source: IDC European Edge Practice Research, 2022)

**IoT:** Organisations utilise IoT for many reasons. It can help organisations control costs, thereby contributing to the bottom line. But it also helps organisations improve the top line by improving customer experience, product quality, or introducing new products and services.



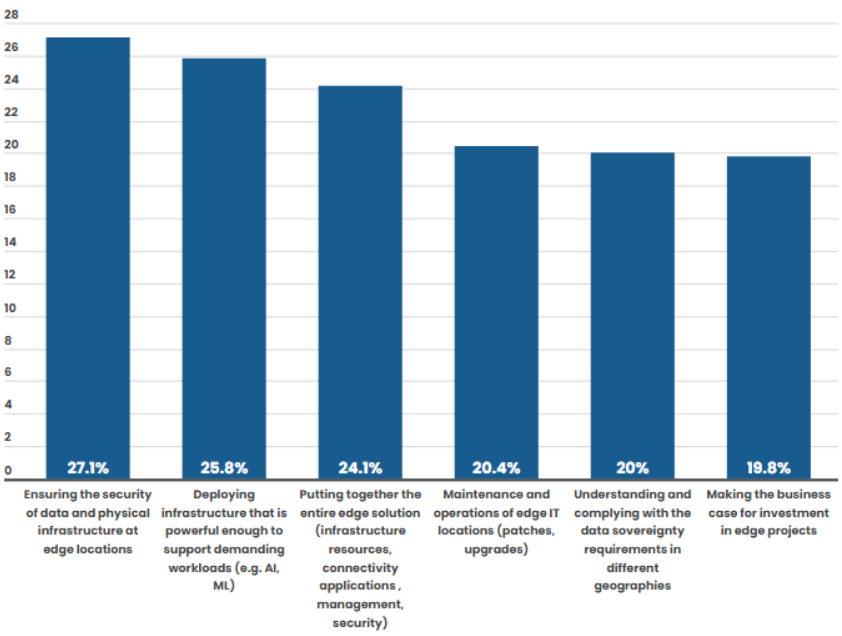
## Barriers

**Cloud:** Most challenges in cloud adoption are related to security and governance. Despite the relatively high cloud adoption, the success rate of cloud projects is still far from ideal. The main reasons for the projects' unsuccess were security and trust issues, inability to integrate well with on-premises applications, other cloud services, and edge and lack of skills. In addition, research shows that companies also struggle with the lack of cloud culture and face performance and reliability issues.



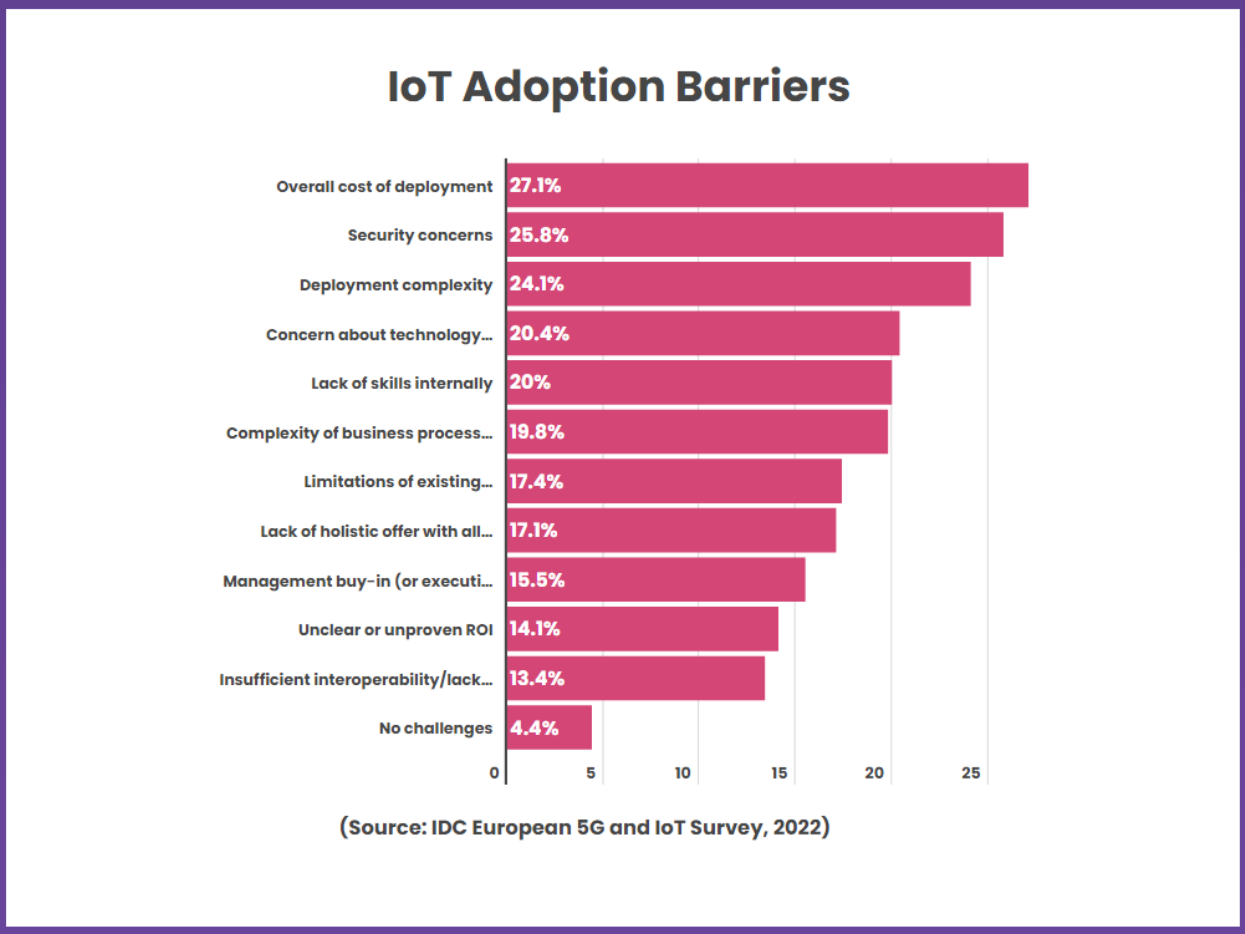

**Main reasons for European organisations' public cloud departments not being successful enough**
**(Source: IDC Multicloud Survey, 2022, N=594)**

**Edge:** According to the IDC Europe Emerging Technologies Survey, the lack of qualified workforce and skills is the primary barrier organisations face, as almost one-third do not have, or are not able to find, the right specialised and technical workforce to implement and adequately use edge technologies. Hence, receiving support from service providers and training and specialising the workforce will be critical for any organisation.




(Source: IDC Future Enterprise Resilience and Spending Survey, 2022)

**IoT** remains a relatively new technology space, with an emerging ecosystem developing and simplifying the technology, integrating components, developing best practices, and standardising solutions for critical use cases. While this maturation process is underway, multiple challenges and implementation barriers remain. Organisations must be aware of these challenges and the steps they can take to overcome them to obtain concrete benefits.




(Source: IDC European 5G and IoT Survey, 2022)