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Preface





Mehmet Ali Tombalak

TÜBİSAD

Chairman of the Board

The information technology sector is of strategic importance due to its contributions to growth in productivity and the general economy, its innovative and high value-added structure, its potential to create employment, and its contribution to the export-to-import coverage ratio.

The economic development of a country is reliant on both the public and private sectors being strong. As demonstrated in our previous reports, the development of information and communication technologies contributes to an increase in productivity in other sectors and accelerates overall growth. Companies that use information technologies effectively become stronger, thus promoting competition, and as a result, the national economy continues to develop. The globalization of a sector necessitates the creation of value based on technological investments, which can only be possible if companies in our country are supported in becoming leaders in their respective fields and the creation of a strong and scaled technology ecosystem.

TÜBİSAD has been publishing the Information and Communication Technology Sector Market Data Report for 13 years as a vital source of information for Türkiye and its companies, the general public, and academia. In 2023, the ICT market increased by 27 percent to reach \$33 billion, i.e., TRY 784.6 billion. For the first time in history, communication technologies were outpaced by information technologies in terms of both growth and scale, ushering in a new era. This is a significant milestone that demonstrates the potential of our country and our sector. This rapid growth in the software and services sector has led to an increase in software exports, raising our expectations for the future.

Working with TÜBİSAD and other non-governmental organizations, as representatives of the sector, we are determined to carry this growth even further by taking advantage of the synergy of the public and private sectors. We will apply common sense in our adoption of a participatory management approach in which we share responsibility and will pull out all the stops to ensure the sustainability of the growth in the sector and to increase the momentum.

Our forecast is not just a prediction, but also a commitment to the steps we will take on this path. We will work towards a more radical future and will consistently raise our voices in favor of technology.

I would like to thank the Ministry of Industry and Technology, the Information Technologies and Communication Authority, Context and all TÜBİSAD members, as well as our supporters, for their valuable contributions to this study.



Murat Boyla

Data Market

CEO

As in previous years, the Information and Communication Technologies Sector 2023 Market Data Report will provide valuable insights, conclusions, and forecasts, allowing us to better analyze the potential of our country in this sector and make the best use of the opportunities. The Information and Communication Technology sector is of strategic importance for Türkiye, where it has made a name for itself as one of the fastest-growing sectors in recent years. Our sector has great potential in exports and employment, providing added value to the national economy.

Türkiye's growth in the Information and Technologies sector is a crucial and valuable indicator of its economic and social status. Furthermore, our sector plays an important role in the digital transformation of companies operating in many different fields. We are seeing the arrival of new technologies, business models, and digital transformation processes in every facet of our lives, and we must adapt to them quickly if we are to remain competitive and achieve sustainable success.

TÜBİSAD's Information and Communication Technology Sector Market Data Report is of great importance as a source of critical data on the sector.

I would like to thank all our stakeholders, including the Ministry of Industry and Technology, the Information Technologies and Communication Authority, Context and all TÜBİSAD employees, as well as our board members who actively worked on the project, for their valuable contributions to such an important study of our sector. Data Market will draw upon its 3 decades of experience to contribute further to the growth of our sector through constant renewal and investments in sustainable IT solutions, being aware of the need for our sector to respond to the day-to-day changes in the technology sector.



Emre Hantaloğlu

Lenovo Türkiye

General Manager

Lenovo is pleased with the announcement of the 2023 Information and Communication Technology (ICT) Sector Market Data Report, prepared by the Turkish Informatics Industry Association (TÜBİSAD). This research provides a comprehensive overview of the growth of the sector and compares it with the preceding year, detailing the rate at which our member companies are adopting new technologies and their innovation efforts, while also shedding light on the future of the ICT ecosystem. It is also of critical importance in its presentation of the growth momentum, trends, and future potential of the dynamic ICT sector in Türkiye.

The report provides valuable insights that can guide the ICT sector towards sustainable, efficient, and innovative growth in the years to come, and supports stakeholders in the sector in taking advantage of artificial intelligence and other technological developments as they work together to increase Türkiye's competitiveness in the technological field.

Featured Technologies in the Sector



Featured Technologies in the Sector

The use of generative artificial intelligence to increase productivity in the business world is gaining momentum each day, and companies are accelerating their cloud transformations as the platforms become more widespread, particularly technology companies.



Generative Artificial Intelligence (GenAI) in Business



Cloud Transformation



Platform Engineering



Sectoral Metaverse

Generative artificial intelligence (GenAI) is being used by more and more companies in support of the **automation of their business processes, lightening their daily workload.** This technology increases employee productivity, whereas **AI-aided software development tools** expedite the coding, testing and bug fixing processes of software engineers, **improving software quality and shortening time to market.**

Cloud investments saw a remarkable upturn last year, **and these investments are being reinforced this year.** Companies are **increasing their investments into cloud-based initiatives** to support their ever-changing business processes. Cloud capabilities **are expanding to support sector-specific requirements,** enabling companies to respond quicker and more effectively to the rapidly changing market conditions and competitive opportunities.

Platform engineering supports the management of complex architectural tools and services, enhancing **both developer experience and business value.** Companies **create scalable and secure platforms** and automate their software development and operation processes, thus improving process efficiency.

The sectoral metaverse integrates their experience in virtual and augmented reality **with sector-specific requirements and reshapes business processes.** This continues to be counted among the technologies that have attracted attention in recent years, and **its integration into the business world has become widespread,** providing opportunities to deepen customer interactions and enrich product/service delivery.

*A still-influential trend: **Sustainability in Business***



The need for sustainability continues to steer the business world, requiring companies to reshape their strategies to meet their environmental, social and governance (ESG) objectives.

A hand and a robotic hand holding a lifebuoy. The background is dark blue with a faint grid pattern. The text is white and centered.

Featured Technologies in the Sector

Generative Artificial Intelligence (GenAI) in Business

Generative Artificial Intelligence (GenAI) in Business

GenAI technologies bridge the gap between business functions and IT teams, providing everyone with access to AI technologies.



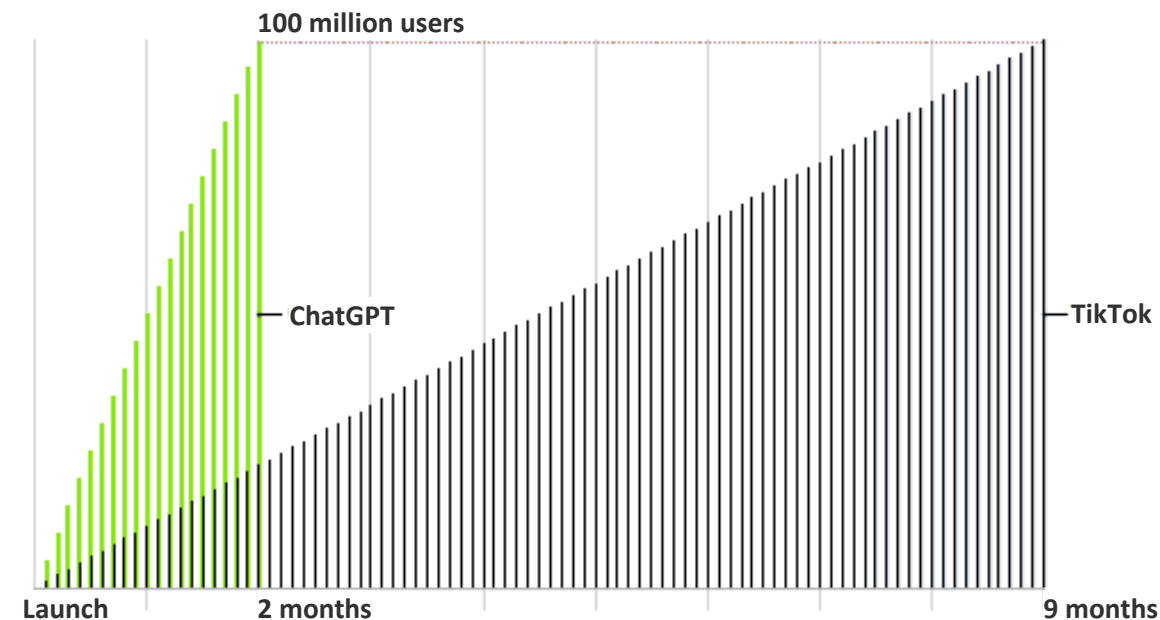
GenAI technologies are witnessing increased growth **not only in software development**, but also in a wide range of applications, **from simple task automation to complex problem solving**, in all areas of business.



GenAI **bridges the gap between business functions and IT** in the provision of access to knowledge and skills. It creates an inclusive and productive environment by allowing not only technology teams, but all employees to interact with AI through intuitive interfaces and natural language processing.

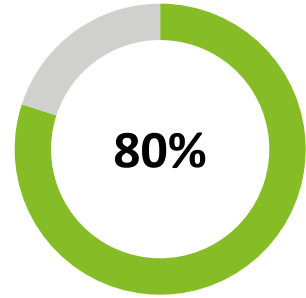
GenAI technologies have been rapidly adopted by the general public, and ChatGPT **has even surpassed the momentum of such popular platforms as TikTok** in terms of the number of users.

Time for Apps to Reach 100 Million Users



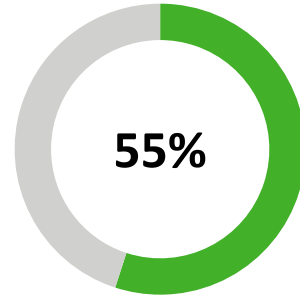
Generative Artificial Intelligence (GenAI) in Business

Leaders are increasing the use of GenAI technologies in their companies and are placing them at the top of their development agenda.



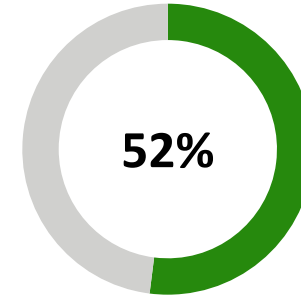
GenAI technologies increase the productivity of the company.

The vast majority of companies agree that GenAI will have a positive impact.



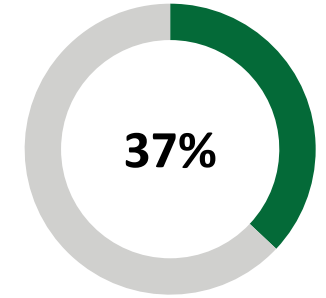
My company is in the process of testing and evaluating GenAI technologies.

The fact that more than half of the companies are actively testing and evaluating GenAI technologies indicates that they understand the importance of GenAI as a key factor in remaining innovative and competitive.



GenAI technologies can help the company grow.

By adopting GenAI, companies open new opportunities for growth, and are looking at how GenAI can be leveraged to increase their market shares and access new customer segments.

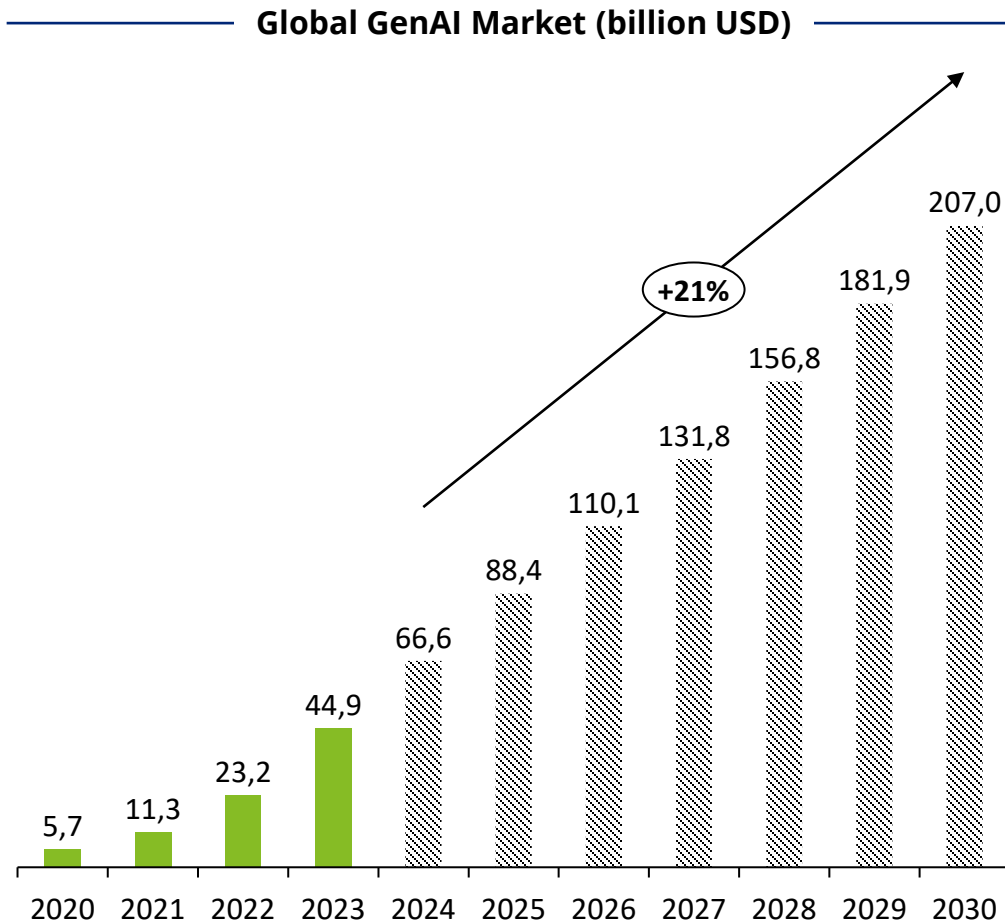


We have integrated GenAI technologies into some of our processes.

Nearly one-third of companies have successfully integrated GenAI technologies into some of their business processes, demonstrating the broad applicability of the technology and its compatibility with business processes.

Generative Artificial Intelligence (GenAI) in Business

The global GenAI market is expected to grow by 21% on average between 2024 and 2030, reaching to a market size of \$207 billion in 2030.



Highlights

- Investments in the global GenAI market have skyrocketed, as evidence of the **trust companies have in GenAI technologies**.
- The impact of GenAI on businesses will not be limited to the technology or IT departments. The associated technologies will come to be utilised in every department of a company, increasing efficiency and driving innovation in all areas, **from business processes to customer relationship management, from marketing strategies to product development, and from human resources to supply chain management**.
- With the increased use of GenAI, **governance is of critical importance**, and setting frameworks that protect business interests, **ensure ethical use** and safeguard intellectual property rights is becoming a priority for organisations.
- It has been reported that **more than 70% of companies are using GenAI, but less than 20% are willing to spend more in this area**. This suggests that while there is considerable interest in GenAI, companies remain cautious in terms of budget allocations.

Generative Artificial Intelligence (GenAI) in Business

AI-aided tools are rapidly changing the way the software development world does business.



In software development, AI technologies **are being applied to routine and repetitive tasks**, allowing employees to focus on more complex and creative works.



AI-aided software development **supports developers in writing code and build applications faster**. AI adds a layer of reliability and efficiency, aside from reducing the time spent on manual coding.

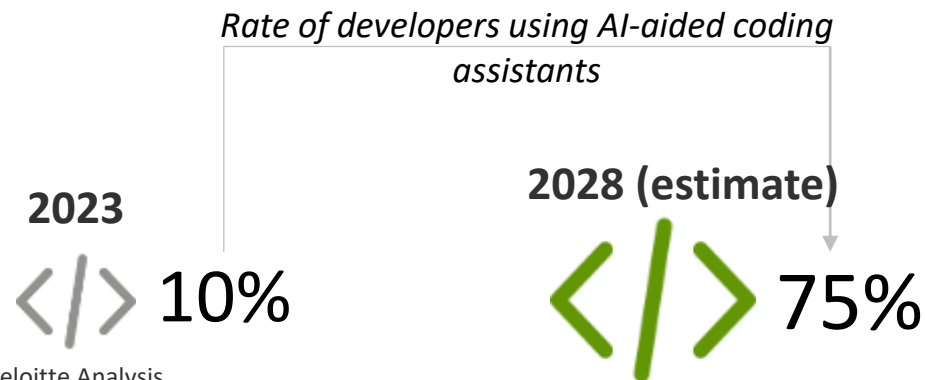


With these revolutionary changes in software development processes, AI-aided development is becoming a **permanent part of software development rather than just a trend**, and all technology teams are shifting to this new working method.

★ Benefits



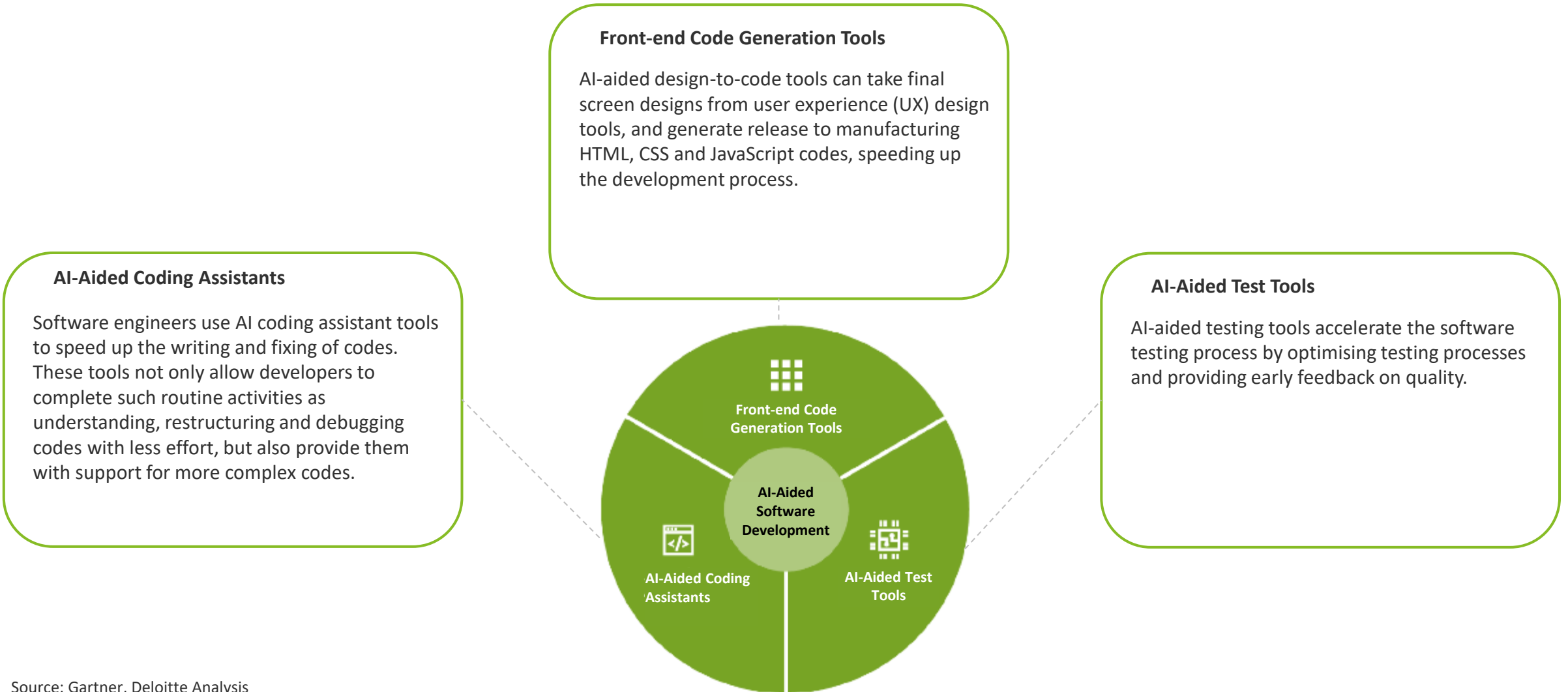
- **Accelerated Development Cycles:** AI-aided development tools shorten development cycles by accelerating such processes as the identification of new products and features, the monitoring of trends and user needs, and the writing and testing of code.
- **Efficient Use of Effort:** AI allows smaller teams work faster and more efficiently, helping to reduce project costs.
- **Improved Efficiency and Productivity:** AI can do more than just generate code, having the ability also to test the generated code, find bugs, suggest solutions and automate complex problem-solving procedures.



By 2025, more than half of the companies are expected to look for advanced GenAI tools competency when hiring software team leaders.

Generative Artificial Intelligence (GenAI) in Business

AI-aided tools can be classified into three groups in the software development value chain: coding assistants, testing tools and front-end code generation tools.



Generative Artificial Intelligence (GenAI) in Business

As the number of players in the market increases with the widespread use of AI-aided tools, the impact created by Amazon and GitHub tools proves their influence on software development.



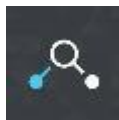
GitHub Copilot simplifies the software development process and coding even for beginners. It has several functions, including code auto-completion and code suggestion, conversion of natural language commands into code, and its use by technology teams is becoming more and more widespread.



ChatGPT is frequently used for chatbots. It overperforms in its design of natural conversational flows, understanding questions and proposing answers, and can generate program code and documentation.



Amazon CodeGuru provides various features, including code optimization, identification of bugs and vulnerabilities, and automated code review. This review enables users to save time and makes software development more efficient.



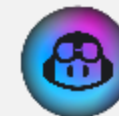
DeepCode, performs code review and diagnoses bugs in real time. It also offers code debugging solutions.



Amazon CodeWhisperer is an AI-aided coding assistant created by Amazon for developers; it offers suggestions and completes codes to help them complete programming tasks in a faster and more efficient manner, as well as makes security scans.



In a coding competition organised by Amazon, developers using an AI tool called CodeWhisperer completed tasks **57% faster** on average than those without access to the tool, and the **success rate of the produced code was 27% higher**.



According to a study in which GitHub Copilot was used by more than 1,000 developers, **it was reported that the tool increased developer productivity by 17% to 20%**. More than 90% of developers reported **time savings of 1–2 hours per week on average**. Moreover, more than 50% of developers reported that **they improved their work experience due to the speeding up of routine tasks**, and more than 75% reported that **it was easier to complete their tasks**.

An abstract, glowing sphere composed of intricate, swirling patterns of teal and orange light against a dark background. The sphere has a textured, almost crystalline appearance with varying intensities of light, creating a sense of depth and movement.

Featured Technologies in the Sector

Cloud Transformation

Cloud Transformation

Cloud computing technologies are consolidating their place in technology trends, and companies need to create cloud strategies to integrate cloud technologies into their business processes in the most efficient way.

As cloud transformation reinforces its place in trends...

- Cloud computing enables companies to be flexible when managing their operations regardless of geographical limitations and thus allows **them to more easily adapt to global markets**.
- Cloud solutions **reduce essential capital expenditures**, allowing companies to **pay only for things that they use**. This is particularly **cost-effective for businesses** that are expanding or in need of scaling up.
- Advanced security features and regular updates allow cloud service providers to support companies **with data security and compliance**, as well as **strengthen business continuity** by making data backup and disaster recovery solutions more accessible and manageable.

- Companies should have a business-oriented **cloud strategy** that is aligned with their business objectives if they are to **maximise the benefits** from cloud computing.
- The cloud strategy should be **designed in coordination with other business strategies**, including security, data center and software development, and all of them should be integrated in a manner to support each other.
- The cloud strategy should be **constantly reviewed and updated** to accord with changing technology and market conditions.
- The cloud strategy should be used as a baseline to achieve specific business outcomes and **all cloud activities should be planned in line with this strategy**.

...it becomes critical for companies to create a cloud strategy.

Cloud Transformation

Cloud services can be provided through public, private, and hybrid cloud models, with various advantages that differ from one model to another.

1 Public Cloud

A Public Cloud is a model through which cloud resources (such as servers and storage) are provided and operated by a third-party cloud service provider via the Internet.

Advantages:

- **Cost Management:** No purchases of hardware or software are required, and payments for services are made on a per-use basis.
- **Ease of Maintenance:** All maintenance and updates procedures are managed by the service provider.
- **Scalability:** Businesses can access resources instantly as they need them.
- **High Reliability:** Extensive server network providing protection against system failures.

2 Private Cloud

In a Private Cloud, cloud resources are hosted in an organisation's own data center or managed and privately used by a third-party service provider.

Advantages:

- **Flexibility:** Organisations can customise their resources according to their IT requirements.
- **Control:** Full control over data and applications ensured.
- **Security:** Businesses can rely on a high level of security and compliance for critical data and applications.
- **Scalability:** Private clouds usually offer more scalability than public clouds.

3 Hybrid Cloud

A Hybrid Cloud is a model in which private cloud resources are combined with public cloud services, and data and applications are able to move freely between the two media.

Advantages:

- **Control:** A private infrastructure is retained for sensitive data, while leveraging the resources offered by the public cloud.
- **Flexibility:** Additional resources can be sourced from the public cloud to cover workload fluctuations.
- **Cost Effectiveness:** Resource utilisation can be adjusted as required, allowing businesses to reduce unnecessary expenditures.
- **Ease of Transition:** The process for the transition to the cloud can be gradual, allowing workloads to be moved to the cloud over time.

Cloud Transformation

By 2025, expenditures on cloud services are projected to surpass those for non-cloud IT services.

Cloud Services

Software as a Service (SaaS)

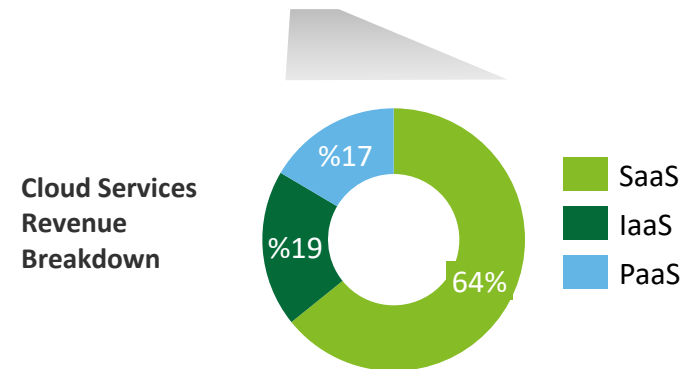
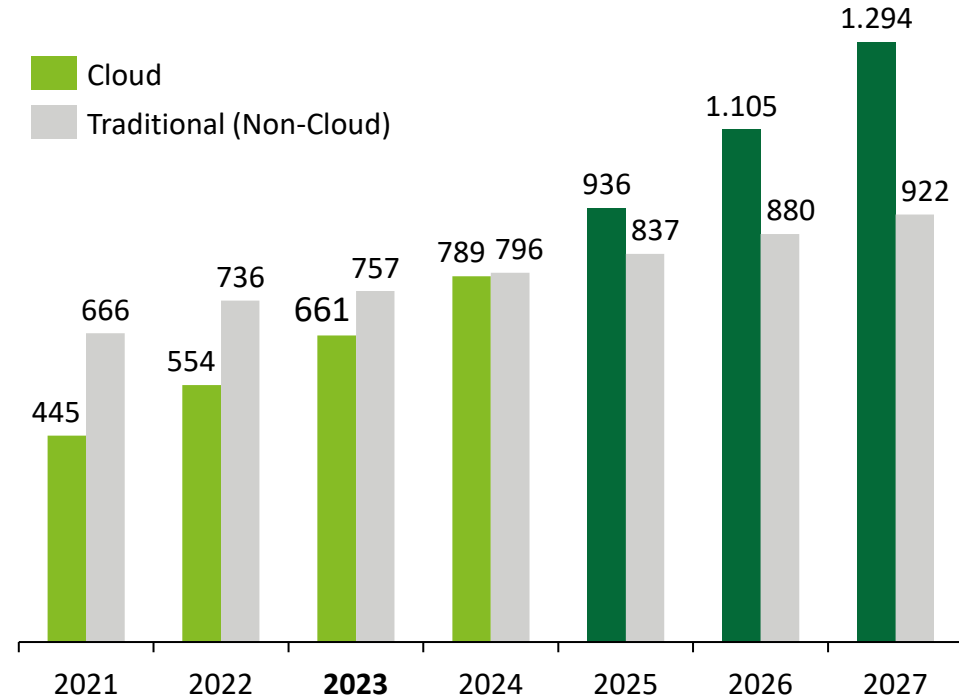
SaaS is a software delivery model that can be accessed from any device with an Internet connection, providing access to applications and data through a web-based platform. Access to these applications is provided on a subscription or pay-per-use basis, and all data is stored in the data centers of the service provider.

Platform as a Service (PaaS)

PaaS provides developers with the cloud infrastructure and platforms they require to build and manage applications on a variety of platforms, including web, business and social applications. These services are usually provided via a subscription or license.

Infrastructure as a Service (IaaS)

IaaS allows companies to rent essential computing resources, such as processing power, storage and network components, through a network connection. Users can fully control and manage their platforms through virtual machines rather than physical servers.





Featured Technologies in the Sector
Platform Engineering

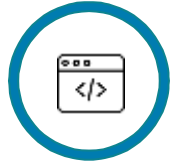
Platform Engineering

The platform system is an approach aimed at improving the experience and productivity of software developers and the quality of their outputs.

Outstanding features



The platform approach supports increased productivity **by allowing different teams to collaborate through access to reusable tools and services.**



It lessens the burden on developers and **increases their experience and productivity, while raising the quality of their outputs** and improving the overall work experience.



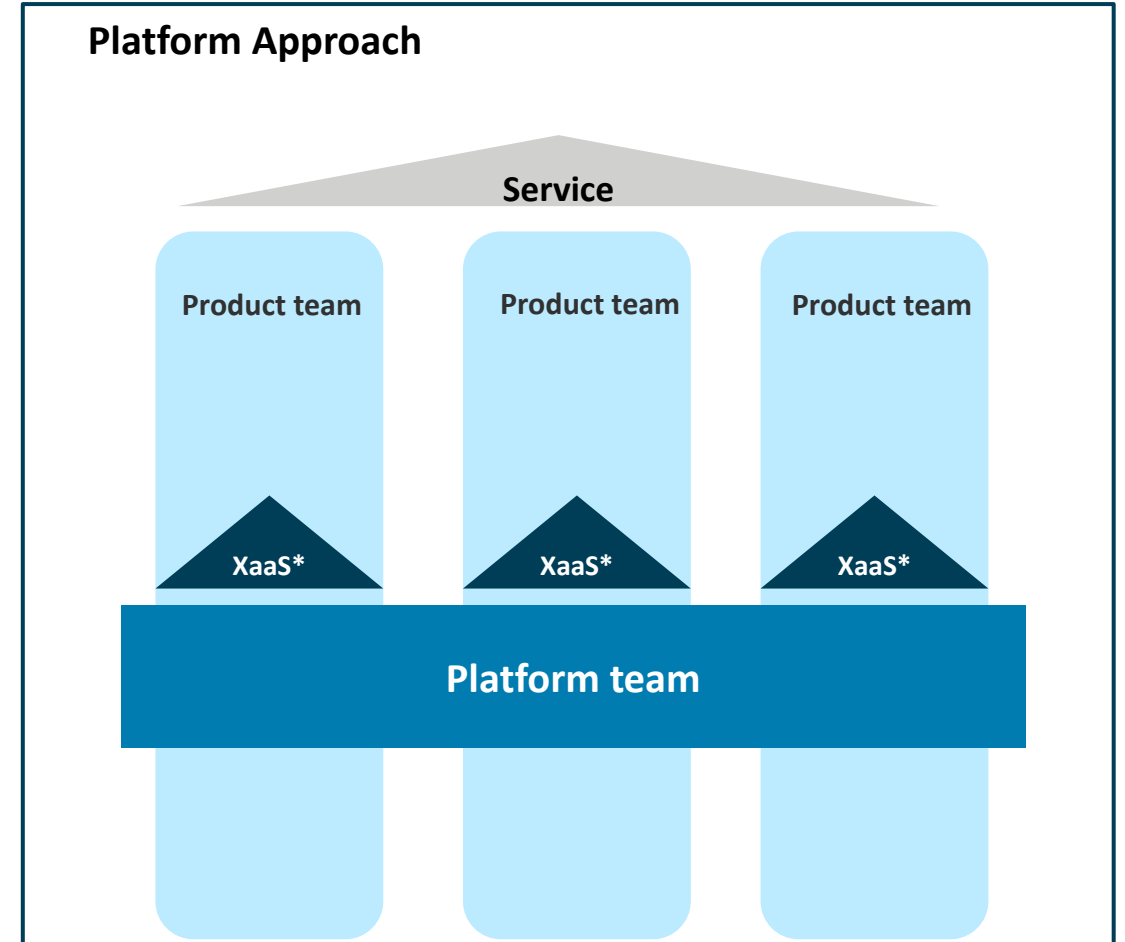
Most experienced IT and software staff do not yet have experience on platform development. It **should be ensured that developers gain this skill in the early stages of the trend.**



Users should not be forced to follow a single common workflow, and the **platform should be developed to provide flexibility.**



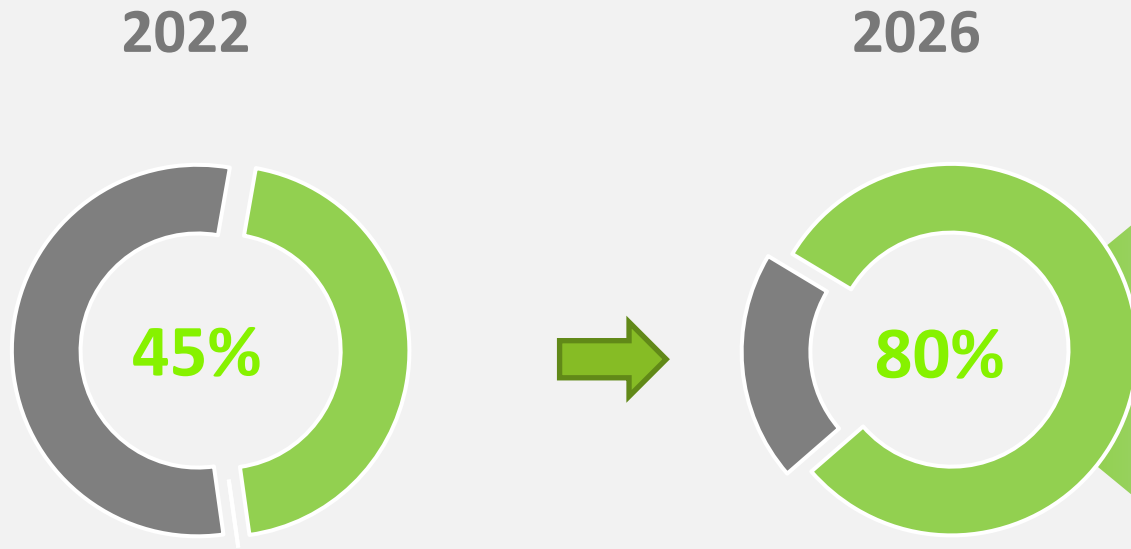
The main objective of the platform approach is to improve **the experience and productivity of developers and users.** The direct cost savings should not be the sole reason for the widespread use of the platform approach.



Platform Engineering

The platform approach focuses on improving the developer experience, and it is becoming more widespread in the sector with each passing day.

Large technology companies that have established platform engineering teams to provide reusable services, components, and tools for application development



Considering the Platform as a Product

Platforms should be managed as a product, and should be developed based on usage and effectiveness, starting as an MVP (Minimum Viable Product).

Demand and Feedback Orientation

Platform product owners should create user feedback loops to determine demand.

Self-Service

Platforms should be usable with no need for IT specialists or ticketing systems, providing time savings to users and ease-of-use.

A man is seated at a desk in an office, wearing a VR headset. He is pointing his right hand towards a computer monitor. The desk is cluttered with various items, including a laptop, a mouse, and several cables. In the background, there are multiple computer monitors and a whiteboard with some writing on it. The overall scene is dimly lit, suggesting an indoor office environment.

Featured Technologies in the Sector

Sectoral Metaverse

Sectoral Metaverse

Sectoral Metaverse allows businesses to transform real-world processes into virtual models and to reshape their processes, from product design to operations, through such technologies as AR, VR and artificial intelligence.



Metaverse Solutions in Digital Transformation

- The Metaverse concept goes beyond digital games and social platforms **through its integration into sectoral applications. It can improve various business processes, from product design and development, to production and operations**, thanks to various technologies, including AR, VR and mixed reality.
- For example, the Omniverse platform of BMW connects different departments throughout the company's ecosystem, contributing to the centralisation of design operations and processes, and creating **a more integrated workflow.**



Upward Trend of Sectoral Metaverse

- The sectoral metaverse **hosts replicas of real-life operations** and adds a new dimension to business and technological applications.
- For example, Hyundai, in collaboration with Unity, is developing a pioneering **full-scale factory simulation software with the aim of simulating and optimising factory operations in a virtual environment.** Similarly, Siemens is using similar technologies to **plan** and build a new factory in a digital environment.



Business of the Future

- These innovations aim to **increase efficiency in business processes, reduce costs and improve workflows in general**, and to better coordinate different sections of the workforce and **speed up decision-making processes.**
- The sectoral metaverse, together with emerging IoT technologies and advanced data analytics, transforms conventional business models and processes and provides businesses with a competitive advantage.

Sectoral Metaverse

The Sectoral Metaverse transforms business processes, from engineering to manufacturing, and provides businesses with innovative opportunities in productivity, training, cooperation and analytics.



Enhanced Remote Collaboration

The sectoral metaverse enables engineers, designers and operators to cooperate in various areas, including augmented reality, virtual reality, spatial computing and 3D environments, regardless of their physical location. This supports the maintenance of more efficient project development and problem solving processes.



Training and Simulation

Realistic simulations allow employees to learn to operate machines without risky training processes, improving their efficiency in decision-making and in the implementation of safety protocols, and supporting their understanding of complex systems.

- Reduced need for physical/field training
- Accelerated skill adaptation and development
- Increased security



Data Visualisation and Analysis

The sectoral metaverse can integrate real-time data from various sources (such as IoT sensors) into a 3D virtual model (digital twins). The simulation can then validate and test replicas in the digital world by using real-time data. This ensures better monitoring, analysis and decision-making capabilities related to business processes, supply chains and facility management.

Benefits and Impacts of the Sectoral Metaverse

The background of the slide is a dense, repeating pattern of green leaves, likely from a plant like a peace lily, arranged in a way that creates a sense of depth and texture. The leaves are various shades of green, from a vibrant lime green to a deep forest green, and are oriented in different directions, creating a complex, organic pattern.

Featured Technologies in the Sector

A Still-influential Trend: Sustainability in Business

Sustainability in Business

The ESG trend is gaining strength worldwide, and the expansion of regulations and increasing demand are bringing about rapid growth in the ESG software market, which is expected to reach a market size of USD 1 billion by 2024.

The ESG megatrend continues to impact the business world:



ESG reporting regulations are gaining strength in major markets, **requiring** companies to report more transparently on their environmental, social and governance performances.



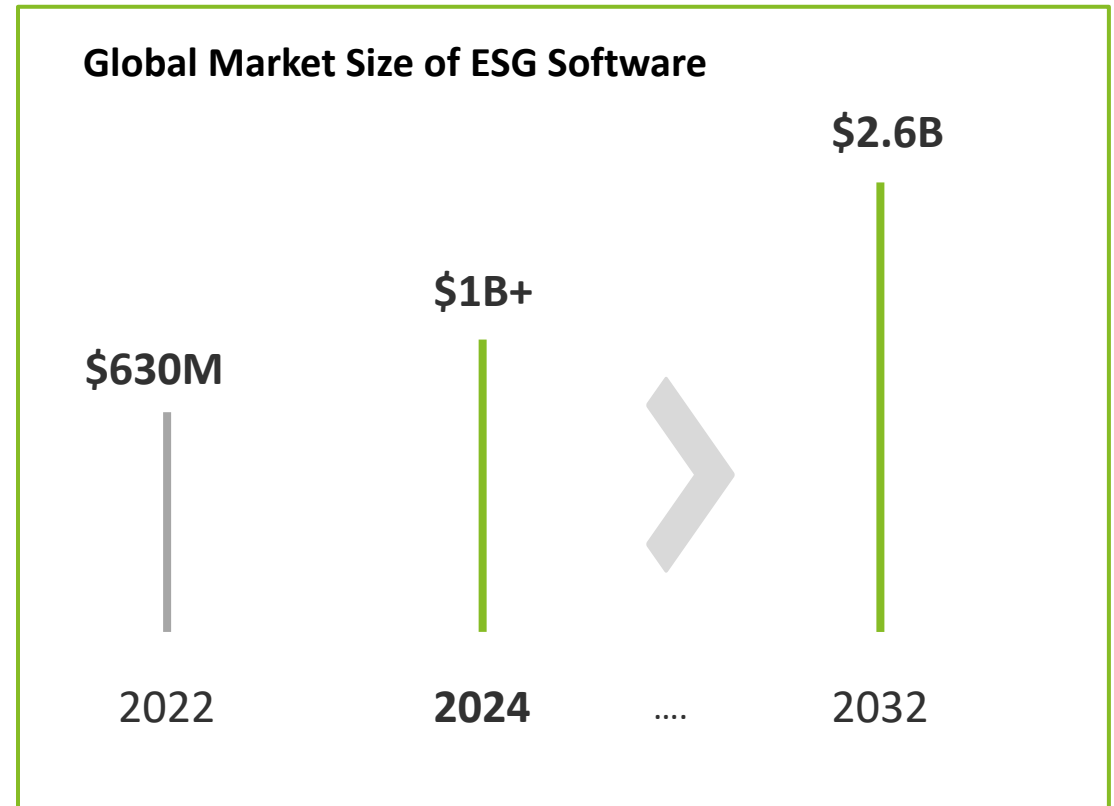
Investors and consumers are **increasingly on the look-out for companies that offer sustainable products and practices**, leading companies **to increase their commitment to sustainability**.



Effective ESG reporting and management processes are expected to **strengthen the market position** and **increase the brand value of compliant companies**, which, in turn, **leads to growth in the ESG reporting software market**.



Annual sales of ESG reporting software are **expected to exceed \$1 billion in 2024**. ESG software has the capacity to provide real-time sustainability data to companies through the provision of information from various data sources, thus bringing convenience to decision-making processes.

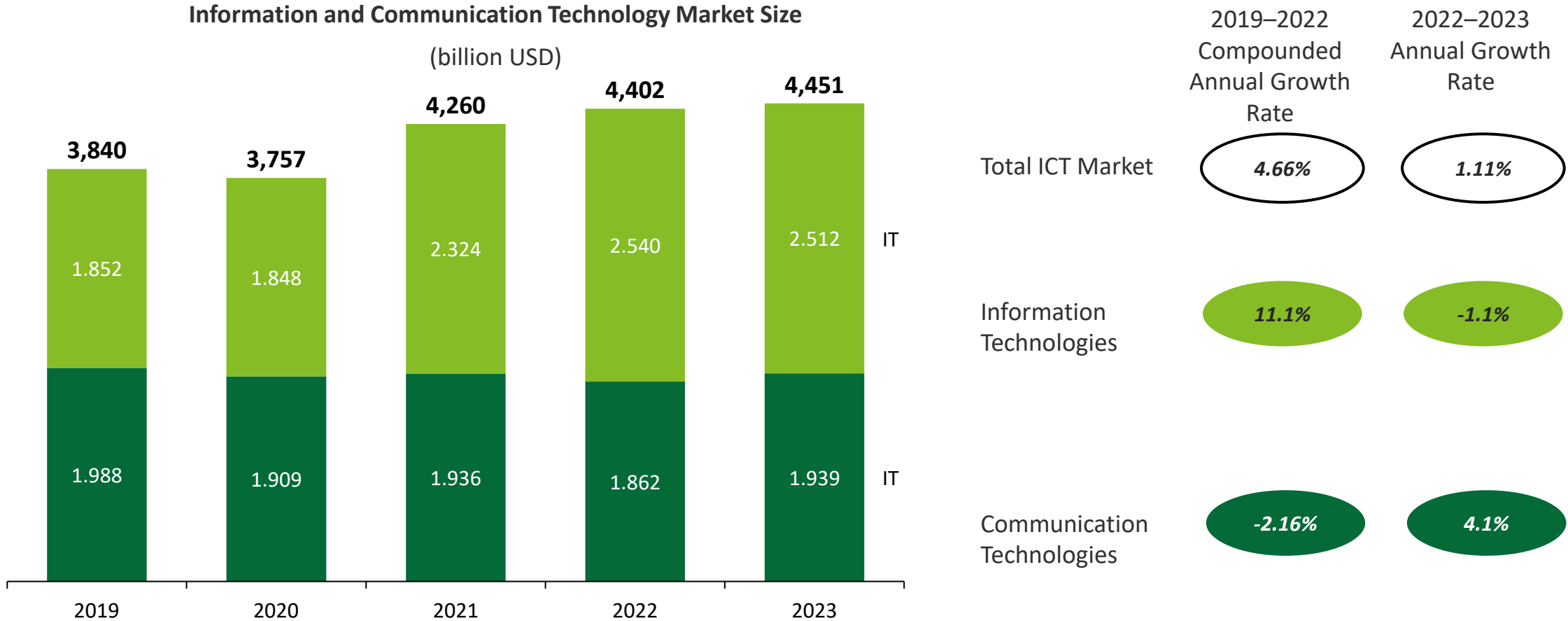


Global Market Size



2023 Global ICT Market Size

In 2023, the global ICT market size increased by 1.1% and reached USD 4.45 trillion, while the information technologies market shrank at the same rate and the communication technologies market size grew by 4.1%.



Note: Differences in the totals may occur due to rounding.
Source: Gartner, Deloitte analysis
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Future Expectations and Global ICT Market Growth Forecast

The global ICT market is projected to reach USD 4.8 trillion in 2024 and then grow by 9% per year to reach USD 6.2 trillion in 2027.

Drivers



Companies outsource IT services to third-party service companies to reduce their IT infrastructure costs



Prioritisation of digital and cloud transformation in company investment plans



Increase in the use of smart devices to meet data-intensive needs based on the introduction of 5G technologies and the expansion of the telecommunications infrastructure



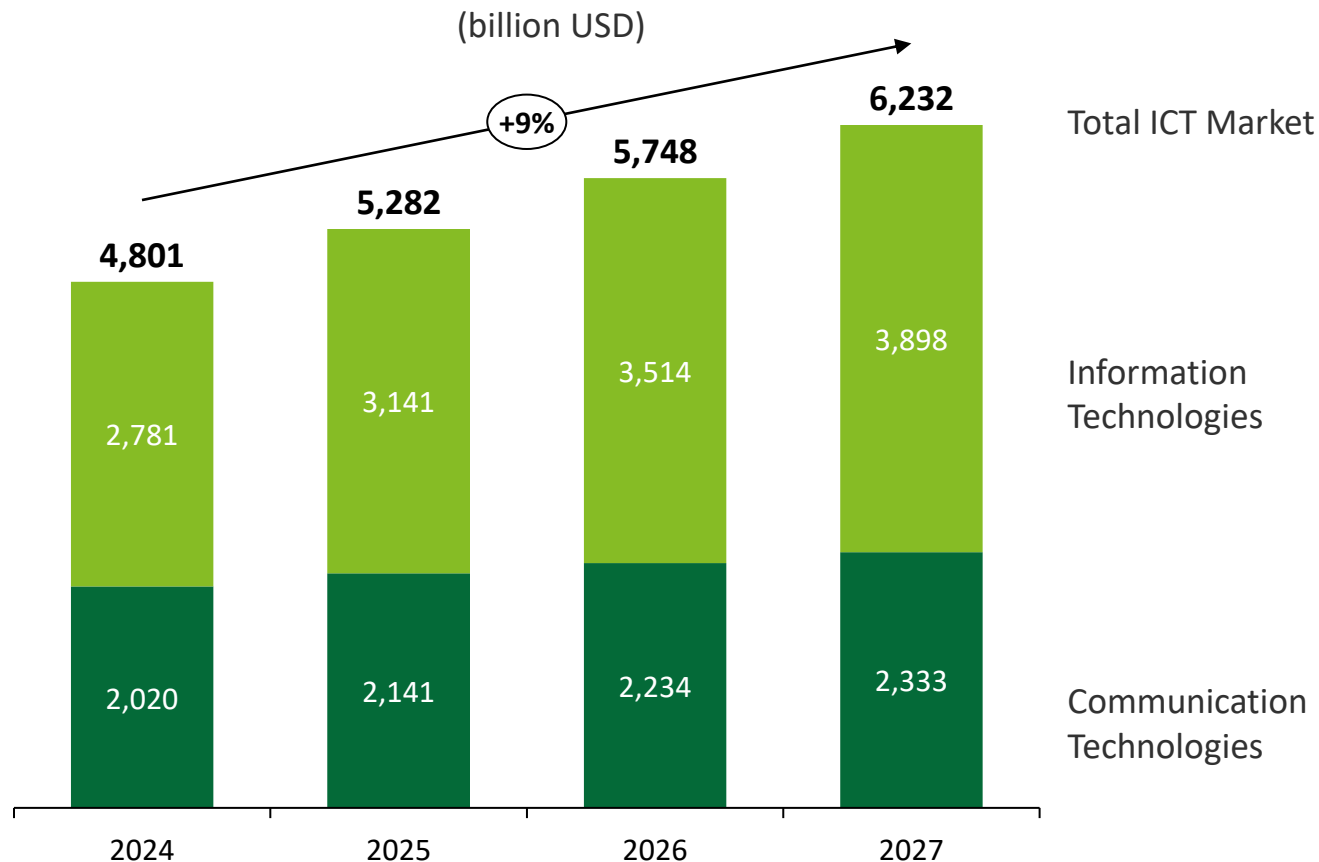
Raised interest rates by countries to take inflation under control and difficulty in accessing funding



Global economic uncertainties and geopolitical tensions

Constraints

Global Information and Communication Technology Market Size



Note: Differences in the totals may occur due to rounding.

Source: Gartner, Deloitte analysis

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Stakeholders of the Study



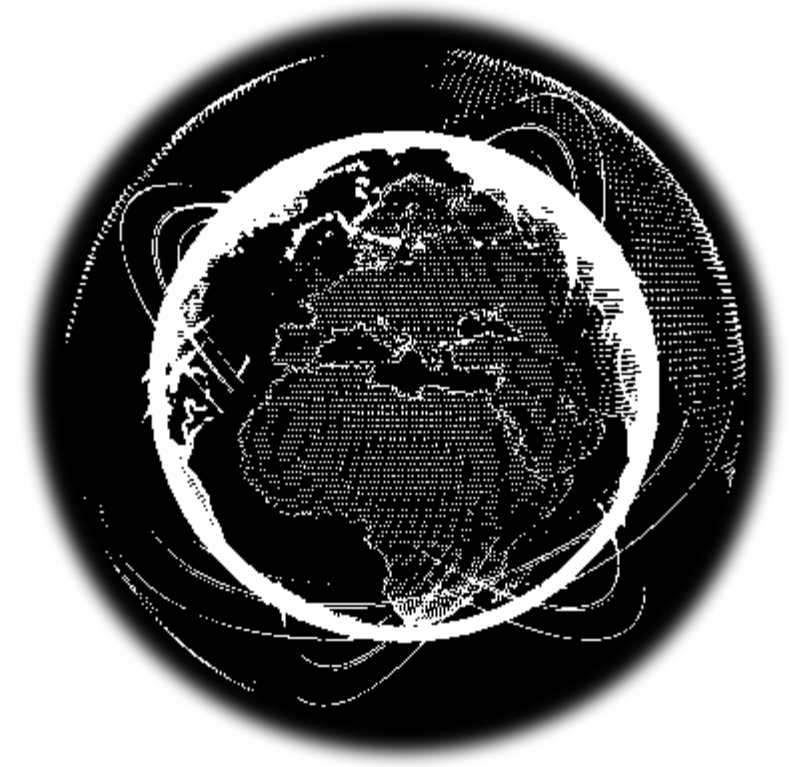
Project Consultant

Deloitte.

Project Data Partners

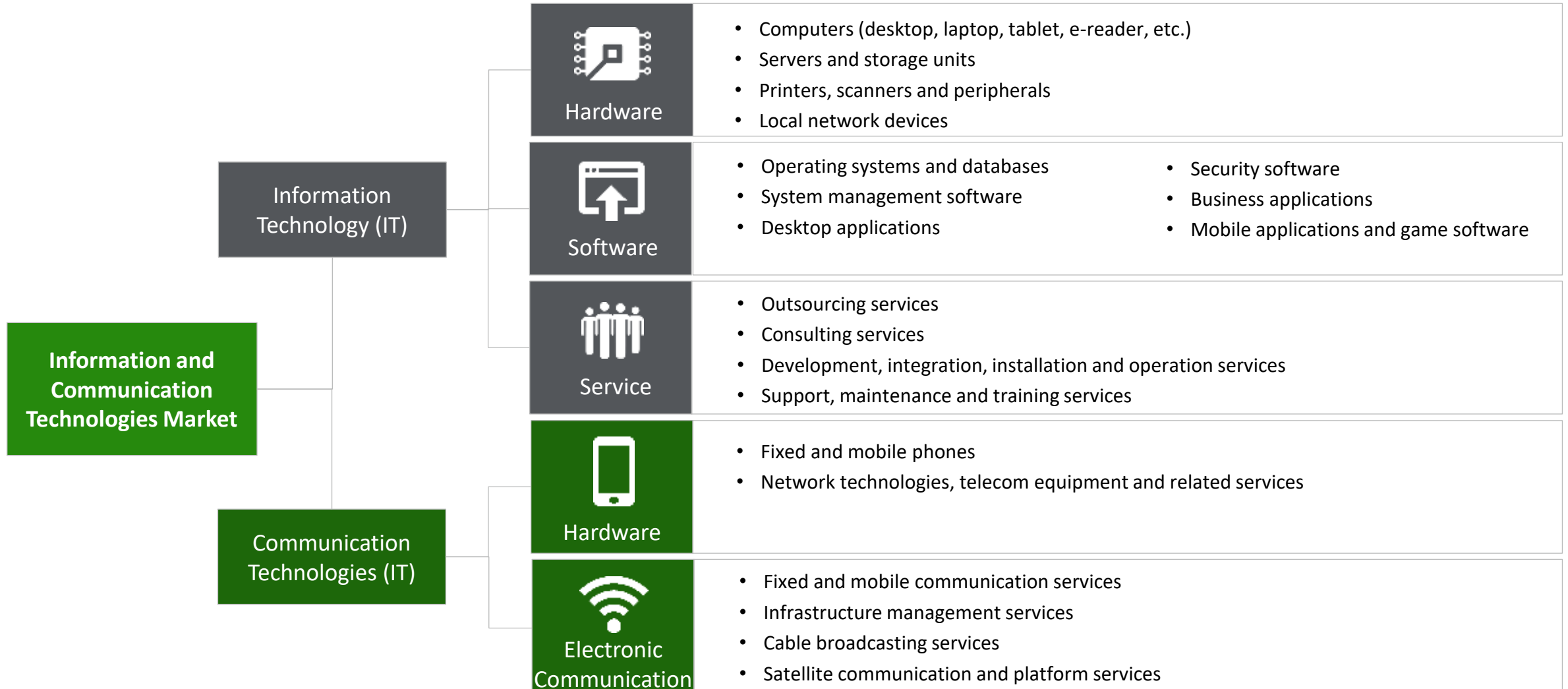


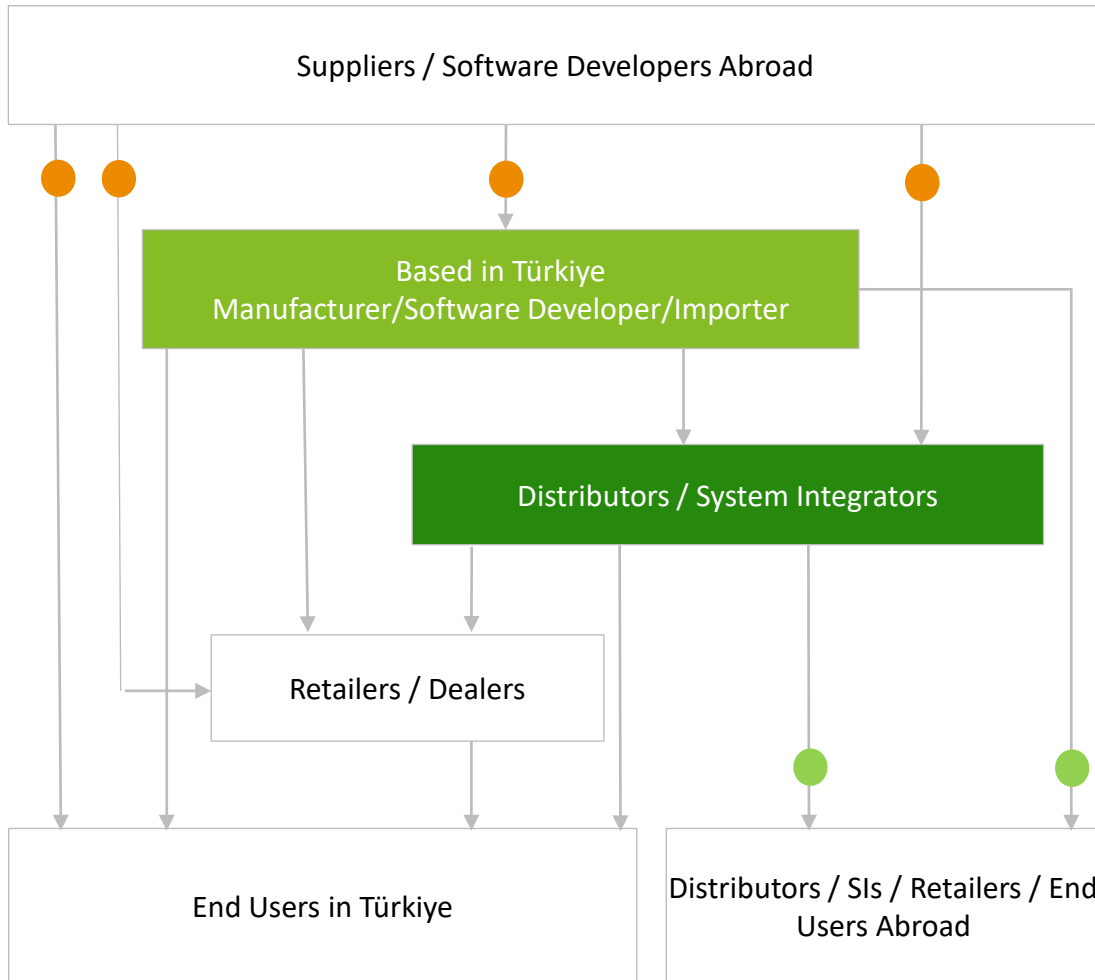
Scope of the Study



Scope of the Study

TÜBİSAD's Market Data study, conducted since 2012, has been performed with Deloitte with a standardized scope and methodology for the last 13 years.





Market size is calculated and verified through a bottom-up approach.

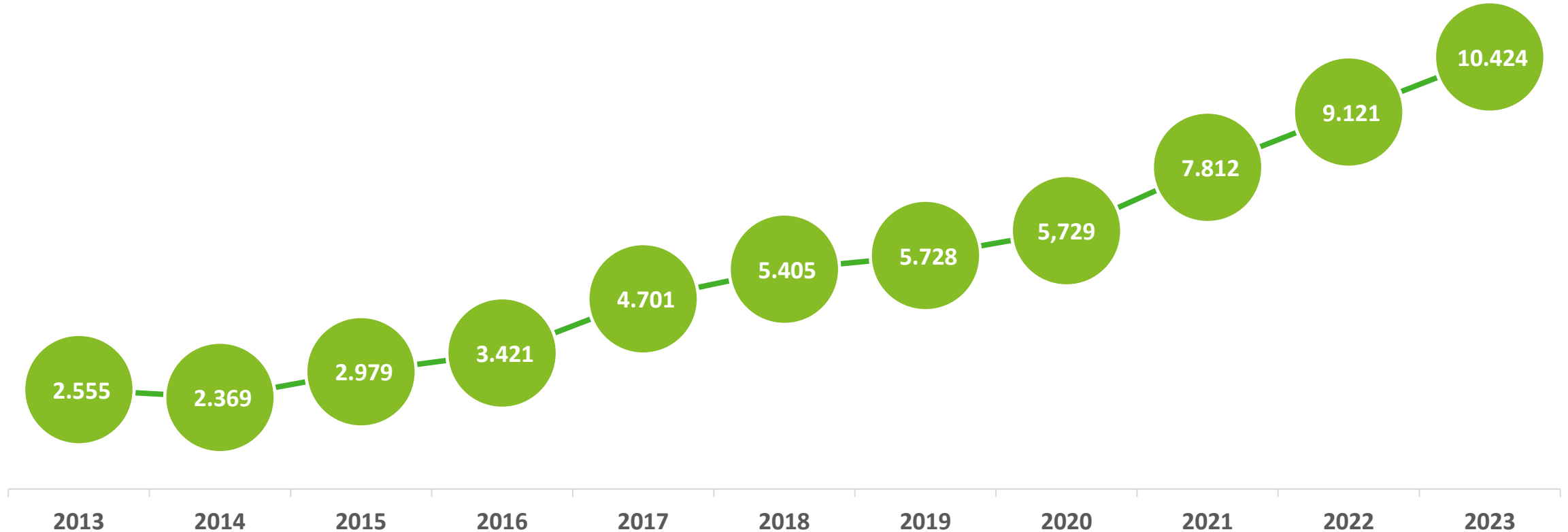
In addition to the data collected from sector companies through a survey, the study also uses data from various institutions, including BTK, Context, SASAD, and the Ministry of Industry and Technology.

- When collecting the data, company and sector data is measured properly to avoid any overlaps or duplicate calculations.
- Company data is gathered together with different breakdowns:
 - End user vs intermediary sales
 - Imports vs exports
 - Origin of products and services
 - Technoparks' share

● = Import
● = Export

Sectoral Players in the Scope of the Study

All data collected as part of the market data study is provided by sector companies. The number of companies covered by the study reached 10,424 in 2023.



Information and Communication Technologies Sector in Türkiye

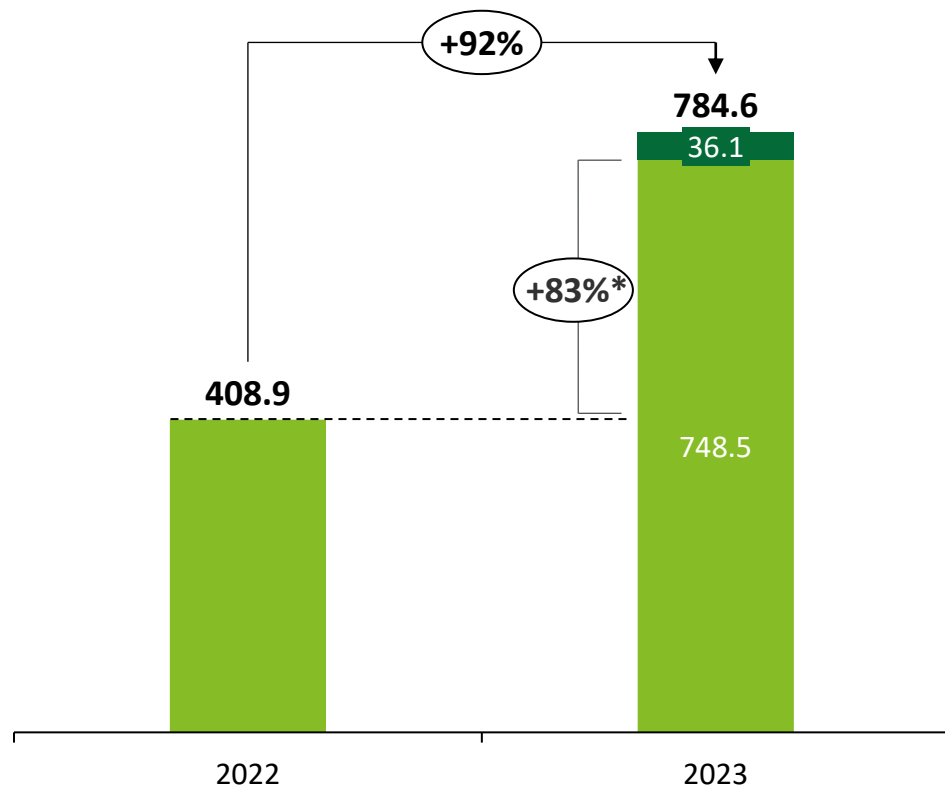


Market Size (billion TRY)

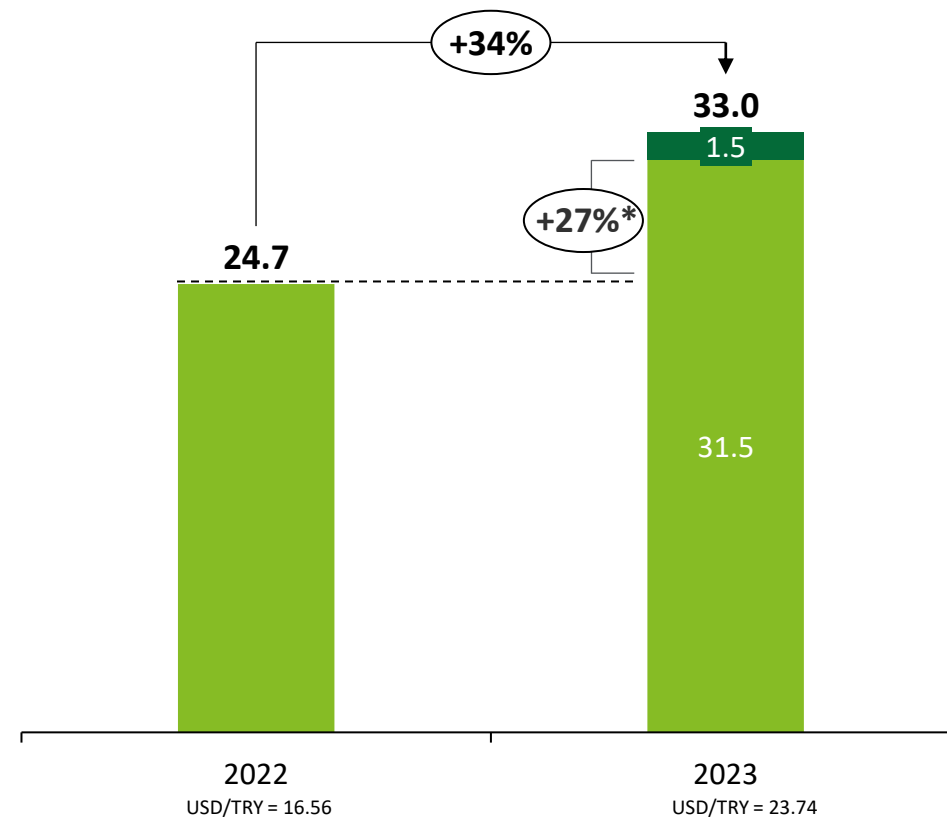
In 2023, the market size reached TRY 784.6 billion (USD 33 billion).

Information and Communication Technologies Market Size

(billion TRY)



(billion USD)



■ Size of newly added companies this year

■ Size of newly added companies this year

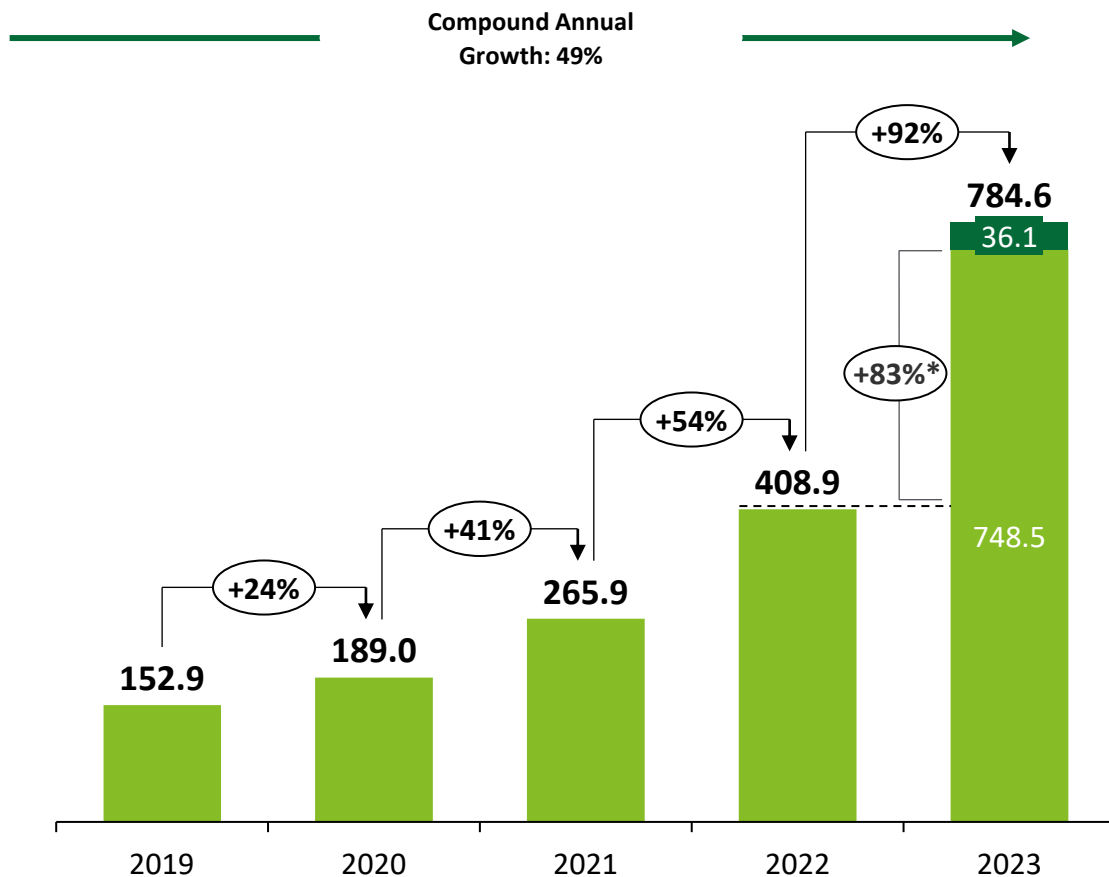
*: Annual changes refer to comparable growth rates.
 Note: Differences in the totals may occur due to rounding.
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Market Size (billion TRY and USD)

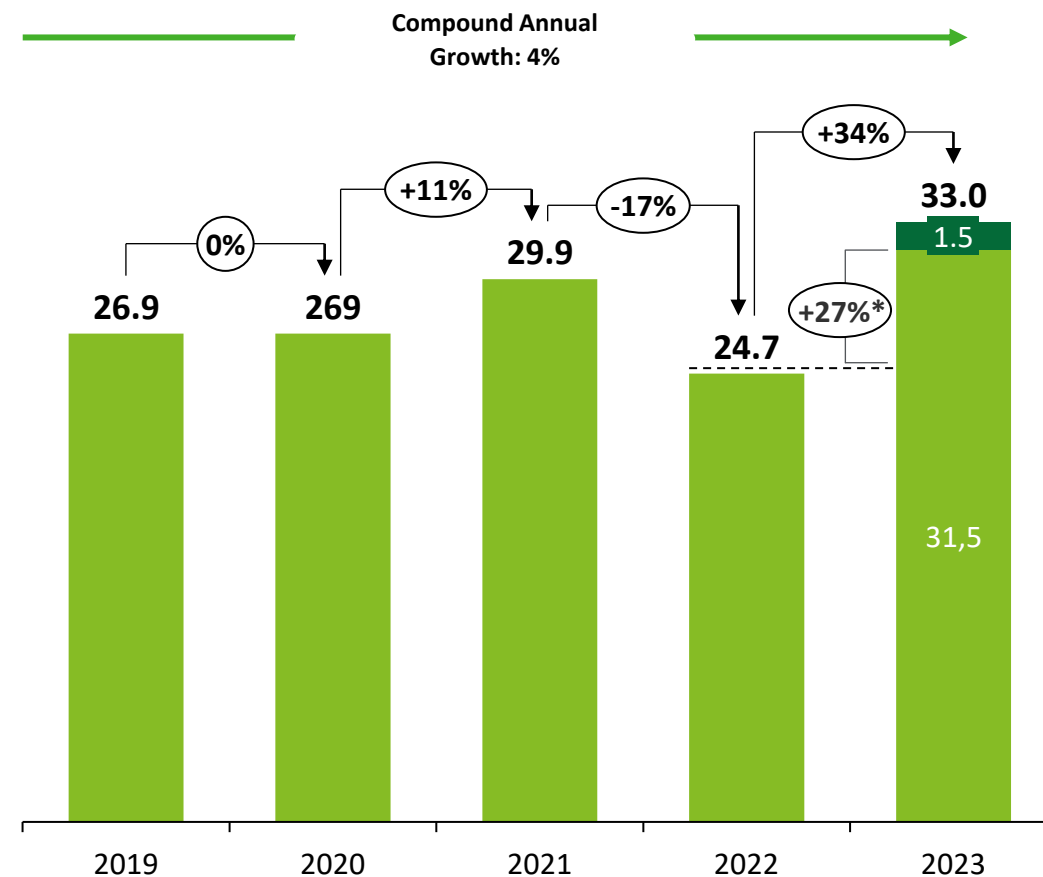
Between 2019 and 2023, the sector's compound annual growth was around 50% in TRY terms.

Information and Communication Technologies Market Size Growth

(billion TRY)



(billion USD)



■ Size of newly added companies this year

*: Annual changes refer to comparable growth rates.

Note: Differences in the totals may occur due to rounding.

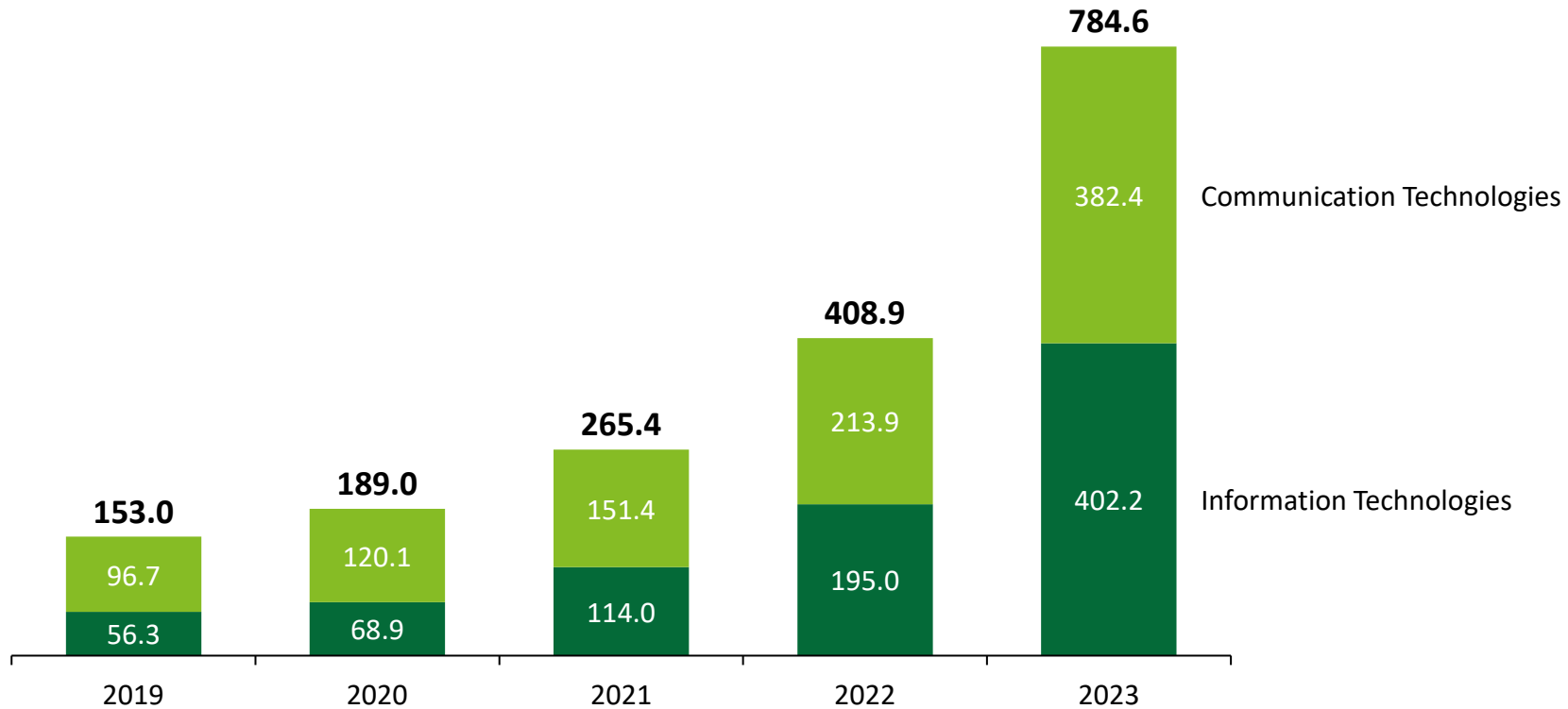
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Information and Communication Technology Market Breakdown - billion TRY

Information Technologies grew faster than Communication Technologies between 2019 and 2023 and outpaced Communication Technologies in terms of market size in 2023.

Information and Communication Technologies Market Size

(billion TRY)



2019–23
Annual Compound
Comparable Growth

41%

60%

Note: Differences in the totals may occur due to rounding.

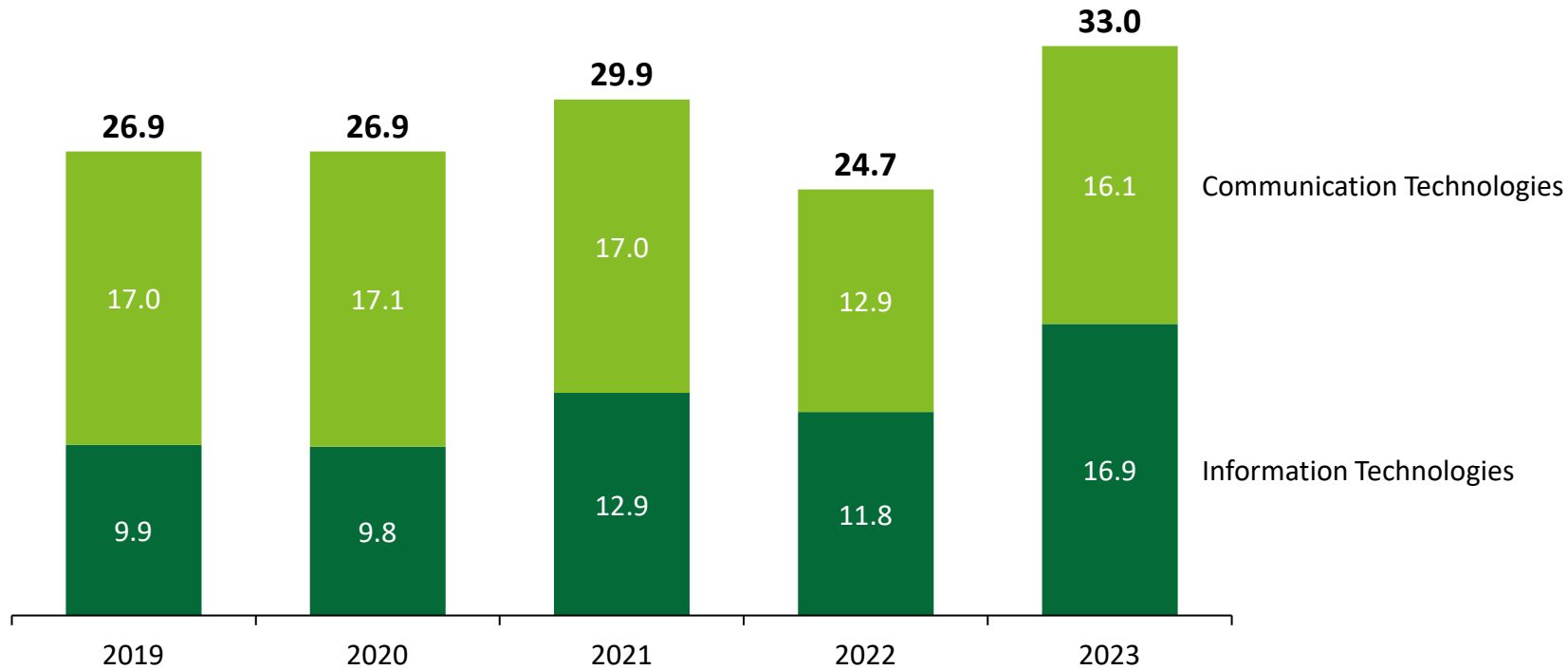
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Information and Communication Technology Market Breakdown - billion USD

Information Technologies grew in the last four years despite the increasing exchange rate, whereas Communication Technologies shrank under the effect of exchange rate fluctuations.

Information and Communication Technologies Market Size

(billion USD)



2019–23
Annual Compound
Comparable Growth

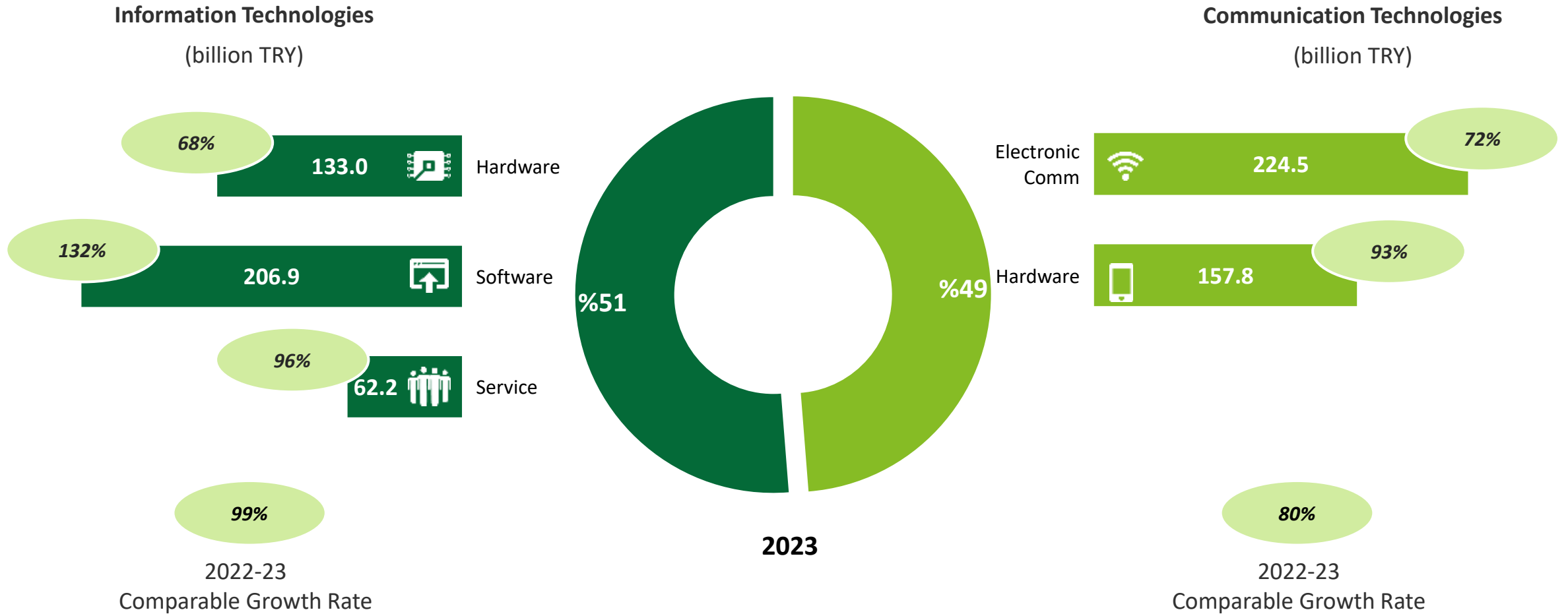
-1%

12%

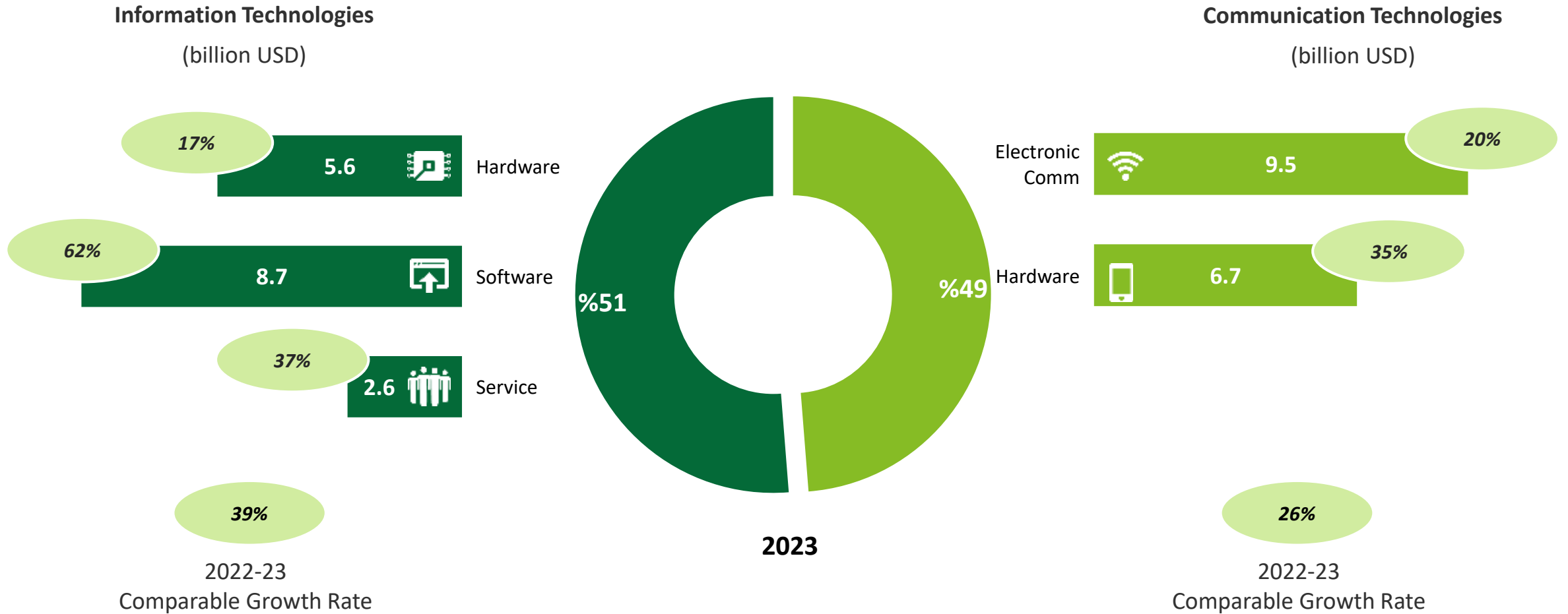
Note: Differences in the totals may occur due to rounding.

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Subcategories of the Information and Communication Technologies Sector



Subcategories of the Information and Communication Technologies Sector



Technology Development Zones (Technoparks)

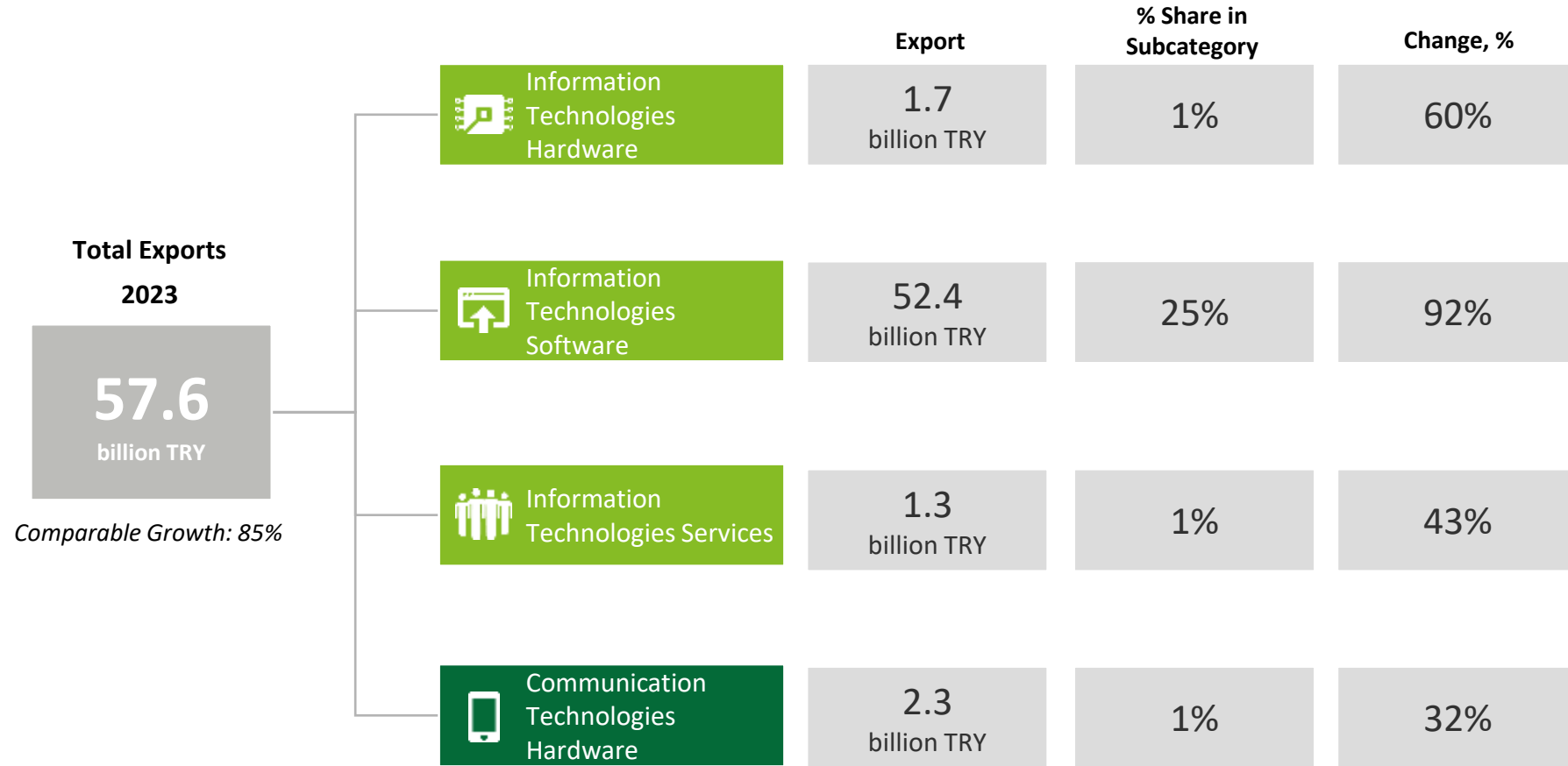
Technoparks in Türkiye	2022	2023	Change
Number of Technoparks	97	101*	4.1%
Number of Companies	8,972	10,275	14.5%
Number of Employees	93,173	108,360	16.3%
Total Revenues (billion TRY)	75.6	207.5	174.5%
Total Exports (billion TRY)	19.9	47.5	138.7%
<i>Revenue per Company (million TRY)</i>	8.4	20.1	139.3%
<i>Revenue per Employee (thousand TRY)</i>	811	1.914	136%
Exports per Technoparks (million TRY)	204.9	470.2	129.5%
Export / Revenue	26%	23%	-

Source: Turkish Ministry of Industry and Technology

*Of the 101 Technology Development Zones, the operations of 89 are continuing, while 12 have not yet started to operate due to ongoing infrastructure works.

Information and Communication Technologies Sector Exports

The largest share of total exports is in the Information Technologies Software category.



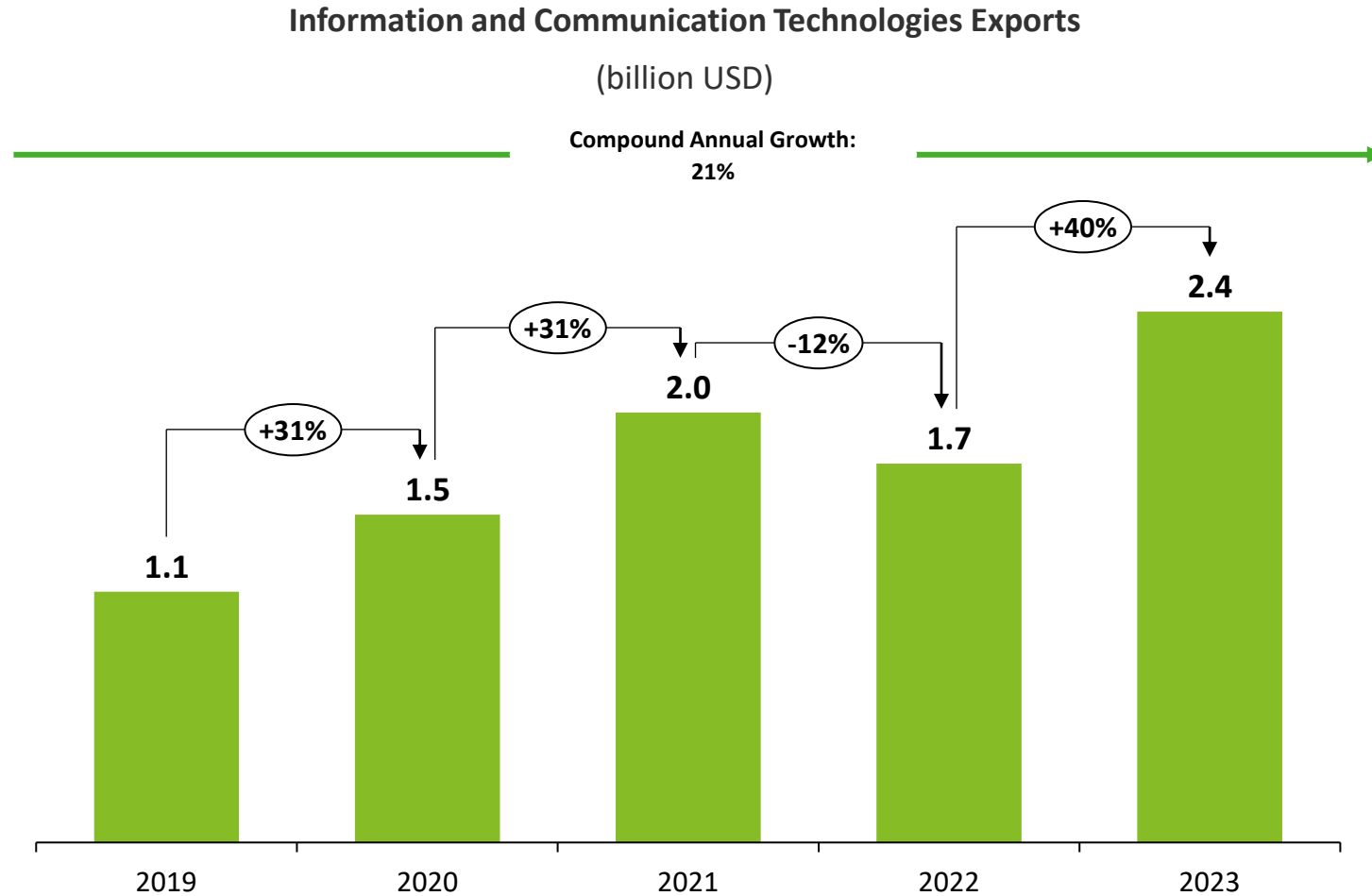
*Rate excluding mobile phones.

Annual changes refer to comparable growth rates.

Note: Differences in the totals may occur due to rounding.

Information and Communication Technologies Sector Exports

Between 2019 and 2023, the total exports of the sector grew by 21% on average each year in USD terms.

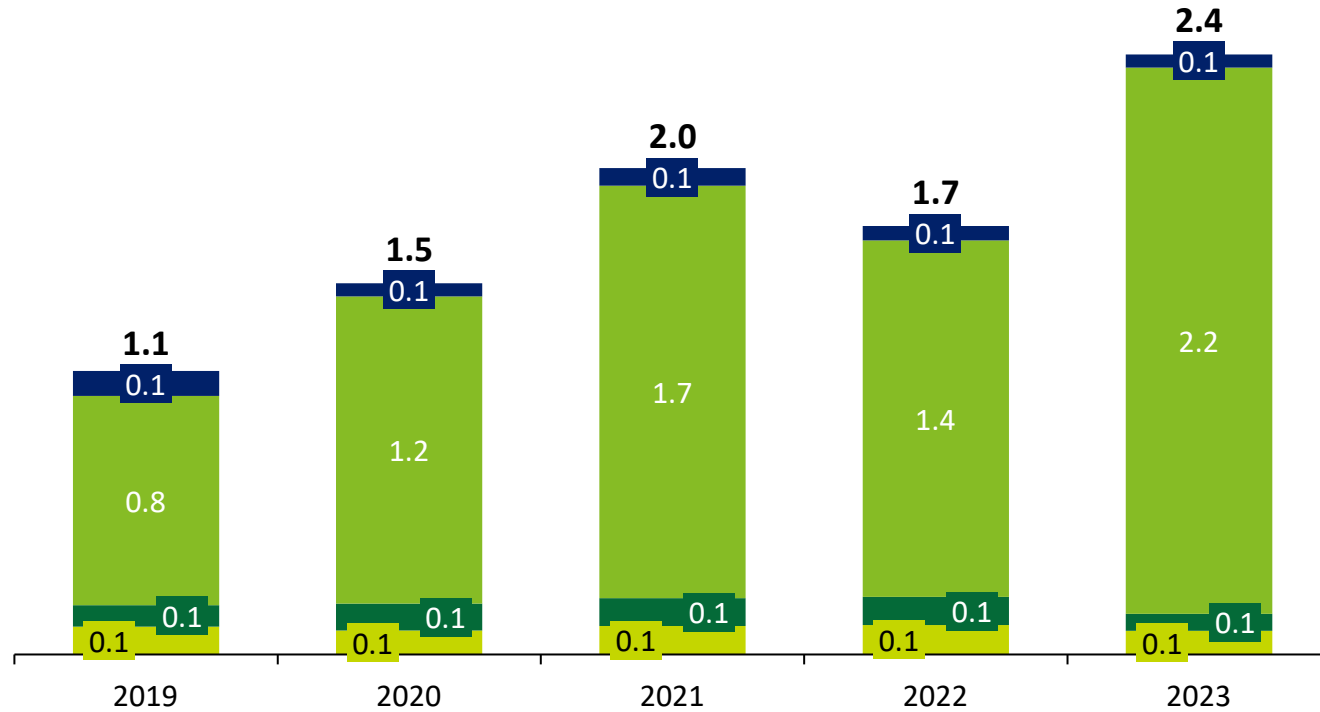


- In 2023, the total size of the sector grew by 83% in TRY terms, and total exports grew by 85%.
- The main driver of this increase is the Software sub-category of the Information Technologies category, which also has the largest share in exports.
- Exports grew by approximately 22% per year on average between 2019 and 2023 in USD terms, but shrunk during 2021 and 2022 due to the rapidly increasing exchange rates in that period. This trend reversed between 2022 and 2023, with a growth rate of 40%.

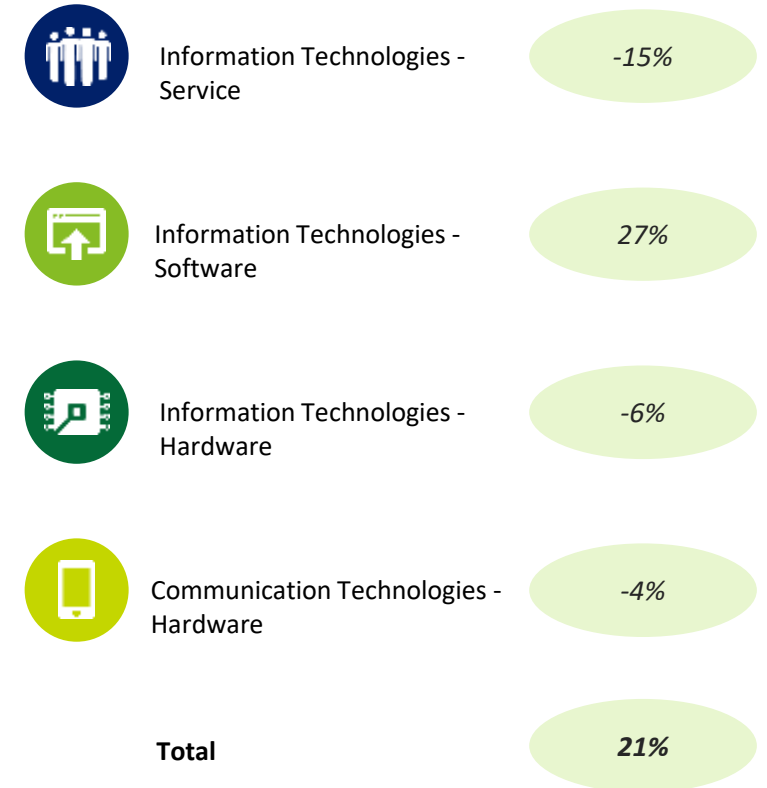
Information and Communication Technologies Sector Exports

Development by sub-category - billion USD

Information and Communication Technologies Exports
(billion USD)



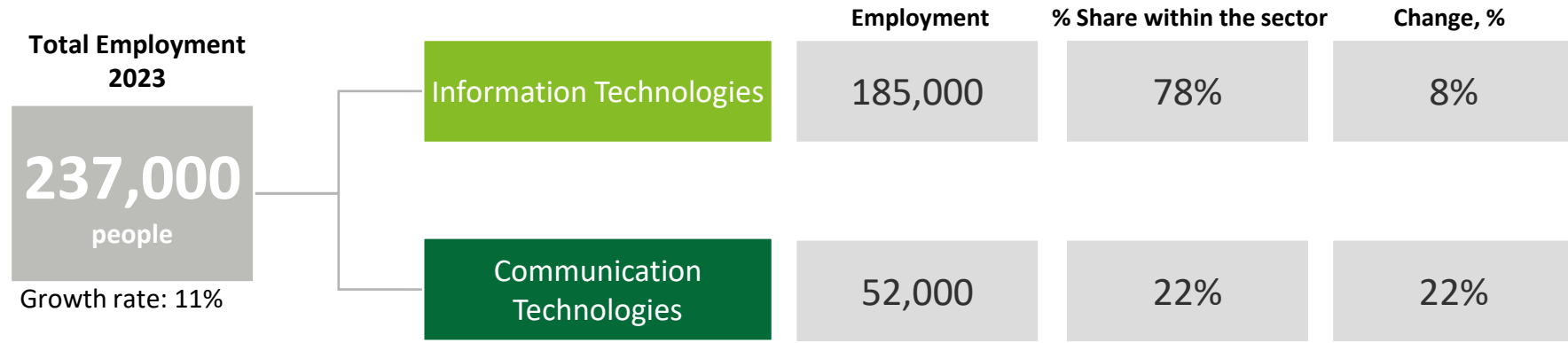
Compound Annual Growth
Rate between 2019 and 2023



Note: Differences in the totals may occur due to rounding.

Employment (thousand people)

Total employment in the sector grew by 11% and reached 237,000 in 2023.



31%
Female employment rate*



30%
Female manager rate*



63%
University degree employment rate*



60%
R&D employee rate**



12%
Subcontracted employee rate*

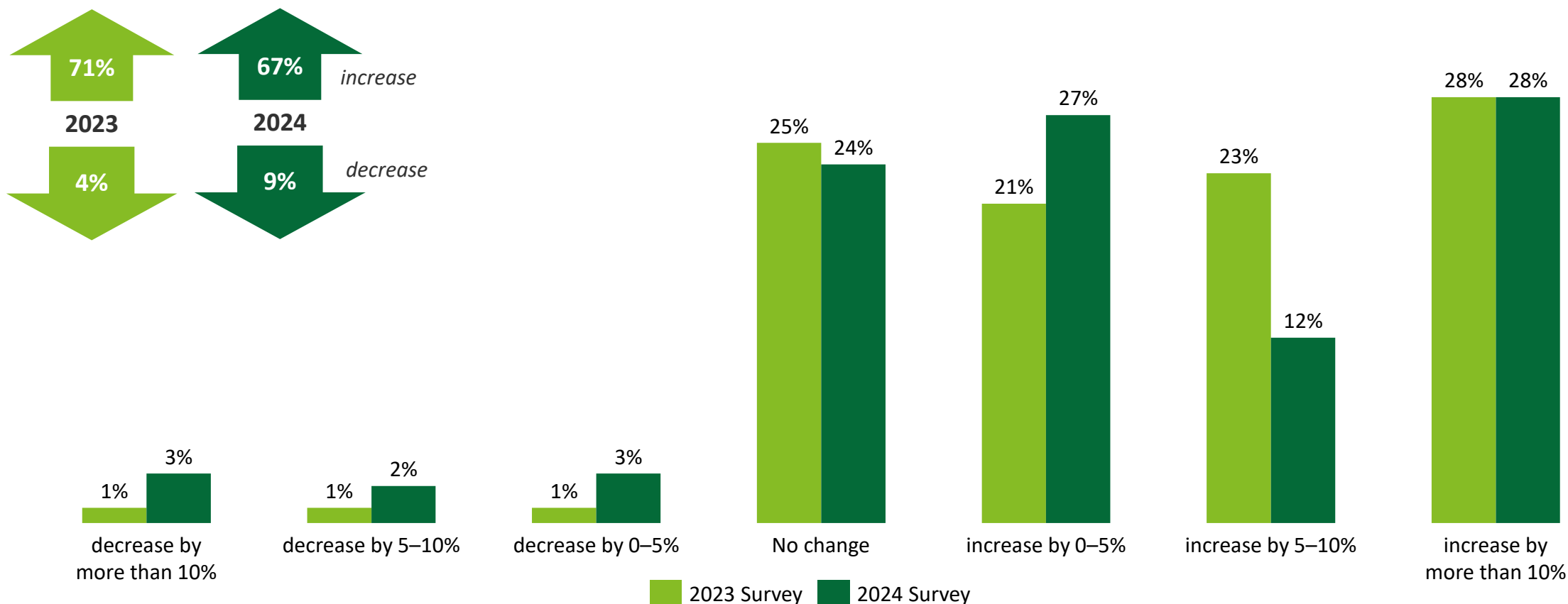
*Companies that Participated in the Survey

**Data from the Companies that Participated in the Survey, ICTA and the Ministry of Industry and Technology

Employment

In 2024, the proportion of sectoral actors that expected employment to increase in the sector decreased when compared to 2023.

What change do you expect for employment in your company this year?



Note: Differences in the totals may occur due to rounding.

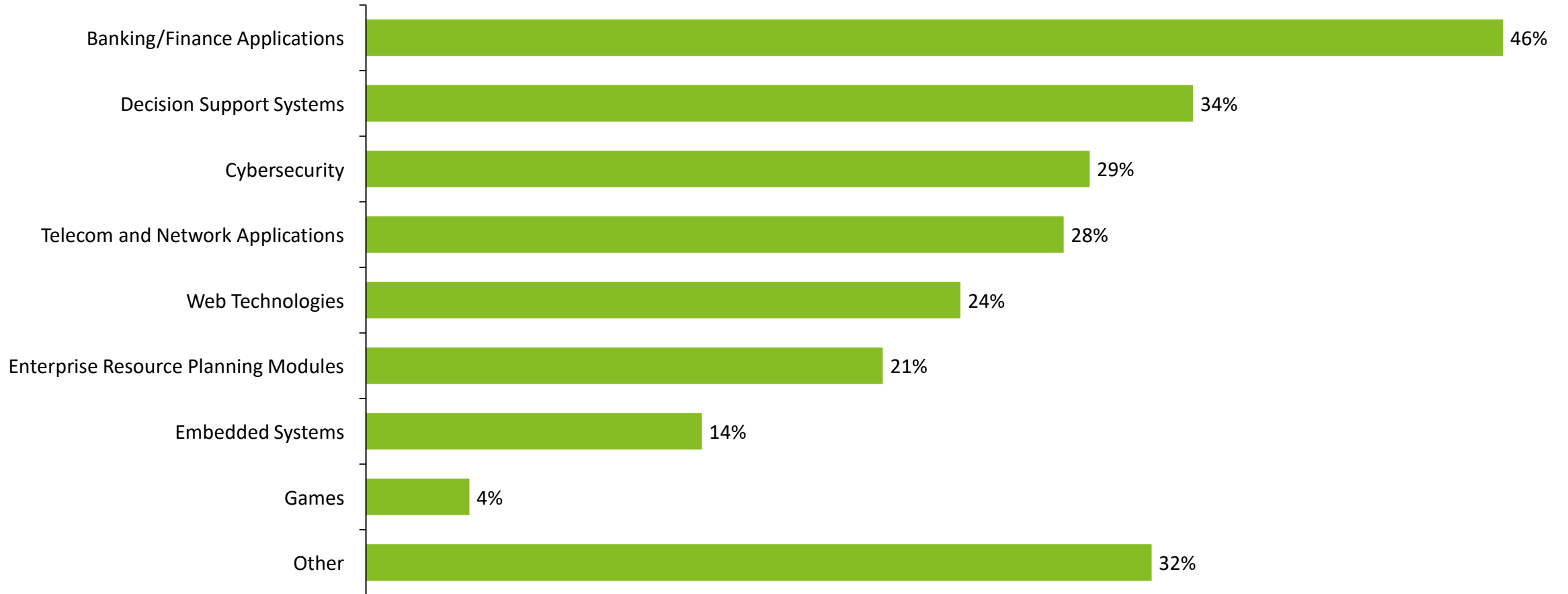
2024 survey N = 123; 2023 survey N = 146

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Software Development Areas in the Sector

Banking and finance applications stand out among the participating companies engaged in the software field.

Which type of software is your company engaged in?



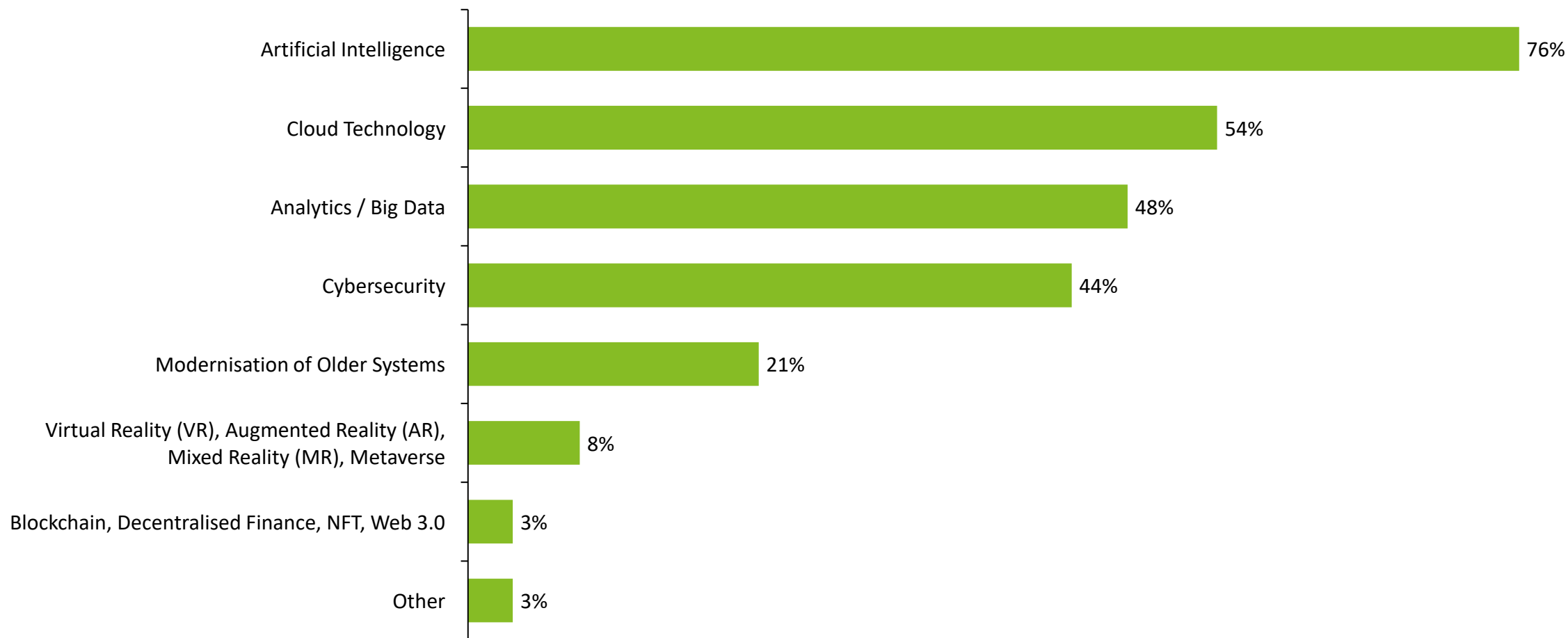
*Includes artificial intelligence, business intelligence and data integration, analytical models, optimisation and simulation models.

Survey participant companies with a software turnover, N = 80

Sectoral Impact Areas

The respondents expect artificial intelligence and cloud computing to be the most prominent technological areas in the sector in the next 1–3 years.

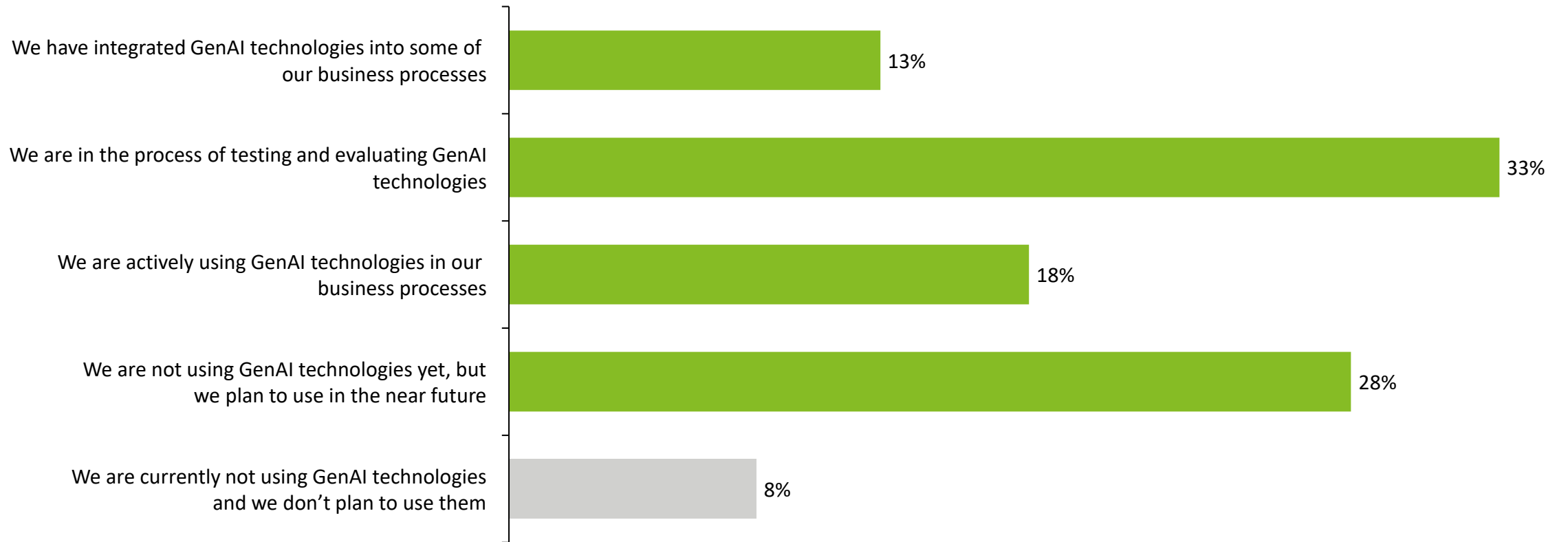
**Which of the following technological areas do you expect to have the most impact on your sector over the next 1–3 years?
 (Please select a maximum of three options)**



Current Status of GenAI Technologies

Of the companies that participated in the study, only 8% stated that they would not use GenAI technologies, whereas the vast majority have completed their integration and planning processes, to a certain extent.

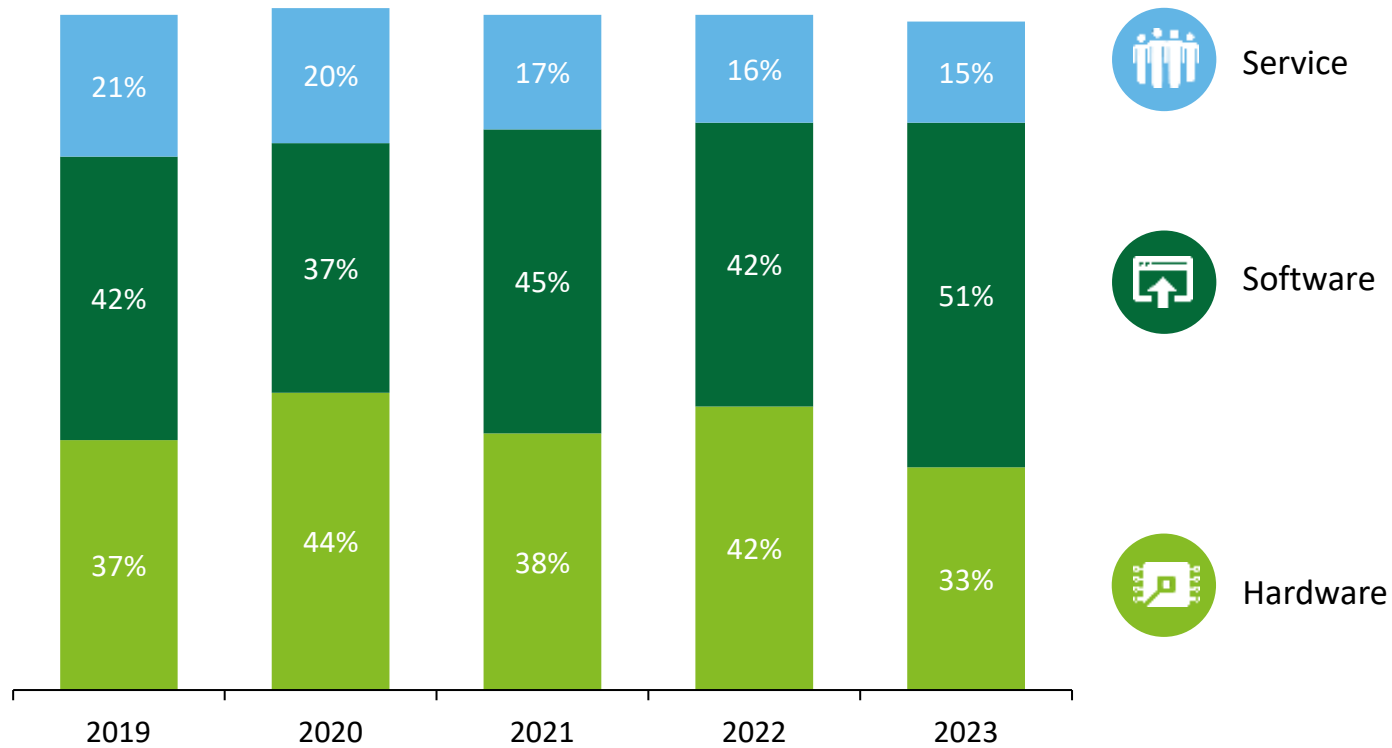
What is the current status of the use and impact of Generative Artificial Intelligence (GenAI) technologies in your company?



Changes in Share of Subcategories By Year

The changes that occurred in 2023 resulted in an increase in the share of software and a decrease in the share of hardware in the distribution of information technology market components.

Information Technology Market Components



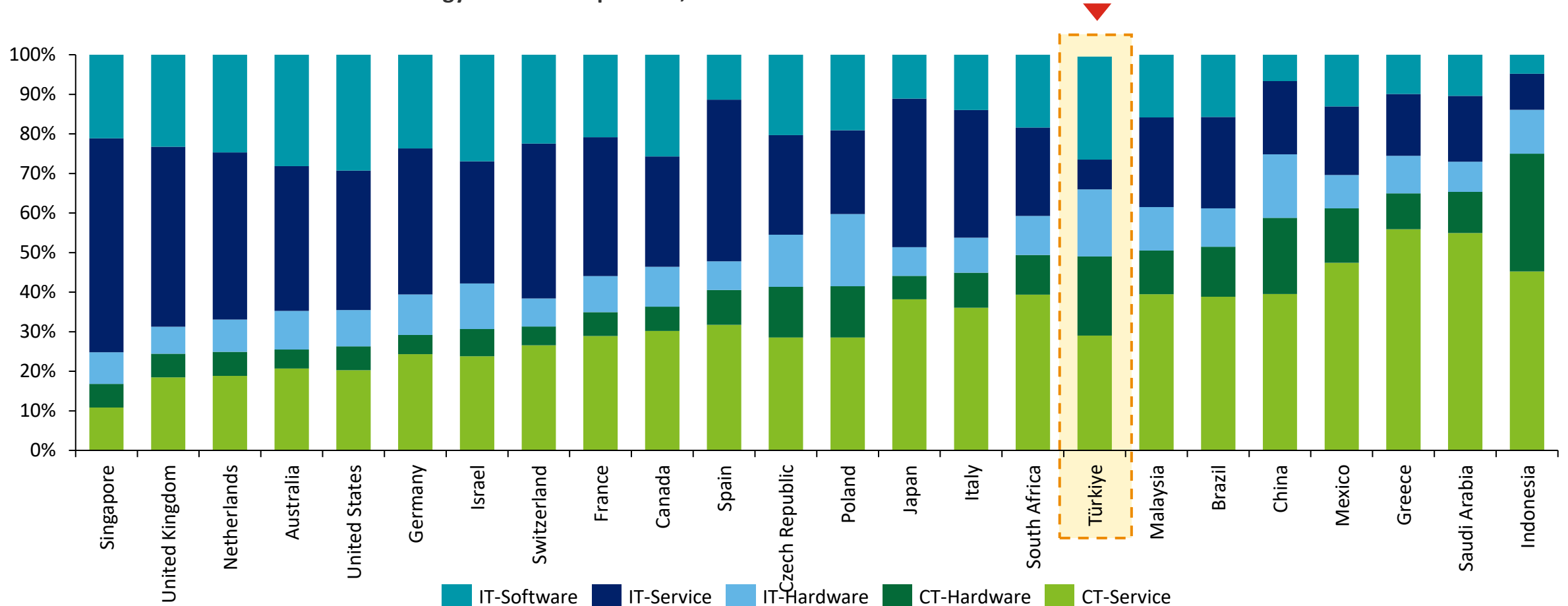
- In 2023, the share of Information Technology in the total market increased significantly.
- A remarkable change was also noted in the Information Technologies subcategories compared to the previous year.
- The share of hardware decreased significantly during 2020 and 2021 and continued to decrease in 2023.
- The share of software, which accounts for nearly half of the IT market, increased from 2020 to 2021, but decreased from 2021 to 2022.

Note: Differences in the totals may occur due to rounding.

Change in the Share of Subcategories by Country

An analysis of the country rankings in terms of the share of Information Technologies in the total sector reveals that Türkiye has a similar profile to that of other developing countries.

Information and Communication Technology Market Components, 2023



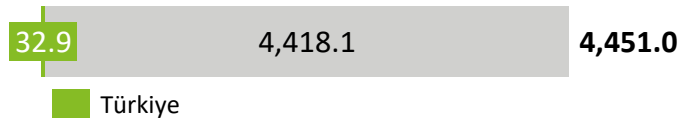
Source: TÜBİSAD, Gartner, Deloitte analysis

Position of the Information and Communication Technologies Sector



Türkiye in the Global ICT Market

(billion USD)



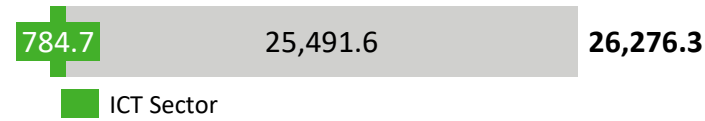
0.74%

Share of Türkiye in the Global ICT Market



Share of the ICT Sector in Türkiye's GDP

(billion TRY)



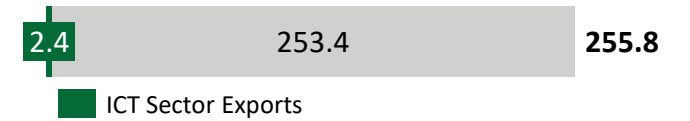
2.99%

Share of the ICT Sector in Türkiye's GDP



Share of the ICT Sector in Türkiye's Total Exports

(billion USD)

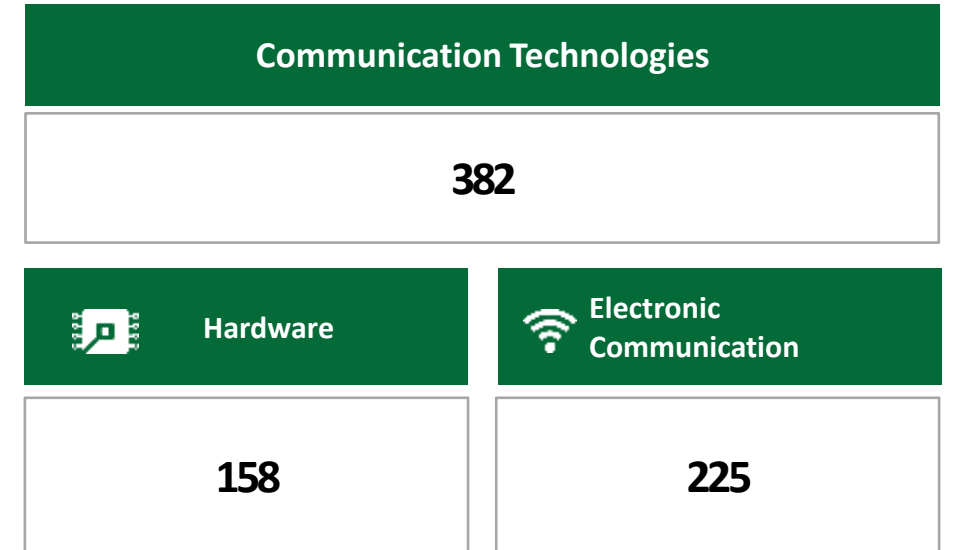
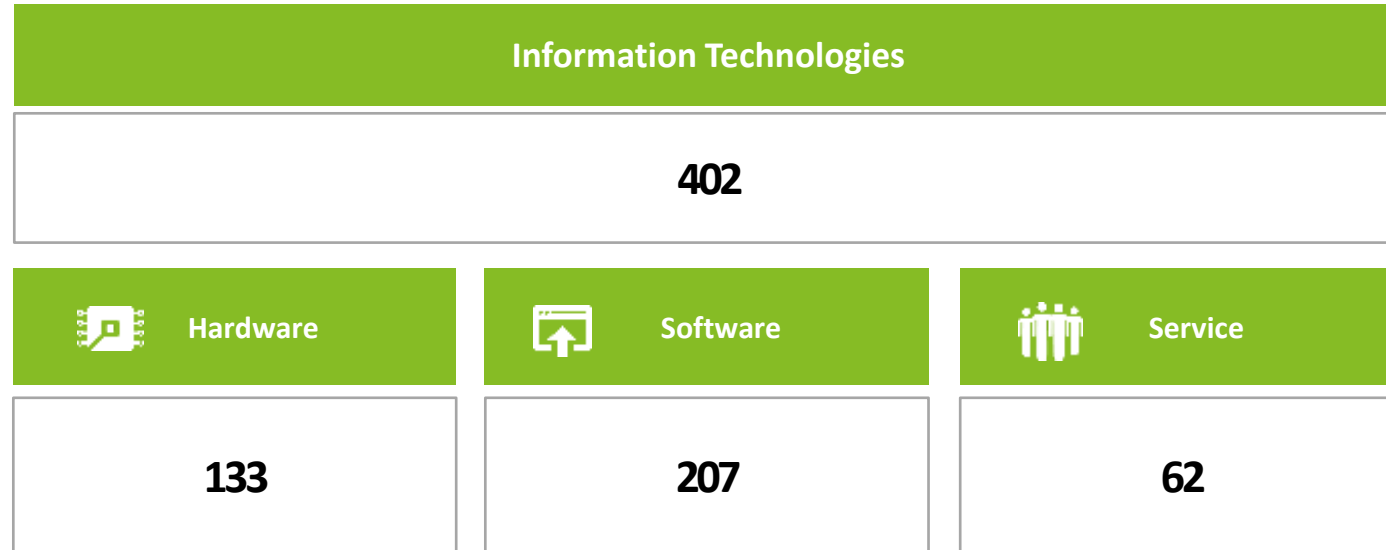


0.95%

Share of the ICT Sector in Türkiye's Total Exports

2023 Information and Communication Technologies Market

billion TRY



Note: Differences in the totals may occur due to rounding.

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2023 Information and Communication Technologies Market

billion USD



Information Technologies

16.9

Hardware

5.6

Software

8.7

Service

2.6

Communication Technologies

16.1

Hardware

6.7

Electronic Communication

9.5

Note: Differences in the totals may occur due to rounding.

THANK YOU

We would like to thank
the Turkish Ministry of Industry and Technology,
the Information Technologies and Communication Authority,
Context and TUBISAD members, as well as the companies in the sector,
for their valuable contributions to our study.

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