WHY INVEST IN TURKISH ICT SECTOR
AGENDA

1. Executive Summary
2. Turkish ICT Sector Outlook
3. Growth Drivers in Türkiye
4. Opportunities in Turkish ICT Sector
5. Start-up Ecosystem
6. Success Stories
EXECUTIVE SUMMARY

FAVORABLE INVESTMENT ENVIRONMENT

- Strong macroeconomic growth with increasing income per capita and a bourgeoning middle class
- Favourable demographics with a dynamic, young and online population supporting the industry
- Cost-competitive ICT skills and communication data infrastructure
- Strong government support through technology and innovation ecosystems as well as incentives that focus on R&D

STRONG INTERNATIONAL PRESENCE

- Global ICT companies have been present in Türkiye with significant activities, using Türkiye as a managerial hub to access regional markets
- Successful partnerships with local companies to grow in the region, capitalizing on locals’ human capital, experience and networks

MARKET POTENTIAL

- World-scale domestic demand and strong ICT skills offer ample opportunities in telecommunications, e-commerce, gaming, banking and finance, data analytics and AI, cloud & data center operations, digital transformation of the Turkish industry, public investments, e-government projects and ICT use in automotive, healthcare sectors

ROBUST GROWTH IN THE SECTOR

- Turkish ICT market surpassed USD 24.7 billion in 2022
- The backbone of the growth is the young and well-educated human capital that the country offers
- The ICT ecosystem is strongly backed by international and local companies, creating a diverse environment for all players
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TURKISH ICT SECTOR OUTLOOK
The drop is due to changing currency rates, although by TRY, it is recorded as an unprecedented average growth of 23% in 5 years.

Source: TUBISAD ICT Market Data 2022
TURKISH ICT SECTOR OUTLOOK

FOREIGN TRADE

TÜRKİYE HAS DOUBLED ITS EXPORTS SINCE 2014 - REACHING OVER USD 1.5 BILLION WHILE BROADENING ITS EXPORT MARKETS

Source: TUBISAD ICT Market Data 2022

ICT Exports
Exports (Million USD)

<table>
<thead>
<tr>
<th>Year</th>
<th>IT-SERVICE</th>
<th>IT-SOFTWARE</th>
<th>IT-HARDWARE</th>
<th>CT-EQUIPMENT</th>
</tr>
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<tbody>
<tr>
<td>2017</td>
<td>190</td>
<td>66</td>
<td>90</td>
<td>177</td>
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<tr>
<td>2018</td>
<td>137</td>
<td>73</td>
<td>137</td>
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<td>2019</td>
<td>112</td>
<td>87</td>
<td>112</td>
<td>97</td>
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<tr>
<td>2020</td>
<td>833</td>
<td>405</td>
<td>57</td>
<td>108</td>
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<td>2021</td>
<td>1241</td>
<td>1667</td>
<td>1667</td>
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<tr>
<td>2022</td>
<td>1440</td>
<td>1440</td>
<td>1440</td>
<td>1440</td>
</tr>
</tbody>
</table>

Source: TUBISAD ICT Market Data 2022

2% AMERICA

73% EUROPE

9% ASIA PACIFIC

17% MIDDLE EAST AND AFRICA
TURKISH ICT SECTOR OUTLOOK

MAJOR PLAYERS

OUT OF 213,000 EMPLOYEES
15% GROWTH RATE

LARGE-SIZED LOCAL
AND INTERNATIONAL
COMPANIES IN THE
ECOSYSTEM

Source: TUBISAD ICT Market Data 2022, CBRT
TURKISH ICT SECTOR OUTLOOK

The Turkish rapid delivery startup Getir raised its valuation to USD 11.8 billion after raising USD 768 million funding and became the second decacorn of Türkiye.

The Turkish ICT sector is poised to further grow with M&As and new entrants.

EARLY-STAGE INVESTMENTS IN ICT COMPANIES IN TÜRKİYE ARE ON THE RISE

Turkey Yearly Angel & VC Deal Activity

Trendyol, Türkiye’s #1 e-commerce platform, has entered into agreements to raise $1.5 billion, valuing the company at $16.5 billion. With this new funding, Trendyol becomes Türkiye’s first Decacorn.

Source: Startups.watch Turkish Startup Ecosystem 2022 Year in Review
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ROBUST ECONOMY

11th largest economy in the World

RANKING OF ECONOMIES BY GDP AT PPP

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2019</th>
<th>2022</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>USA</td>
<td>CHINA</td>
<td>CHINA</td>
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<tr>
<td>2.</td>
<td>CHINA</td>
<td>USA</td>
<td>USA</td>
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<tr>
<td>3.</td>
<td>JAPAN</td>
<td>INDIA</td>
<td>INDIA</td>
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<tr>
<td>4.</td>
<td>GERMANY</td>
<td>GERMANY</td>
<td>JAPAN</td>
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<tr>
<td>5.</td>
<td>INDIA</td>
<td>GERMANY</td>
<td>GERMANY</td>
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<tr>
<td>6.</td>
<td>RUSSIA</td>
<td>RUSSIA</td>
<td>RUSSIA</td>
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<tr>
<td>7.</td>
<td>FRANCE</td>
<td>INDONESIA</td>
<td>INDONESIA</td>
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<tr>
<td>8.</td>
<td>UK</td>
<td>BRAZIL</td>
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<tr>
<td>9.</td>
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<td>UK</td>
<td>UK</td>
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<td>10.</td>
<td>ITALY</td>
<td>FRANCE</td>
<td>FRANCE</td>
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<tr>
<td>11.</td>
<td>MEXICO</td>
<td>MEXICO</td>
<td>MEXICO</td>
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<tr>
<td>12.</td>
<td>INDONESIA</td>
<td>ITALY</td>
<td>ITALY</td>
</tr>
<tr>
<td>13.</td>
<td>SPAIN</td>
<td>TÜRKİYE</td>
<td>TÜRKİYE</td>
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<tr>
<td>14.</td>
<td>CANADA</td>
<td>S.KOREA</td>
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<td>S.KOREA</td>
<td>SPAIN</td>
<td>SPAIN</td>
</tr>
<tr>
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<td>S.Arabia</td>
<td>CANADA</td>
<td>CANADA</td>
</tr>
<tr>
<td>17.</td>
<td>IRAN</td>
<td>S.Arabia</td>
<td>S.Arabia</td>
</tr>
<tr>
<td>18.</td>
<td>TÜRKİYE</td>
<td>IRAN</td>
<td>EGYPT</td>
</tr>
</tbody>
</table>

AVERAGE ANNUAL GDP GROWTH (%)

2002-2022

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>TÜRKİYE</th>
<th>POLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.4</td>
<td>2002-2022</td>
<td>3.9</td>
<td>3.5</td>
</tr>
<tr>
<td>2.9</td>
<td>2002-2022</td>
<td>2.9</td>
<td>2.5</td>
</tr>
<tr>
<td>1.0</td>
<td>2002-2022</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

REAL GDP GROWTH (INDEX: 2002=100)

Turkish economy has more than tripled over the past 20 years and is promising more growth in future.
FAVORABLE DEMOGRAPHICS

HALF OF POPULATION UNDER AGE OF 33.5 CREATING DYNAMIC LABOR FORCE AND FISCAL DISCIPLINE

Source: Turkstat, Eurostat, UN, 2019
SKILLED & COST-COMPETITIVE LABOR FORCE

TÜRKİYE’S EDUCATION SYSTEM UPGRADED TO OFFER OUTSTANDING ACADEMIC PROGRAMS

Annual Number of University Grads in ICT & Engineering Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>75,520</td>
</tr>
<tr>
<td>Undergraduate</td>
<td></td>
</tr>
<tr>
<td>Graduates</td>
<td>12,572</td>
</tr>
<tr>
<td>ICT</td>
<td>10,975</td>
</tr>
<tr>
<td>Undergraduate</td>
<td></td>
</tr>
<tr>
<td>Graduates</td>
<td>2,756</td>
</tr>
<tr>
<td>TOTAL</td>
<td>101,823</td>
</tr>
</tbody>
</table>

Source: Ministry of National Education Council of Higher Education, Turkstat, stackoverflow.com

Ecole 42 offers peer-to-peer, project based, and gamified learning system with a capacity of 800 stations to fill the gap of qualified software developers in digital transformation of manufacturing, finance and communication sectors

Over 120K professional software developers in Türkiye

1 million software developer training program has been launched to upgrade country’s labor force with regard to its ever-growing digital sectors

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SKILLED & COST-COMPETITIVE TALENT POOL

...TO SUPPORT A SKILLED ENGINEERING POOL AT COST-COMPETITIVE PRICES

Distribution of ICT Specialist by Age (%)
Distribution of ICT specialist by age, 2022 (%)

Average Salaries for Software Developers
(with 3-5 year experience)

Source: Eurostat, OECD, BLS, Turkstat, Wearedevelopers
BROADBAND SUBSCRIPTIONS DOUBLED SINCE 2010 TO REACH 91 MILLION, EUROPE’S 6TH BIGGEST ONLINE POPULATION

Fixed and Mobile Broadband Subscriptions (in millions)

Mobile Data Usage (GB per month, per mobile broadband subscription)

Source: OECD Broadband Portal, 2022 Dec
TECHNOPARKS & R&D CENTERS MAKE IMPORTANT CONTRIBUTIONS TO INNOVATION ECOSYSTEM AND TECHNOLOGY DEVELOPMENT

**TECHNOPARKS**
- 87 Technoparks (an additional 13 underway)
- 103K employment in over 9,736 companies
- >1951 companies with academia partnership
- Total export is USD 10 Billion

**R&D CENTERS**
- 1,298 R&D Centers
- 79K employment; 18% in ICT industry
- 18% international companies

**UNIVERSITIES**
- 10 universities in Top 1000; 3 in Top 500 (QS World University Rankings 2024)
- Over 1450 academicians in ICT

**TÜRKİYE’s GERD (gross expenditure on R&D) is 0.8% of GDP**

**TÜRKİYE ranks 12th in GERD financed by business enterprises**

Source: Global Innovation Index 2022

**Out of 63 countries, TÜRKİYE ranks 30th in female researchers ratio 11th in R&D productivity by publication**

Source: IMD Digital Competitiveness Index 2022

Source: Turkish Ministry of Industry and Technology R&D Centers and Technology Development Zones 2023 January Reports, Ministry of National Education Council of Higher Education, IMD World Digital Competitiveness Yearbook 2022
ICT INVESTMENTS AND R&D TAKE PRIORITY AND CAN BENEFIT FROM VARIOUS LUCRATIVE INCENTIVES

MINISTRY OF INDUSTRY AND TECHNOLOGY
MAIN INCENTIVE TOOLS

**TAX DEDUCTION:**
Reduced tax rates for investor's income (50-90%) until the total deduction reaches to a certain percentage of capex. (15-65% of capex, in the case of project-based incentives up to 200% of capex). For R&D investments, all R&D expenditures are deducted from tax base.

**VAT EXEMPTION:**
Investment machinery and equipment imported and/or locally provided within the scope of the incentive certificate will be VAT exempt.

**CUSTOMS DUTY EXEMPTION:**
Investment machinery and equipment imported within the scope of the incentive certificate will be customs duty exempt.

**INTEREST RATE SUPPORT:**
For investment loans, a certain portion of the interest share will be covered by government. (3-7% points for TL-denominated, 1-2% points for forex-denominated loans) (1M-1.8M TRY).

**LAND ALLOCATION:**
Government land will be allocated for the investments, if no land is available in OIZs.

<table>
<thead>
<tr>
<th>Main Incentive Tools</th>
<th>General Incentives</th>
<th>Regional Incentives</th>
<th>Incentives for Strategic Investments</th>
<th>Project Based Incentives</th>
<th>R&amp;D Incentives</th>
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<tbody>
<tr>
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<tr>
<td>VAT/Custom Duty Exemption</td>
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<tr>
<td>Social Security Premium Support</td>
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<tr>
<td>Income Tax Withholding Support*</td>
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<tr>
<td>Interest Support**</td>
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<tr>
<td>Land Allocation</td>
<td>☒</td>
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<td></td>
<td></td>
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<tr>
<td>Qualified Personnel Support</td>
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<tr>
<td>Infrastructure Support</td>
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<tr>
<td>Energy Cost Support</td>
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</tbody>
</table>

*Provided that investments, except R&D, are made in Region 6.
**Provided that investment, except R&D, are made in Regions 3, 4, 5 or 6 within the frame of the Regional Incentive Scheme.

Source: Ministry of Industry and Technology, MSTI
INCENTIVES THROUGH INNOVATION LIFECYCLE

COMPREHENSIVE INCENTIVES PROGRAM WITH A WIDE RANGE OF INSTRUMENTS HELPS TO ACCELERATE THE RETURNS ON R&D INVESTMENTS

START:
Technostartup Incentives: Cash support up to 900K TRY

PRODUCT / PROJECT DEVELOPMENT
TUBITAK programs: Cash support up to 60-80% of the project budget
Industrial PhD Fellowship Program: Grants for PhD research scientist employed in private sector

COMMERCIALIZATION
Technoparks and R&D Centers: Income Tax Exemption
Tax cuts up to 20-30% of the personnel cost

MANUFACTURING
Technology Focused Industrial Movement Program (HAMLE) Incentives: Cash/credit support up to 5 Million TRY for SMEs

GROWTH & COMPETITION
Patented sales: Income Tax & VAT Exemption

ANGEL INVESTORS ARE EXEMPT FROM INCOME TAX BY 80-100% AT THE AMOUNT OF THEIR INVESTMENT

1514 VC Support Program is launched to support the VC ecosystem in Türkiye

1514 VC
TÜBİTAK
Angel investors are exempt from income tax by 80-100% at the amount of their investment

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1514 VC
Support Program is launched to support the VC ecosystem in Türkiye
TÜRKİYE OFFERS SOLID FUNDAMENTALS FOR PROFITABLE INVESTMENTS IN THE ICT SUBSECTORS

TELECOMMUNICATIONS
E-COMMERCE
FINTECH
GAMING
CLOUD & DATA CENTER
DIGITAL TRANSFORMATION
DATA ANALYTICS & AI
PUBLIC INVESTMENTS & E-GOVERNMENT
ICT IN MOBILITY
ICT IN HEALTHCARE
TÜRKİYE’S TELECOM MARKET HAS REACHED TO 213.9 BILLION TRY - USD 12.9 BILLION IN 2022

- Strong growth of the market – doubled to 213.9 Billion TRY in the last 5 years
- Growing export - USD 118 Million in 2022
- Fixed and mobile broadband subscriptions in Türkiye have exceeded 94.3 million in 2023
- 549k km of fiber optic with 6.5 million subscribers (as of 2023 Q3)
- A high mobile / smartphone penetration rate of 75%
- Strong ecosystem with local and international players with a total of 42k employees

5G AND BEYOND

5G WILL SHAPE ALL VERTICAL SECTORS

ENERGY  MANUFACTURING  HEALTHCARE  AUTOMOTIVE  TRANSPORTATION  FINANCE

Milat Network Management and Analysis System, which is the national and domestic network management infrastructure, is now in use.

Ulak is now developing 5G Core Network Development project Çınar.

5GTR Forum established to develop products, services and technologies that will take place in domestic and international market in next generation communication systems.

Nokia has a partnership agreement with Karel, Turkish electronic manufacturer, to produce 4.5G and 5G base stations in Türkiye. Local manufacturing of Nokia base stations started in 2022.

5G@EndTech acceleration program in collaboration with the Investment Office, KOSGEB, TÜBİTAK, Arçelik, Nokia, and Türk Telekom, aims to support the commercialization and globalization processes of 5G-based enterprises in Türkiye.

5G Valley Open Test Bed created to be a platform for R&D and Product development opportunities for public, university, operator, and industry collaborations that work on 5G and Beyond Technologies.

Ericsson Türkiye Research Laboratory, within the scope of TÜBİTAK's 1515 - Support Program for Frontier R&D Laboratory Support Program, carries out innovative studies in the field of 5G, IoT and 6G technologies.

End to End Domestic and National Communication Network Project carried out by 16 members of Communication Technologies Cluster and 3 operators.

Source: company websites, expert interviews
Türkiye's e-commerce market has reached TRY 800.7 billion in 2022. The e-commerce market in Türkiye continues to grow with an annual growth of 109%, reaching TRY 800.7 Billion. Fixed and mobile broadband subscriptions in Türkiye have reached a total of 93.1 million in 2022 - an of 116% impressive penetration rate. Enhanced use of internet and incremental number of online shoppers' rate of 49.5% - a population of 28.4 Million. Potential in mobile phone shopping - a mobile shopper's rate of 53%, which is higher than that of USA, UK, Spain and Brazil. Türkiye is home to global e-commerce giants and received many international investments. Sales of e-commerce and online market applications skyrocketed by 300% amid coronavirus outbreak - the number of

Source: Ministry of Trade E-Commerce Statistics, Turkstat, company websites, expert interviews
TÜRKİYE IS TRANSFORMING INTO A FINTECH HUB, WITH OVER 665 COMPANIES AND AN ONLINE PAYMENT MARKET OF OVER USD 50 BILLION

A strong banking system with an educated workforce
Europe’s biggest credit and debit card market – 400 million (as of December 2023)
Total amount of card payments at around USD 359 Billion (in 2023)
Remote and Digital Customer Acquisition has been enabled for Banks and FinTechs.
The Instant and Continuous Transfer of Funds (FAST) System has made it possible to initiate instant retail payment service available 24/7
Legislation for Account Information Service (AISP) and Payment Initiation Service (PISP) enacted within the scope of open banking applications in line with the PSD 2 of EU

CAN TÜRKIYE BE THE NEXT FINTECH HOTSPOT?

Share of online payments is 28% with around USD 100 Billion
Türkiye’s strategic location within a 4-hour flight distance from London and Dubai
Türkiye’s vision of turning Istanbul into a regional finance center
Digital banking license issued for the 6 FinTechs (as of October 2023)
Equity-based crowdfunding applications are available-12 platforms registered (as of September 2023)
104 Million active user base in digital banking platforms

Source: BKM statistics, Fintech Istanbul TÜRKIYE Fintech Report 2019, Turkish Fintech Ecosystem Map v6.03 by Fintechtime, Startupwatch 2020 Year in Review
Source: Turkish Fintech Ecosystem Map v7.00 by Fintechtime
TÜRKİYE’S GAMING MARKET HAS PASSED USD 900 M IN 2022

Total generated game revenue in 2022 is USD 625 Million in mobile, USD 275 Million in mobile, USD 350 Million in PC/Console. 30th highest in global revenue. Digital gamers exceeded 44M+.

An ecosystem that consists of over 740 large & small companies including indies -

- Game startups recently received notable investments: Spyke ($55M), Libra Softworks ($30M), Ace Games ($25M), Metaverse ($10M)

TOP GAMING EXIST IN TÜRKİYE

- peak: $1.8B in 2020
- rollic: $180M in 2020, $100M in 2022
- alicantus: $100M in 2022, $200M in 2019, $250M+ in 2018
- gram games: $250M+

Digital gamers exceeded 44M+

TOP 5 EUROPE CITIES FOR GAMING

- LONDON: 636
- İSTANBUL: 331
- PARIS: 136
- ANKARA: 108
- STOCKHOLM: 87

Active Gaming Startups: 700
Gaming Incubators: 13
Gaming Accelerators: 21
Gaming Clusters: 2
Gaming Only Funds: 5
Unicorns: 2
Exits ($100M+): 5

Source: Gaming In TÜRKİYE Turkish Game Market 2019 Report, TOGED, gamingintURKIYE.com, AdColony&Nielsen Research, Press excerpts
Türkçe’ye Public Cloud Market has reached USD 482 Million in 2022

Public cloud market in Türkiye is USD 482 Million in 2022, expected to double in next few years.

Robust terrestrial fiber and submarine cable connectivity with international networks.

There are 38 Tier III and Tier IV data centers.

Regulation requires data systems for telecom companies and banks in the country.

14% of SMEs in Türkiye use cloud computing services whereas this ratio increases to 40% for large size companies (with >250 employees).

A total of 100,000 m² white space is estimated – 60K white space capacity in Marmara region and 30K in Ankara.

Data center investments are incentivized - lower energy costs, fiber optic infrastructure, land etc.

536 km Fiber length

AI AND DATA ANALYTICS

Türkiye Open Source Platform
500,000 software developers training program initiated to achieve worldwide scaled products

Artificial intelligence (AI) and machine learning (ML) incorporated into Cloud services utilized for smart automation and predictive analytics

TÜBİTAK Artificial Intelligence Institute plays a critical role as a catalyst for advance research in the development of start-up networks and

Financial services sector
is the pioneering industry for the exploitation of AI applications followed by retail

Machine learning is the most preferred AI tool for Turkish companies followed by data analytics and artificial neural networks

66 Turkish startups with published patent application in the field of AI and Data Analytics

9,409 indexed publications made Türkiye #16th globally in AI publications

Over 1,200 Academicians with research areas in AI

Top-notch universities offering undergraduate and graduate programs that focuses on the field of AI.

TUBITAK provided 1.7 billion TRY financing to over 1,700 R&D and Innovations projects in the last 10 years-

Digital transformation of Industry, Digital transformation in commerce and Smart living and health were the most supported verticals.

Source: How does Cloud and AI transforming the Contact Centers to improve customer experience IDC Whitepaper, National Artificial Intelligence Strategy Draft Report

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CYBER SECURITY MARKET IS USD 345 MILLION IN 2023, EXPECTED TO SHOW 12.68% CAGR RESULTING IN A PROJECTED MARKET VOLUME OF USD 630M BY 2027

Source: Statista Market Insights, IDC,BTK

TUBITAK Research Technologies & Solutions
Institute carries out innovative solutions in the field of Data Leakage Prevention, Centralized Cyber Threats, Cyber Space Trap, Penetration Tests, Risk Analysis, Malware Analysis, Vulnerability Analysis

Established in 2017 to develop the ecosystem with the contribution of all public agencies, academia and private sector representatives under the leadership of the Presidency of Defense Industries.

National Cyber Security Incident Response Team
There are over 2200 CSIRTs and over 6500 cyber security professionals in nearly every sector in Türkiye that coordinate with TR-CERT regarding cyber incidents

STM beats out several rivals to secure one of the largest software development projects on NATO’s intelligence infrastructure

Cyber Security MA/PhD Programs
Top-notch universities offering undergraduate and graduate programs cyber security and informatics.

Ankara, Ege, Gebze Technical and Istanbul Technical Universities launched 4 new cyber security vocational schools to meet ever-growing demand for cyber talent.

Private Sector Trainings:
- THY Cyber Take Off
- Picus Cyber Talent Academy
- Patika Cybersecurity Bootcamp

International Projects and Competitions
Prominent Acquisitions in Cyber Security Field

Trainings & Bootcamps
TÜRKİYE HAS ANNOUNCED NATIONAL AI STRATEGY ROADMAP ON ITS ROAD TO BECOME A REGIONAL LEADER IN AI FIELD

NATIONAL AI STRATEGY OBJECTIVES

**Human Capital**
Training AI Experts and Increasing Employment in the Domain
- Employment in the field of AI will be increased to 50,000 people.
- The aim is to hire 1,000 people for AI related roles in central and local government institutions.
- The number of graduate-level diploma holders in the field of AI will be increased by 10,000.
- The number of academicians working in the field of AI will be increased to 5,000.
- It will be ensured that the number of postgraduate theses on social and technical fields of AI is at least 1,000.

**Infrastructure**
Facilitating Access to Quality Data and Technical Infrastructure
- It will be ensured that the number of public institutions and enterprises providing access to common high-performance computing infrastructures will be at least 200.
- At least 50 institutions will be included in the Public Data Space.
- At least 10 sectoral cloud platforms for data sharing will be established.
- The number of individual AI project developers will be increased to at least 1,000 within Türkiye Open-Source Platform.
- At least 1,000 open datasets will be shared via the Open Data Portal.

**International Cooperation**
Strengthening International Cooperation
- Participation in at least 100 cross-border project calls in AI will be ensured.
- At least 2 Türkiye-oriented international reports will be conducted in the field of Trustworthy and Responsible AI.
- At least 10 international competitions and project calls will be launched in the field of AI.

**AI Ecosystem Supports**
Supporting Research, Entrepreneurship, and Innovation
- It will be ensured that the ratio of AI R&D expenditures to total R&D expenditures is at least 15%.
- The number of start-ups in the field of AI will be increased to 1,000.
- Public procurement will prioritize commercializing developed AI solutions.
- The objective is to create 5 AI tech spin-offs from public institutions and companies.
- At least 1 global initiative will be established in the field of natural language processing.
- The goal is to start 10 pre-competitive AI projects with a focus in image processing.

**Socioeconomic Adaptation**
Regulating to Accelerate Socioeconomic Adaptation
- It will be ensured that at least 20 start-ups benefit from the regulatory sandbox.
- At least 10 sociotechnical research projects will be conducted in AI.
- Research on brain drain and reverse brain drain in AI will be published on a yearly basis.
- AI education workforce surveys will be published on a yearly basis.
- 1 million people annually to benefit from shared digital content for promotional and information

**Structural Transformation**
Accelerating Structural and Labor Transformation
- At least 40 projects will be developed in the Public AI Ecosystem.
- At least 100 projects will be developed in Sectoral Co-Creation Laboratories.
- Target: At least 100 organizations will use Public AI-as-a-Service Platform.
- Implementation of AI maturity model and project management guidelines in 150 organizations.
- Awareness training will be provided to 50,000 central and local government employees.
- At least 250 municipalities will actively use AI technologies in smart city applications.
- At least 100 AI applications that receive the Trustworthy AI Seal will be released.

Source: Ministry of Industry and Technology Digital TÜRKİYE Roadmap 2018

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TÜRKİYE HAS ANNOUNCED ITS DIGITAL TRANSFORMATION ROADMAP ON ITS ROAD TO BECOME A REGIONAL LEADER IN SELECTED TECHNOLOGIES

DIGITAL TÜRKİYE PROGRAMME

INFRASTRUCTURE

Improving data communication infrastructure
- 1 Gbps speed for 100% of industry zones and technology development zones
- Attendance to international studies on data communication standards
- Development of a national industrial cloud platform

TECHNOLOGY

Development of education infrastructure and raising qualified workforce
- Technology Roadmaps for Focus Technologies (Cloud, Big data, AI, Autonomous Robots etc.)
- 50 Applied Research Centers for Focus Tech
- 60K R&D personnel in Focus Technologies
- 2500 Digital Innovation Projects in R&D Centers
- 250 patents in Digital Technologies

HUMAN CAPITAL

Development of education infrastructure and raising qualified workforce
- 100 Thematic Technical Colleges
- 400 Digital Technology High School Teachers
- 100K Digital Technology High School Graduates
- 2500 Digital Innovation Projects in R&D Centers
- 250 patents in Digital Technologies

SUPPLIERS

Supporting local technology suppliers
- 1000 medium and large sized digital technology suppliers
- USD 1Billion capital investment for technology firms
- 10 Digital Technology Excellence Centers

USERS

Supporting digital transformation of the industry
- 10 Digital Transformation Centers
- 81 Digital Transformation Information Centers
- 500 Consultants on Digital Transformation of the industry
- 7000 Companies to benefit from Transformation Centers
- 2500 Companies to develop high digital expertise

GOVERNANCE

Improving corporate governance
- Digital Transformation Platform to include all stakeholders
- Committees on education, data communication standards and focus technologies to be established

Source: Ministry of Industry and Technology Digital TÜRKİYE Roadmap 2018

1 MILLION SOFTWARE DEVELOPER TRAINING PROGRAM HAS BEEN LAUNCHED TO UPGRADE COUNTRY'S LABOR FORCE WITH REGARD TO ITS EVER-GROWING DIGITAL SECTORS
E-GOVERNMENT

THE ELEVENTH DEVELOPMENT PLAN (2019-2023) ENVISIONS THE UPTAKE OF ELECTRONIC SERVICES TO 70% BY 2023

Digital Transformation Office of Türkiye was established in 2018 to coordinate the digital transformation of the Turkish government, as well as develop strategies and oversee projects in cyber security and AI.

Public ICT investments have reached a total of $7.9 Billion since 2002 – $890M in 2023

Education, transportation-communication and energy with larger shares

‘Infrastructure Development in Residential Areas without Mobile Communication Infrastructure’ and ‘Hardware-Infrastructure Expansion Project for Big Data’ comprehensive projects has the highest share in public ICT investments in 2023

Selected e-government services provided for businesses:

**Start and grow**
- Centralised Corporate Body Information System (MERSIS)
- Registration of a new company
- Commercial business and company interrogation
- Intellectual property rights
- Submission of data to statistical offices

**VAT and Customs**
- VAT declaration, electronic payments
- Corporate tax

**Staff**
- Social contribution payments for employees
- National council on occupational safety and health web portal

**Public Contracts - eProcurement**

**eMunicipality Information System**

**Environment related permits**

THE DIGITAL TÜRKİYE PORTAL HAS REACHED OVER 64.5 MILLION USERS AND CURRENTLY, MORE THAN 7,800 SERVICES PROVIDED BY 1,028 INSTITUTIONS

türkîye is a manufacturing and engineering center in automotive and already an export hub for the european automotive industry

highly integrated to the global industry with 13 oems manufacturing passenger cars, lcv's and heavy-duty trucks - around 1.5 million vehicles

mobility ecosystem is building around electric, connected and new generation vehicles - full spectrum of services from charging infrastructure to location-based applications, smart device connection to smart parking applications

TOGG have been developing a smart mobility ecosystem with more than 50 partner startups.

new services and business models will be developed within the smart and connected vehicle ecosystem.

well-trained human capital - cost competitive and high-quality production and engineering

increasing R&D activities - 9 R&D Centers play a dominant role in exporting engineering services

ford otosan R&D Center is among Ford's top3 global R&D Centers

TOFAŞ Fiat R&D Center is Fiat's only R&D Center outside of Italy serving the European market

6th largest domestic market in Europe - around 1 million vehicles

Source: company websites, expert interviews
ICT IN MOBILITY

USE CASE MOBILITY® BY TOGG

Smart Living Solutions

As a platform for users to earn, travel, entertain and continuously develop with collaborations, Trumore will provide a personalized, smart, empathetic and seamless user experience. Plug and Play will support more than 30 Start-ups working smart life solutions in smart cities.

Data Driven Business Models

Trumore will provide personalized socially interactive experiences like payments, digital asset rewards for review, personalized routes, device sharing through Togg ID.

New Mobility Services

In partnership with Ava Labs will enable use cases like Smart Device Passport, service history, valuable part tracking, carbon footprint and emission record, and supply chain authentication via smart contracts.

Smart Energy Solutions

Secondary Cell- V2V charging System
Trugo - Ultrafast Charging Network fed by 100% renewable energy tracking with the blockchain technology.
TÜRKİYE IS A HUB FOR HEALTHTECH ECOSYSTEM LEVERAGING THE DEPTH, VARIETY AND QUANTITY OF DATA ACUMULATED IN THE NATIONAL HEALTH INFORMATION SYSTEM (NHIS) WITH 1 BILLION+ EXAMINATION IN HEALTH INSTITUTIONS PER YEAR

**National Health Information System (NHIS)**

The National Health Information System of TÜRKİYE (NHIS) is a nation-wide infrastructure for collecting and to some extent sharing patients’ Electronic Health Records (EHRs) since 2009.

It is a personal health record system where you can manage all your health information, regardless of where your examinations and treatments are conducted, and where you can access your medical background from one place.

**Family Medicine Information System**

**National Health Data Dictionary**

**PHARMACEUTICAL TRACK&TRACE SYSTEM**

The Pharmaceutical Track Trace System’s (ITS) aim is to provide drug safety and prevent counterfeiting. System follows the supply chain from the production/importation to the end user - SINCE 2012.

**Public & Private Telemedicine Platforms**

**Ministry of Health**

Tele-medicine System

**callendoc**

**Klinik**

**evital**

SPREAD OF DIGITAL HEALTH SERVICES MOTIVATED BY THE GOVERNMENT’S AMBITIOUS HEALTH TRANSFORMATION PROGRAM IS PAVING THE WAY FOR HUNDREDS OF HEALTHTECH VENTURES

Source: HIMSS Analytics, Ministry of Health, Investment Office Study HIMSS: Healthcare Information and Management Systems Society  EMRAM: Electronic Medical Record Adoption Model
ISTANBUL has been ranked 16th the top 25 Ecosystems & takes the #1 spot in the Strong Starters ranking thanks to a 60% increase in early-stage deal count and 35% increase in early-stage deal amount.
STARTUP ECOSYSTEM

Most Funded Verticals in 2023

Top 5 funded verticals by deal value ($M)

- Grocery Delivery: 500
- SaaS: 41
- AI: 36
- Gaming: 31
- Retailtech: 30

Top 5 funded verticals by deal count

- AI: 47
- Gaming: 41
- SaaS: 34
- Fintech: 33
- Climatetech: 25

Acquisitions by Turkish startups in 2022-2023

- getir
- gorillas
- bin bin
- go
driver
- colendi
- setl
- param
- twisto
pay
- babancidx
- radiflow
- rollic
- missafir
- papara
- rahatliq

Source: Startups Watch Turkish Startup Ecosystem 2022 Year in Review, Startup Genome GSER 2022
Women Entrepreneurship in Türkiye

In 2023, 70 out of 325 investments were made to startups with female founders.

Women Entrepreneur Support Program planned and implemented by KOSGEB

Arya VC, established in partnership with Arya Women Investment Platform and Türkiye İş Bankası, aims to fund gender-balanced early-stage ventures operating in Türkiye.

EBRD allocated €600 million loan to Denizbank, Halkbank, Türkiye İş Bankası, Akbank, QNB Finansbank, Şekerbank, TEB, Vakıfbank, Yapı Kredi dedicated to Turkish women entrepreneurs for Women in Business programme.

IFC provides Garanti BBVA &TSKB a loan, that increases women’s employment in order for women entrepreneurs to use it as working capital.

Türk Eximbank: “Women Entrepreneur Export Support Loan

Source: Startupwatch 2023 Year in Review, company websites, expert interviews
SOME OF THE LARGEST DEALS IN 2015-2023

Delivery Hero bought Turkish yemeksepeti for USD 589Million

Zynga bought 1010 maker Gram Games for USD 250Million

Microsoft acquired open-source firm Citus Data

Zynga bought Turkish mobile game maker Peak for $1.8bn

Brisa acquired mobility solutions provider Arvento Mobile Systems

Zynga bought Turkish mobile game maker Peak for $1.8bn

Source: Startups.Watch Notes: Only exits and secondary transactions above 50% are counted. Feel free to ask for updates: support@startups.watch
AGENDA

1. Executive Summary
2. Turkish ICT Sector Outlook
3. Growth Drivers in Türkiye
4. Opportunities in Turkish ICT Sector
5. Start-up Ecosystem
6. Success Stories

SUCCESS STORIES
SUCCESS STORIES

ICT GIANTS HAVE BEEN INVESTING IN TÜRKİYE FOR DECADES

Founded in 1984, Cisco Systems, Inc. is an American multinational technology conglomerate that develops, manufactures and sells networking hardware, telecommunications equipment and other high-technology services and products. The largest networking company in the world, Cisco’s FY’19 Revenue is USD 51.9 billion with an employee count of 77,500 globally.

Cisco has been present in TÜRKİYE for years and has invested in various areas, one of which is training programs in the tech industry through the Cisco Networking Academy Program. Trainings have been provided through this program since early 2000s.

In 2018, Cisco opened an innovation center in Istanbul, TÜRKİYE in a bit to develop solutions for the digital era.

IBM, an American multinational information technology company that not only provides hosting and consulting services from computers to nanotechnology, but also manufactures and markets computer hardware, middleware and software.

IBM has been operating in TÜRKİYE since the 1930s, and since then has participated in various projects. Projects have included working together with Turkish local bodies, both governmental and NGO, to strengthen the governance practices of community organizations who are implementing a range of local initiatives that promote economic development and growth.

Ericsson, a world leader in communications technology and service, works in 180 countries and employs more than 111,000 experts in line with its vision of “the Networked Society”. Ericsson’s services, software, and infrastructure – particularly in mobility, broadband, and the cloud – enable the telecoms industry and other sectors to conduct better business, increase efficiency, improve user experience, and capture new opportunities.

Ericsson TÜRKİYE’s R&D team, consisting of more than 550 R&D and technical support employees based in its Istanbul, Izmir and Ankara locations, provides services through innovative activities in various fields of information and telecoms technologies. In those centers, more than 140 R&D projects, 20 of which are supported by TÜBİTAK, are being implemented. Ericsson TÜRKİYE participates in many international R&D projects together with SMEs and universities in TÜRKİYE. Ericsson Research is a global organization that develops new patentable technologies and system concepts, which drive the standardization of future mobile systems, innovating and re-shaping the industry 5-10 years ahead. Ericsson Research has operations in eleven countries including TÜRKİYE.
ICT GIANTS HAVE BEEN INVESTING IN TÜRKİYE FOR DECADES

SAP SE is a German-based European multinational software corporation that makes enterprise software to manage enterprise resources, business operations and customer relations. Founded in 1972, SAP currently has operations in over 180 countries and has labs in only 20 countries, one of which is in TÜRKİYE.

Within this context, a significant portion of the SAP Data Hub solution, which includes artificial intelligence and machine learning applications, is developed by Turkish engineers at the SAP Development Center and exported to the whole world.

SAP SE sees TÜRKİYE as the “main hub” for digital transformation and Turkish engineers carry out “mega” projects in Turkic republics, Russia, Africa, the Middle East and Europe.

Chinese multinational networking, telecommunications equipment, and services company. Founded in 1987, Huawei is currently the largest telecommunications equipment manufacturer in the world, as well as the second largest smartphone manufacturer in the world.

Huawei began its operations in TÜRKİYE in 2002. Currently, in its TÜRKİYE office, Huawei has over 1,500 employees, an R&D center which is second-largest R&D center outside of China, training center, and a customers solutions and integration experience center.

Alibaba Group is the world’s largest online and mobile commerce company. Alibaba describes its mission as to make it easy to do business anywhere.

In 2018, Alibaba group acquired the major shares of TÜRKİYE’s leading e-commerce platform Trendyol which is serving over 16 million customers. It is also the fastest growing e-commerce company in the region with over 90 million monthly visits.

Trendyol is the largest internet employer in TÜRKİYE with a team over 2300 people. Trendyol has an R&D team with an ever-growing R&D team that focuses on NLP, real-time data analysis, machine and deep learning, data visualization and big data.
ICT GIANTS HAVE BEEN INVESTING IN TÜRKİYE FOR DECADES

**Microsoft**

American multinational technology company that develops, manufactures, licenses, supports and sells computer software, consumer electronics, personal computers and related services.

Founded in 1975, in 2020, Microsoft reported revenue was 143 billion dollars with over 144,000 employees.

Microsoft Türkiye is used as a managing center for the Middle East and Africa regions, composed of 79 countries.

Microsoft acquired Citus Data Inc., a Software Development company that was founded in Türkiye and then expanded internationally. Upon acquisition, Microsoft continued investing Citus’s team in Türkiye and expanded their responsibility by giving them additional products to develop that are core to Microsoft’s Azure Data platform.

**Nokia**

As a B2B technology innovation leader, Nokia pioneering networks that sense, think and act by leveraging work across mobile, fixed and cloud networks. In addition, Nokia create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs. Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today and to create the digital services and applications of the future.

Nokia operates in Türkiye for several decades and adheres to a long-term integration strategy aiming development of innovative technologies, creation of digital economy and a digital society.

Nokia has a partnership agreement with Karel, Turkish electronic manufacturer, to produce 4.5G and 5G base stations in Türkiye. Local manufacturing of Nokia base stations started and ongoing since May 2022. Jointly with Turk Telekom and Arcelik Nokia runs 5G@EndTech program to stimulate development of the local 5G use-cases for industries. Nokia has a strategic partnership agreement with MEXT Technology Center, to collaborate in the context of digitalization of the industrial manufacturing sector in Türkiye with Nokia 5G infrastructure.

**ZTE**

ZTE, Chinese multinational ICT solutions vendor acquired nearly half of Turkish Netas’ shares in 2017. This is considered one of the biggest transactions in technology development investments in Türkiye.

2020 was the year that started reaping the synergic benefits of ZTE and Netas working together. Netas achieved 170% growth in telecommunications technologies. Localization efforts, conceived in 2019 with FTTx systems, endure with many other products of ZTE. The goal here is to undertake local production of ZTE staples by way of transferring the knowhow to Türkiye.

Another joint step in this direction was for the IPTV technologies. Netas started building ZTE’s new generation IPTV platform in Türkiye.
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