

**TÜRKİYE'S AI ECOSYSTEM:
KEY ACTORS, RESEARCH INSTITUTES,
STARTUPS, AND COLLABORATIONS**

Dr. Mehmet Haklıdır

Director, TÜBİTAK BİLGEM Artificial Intelligence Institute

Attribution: Haklıdır, M. (2026). Türkiye's AI ecosystem: Key actors, research institutes, startups, and collaborations. In H. Arslan, A. Taşdelen, E. Kuzucu Hıdır, & O. A. Çetin (Eds.), *Artificial intelligence and national technology reflections* (pp. 381–412). Turkish Academy of Sciences. <https://doi.org/10.53478/TUBA.978-625-6110-86-1.ch16>

TÜRKİYE’S AI ECOSYSTEM: KEY ACTORS, RESEARCH INSTITUTES, STARTUPS, AND COLLABORATIONS

Dr. Mehmet Haklıdır

Director, TÜBİTAK BİLGEM Artificial Intelligence Institute

Abstract

This chapter provides a comprehensive overview of Türkiye’s artificial intelligence (AI) ecosystem over the past five years (2020–2025). It first situates AI within the national policy framework, including the National Artificial Intelligence Strategy and its 2024–2025 Action Plan, to outline strategic priorities for talent, data and computing infrastructure, regulation, and international cooperation. It then maps the principal institutional actors: the Ministry of Industry and Technology, TÜBİTAK and the BİLGEM Artificial Intelligence Institute, sectoral regulators, and the defense cluster, clarifying their complementary roles in funding, coordination, standard-setting, and application. The academic backbone is described through the rapid expansion of AI degree programs, research labs, and EU-linked projects that cultivate a growing talent pipeline. The chapter also surveys a rising startup landscape, highlighting enterprise AI firms and vertical applications (e.g., retail computer vision, industrial AI, conversational AI) and the support structures of technoparks, accelerators, and venture capital. National collaborations (co-development labs, public-private projects) and international linkages (Horizon Europe, EDIH, GPAI) are examined as key engines of knowledge transfer, diffusion, and alignment with global norms. In comparative perspective, Türkiye is an emergent regional player: not yet top-tier in private investment volumes, but increasingly organized, capability-rich, and globally connected. The concluding section synthesizes achievements and open challenges: scaling compute and data resources, broadening high-quality datasets, increasing late-stage finance, and ensuring trustworthy, human-centric AI, offering a grounded view of Türkiye’s trajectory from planning to execution.

Keywords

Artificial Intelligence, Türkiye, National Strategy, Startups, International Collaboration

Introduction

Artificial Intelligence (AI) has emerged as a strategic priority for Türkiye in the past five years. In line with global trends, Turkish policymakers and stakeholders have sought to harness AI for economic growth, societal benefit, and national technological autonomy. The period 2020–2025 has seen the formulation of Türkiye's first National Artificial Intelligence Strategy and numerous initiatives to build an “agile and sustainable AI ecosystem for a prosperous Türkiye,” in the words of the strategy's vision. These efforts align with the country's broader “National Technology Initiative” (Milli Teknoloji Hamlesi) ethos of technological self-reliance and innovation-driven development. This chapter provides a deep dive into Türkiye's AI ecosystem, examining key actors (government bodies, research institutes, academia, and industry), the burgeoning startup scene, and collaborative endeavors both nationally and internationally. The aim is to offer a structured, comprehensive overview of how Türkiye is cultivating AI capabilities, its achievements, challenges, and its positioning relative to global peers, using accessible language for a broad educated readership.

1. National AI Strategy and Policy Landscape

Türkiye's AI journey took a definitive shape with the National Artificial Intelligence Strategy 2021–2025 (NAIS), issued via Presidential Circular 2021/18 in August 2021. Jointly developed by the Presidency's Digital Transformation Office (DTO) and the Ministry of Industry and Technology (MoIT), NAIS was the country's first comprehensive roadmap for AI. It was crafted through a participatory process engaging public institutions, universities, private sector, professional organizations, and international bodies, ensuring broad input. The strategy's vision is “creating value on a global scale with an agile and sustainable AI ecosystem for a prosperous Türkiye”, reflecting an ambition to make AI a pillar of national progress.

1.1. Strategic Priorities

The NAIS is organized around six strategic priorities, each addressing a facet of ecosystem development:

1. Develop AI Talent and Employment: Train specialists and increase employment in AI roles.
2. Support Research, Entrepreneurship, and Innovation: Boost R&D and nurture AI startups and innovation.
3. Expand Access to Quality Data and Infrastructure: Improve data availability and computing resources for AI.
4. Regulation and Adaptation: Implement regulations to facilitate AI's socio-economic integration.

5. Strengthen International Cooperation: Engage in global AI partnerships and align with international standards.
6. Accelerate Structural and Workforce Transformation: Prepare industries and the workforce for AI-driven changes.

Under these priorities, NAIS specifies 24 objectives and 119 measures. Notably, it set 2025 targets to gauge progress: for example, AI's contribution to GDP is to reach 5%, AI-related employment to 50,000 people (with 1,000 in public sector) and at least 10,000 graduate-level AI specialists should be trained.

1.2. Governance and Updates

Recognizing AI's fast-evolving nature, NAIS was designed as a "living" document to be updated as needed. Indeed, by mid-2024 the government released an Artificial Intelligence 2024–2025 Action Plan, updating NAIS to align with current technological trends such as generative AI and the Twelfth Development Plan (Presidency of the Republic of Türkiye / Presidency of Strategy and Budget, 2023, 2024). The updated Action Plan retains the six strategic pillars but concentrates on 19 concrete actions for 2024–25. These actions include launching a TechVisa program to attract AI talent to Türkiye, integrating AI topics into higher education curricula, and establishing technical and ethical standards for locally developed AI models. A flagship initiative is the development of a large-scale Turkish language model (a foundational AI model for Turkish) and the creation of a community around it. This aligns with a broader push to ensure Turkish language and context are well represented in AI - a strategic move for cultural and technological sovereignty. Additionally, the Action Plan calls for a "Central Public Data Area" to inventory and open up public sector data for researchers and developers, addressing the oft-cited need for quality data in Turkish AI projects. Other measures include setting up a "Trusted AI" certification seal for AI applications (in partnership with the Turkish Standards Institute) to ensure AI systems are audited for safety and compliance, developing legal guidelines for AI, and monitoring international AI regulatory developments to align Türkiye's approach.

Crucially, the Action Plan also mandates the establishment of new mechanisms and institutions: a national AI Portal managed by TÜBİTAK's AI Institute to serve as a knowledge hub, and AI co-development laboratories to spur joint industry-academic R&D projects under the AI Institute's umbrella (TÜBİTAK YZE, 2025). These steps indicate a move from planning to execution, with specific agencies assigned responsibilities (MoIT, TÜBİTAK, universities, and even the Turkish Employment Agency and Ministries of Education and Justice are among those named to lead actions).

As the focal framework for national technology policy, the National Technology Initiative seeks to expand domestic production capacity and secure Türkiye's technological sovereignty. Building on this Initiative, the Ministry of Industry and Technology's Industry and Technology Strategy 2030 identifies artificial intelligence as a priority among advanced technologies and underscores the enabling role of digital transformation technologies (Ministry of Industry and Technology of the Republic of Türkiye, 2025a). Within this umbrella, the Technology-Oriented Industry Initiative Program (HAMLE) has supported 100+ projects in digital transformation and emerging innovations (Ministry of Industry and Technology of the Republic of Türkiye, 2025c). These instruments are designed to contribute to the expected $\approx 5\%$ uplift in GDP attributable to AI adoption in Türkiye. Complementing HAMLE, the High Technology Investment Program (HIT-30) provides an integrated, end-to-end investment pathway to scale high-tech projects and capture these gains (Ministry of Industry and Technology of the Republic of Türkiye, 2025b).

1.3. Data Protection and Ethics

In parallel with AI strategy, Türkiye has been updating its data protection and cybersecurity frameworks in harmony with European standards. The Personal Data Protection Law (KVKK) is being aligned with the EU's GDPR, given that data privacy is foundational for trustworthy AI. Türkiye's International Direct Investment Strategy (2024–2028) also emphasizes improving data governance and cybersecurity as prerequisites to attract high-tech investment. Ethical AI principles are on the agenda too: the action plan mentions creating a framework for AI values and impact analysis, and tools for auditing AI systems. Türkiye's participation in UNESCO's Recommendation on AI Ethics and OECD AI principles is likely, and in 2022 Türkiye joined the Global Partnership on Artificial Intelligence (GPAI) – an international initiative for responsible AI – committing to promote the ethical, human-centric development of AI (Anadolu Agency, 2022; Ministry of Foreign Affairs of Türkiye, 2022). Becoming a member of GPAI was a notable step, as the Turkish Foreign Ministry stressed Türkiye's role as a “rapidly developing AI ecosystem” and willingness to actively contribute to global AI cooperation.

2. Government Bodies and Key Institutions in AI

Türkiye's AI ecosystem features several government bodies and public institutions at its core, each playing distinct roles in policy, funding, research, and implementation:

- Ministry of Industry and Technology (MoIT): MoIT is the other key architect of AI strategy and oversees many innovation programs. It aligns AI policy with Türkiye's development plans and industrial strategy. Under MoIT's umbrella, major endeavors like Informatics Valley (Bilişim Vadisi) – Türkiye's largest tech development zone – have been nurtured. Informatics Valley hosted the launch of the AI Strategy in 2021 and now incubates

numerous AI startups and programs. MoIT also partners in events like TEKNOFEST (the aerospace/technology festival) which has AI competitions, signaling high-level support for talent development. In essence, MoIT provides funding mechanisms (like industrial R&D grants, startup funds) and integrates AI into sectoral policies (e.g. smart manufacturing, Industry 4.0, etc.).

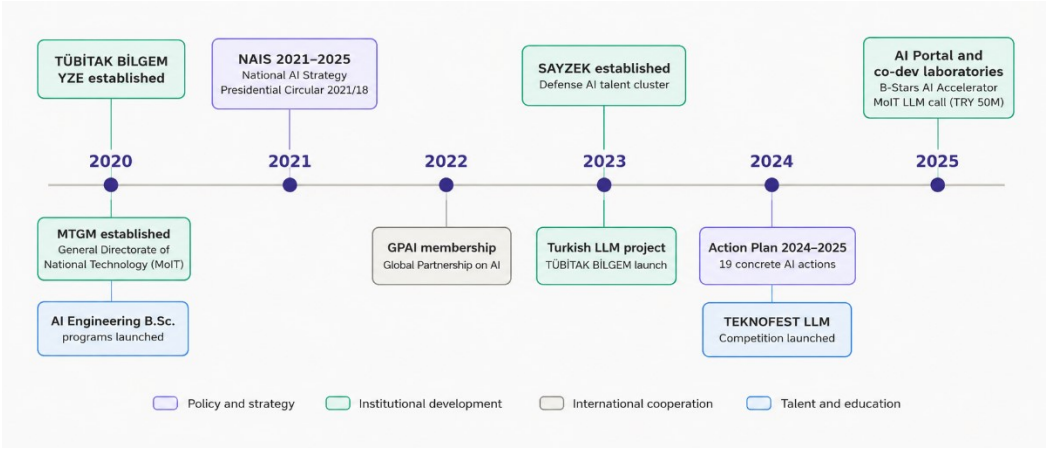
- General Directorate of National Technology (MTGM), was established by the 2020 amendment to the Presidential Decree on the central administration, sits within the Ministry of Industry and Technology as the policy and program arm for the National Technology Initiative, coordinating digital-technology transformation across industry and society (Ministry of Industry and Technology of the Republic of Türkiye, n.d.; Lexpera, 2020).
- TÜBİTAK and BİLGEM AI Institute: TÜBİTAK (The Scientific and Technological Research Council of Türkiye) is the national R&D funding agency and operates research institutes. It has taken a lead in building research capacity for AI. In 2019, TÜBİTAK established the Artificial Intelligence Institute (Yapay Zekâ Enstitüsü, YZE) under its Informatics and Information Security Center (BİLGEM). The TÜBİTAK BİLGEM AI Institute is a central node for AI R&D, focusing on core AI technologies and coordinating ecosystem projects (TÜBİTAK YZE, 2025). Uniquely, this institute cuts horizontally across sectors and academic disciplines to drive AI innovation. It is tasked with managing the upcoming “Türkiye AI Portal” and hosting co-development labs where academia and industry work on applied AI solutions. TÜBİTAK’s funding programs specifically targeting AI have ramped up: for instance, the institute runs the “AI Ecosystem Call” (TÜBİTAK call 1711) which funds collaborative projects to solve sectoral problems with AI (TÜBİTAK, 2025). Through such calls, TÜBİTAK provides grants and the AI Institute ensures that solutions (and data/knowledge generated) are shared across the ecosystem. Another TÜBİTAK program is supporting development of Türkiye’s large-scale Turkish Language Model – a critical resource for Turkish NLP. In 2023, TÜBİTAK BİLGEM launched a project to develop a Turkish Large Language Model (Türkçe Büyük Dil Temel Modeli), which involves open-source contributions and sector-specific adaptations. This effort has been publicized via popular science outlets and even a TEKNOFEST competition dedicated to building Turkish language AI applications. The government has backed this with substantial funding: project calls in 2023 offered up to £50 million grants for initiatives to enhance Turkish large language models with multimodal capabilities (e.g. adding vision and speech to text-based models). All these signal TÜBİTAK’s role as a linchpin connecting research, data resources, and funding to implement the national AI agenda.

- Between 2020 and 2025, TÜBİTAK's AI-related programs supported 2,935 projects and 3,721 researchers and young scientists, corresponding to ₺11.3 billion (2025 prices) in total funding.
- Within this, ₺1.51 billion went to academia (815 projects) and ₺4.76 billion to industrial R&D (2,120 projects). These figures demonstrate TÜBİTAK's pivotal financial role in scaling Türkiye's AI ecosystem beyond policy design toward tangible R&D outcomes.
- Presidency of Defense Industries (SSB) and Defense AI Cluster: The defense sector is a major driver of advanced technology in Türkiye, including AI. In late 2023, under SSB's coordination, Türkiye established the Savunma Sanayii Yapay Zeka Yetenek Kümesi (SAYZEK - Defense Industry AI Talent Cluster). This cluster brings together defense companies, the military, research institutes, and academia to centrally manage AI research needed for defense applications. SAYZEK aims to accelerate productization of AI in defense, avoid duplication, share infrastructure like test labs, and run training programs to funnel skilled students into defense projects. For example, one initiative under SAYZEK is an "AI Academic Thesis Program" to support graduate students working on defense-related AI research. By coordinating needs of the armed forces with solutions from companies and universities, this cluster is expected to fast-track AI enhancements in areas such as autonomous systems, intelligence analysis, and operational decision-support. The existence of SAYZEK also exemplifies how Türkiye's defense industry, which includes major state-affiliated companies like ASELSAN, HAVELSAN, ROKETSAN, BAYKAR, and TUSAŞ, plays a dual role in the AI ecosystem: it's both a consumer of cutting-edge AI (for e.g. drone swarming algorithms, target recognition, cybersecurity) and a contributor of R&D investment. ASELSAN (the leading defense electronics firm) even has an in-house Research Center focused on AI domains like computer vision, natural language processing, and decision systems. Such efforts underscore why defense is seen as a locomotive for Türkiye's AI advancement, often yielding spillover benefits to civilian tech.
- Other Ministries and Agencies: AI development is an interdisciplinary endeavor, and various other bodies are involved. The Ministry of National Education has introduced AI topics in curricula and is even piloting AI in education management (e.g. adaptive learning systems in schools). Universities operate with oversight from the Council of Higher Education (YÖK), which approved new AI Engineering programs starting from 2019–2020 to train more specialists. General Data Protection Regulation (KVKK), as mentioned, ensures AI initiatives comply with data privacy laws and fosters awareness of data ethics in AI – an important factor for public trust. The Ministry of Justice has explored AI for judicial processes (e.g. an AI-based translation for legal documents, or scheduling systems), and is tasked

with developing a legal assessment guide for AI per the Action Plan (Presidency of the Republic of Türkiye / Presidency of Strategy and Budget, 2024). The Ministry of Health has been exploring AI in healthcare, running pilot projects in collaboration with TÜBİTAK and universities on medical image analysis and epidemiological modeling. While not a formal “actor” in policy, the Turkish Academy of Sciences (TÜBA) has contributed by organizing panels and publications on AI’s scientific and societal impacts – for instance, the very book this chapter will appear in (co-sponsored by TÜBA) reflects the academy’s role in framing AI within national science policy discourse.

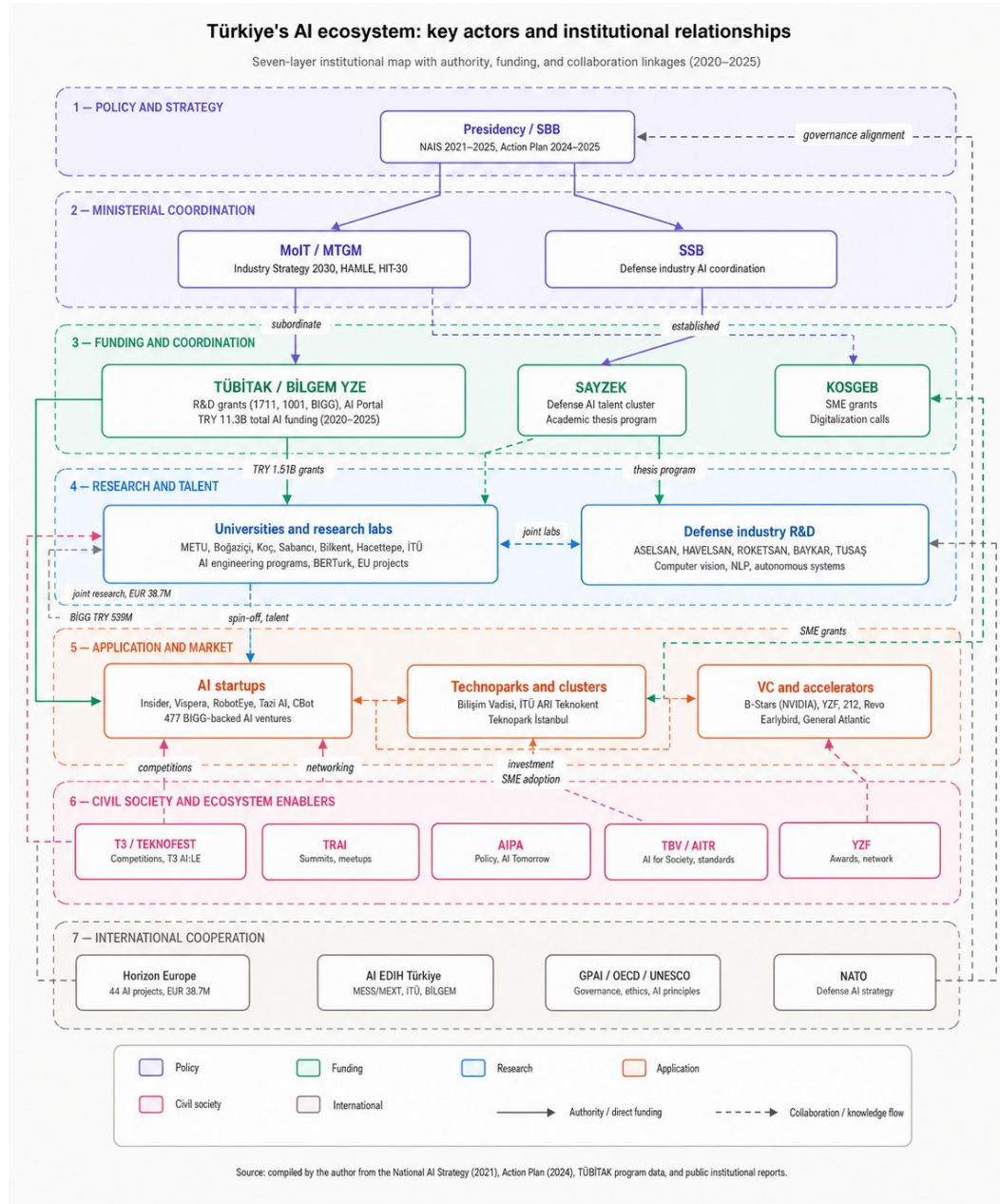
- **Civil-Society & Foundation Catalysts:** Alongside public agencies, Türkiye’s AI ecosystem is animated by mission-driven associations and foundations that convene stakeholders, publish guidance, and run large-scale programs. The Turkish Technology Team Foundation (T3 Foundation) acts as a nationwide catalyst through TEKNOFEST technology competitions and a growing AI pillar, T3 AI, an open, volunteer-driven initiative to develop Turkish-centric AI resources and models. The Turkish Artificial Intelligence Initiative (TRAI) positions itself as a platform to raise national AI awareness, strengthen the ecosystem, and broker sustainable collaborations; its activities span the annual TR AI Summit/Week, member networks, and training streams (TRAI Academy) (TRAI, 2023) (TRAI, 2025) (TRAI, 2025a). The Artificial Intelligence Policies Association (AIPA) operates as a non-partisan NGO focused on AI policy and governance, producing policy briefs (e.g., AI in education), running the AI Tomorrow Summit, and growing a practitioner community (AIPA, 2025). The Turkish Informatics Foundation (TBV) is a long-standing convener for digital policy and AI adoption, running open calls such as “AI for Society,” often co-run with the AI/TR platform (AITR) and AI Factory (YZF) (TBV, 2024); AITR itself serves as an open national hub with chapterized practice communities (e.g., Smart Cities & AI) and programmatic series (e.g., AIWARENESS talks) foregrounding standards, policy, and enterprise adoption (AITR, 2024) (TBV, 2025). Together, these organizations broaden participation from students to enterprises and help translate policy goals into deployable projects, standards, and pilots across sectors.
- In summary, Türkiye’s public sector approach to AI is multi-faceted: a top-down strategy guides it, but execution is distributed across specialized institutions. Figure 1 presents a timeline of the principal policy and institutional milestones that have shaped the national AI landscape since 2020.

Figure 1
Major AI Policy and Institutional Milestones in Türkiye (2020–2025)



The creation of coordinating clusters and portals is meant to mitigate fragmentation. The success of these efforts will hinge on how well these entities collaborate and share resources. As noted, the impetus now is on moving from planning to tangible outcomes – increasing the number of AI experts, products, and services originating from Türkiye, and doing so in an ethical, secure manner.

Figure 2 presents an institutional map of the AI ecosystem, illustrating the authority, funding, and collaboration linkages among the seven functional layers described above.

Figure 2*Türkiye's AI Ecosystem: Key Actors and Institutional Relationships (2020–2025)*

3. Academic Ecosystem and Research Capacity

Academic institutions in Türkiye form the bedrock of AI talent development and research. Over the past five years, Turkish universities have significantly ramped up AI-focused programs and labs, aligning with the national goal of producing 10,000 graduate-level AI specialists by 2025.

3.1. University Programs and Talent Pipeline

In a pioneering move, a few Turkish universities launched dedicated Undergraduate programs in Artificial Intelligence (AI) Engineering around 2019–2020, making Türkiye among the early adopters of specialized AI degrees. For example, Hacettepe University and TOBB University of Economics and Technology (ETU) in Ankara, and Bahçeşehir University in Istanbul, were among those establishing AI Engineering B.Sc. programs. Soon after, institutions like Istanbul Technical University (ITU) and Yıldız Technical University added “AI and Data Engineering” undergraduate tracks. These programs blend computer science, machine learning, and domain-specific AI applications, and are often taught in English to attract international students and collaborations. At the graduate level, many universities now offer AI specializations within Computer Science M.Sc./Ph.D. programs, and a few (such as METU NCC – Middle East Technical University’s Northern Cyprus campus) even have a standalone AI Engineering M.Sc.. These are illustrative examples; by 2025, 22 universities across Türkiye offer AI-focused undergraduate programs, complemented by 26 graduate programs and 31 dedicated AI research centres (TRAI, 2025b). The curriculum changes mandated by the National AI Strategy – integrating data science and AI into broader education – have also trickled down: by 2024, basic AI and coding modules were being introduced in some high schools and vocational programs, creating a pipeline of AI-aware students. The expansion of academic programs is an important quantitative development: Türkiye’s AI workforce is growing not only through upskilling but through new graduates each year. Nevertheless, quality and practical experience are equally important; hence many programs partner with industry for internships and applied projects, ensuring students get hands-on experience with real datasets and problems.

3.2. Leading Research Universities and Labs

A handful of Turkish universities lead in AI research output and have established dedicated labs or centers:

- Middle East Technical University (METU, Ankara): Long known for its Computer Engineering department, METU produces a large share of Türkiye’s AI research publications. METU’s Artificial Intelligence Research Lab works on areas from evolutionary AI to natural language processing. METU is also home to one of the country’s High Performance Computing centers, crucial for AI model training. Notably, METU was an early participant in EU research projects on AI and has European Research Council (ERC) grant holders working on AI theory.
- Boğaziçi University (Istanbul): Boğaziçi has a strong legacy in machine learning and NLP. Professors from Boğaziçi developed language processing tools and corpora for Turkish in the 2010s, laying groundwork for today’s

Turkish BERT and other language models. The university's AI-related labs (e.g. CMPE AI Lab, the NLP research group) are known for work on multilingual NLP, computer vision, and even cognitive modeling. Boğaziçi's reputation is such that it often collaborates internationally; for instance, Boğaziçi University was part of a Horizon 2020 "Excellence in Türkiye" Twinning project to boost AI research networks. However, Boğaziçi also faced challenges in recent years due to administrative changes, which some fear might impact research freedom – an issue beyond our scope but worth noting for context.

- Koç University (Istanbul): A private university that has heavily invested in research, Koç University established the Koç University AI Center (KUAI) and the affiliated Computer Science department is highly regarded. Koç has drawn top AI researchers (including Turkish academics returning from abroad) and is strong in computer vision, autonomous vehicles, and human-computer interaction. Koç University also entered into partnerships with industry – for example, media reported collaborations between Koç and technology companies for joint AI research, and Koç's tech incubator regularly spins off AI startups. Additionally, Koç's researchers have worked on social impact AI projects, such as AI for assisting visually impaired people, aligning with global "AI for good" trends.
- Sabancı University (Istanbul): Another private research university, Sabancı, hosts the Center of Excellence in Data Analytics which covers AI and machine learning. Sabancı has strengths in data science, network analytics, and also interdisciplinary AI ethics studies. It has been involved in TÜBİTAK's funded "1004 Center of Excellence" projects, one of which in recent years targeted AI in smart manufacturing. The university also co-leads an EU Horizon Europe project on human-centric AI in robotics (e.g. AI-PRISM for human-robot collaboration) with European partners. Such projects elevate Sabancı's research profile and integrate Turkish scientists into European innovation networks.
- Bilkent University (Ankara) and Hacettepe University (Ankara): These universities have notable contributions as well. Bilkent's Computational Intelligence lab and Hacettepe's work in biomedical AI stand out. For instance, Hacettepe's Computer Engineering department, which started one of the first AI undergrad programs, conducts research on medical image analysis and bioinformatics AI. Bilkent is strong in theory and maintains the National Magnetic Resonance Research Center (UMRAM), which has done AI-driven MRI analysis research. These institutions also collaborate with Ankara-based defense companies; it's common for a Bilkent or Hacettepe professor to simultaneously consult for ASELSAN or HAVELSAN on AI projects, creating an academia-industry link.

- **İstanbul Technical University (ITU):** ITU's long history in engineering now extends to AI and data science. ITU faculties have developed AI for energy optimization, geospatial AI (leveraging Türkiye's satellite programs), and were part of the AI EDIH Türkiye consortium (European Digital Innovation Hub) focusing on AI in manufacturing. ITU's ARI Teknokent (tech park) incubates startups (including AI firms), and ITU's Robotics Laboratory works on autonomous systems, an area blending AI with control engineering.

Beyond these, many other universities across Anatolia are ramping up AI research, often focusing on local industry needs. For example, Kocaeli University and Gebze Technical University near the Marmara industrial region work on AI for manufacturing and materials. In Izmir, Ege University has projects on AI in agriculture, important for Türkiye's large agri-sector. Erciyes University in central Türkiye explores AI in biomedical devices. Gazi University (Ankara) advances AI through its AI Center and Big Data & AI Lab, with projects in machine learning, big-data analytics, and computational neuroscience applied to health and engineering. Kapadokya University (Nevşehir) focuses on AI for tourism and regional services, with AI & Data Science initiatives and ecosystem events (e.g., the National AI Meetup) that bring academia and industry together. The diffusion of AI research geographically is a healthy sign, as it prevents all talent from clustering only in Istanbul/Ankara.

3.3. Research Output and Recognition

Quantitatively, Türkiye's AI publications and citations have grown. While Türkiye may not yet produce breakthroughs at the level of AI giants (US, China), there have been notable recognitions: Turkish teams have won or placed well in international AI competitions. Turkish researchers contribute to open-source projects – for instance, BERTurk, a Turkish language model, was released by AI researchers to facilitate NLP in Turkish, and has become a widely used tool in academia and industry. Additionally, Türkiye is increasing its participation in prestigious conferences like NeurIPS, CVPR, etc., with a small but rising number of accepted papers from Turkish institutions.

One should also note the role of TÜBA (Turkish Academy of Sciences) and TÜBİTAK awards in motivating academic excellence. TÜBA annually awards outstanding young scientists (many of whom are AI or computer science researchers) which helps retain talent. TÜBİTAK's incentive awards and project grants (1001 scientific research grants) provide modest but crucial funding for fundamental AI research in universities. Furthermore, programs like TÜBİTAK 2247 and TÜBİTAK 2232 bring back Turkish researchers from abroad to lead projects in Türkiye (the latter is a fellowship for returning scientists, and several awardees have been in AI-related

fields like machine learning and autonomous vehicles). These efforts tie into the strategic goal of building human capital: Türkiye acknowledges that meeting the target of 50,000 AI experts is challenging without tapping into its diaspora and attracting international talent. The TechVisa aims to streamline work visas for foreign AI experts to work in Türkiye, which could help universities and companies hire globally.

TÜBİTAK's human-resource instruments have explicitly prioritized AI. In the past five years, 609 researchers received international PhD or post-doctoral fellowships, 178 students were funded for domestic graduate studies, and 112 industry-linked PhD students participated in 30 projects under the Industrial PhD Program. Additionally, 42 foreign researchers joined Turkish labs through the International Leading Researchers Program, and 33 visiting fellows conducted AI-related research at local institutions.

4. AI Startups and Industry: Innovation and Entrepreneurship

One of the most dynamic elements of Türkiye's AI ecosystem is its startup scene. Over 2020–2025, Türkiye experienced a startup boom, producing multiple “unicorns” (startups valued over \$1 billion) (Lee, 2013) and record funding rounds - particularly in sectors like e-commerce, gaming, and fintech. AI-focused startups, while a subset of the overall ecosystem, have been steadily rising in number and scale. These startups are critical for translating academic research and corporate know-how into innovative products and services. They also contribute to employment of AI talent and often act as bridges to global markets.

4.1 Overview of the AI Startup Landscape

According to ecosystem reports, as of 2025 Türkiye's startup ecosystem ranks in the top 40 globally by various metrics (StartupBlink, n.d.). StartupBlink's global index placed Istanbul as a leading startup hub in the region, and overall startup investment in Türkiye hit historic highs in 2021 and 2022 (over \$1.5 billion in 2021, driven by big deals in gaming and e-commerce) (StartupCentrum, 2024). Within this, the AI and machine learning vertical has drawn growing investor interest. In 2022, there were 42 investment rounds in AI/ML startups in Türkiye totaling about \$125.5 million (StartupCentrum, 2024). While that figure is modest compared to the U.S. or EU powerhouses, it marked a significant jump from previous years (for context, AI startups had only about \$12.6 million in the first half of 2023 amid a global VC downturn, but this picked up sharply by 2024 with the global generative AI wave) (Anadolu Agency, 2025b).

By the first nine months of 2025, Turkish startups across all sectors raised \$475 million in 240 deals, and AI ventures accounted for 17.7% of all transactions over the past five years (Turkish Startups Attract, 2025). This indicates that nearly one in six startup deals in recent years has involved an AI-oriented company – a considerable share, reflecting AI's cross-cutting nature. Venture capitalists in Türkiye expect AI to remain a key driver of innovation and are encouraging entrepreneurs to embed AI in solutions for sectors like finance, healthcare, retail, and manufacturing. Indeed, local VCs note that Türkiye's startup strengths historically lay in gaming, fintech, retail tech, and defense tech, while pure AI and deep-tech startups were fewer – but this is changing as global trends shift investor focus to AI and deep technology. Comparatively, Türkiye's startup investment volume is above some regional peers (e.g. higher than Romania or Bulgaria) but still below countries like Poland or Czechia. In terms of deal count, however, Türkiye is among the top five in Central and Eastern Europe, indicating many early-stage deals even if average ticket sizes are smaller (EY, 2024).

Technology development zones play an important enabling role in this landscape. Informatics Valley (Bilişim Vadisi) in Kocaeli hosts over 250 technology companies, many working on AI and autonomous systems, and runs dedicated AI accelerator programmes in partnership with NVIDIA and Microsoft (Bilişim Vadisi, 2025). In the adjacent Gebze district, MARTEK Technopark and Gebze Technical University's campus anchor a manufacturing-oriented AI cluster. İTÜ ARI Teknokent and Teknopark İstanbul likewise incubate a growing number of AI startups, reinforcing Istanbul's position as the ecosystem's primary hub.

4.2 Notable AI Startups and Their Focus Areas

A number of Turkish AI startups have gained visibility for their innovative products and international reach. Table 1 highlights a selection of these startups, illustrating the diversity of focus areas in Türkiye's AI entrepreneurial scene.

Table 1*Selected Turkish AI Startups (2020–2025) and Their Focus Areas*

Startup	Domain	Notable Achievements
Insider	AI-powered marketing & customer engagement (MarTech)	Türkiye's first AI unicorn; provides an omnichannel personalization platform used in 28+ countries. Raised \$121M in 2022 (valuation \$1.2B) and a further \$105M in 2023 (valuation \$2B) ("More Big Money," 2023; KPMG Türkiye, 2023; Insider, 2023). In 2024, secured a \$500M Series E led by General Atlantic to expand AI solutions and global footprint.
Vispera	Computer vision for retail analytics (FMCG sector)	Offers image recognition solutions for retail shelf monitoring and inventory management. Active in over 25 countries including U.S., Europe, Middle East. Partnerships with NVIDIA, HP, and others to scale globally ("Turkish Startups Seek," 2021). Has Koç Holding as an investor, and listed among Fast Company's Fast 50 Türkiye.
RobotEye AI	AI-driven surveillance and border security (Defense tech)	Develops smart, autonomous surveillance cameras and analytics for border and perimeter security. Its "Smart Trailcam" device uses on-device edge AI and satellite links to monitor remote areas. In 2024, RobotEye received investment from a Turkish VC at a \$12.5M valuation, to fuel growth in meeting security demands from Europe to Indo-Pacific (Anadolu Agency, 2024).
Tazi AI	Automated machine learning platform (AutoML)	Founded by Turkish academics, Tazi offers an AutoML solution for businesses to continuously update AI models. Recognized for its explainable AI approach. While headquartered partly in the USA, it maintains R&D in Türkiye. Has raised multi-million funding and won clients in finance and insurance sectors in Europe and North America.
Falcon AI	AI for sports analytics and computer vision	A spin-off by Turkish engineers focusing on AI-powered performance tracking for basketball and football. Gained clientele with professional teams using its computer vision to analyze game footage. Raised seed funding from international angels.

This selection only scratches the surface. Other startups of note include HockeyStack (marketing analytics SaaS using AI), Picus Security (cybersecurity firm using AI to simulate cyberattacks – it raised over \$20 million and is expanding globally), Tarentum (AI solutions in energy efficiency, particularly for wind turbine optimization), Optiyol (route optimization AI for logistics, which saw adoption by delivery firms in emerging markets), and CBot (a leading Turkish chatbot/NLP startup whose virtual assistants are used by banks and government e-services).

A highlight in 2022 was the unicorn valuation of Insider, as detailed, which underscored that a Turkish-born company with AI at its core can scale globally and attract top-tier investment. Following that, in 2023–2024, trend seems to be toward larger later-stage rounds: Insider's \$500 million round, and other big raises like Getir (ultrafast delivery, uses AI in logistics) and Hepsiburada (e-commerce). While those are not "AI startups" per se, they invest heavily in AI (recommendation engines, demand forecasting). The convergence of AI with mainstream tech sectors means many Turkish startups are becoming "AI-enabled" even if AI isn't their primary product. For instance, Getir acquired an AI routing startup to improve its delivery times. Trendyol (Türkiye's largest e-commerce platform) opened an R&D center focusing on AI for logistics and customer experience.

4.3 Startup Support Systems and Funding

The growth of AI startups has been supported by a developing venture capital and incubation infrastructure in Türkiye:

- **Venture Capital:** Indigenous VC firms like 212, Revo Capital, Earlybird Digital East, and Collective Spark have all invested in AI-related companies. International investors and corporate VCs are also active – e.g., General Atlantic in Insider, QIA (Qatar's sovereign fund) has shown interest in Turkish tech, and Big Tech companies (like Google's AI fund) have occasionally scouted Turkish talent. Total funding in AI startups grew year-on-year up to 2022, though it dipped in the global VC slowdown of 2023. Turkish VCs emphasize that investors are "remaining selective" and favor startups that integrate AI robustly into clear business models. Encouragingly, foreign investor participation in Turkish startup deals has remained steady (65 international investors took part in deals in the first 9 months of 2025) (Turkish Startups Attract, 2025), implying that Turkish AI startups are on the radar of global funds.
- **Accelerators and Incubators:** Programs specifically tailored for AI startups have emerged. A notable one is the Bilişim Vadisi B-Stars AI Accelerator, run in partnership with NVIDIA and Microsoft's startup hub. In 2025, out of 300+ applicants, 32 AI startups were selected for an 8-week accelerator, receiving training, mentorship, and cloud computing credits. The program culminated in a Demo Day connecting these startups with investors (Bilişim Vadisi, 2025). This kind of program helps early-stage teams refine their tech and business models. Tech giants' involvement is crucial given AI's need for computing power and advanced tools. Other incubators like ITU Çekirdek host many AI startups, and Teknopark İstanbul has an "AI cluster" as well. Türk Telekom's PILOT accelerator explicitly has nurtured AI startups. Additionally, corporate innovation programs by banks (İşbank's Workup, Akbank's AkÖde etc.) include AI fintech startups. The proliferation of such platforms means new startups can find support in the critical early phases.

Horizontal ICT associations have become important multipliers for AI adoption. The Informatics Industry Association (TÜBİSAD) produces market analyses and AI-themed briefs, engaging corporate leaders across verticals. The Informatics Association of Türkiye (TBD) runs AI working groups and publishes sectoral reports such as AI in the Public Sector (2024), providing use-case surveys and practitioner guidance for government IT leaders. Specialist NGOs also emerge to convene deep-tech adopters: AI & Technology Association (YZTD) aims to coordinate actors across research and industry; AI for TR (AI4TR) promotes collaborative R&D and regulatory dialogue to build sustainable national advantages.

The AI Factory (YZF), a corporate venture and acceleration vehicle backed by Türkiye İş Bankası, has emerged as a visible market-maker for applied AI. YZF curates a national AI Network, runs structured selection committees, and established the YZF Awards (2024) to recognize high-impact deployments across multiple categories, with bank-level amplification to enterprises and startups (Türkiye İş Bankası, 2024; Yapay Zekâ Fabrikası, 2024). These channels complement public accelerators by providing late-stage exposure and commercial pilots (Yapay Zekâ Fabrikası, 2025).

- **Government Grants and Programs:** The government, through TÜBİTAK and other agencies, has injected early-stage funding especially at the ideation stage. The TÜBİTAK BİGG (1512) program is a startup grant scheme which provides seed funding (around \$20,000 each) to hundreds of tech entrepreneurs annually. TÜBİTAK's BİGG (Entrepreneurship Support) Program has become a cornerstone for early-stage AI entrepreneurship. Since 2012, it has backed 2,490 technology companies, providing \$2.6 billion in total support. Within this portfolio, 477 AI-oriented startups were established; 373 successfully completed their projects, receiving \$539 million in cumulative support. Selected success stories include:
 - HEVI AI – developer of hStroke, an AI-based early-warning system for stroke diagnosis, deployed in 17 private and 5 public hospitals, recipient of multiple international awards and \$ 630 thousand strategic investment in 2024.
 - Smart Capital – AI-driven robo-advisory platform with \$800 million cumulative investments under management.
 - Move On Tech – vision-based tractor guidance system for sustainable agriculture, valued at \$2.5 million in 2023.
 - Stroma Tech – AI-enabled worker-safety monitoring, securing \$1.32 million investment from U.S. VC funds.

In 2025, over 100 deals (grants to nascent startups) were done via BiGG, totaling \$2.42 million – many of these involve AI-driven projects. Another mechanism, techno-investment capital support from the Ministry (through Teknopark incubators), co-invests with VCs to de-risk early-stage funding for deep-tech startups.

The Ministry of Industry and Technology opened a pre-competitive collaboration call inviting consortia to develop sector-specific Turkish LLMs and multimodal capabilities (e.g., vision/audio, video generation, function calling/agent layers), starting around TRL-3–5 and targeting TRL-8. The scheme offers up to 50% grant support (ceiling TRY 50 million) over 18 months, with explicit deliverables and benchmarking guidance. Priority domains include finance, e-commerce, education, health, industry, and public services

Moreover, KOSGEB (the Small and Medium Enterprise Development Organization) launched calls specifically for digitalization and AI solutions, giving small grants to SMEs that adopt local AI products.

- Competitions and Awards: Beyond formal programs, Türkiye's vibrant hackathon and competition culture has spurred AI innovation. TEKNOFEST, the massive annual technology festival initiated in 2018 by the T3 Foundation and government institutions, features multiple AI-related competitions. For example, in TEKNOFEST 2021 and 2022 there were contests for “Artificial Intelligence in Healthcare” and “Agricultural Technologies with AI”, where student teams built prototype solutions. The TEKNOFEST competition platform, co-organized with the T3 Foundation, now hosts multiple AI tracks, moving beyond robotics into LLM fine-tuning and agentic systems. In 2024, TEKNOFEST introduced the Action-Based Turkish Large Language Model Competition, inviting teams to fine-tune open models and build AI-agent layers to solve sectoral tasks reliably in Turkish, with clear deliverables and prize funding. TEKNOFEST also runs AI-adjacent challenges (e.g., AI in Aviation, AI-assisted short-film contests) and announces T3 AI Hackathons under its umbrella (TEKNOFEST, 2024). These pipelines are increasingly used by startups to recruit, pilot MVPs, and meet investors. Such events have engaged tens of thousands of youths (TEKNOFEST attendance broke records, with millions visiting over a week), boosting public awareness and enthusiasm for AI and tech. They also signal government and major industry players' support: e.g., ASELSAN and TUSAŞ sponsor some AI challenge tracks to spot talent for recruitment.

Complementing state-backed Turkish LLM efforts, the T3 Foundation launched T3 AI'LE, a Turkish-centered large language model initiative built with a volunteer network. The project's stated goals are to “overcome language barriers,” contribute to digital transformation, and release open

resources; early communications describe a beta integrated into the TEKNOFEST social platform, with contributions from 1,792 volunteers across 67 provinces and partnerships across media, academia, and technology stakeholders. While technical reports are still emerging, the initiative signals added plurality in Turkish-language model development alongside public institutes and universities. Table 2 lists the TEKNOFEST competitions focused on AI in the 2025 season, illustrating the breadth of sectoral engagement from healthcare and aviation to e-commerce and creative AI.

Table 2*TEKNOFEST Competitions Focused on Artificial Intelligence (2025 Season)*

Competition	Sponsor(s)	Domain	Focus
Artificial Intelligence in Healthcare	Ministry of Health / TÜSEB	Healthcare	AI-based classification models for cardiac arrhythmia detection (high school) and pathogenic genetic variant prediction (university)
Artificial Intelligence in Aviation	ASELSAN / CEZERİ / TÜBİTAK	Aviation / Defense	Object detection, GPS-denied visual localization, and reference-object recognition for autonomous UAV flight
AI-Assisted Airline Optimization	Turkish Airlines (THY)	Aviation / Logistics	Flight-network scheduling optimization using AI, data analytics, and operations research to improve passenger connectivity
E-Commerce Search Relevance	Trendyol	E-commerce	Semantic relevance models combining search terms, product attributes, and category hierarchies for search-result ranking
AI-Assisted Logistics Optimization	Hepsiburada	Logistics	Demand forecasting and linehaul route planning combining ML prediction with mathematical fleet optimization
Turkish Natural Language Processing	Bilişim Vadisi	NLP	Development of NLP projects for the Turkish language using AI techniques
5G & AI for Smart Road Safety	Turkcell	Telecommunications / Transport	Real-time video analytics with 5G Quality-on-Demand APIs for intelligent road-safety applications
AI Film Competition	Google	Creative AI	Short-film production using generative AI tools, combining technology with artistic storytelling
Action-Based Turkish Large Language Model	T3 Foundation	LLM / NLP	Fine-tuning open LLMs and building AI-agent layers to solve sectoral tasks reliably in Turkish

Overall, the environment for AI entrepreneurship in Türkiye is improving, though challenges remain. Access to capital beyond Series A is one hurdle – local funds are often not large enough for big follow-on rounds, which is why startups like Insider seek global investors. Another challenge is scaling internationally: while Türkiye is a great test market, true success often lies in capturing the US or broader European market. Companies like Vispera and Insider opening U.S. offices, or RobotEye marketing to NATO countries, exemplify the push outward. The support of the Investment Office and programs like Turcorn (Türkiye Unicorn) 100 are geared to help with this by promoting Turkish startups abroad. Interestingly, the term “Turcorn” was coined to celebrate local unicorns and set a target (10 Turcorns by 2023); by 2023 that count was achieved (with companies like Getir, Dream Games, Trendyol, Insider, etc.). While not all Turcorns are AI companies, their success creates a halo effect attracting talent and investors that benefit the AI sector too.

One more point on startups: international comparisons show both promise and gap. In 2023–2024, AI startups globally saw massive valuations (OpenAI's multi-billion deals, etc.). Türkiye's largest AI rounds (Insider's \$105 million or \$500 million) are comparatively smaller but significant for an emerging market. Türkiye producing a unicorn in AI (Insider) and a host of Series A/B-stage AI firms is akin to countries like Poland or Brazil, rather than the top-tier like UK or Israel which have dozens of AI unicorns. It highlights that Türkiye is an “up and coming” player – not a global leader in AI startup output yet, but among the leaders in its region. According to Tortoise Media's Global AI Index 2023, Türkiye's overall AI capacity score was mid-tier, dragged down by lower private investment but bolstered by a large developer talent pool. Many Turkish developers rank highly on global coding platforms and there's a vibrant freelancing community doing AI-related work. The entrepreneurial energy is evident; the key is ensuring enough capital, mentorship, and connections to turn more of that energy into globally competitive companies.

5. National and International Collaborations

Collaboration is a cornerstone of Türkiye's AI strategy – recognizing that an ecosystem can only mature when its parts synergize and when it taps into global knowledge networks. This section examines collaborative efforts within Türkiye (public-private partnerships, inter-sectoral initiatives) and Türkiye's engagement in international cooperation related to AI.

5.1 National Collaborations and Public-Private Partnerships

From the earlier sections, it's clear that the Turkish government actively encourages multi-stakeholder collaboration in AI:

- **Public-Private Research Projects:** Programs like TÜBİTAK's "AI Ecosystem Call 2023" fund consortia that typically include a mix of universities, private tech companies or startups, and sometimes public agencies, all working on a common AI project (TÜBİTAK YZE, 2025). For instance, a funded project might involve a university AI lab teaming with a hospital and a software company to develop an AI radiology tool. The TÜBİTAK AI Institute often plays a coordination role, ensuring knowledge from these projects (e.g. anonymized data sets, algorithms) is disseminated for reuse. By breaking silos between academia and industry, these collaborations accelerate application of research. One concrete outcome is the planned "AI Co-Development Laboratories" under TÜBİTAK BİLGEM – essentially shared R&D facilities focused on thematic areas where university researchers and company engineers can literally work side by side. These labs will be co-funded by government and industry, reflecting a cost-sharing in pursuit of innovation.
- **Techno-parks and Clusters:** Türkiye's numerous techno-parks (technology development zones) act as physical collaboration hubs. Informatics Valley (Bilişim Vadisi) in Kocaeli, for example, hosts over 250 companies and startups, many in AI/IoT/autonomous systems. It regularly convenes "Meetups" where AI entrepreneurs, corporate representatives, and investors mingle. Informatics Valley also partnered with an investment firm called "AI Factory" (Yapay Zeka Fabrikası) to organize events and provide strategic investments to AI startups. In May 2025, Bilişim Vadisi and AI-Factory co-hosted the B-Stars Accelerator Demo Day, and their collaboration aims to continue funneling support to promising AI firms. Another example is the Defense AI Cluster (SAYZEK) described earlier – it inherently is a collaborative platform across the defense industry, academia, and government. The fact that its events and workshops involve both military officials and civilian researchers together is unprecedented in some ways, creating trust and knowledge exchange (e.g. identifying academic expertise that could solve defense problems, or exposing students to defense use-cases so they consider careers in that field).
- **Industry-Academia Initiatives:** Several big companies have set up joint labs or sponsored research at universities. For instance, ASELSAN has research centers at METU and Bilkent where some of its staff are embedded doing graduate studies on ASELSAN projects. Arçelik, a consumer electronics giant, sponsors an AI research program at Koç University related to smart appliances and manufacturing optimization. Turkcell and Türk Telekom (the telecom operators) both have collaboration agreements with universities: Turkcell's AI teams worked with Istanbul Technical University on Turkish language speech recognition, and Türk Telekom's R&D labs partner with

Middle East Technical University on network optimization using AI. These partnerships are mutually beneficial: companies access talent and pilot environments, while techno-parks and universities scale validated use cases.

- **Hackathons and Civic Tech:** Collaboration isn't only at high levels; the civic tech community in Türkiye also fosters AI projects. There have been hackathons like İTÜ-Bootcamp for AI where students from different universities form teams to build solutions for NGO or government-proposed challenges (e.g. AI for disaster response, which gained focus after Türkiye's devastating earthquakes in 2023). The government's open data portal (a pilot at acikveri.gov.tr) encourages developers to use public datasets. In one case, the Istanbul Metropolitan Municipality released traffic camera data for an AI competition to improve traffic flow algorithms. This kind of local government collaboration with tech communities indicates a cultural shift toward openness and co-creation.
- **Social Impact and Talent Development:** TÜBİTAK's popular-science and youth programs now embed AI themes at all levels. Between 2019 and 2024, more than 13 million visitors engaged with AI-related exhibits across 35 science centers. The "Deneyap (Experimental) Technology Workshops" reached nearly 19,000 students with 44-week AI and robotics training, while national student competitions (AI in Transportation, Quantum Hackathon, etc.) attracted over 29,000 participants in 2024 alone.

T3 Foundation also expanded dedicated AI upskilling academies for young adults. The Artificial Intelligence & Technology Academy (run with the Ministry of Industry and Technology, Google Türkiye, and entrepreneurial organizations) offers free, cohort-based online training in AI applications, data science, and game development, funneling top performers into in-person intensives. The program claims thousands of participants to date, complementing Deneyap's school-age track with a targeted 18-29 age pathway.

Under MTGM, the National Technology Academy (Milli Teknoloji Akademisi) scaled open learning for AI and data skills: 336 courses delivered under the Academy umbrella in 2024, with 12,424 learners recorded - exceeding annual targets and complementing Deneyap's school-age track.

NGO-run programs complement state initiatives by delivering open seminars, meet-ups, and cohort courses. TRAI hosts monthly meet-ups and the TR AI Summit/Week to connect startups, researchers, and corporate adopters; TBD chapters run recurring AI seminars through data-science working groups; AIPA Academy offers free policy-aware training cycles aligned with its summit agenda. Collectively, these channels extend AI literacy from students to mid-career professionals. Turkish Informatics

Foundation (TBV) and Türkiye AI Initiative (TRAI) jointly run public-interest AI programs and showcases (e.g., AI for Society), funneling student and professional teams to build deployable solutions for social challenges, while giving them visibility to banks, municipalities and NGOs. The AITR chapters (e.g., Smart Cities & AI) provide structured materials and guidance that cities can adapt to improve livability, sustainability and service delivery with AI.

- **NGO:** Bodies like the Turkish Informatics Foundation (TBV) and Türkiye AI Initiative (TRAI) act as quasi-collaborative forums. The TRAI, established in 2017, is a private initiative that connects enthusiasts, professionals, and companies through meetups and annual Türkiye AI Summit events. TRAI has support from tech companies and serves to raise awareness and share knowledge – essentially complementing official efforts by building an AI community. It is common for TRAI events to host speakers from government, academia, and startups, all sharing the stage, which helps alignment and networking.

Civil associations institutionalize collaboration via recurring national events, notably TR AI Summit/Week (TRAI) and AI Tomorrow Summit (AIPA), which assemble ministries, universities, startups, investors, and global tech vendors. These fora translate policy goals into project pipelines and disseminate standards and best practices across sectors.

TBV and AITR regularly co-host ecosystem convenings with global tech firms (e.g., AIWARENESS at Google) that assemble policymakers, enterprise leaders, researchers and startups around safe adoption, standards and cross-sector pilots. These events sit alongside TEKNOFEST and trade associations to translate policy into project pipelines.

5.2 International Collaborations and Alliances

On the international front, Türkiye has actively sought partnerships and participation in global AI endeavors:

- **European Union – Horizon Programs:** Türkiye is an associate member of the EU's research funding framework (Horizon 2020 and Horizon Europe), which means Turkish researchers and companies can fully participate in EU-funded projects. Turkish teams have been partners in numerous Horizon 2020 AI projects. For instance, Türkiye was involved in AI-PRISM, a Horizon Europe project on human-centric AI in manufacturing, via Sabancı University and a couple of tech SMEs. Under Horizon 2020, Turkish organizations took part in projects on robotics, big data, and AI for healthcare. Türkiye's participation and success rates in Horizon Europe calls have been improving. The EU's report praised Türkiye's progress especially

in programs like the European Research Council and Marie Curie fellowships. Furthermore, TÜBİTAK itself has launched complementary calls to encourage Turkish entities to join Horizon Europe consortia. Being plugged into EU networks also ensures Türkiye stays aligned with EU AI regulations and standards - for example, Türkiye has been observing and providing input on the EU's AI Act through these collaborations, aiming to harmonize its future regulations with it.

Under Horizon Europe (2021–2025), Turkish researchers have participated in 44 AI-themed projects, securing €38.7 million in funding. These projects involve 47 organizations (43 private companies, 3 universities, and 1 public research center - BİLGEM) and span areas such as Smart and Sustainable Manufacturing, Circular Economy, AI Infrastructure and Security, Human–Robot Interaction, and Autonomous and Electric Vehicles.

- **European Digital Innovation Hubs (EDIH):** Türkiye has established a hub called AI EDIH Türkiye, which is part of the EU's EDIH network even though Türkiye isn't an EU member. Led by the Turkish Employers' Association of Metal Industries (MESS) and its tech center MEXT, in partnership with ITU, TÜBİTAK BİLGEM and others, AI EDIH Türkiye is designed to help SMEs adopt AI and high-performance computing for the twin digital-green transition (European Commission, n.d.; MESS / MEXT Technology Center, 2025). It effectively extends the EU's digital innovation ecosystem into Türkiye. Through this, Turkish SMEs gain access to expertise and testbeds across Europe, and vice versa, European entities can collaborate with Turkish industries. MEXT (the Istanbul-based center) already had deep ties with German and other European industry 4.0 initiatives, and now as an AI EDIH leader, it anchors Türkiye in Europe's digital fabric. This also facilitates knowledge exchange: workshops and open calls have been held jointly with Hungary's AI hub and others, showing peer learning.
- **Global AI Governance and Standards:** As mentioned, Türkiye joined the Global Partnership on AI (GPAI) in 2022. Through GPAI, Turkish experts participate in working groups on themes like AI governance, data governance, future of work, etc., alongside OECD countries. Türkiye's contribution, as stated by officials, is especially in promoting "ethical and responsible use of AI" on international platforms. Additionally, Türkiye supports the UNESCO Recommendation on AI Ethics - Türkiye was among the countries that helped shape it and is now aligning its national ethics framework accordingly. In the Council of Europe, Türkiye has been engaged in the committee drafting a possible Convention on AI and Human Rights. These involvements indicate Türkiye's intent to be seen as a responsible player in AI, aligning with European human-centric AI values, which is

important for trust if Turkish AI companies want to operate in Europe or elsewhere.

- **Regional and Bilateral Cooperation:** Türkiye often emphasizes tech cooperation in its diplomacy. With Azerbaijan, for example, joint technology centers have been announced (after Azerbaijan's TEKNOFEST visits) that include AI research for defense and smart city applications. Türkiye and Qatar have a strong partnership in technology; a "Qatar-Türkiye Artificial Intelligence Initiative" was hinted at in press around 2022, aiming to co-develop AI solutions for finance and security. While details are sparse, some Turkish AI startups (like Insider) have received investment from Qatari funds. With Turkic States (Central Asia), Türkiye via organizations like the Organization of Turkic States has proposed collaboration on emerging tech - an example being offering training to Uzbek and Kazakh engineers at Turkish AI centers. Pakistan and Türkiye have long-standing defense co-development agreements; in AI, this translates to sharing know-how on autonomous drones and command systems. NATO is another forum: Türkiye is part of NATO's Science and Technology board which looks at AI implications for defense, and Turkish representatives contributed to NATO's AI strategy published in 2021.
- **Academic International Links:** On a scholarly level, many Turkish AI researchers maintain close ties with colleagues abroad. There are Erasmus+ exchange programs focusing on AI courses, and twinning projects (like one involving Boğaziçi University and partners in Italy and France to boost AI excellence). These not only elevate research quality but also raise Türkiye's profile.
- **Comparative Positioning:** Internationally, Türkiye's AI ecosystem can be contrasted with, say, European peers: It is similar in ambition to mid-sized EU countries (like Poland or Italy) but it lags leading AI nations in outputs. For example, France aims to invest €1.5 billion in AI over 5 years, and countries like France (\$109 billion) and Saudi Arabia (\$40 billion) announced huge AI investments, whereas Türkiye's public spending on AI is smaller and not fully disclosed (likely a few hundred million USD at most, via various programs). The absence of Türkiye in lists of top spenders was noted as a concern domestically. However, in terms of vision and policy frameworks, Türkiye is on par with many – having a national strategy, action plans, and integration into global governance means it is doing the right things. The challenge is mostly one of scale and coordination in implementation, which Turkish stakeholders are aware of.

Conclusion

Türkiye's AI ecosystem in 2020–2025 has evolved rapidly from nascent to emergent, guided by strategic vision and energized by a vibrant community of stakeholders. Government institutions like MoIT and TÜBİTAK have set a clear direction through the National AI Strategy and backed it with programs to develop talent, data infrastructure, and innovation. Academia has responded by expanding AI programs and research, producing skilled graduates and notable research contributions especially in areas like natural language processing and computer vision. A burgeoning startup scene, exemplified by companies such as Insider, Vispera and others, has put Türkiye on the map as a source of AI innovation, achieving milestones in funding and global market reach. The private sector, including powerful defense and telecom industries, has embraced AI to improve products and efficiency, often collaborating with universities and startups in the process.

Collaboration emerges as a linchpin of Türkiye's approach: nationally, through clusters like the defense AI consortium (SAYZEK) building synergies between military, industry and academia, and internationally, through active participation in EU research programs, global partnerships, and adherence to emerging AI governance norms. These efforts not only accelerate learning and innovation but also help Türkiye align with global standards on ethical and trustworthy AI – a critical aspect as it seeks to deploy AI widely in society.

In comparative perspective, Türkiye stands out in its region for the comprehensiveness of its AI push. It is not yet a top-tier AI power by global indices, but it has laid the groundwork to significantly improve its standing. The targets set for 2025 (like top-20 ranking in AI indices, 5% GDP contribution from AI) may be stretch goals, yet even partial attainment of these will mean a transformative impact on Türkiye's economy and governance (Presidency of the Republic of Türkiye (Presidency of Strategy and Budget, 2023). There are early indicators of such impact: AI is increasingly used in Turkish public services, and industries like manufacturing and agriculture are piloting AI solutions to boost productivity, aligning with the national goal of socio-economic adaptation to AI.

In conclusion, Türkiye's AI ecosystem has transitioned from groundwork to growth. It features an encouraging mix of top-down support and bottom-up innovation. Institutions are in place, talent is being cultivated, startups are thriving, and collaborations form the glue binding it all. In sum, Türkiye's AI ecosystem is moving from groundwork to growth, combining top-down policy with bottom-up innovation.

References

- AIPA – Artificial Intelligence Policies Association. (2025). *AI Tomorrow Summit 2025*. <https://aitomorrowsummit.com/>
- AITR – AI/TR Platform. (2024, July 2). AIWARENESS[at]Google gerçekleşti. <https://ai.org.tr/2024/07/02/aiwarenessgoogle-gerceklesti/>
- Anadolu Agency. (2022, November 23). *Türkiye welcomes inclusion in global artificial intelligence group*. <https://www.aa.com.tr/en/science-technology/turkiye-welcomes-inclusion-in-global-artificial-intelligence-group/2746254>
- Anadolu Agency. (2024, April 19). *Turkish AI defense firm secures investment at valuation of \$12.5M*. <https://www.aa.com.tr/en/artificial-intelligence/turkish-ai-defense-firm-secures-investment-at-valuation-of-125m/3196076>
- Anadolu Agency. (2025a, May 30). *Yapay zeka girişimcileri ve yatırımcılar Bilişim Vadisi'nde buluştu*. <https://www.aa.com.tr/tr/bilim-teknoloji/yapay-zeka-girisimcileri-ve-yatirimcilar-bilisim-vadisinde-bulustu/3584847>
- Anadolu Agency. (2025b, August 13). *Turkish fintech, gaming, AI startup investments reach \$211M in first half of 2023*. <https://www.aa.com.tr/en/science-technology/-turkish-fintech-gaming-ai-startup-investments-reach-211m-in-first-half-of-2023/3657959>
- Bilişim Vadisi. (2025, May 29). *B-Stars AI Hızlandırma Programı Demoday*. <https://bilisimvadisi.com.tr/etkinlikler/b-stars-ai-hizlandirma-programi-demoday/>
- European Commission – European Digital Innovation Hubs Network. (n.d.). *AI EDIH Türkiye*. Retrieved November 11, 2025, from <https://european-digital-innovation-hubs.ec.europa.eu/tr/node/111451>
- European Commission – European Digital Innovation Hubs Network. (n.d.). *EDIH catalogue*. Retrieved November 11, 2025, from <https://european-digital-innovation-hubs.ec.europa.eu/edih-catalogue>
- EY. (2024). *Central and Eastern Europe mergers and acquisitions first quarter 2024*. https://www.ey.com/en_cz/insights/strategy-transactions/m-and-a-in-the-cee-region-started-2024-on-a-cautious-note
- Insider. (2023, May 24). *Insider announces investment of up to \$105 million led by QIA to accelerate M&A-focused strategy, bringing total investment to \$274 million*. <https://useinsider.com/news/insider-announces-105-million-usd-investment/>
- KPMG Türkiye. (2023, October). *Turkish startup investments review Q2 2023*. <https://assets.kpmg.com/content/dam/kpmg/tr/pdf/2023/10/turkish-startup-investments-q2-2023-kpmg.pdf>
- Lee, A. (2013, November 2). *Welcome to the unicorn club: Learning from billion-dollar startups*. TechCrunch. <https://techcrunch.com/2013/11/02/welcome-to-the-unicorn-club/>
- Lexpera. (2020, April 14). *59 sayılı Cumhurbaşkanlığı Teşkilatı Hakkında Cumhurbaşkanlığı Kararnamesinde Değişiklik Yapılmasına Dair Cumhurbaşkanlığı Kararnamesi*. <https://www.lexpera.com.tr/resmi-gazete/metin/cumhurbaskanligi-teskilati-hakkinda-cumhurbaskanligi-kararnamesinde-degisiklik-yapilmasina-dair-5>
- MESS / MEXT Technology Center. (2025). *AI EDIH Türkiye Newsletter No. 1*. <https://mess.org.tr/media/ai-edih-turkiye-newsletter-no1.pdf>

- Ministry of Foreign Affairs of Türkiye. (2022, November 23). No: 350, *Press release regarding Türkiye's membership to GPAI*. https://www.mfa.gov.tr/no_-350_-turkiye-nin-gpai-uyeligi-hk.en.mfa
- Ministry of Industry and Technology of the Republic of Türkiye. (n.d.). *Millî Teknoloji Genel Müdürlüğü – Hakkımızda*. Retrieved November 11, 2025, from <https://sanayi.gov.tr/merkez-birimi/c03f1f3bae27/hakkimizda>
- Ministry of Industry and Technology of the Republic of Türkiye. (2025a). *2030 Industry and Technology Strategy*. <https://hamle.sanayi.gov.tr/Files/dokumanlar/2030SanayiveTeknolojiStratejisi.pdf>
- Ministry of Industry and Technology of the Republic of Türkiye. (2025b). *HIT-30 High Tech Türkiye*. <https://hit30.sanayi.gov.tr/>
- Ministry of Industry and Technology of the Republic of Türkiye. (2025c). *Technology Focused Industry Initiative Program Atlas*. <https://yatirimharitasi.hamle.gov.tr/>
- More big money for AI: Insider raises \$105M. (2023, May 24). *Crunchbase News*. <https://news.crunchbase.com/ai/venture-funding-marketing-platform-insider/>
- Presidency of the Republic of Türkiye / Presidency of Strategy and Budget. (2023). *Twelfth Development Plan (2024-2028)*. https://www.sbb.gov.tr/wp-content/uploads/2025/03/Twelfth-Development-Plan_2024-2028.pdf
- Presidency of the Republic of Türkiye / Presidency of Strategy and Budget. (2024). *Yapay zekâ 2024-2025 eylem planı*. https://www.sbb.gov.tr/wp-content/uploads/2024/08/Yapay_Zeka_2024-2025_Eylem_Planı.pdf
- StartupBlink. (n.d.). *Türkiye startup ecosystem: Rankings, startups, and insights*. Retrieved November 12, 2025, from <https://www.startupblink.com/startup-ecosystem/turkiye?page=1>
- StartupCentrum. (2024, January). *Turkish startup ecosystem: 2023 funding report*. <https://www.turcorn.gov.tr/upload/Node/100285/files/TURKISH-STARTUP-ECOSYSTEM-2023-FUNDING-REPORT.pdf>
- TBV – Türkiye Bilişim Vakfı. (2024). *“Toplum İçin Yapay Zekâ” Yarışması (TBV-AİTR-YZF)*. <https://www.tbv.org.tr/haber/toplum-icin-yapay-zeka%E2%80%9D-yarismasi>
- TBV – Türkiye Bilişim Vakfı. (2025, October 30). *AIWARENESS[at]Google etkinliğinde buluşuyoruz!* <https://tbv.org.tr/haber/aiawareness%40google-etkinliginde-bulusuyoruz>
- TEKNOFEST. (2024). *Eylem Temelli Türkçe Büyük Dil Modeli Yarışması*. <https://www.teknofest.org/tr/yarismalar/eylem-temelli-turkce-buyuk-dil-modeli-yarismasi/>
- TRAI – Turkish Artificial Intelligence Initiative. (2023). *TR AI Summit 2023*. <https://turkiye.ai/en/trai-summits/>
- TRAI – Turkish Artificial Intelligence Initiative. (2025a). *Turkey Artificial Intelligence Summit 2025*. <https://zirve.turkiye.ai/en/home/>
- TRAI – Turkish Artificial Intelligence Initiative. (2025b, July 7). *2025 üniversite tercihleri için yapay zeka bölümleri ve yeni açılan bölümler*. <https://turkiye.ai/2025-universite-tercihleri-icin-yapay-zeka-bolumleri-ve-yeni-acilan-bolumler/>
- TÜBİTAK. (2025). *TÜBİTAK Artificial Intelligence Ecosystem Call*. <https://tubitak.gov.tr/tr/destekler/sanayi/ulusal-destek-programlari/1711-yapay-zeka-ekosistem-cagrisi>

- TÜBİTAK YZE. (2025). *TÜBİTAK Artificial Intelligence Institute (YZE)*.
<https://bilgem.tubitak.gov.tr/en/ye-corporate/>
- Turkish startups attract \$475 million in first nine months of 2025. (2025, October 15). *Hürriyet Daily News*. <https://www.hurriyetdailynews.com/turkish-startups-attract-475-million-in-first-nine-months-of-2025-214732>
- Turkish startups seek larger footprint in US market. (2021, June 17). *Daily Sabah*.
<https://www.dailysabah.com/business/tech/turkish-startups-seek-larger-footprint-in-us-market>
- Türkiye İş Bankası. (2024, December 13). *Yapay Zekâ Fabrikası Ödülleri sahiplerini buldu*.
<https://www.isbank.com.tr/bankamizi-taniyin/yapay-zeka-fabrikasi-odulleri-sahiplerini-buldu>
- Yapay Zekâ Fabrikası. (2024, December 11). *Yapay Zekâ Fabrikası 2024 Ödülleri*.
<https://www.yapayzekafabrikasi.com.tr/kutuphane/yapay-zek%C3%A2-fabri%C3%87kasi-2024-%C3%B6d%C3%BClleri%C3%87>
- Yapay Zekâ Fabrikası. (2025, January 15). *Yapay Zekâ Fabrikası'ndan büyük ekosistem buluşması*. <https://www.isbank.com.tr/bankamizi-taniyin/yapay-zeka-fabrikasindan-buyuk-ekosistem-bulusmasi>

About the Author

Dr. Mehmet HAKLIDIR

TÜBİTAK BİLGEM Artificial Intelligence Institute | [mehmet.haklidir\[at\]tubitak.gov.tr](mailto:mehmet.haklidir[at]tubitak.gov.tr)

ORCID: 0000-0003-4985-1116

Dr. Mehmet HAKLIDIR has been serving as the Director of TÜBİTAK BİLGEM Artificial Intelligence Institute (YZE). He graduated from Istanbul University with a bachelor's degree in Mechanical Engineering and a minor degree in Computer Science. He received his MSc in Mechatronics Engineering from Istanbul Technical University and his PhD in Control and Automation Engineering from the same institution. With more than 20 years of experience, Dr. HAKLIDIR has assumed managerial and technical expertise roles in national and international large-scale projects. He played an important role in the establishment of TÜBİTAK BİLGEM Artificial Intelligence Institute and contributed to the development of Türkiye's National Artificial Intelligence Strategy. Dr. Mehmet HAKLIDIR is a member of the OECD One AI Expert Group, a member of the Global Partnership on AI (GPAI) and a member of the Advisory Board for Artificial Intelligence Technologies of the Science, Technology, and Innovation Policies Council. He also holds the position of Secretary-General at the International Society for Artificial Intelligence in Healthcare. Dr. HAKLIDIR continues his research in the fields of AI, big data and robotics. Throughout his career, he has made presentations at various national and international congresses and scientific conferences and published articles in SCI indexed international scientific journals. He has also received national and international awards from different organizations throughout his career.