Qatar's Artificial Intelligence Sector

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SME Industry Series 2024

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CEO'S MESSAGE

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As part of Qatar's efforts to develop its private sector and bring progress to the country's Entrepreneurship, and Small and Medium-sized Enterprises (SMEs), and Innovation Ecosystems towards the realization of its national vision for 2030, Qatar Development Bank (QDB) continues to advance its role as the Entrepreneur's and SME's growth partner from ideation to fruition.

To support Qatari entrepreneurs and foster a data-driven approach to business ventures, QDB has published a series of reports that explore potential SME opportunities across various sectors within the local market. These reports provide entrepreneurs with valuable insights, including market demand analysis, competitive landscape assessments, and information on existing market players, enabling them to make informed decisions regarding market entry and business development.

This report provides a comprehensive overview of Qatar's thriving Artificial Intelligence (AI) sector. Recognizing the pivotal role of Data and AI in driving nation's digital transformation, it emphasizes the potential of AI driven technologies, particularly for supporting local businesses and SMEs. SMEs can leverage AI to enhance their services, drive innovation, reduce operational costs, and ultimately boost their global competitiveness.

The Gulf Cooperation Council (GCC) region is witnessing a surge in interest in adopting AI technologies across key sectors such as financial services, healthcare, and smart cities, fueled by strong government initiatives. The GCC AI market is poised for significant expansion, with projections indicating growth from QAR 12 billion in 2024 to QAR 56 billion by 2030, representing a robust CAGR of 29%.

This report explores the global AI market, analyzes GCC market trends, and provides a detailed understanding of the Qatari market. Notably, Qatar's AI market is poised for significant growth, with projections indicating an increase from QAR 2 billion in 2024 to QAR 7 billion by 2030, reflecting a CAGR of 29%. While Machine Learning currently dominates the local market, Generative AI is expected to experience substantial growth, accounting for approximately 30% of the market share by 2030.

The local AI ecosystem is supported by investments in technological infrastructure and government initiatives such as Qatar's National AI Strategy and Digital Agenda (DA) 2030, creating a conducive environment for private sector growth and innovation.

I invite you to explore the findings of this report to discover how AI can elevate your business in this rapidly evolving sector and help you stay ahead in the age of intelligent technology.

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List of Abbreviations

AGV	Automated Guided Vehicles
AI	Artificial Intelligence
AMR	Autonomous Mobile Robots
API	Application Programming Interface
AWS	Amazon Web Services
CAGR	Compounded Annual Growth Rate
CPU	Central Processing Units
CRM	Customer Relationship Management
DA	Digital Agenda
ERP	Enterprise Resource Planning
GANs	Design For Manufacturing
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GDRP	General Data Protection Regulation
GenAI	Generative AI
GPT	Generative Pretrained Transformer
GPU	Graphics Processing Unit
HBKU	Hamad Bin Khalifa University
ICT	Information and Communications Technology
IoT	Internet-of-Things
IT	Information Technology
KYC	Know Your Customer
LLM	Large Language Model
MCIT	Ministry of Communications and Information Technology
MENA	Middle East and North Africa
MOCI	Ministry of Commerce and Industry
NDS3	Third National Development Strategy
NLP	Natural Language Processing
QFTH	Qatar FinTech Hub
QFZA	Qatar Free Zones Authority
QBIC	Qatar Business Incubation Center
QCB	Qatar Central Bank
QCRI	Qatar Computing Research Institute
QFC	Qatar Financial Centre
QNV	Qatar National Vision 2030
QRDI	Qatar Research, Development and Innovation
QSTP	Qatar Science and Technology Park
RNN	Recurrent Neural Networks
SDAIA	Saudi Data & AI Authority
SME	Small and Medium Enterprises
SAP	Systems, Applications & Products
TPU	Tensor Processing Units
VAE	Variational Autoencoders

1. Introduction to Artificial Intelligence

1.1 Purpose of the Report

Artificial Intelligence (AI) is a powerful tool that is advancing rapidly. AI is capable of performing tasks that have traditionally required human intelligence, such as decision-making, problem-solving and language comprehension. This report examines AI's global, regional, and local landscape, with a focus on Qatar. It covers key domains, including Computer Vision, Machine Learning, Natural Language Processing (NLP), AI Robotics, Autonomous & Sensor Technology, and Generative AI. These technologies drive innovation, enhance efficiency, and boost productivity across industries, particularly benefiting small and medium enterprises (SMEs) in Qatar.

SMEs play a vital role in Qatar, driving economic diversification, innovation and job creation. AI technologies offer SMEs opportunities to enhance efficiency, reduce costs, and innovate. For example, by leveraging advancements like NLP for customer interactions or Machine Learning for optimized production, SMEs can scale and compete globally. This report covers key technologies, trends, and local market dynamics. Particularly, emphasizing AI's role in helping SMEs adapt to market changes and strengthen their competitive edge in Qatar's evolving economy.

1.2 AI Market Segmentation

The scope of this report is the exploration of how AI-driven solutions can specifically benefit SMEs in Qatar. This report does not cover hardware aspects related to robotics, Enterprise Resource Planning (ERP) software like Systems, Applications & Products in Data Processing (SAP) or web development services for designing websites.

The AI market has been segmented into key technologies, prioritized based on their relevance and potential impact in Qatar:

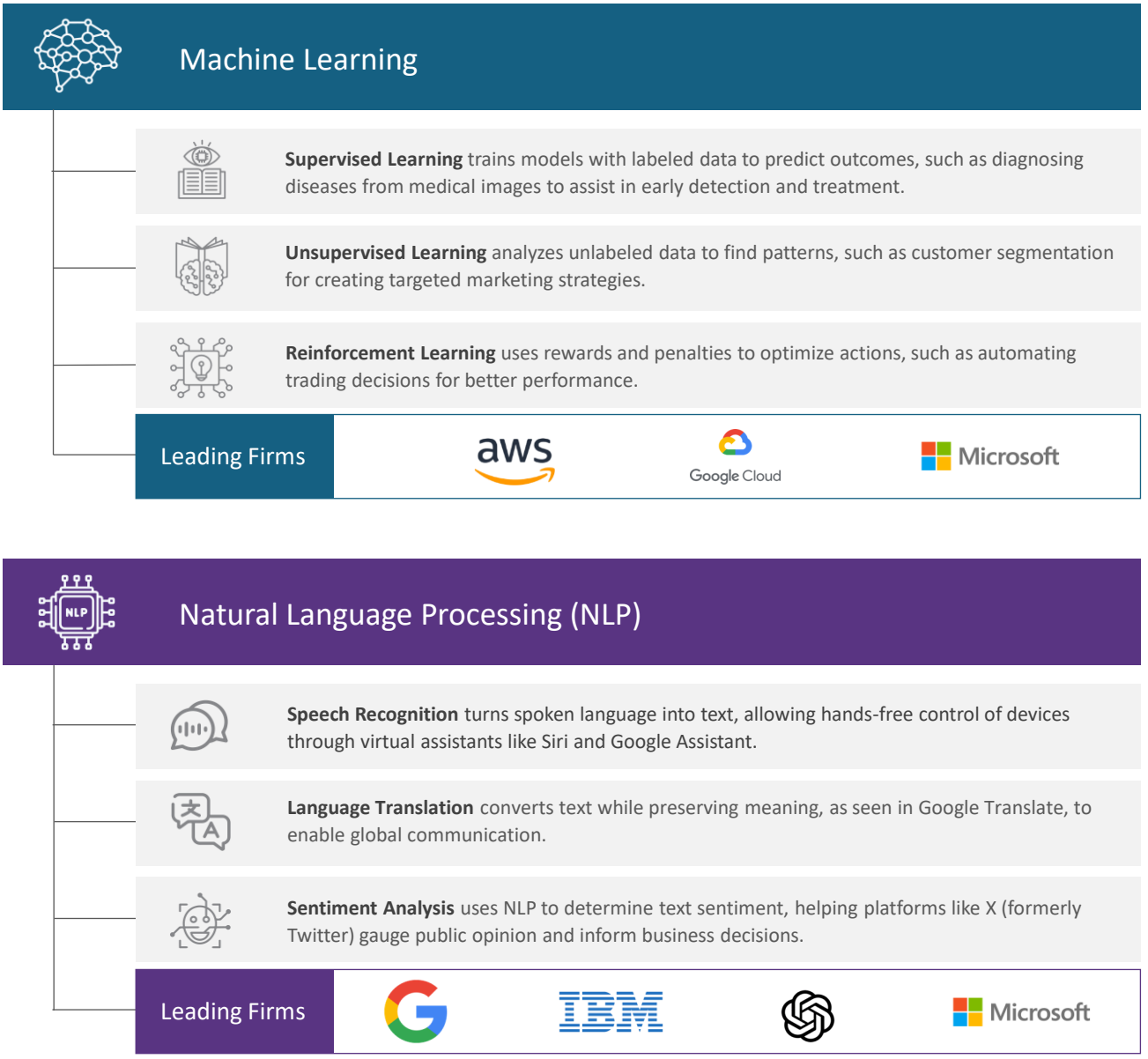


Figure 1: AI Market Technologies

Computer Vision

Image Classification categorizes visual inputs, as seen in Google Photos, which tags and organizes images by objects, people, and scenes for easy searching.

Object Detection identifies specific objects within images or videos, as used by Tesla's self-driving cars to detect vehicles, pedestrians, and obstacles for safe navigation.

Facial Recognition uses algorithms to categorize and label images for automatic sorting, as seen in China's surveillance systems for real-time identification.

Leading Firms: Verkada, VERITONE, Google, Tesla

Robotics & Automation

Autonomous Mobile Robots (AMRs) navigate independently using sensors and cameras for real-time decision-making, such as obstacle avoidance and item selection.

Automated Guided Vehicles (AGVs) follow predefined paths in controlled environments for material handling and transportation.

Articulated Robots (Robotic Arms) mimic human arm functions with multiple joints for precise tasks like welding, material handling, and packaging.

Hybrid Robots combine features of different robot types, such as AMRs with robotic arms, to handle complex tasks in environments like warehouses.

Leading Firms*: Boston Dynamics, VECNA ROBOTICS, FANUC, ABB

**While global leaders are primarily focused on manufacturing and designing AI-powered robots, local SMEs can benefit significantly from using these robots to optimize their existing operations. For instance, Qatar Post successfully employed hybrid robots in its Robotic Sorting Project to enhance efficiency and streamline processes.*

Autonomous & Sensor Technology

Autonomous Vehicles use AI, cameras, LIDAR, and sensors to navigate roads, avoid obstacles, and ensure safety without human input, exemplified by Tesla's self-driving car.

Autonomous Process Systems automate repetitive tasks, improving efficiency and productivity, as exemplified by Amazon's robots in warehouse operations.

Autonomous Health Systems analyze patient data, assist in surgeries, and monitor vital signs, with AI-driven robots performing precise procedures.

Leading Firms: Verkada, Waymo, Velodyne Lidar, Tesla

Generative AI

Transformers generate human-like text by predicting sequences, as demonstrated by OpenAI's Generative Pretrained Transformer 4 (GPT-4) in chatbots, content creation, and translation.

Variational Autoencoders (VAEs) simplify and reconstruct data, with Adobe using them to generate realistic images and enhance photo editing.

Generative Adversarial Networks (GANs) use a generator and discriminator to create realistic data, like NVIDIA's images of non-existent people for enhanced graphics.

Large Language Models (LLMs) like OpenAI's ChatGPT generates text by predicting words based on context, used in customer service, content creation, and virtual assistance.

Recurrent Neural Networks (RNNs) predict the next data point in sequences, powering features like predictive text and voice recognition in Google and Apple applications.

Leading Firms: Microsoft, NVIDIA

Please note the list of entities provided is not exhaustive.

2. Overview of the Global AI Market

2.1 Global Value Chain Analysis

The AI value chain consists of an interconnected ecosystem that enables AI development and deployment, highlighting the roles of each category of providers in delivering AI capabilities to various industries. This ecosystem is depicted in Figure 2 below.

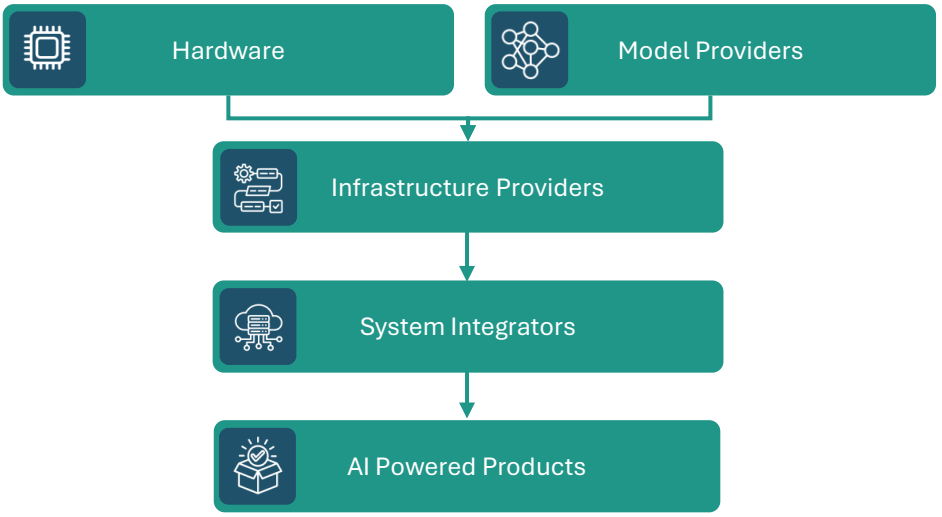


Figure 2: Global Value Chain Analysis[1]

Hardware providers supply the essential processing power through Graphics Processing Units (GPU), Central Processing Units (CPU), Tensor Processing Units (TPU), and neural engines optimized for AI tasks. These components form the backbone of AI ecosystem enhancing processing speed and efficiency

NVIDIA AMD intel

Model Providers rely on hardware for training and optimizing AI models. Companies such as OpenAI, Meta AI, and Anthropic develop advanced algorithms and models, contributing to progress in areas like natural language processing (NLP) and computer vision. These providers play a key role in AI research and innovation, creating models that drive diverse AI applications across industries.

OpenAI Meta ANTHROPIC

Infrastructure Providers are the essential link between hardware and model providers, transforming raw hardware and AI models into accessible, scalable services. They integrate powerful computing resources, deploy sophisticated algorithms, and manage vast datasets, enabling widespread AI adoption through reliable cloud platforms.

Google Cloud aws Azure

[1] Team Analysis

Please note the list of entities provided is not exhaustive.

System Integrators bridge the gap between technology and business by integrating AI solutions into AI models to enhance existing processes, optimizing workflows, and driving innovation. They define use-cases and customize AI applications to meet business needs, helping companies leverage AI technologies.

accenture IBM Deloitte.

AI Powered Products are practical solutions, such as chatbots (e.g., ChatGPT, Claude), image generation tools (e.g., Midjourney), and predictive analytics tools, that translate AI models into accessible applications across diverse industries. This accessibility is accelerated by companies like OpenAI, which, as both model providers and product developers, leverage vertical integration for faster innovation and direct deployment. While System integrators offer a service through integration and customization, AI Powered Products are the end products themselves

*The AI value chain encompasses prominent global players, spanning **hardware and model development** to **AI powered products***

2.2 The Global AI Market Landscape

AI systems generate outputs – recommendations, decisions, or predictions – based on specific objectives. These systems simulate human intelligence and problem-solving capabilities, driven by powerful tools like machine learning and deep learning, which make increasingly accurate predictions from data[2,3].

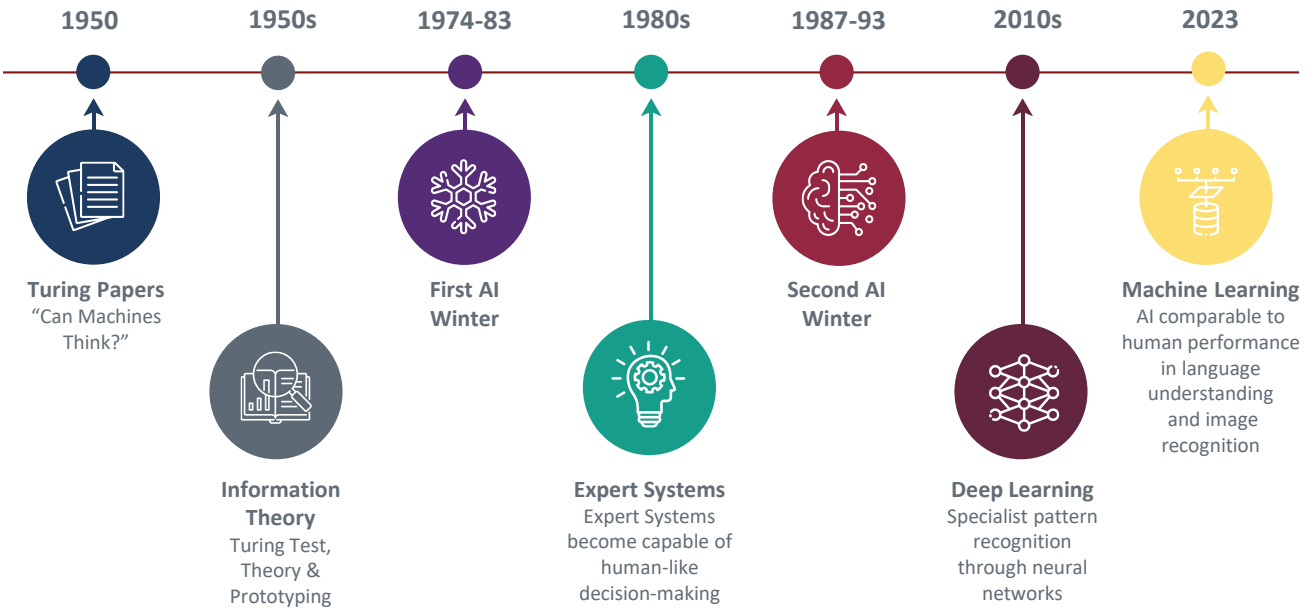


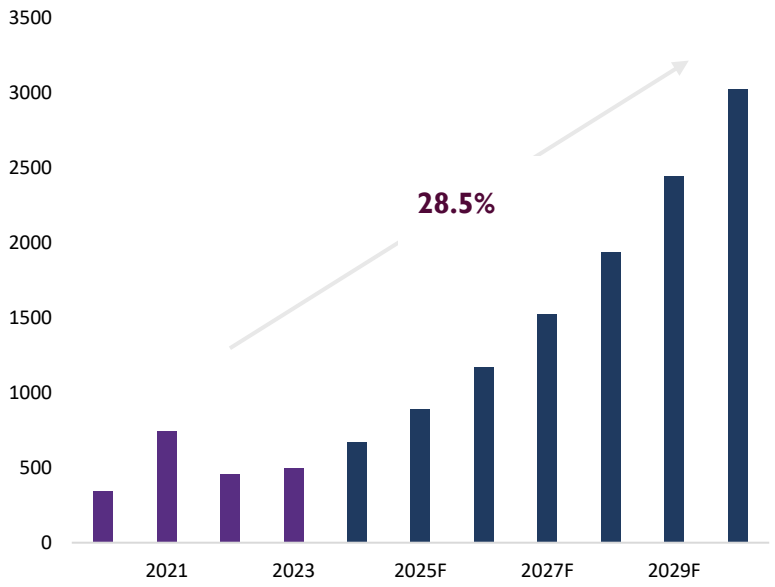
Figure 3: The Evolution of AI[4]

Since the 1950s, AI development has seen cycles of breakthroughs, transformations, disappointments, as well as periods of minimal funding, known as AI winters (Figure 3 above)[5]. Despite its historically fluctuating importance, AI is set to significantly impact the economy through growth, productivity, innovation, and employment, transforming daily life and possibilities with new tools.

A range of industries and firms have already integrated AI systems extensively into their processes. Despite these rapid advancements, AI is at a nascent stage with regards to its development and maturity. From a broader perspective, there is tremendous potential for global economies to further leverage AI solutions.

[2] IBM – Topics – Artificial Intelligence
[3] OECD – AI Principles
[4] Public Sources, Team Analysis
[5] Our World In Data – History of AI

Global AI Market (QAR Bn, 2020-2030F)



Key Insights

The AI market is experiencing exponential growth, driven by factors such as increasing **data volumes**, **advancements in computing power,** and the **rising adoption of AI** across industries.

The AI landscape is dominated by a combination of tech giants such as **Microsoft**, **OpenAI**, and **Google,** alongside a vibrant ecosystem of innovative startups.

The future of the AI market is incredibly promising, as AI technologies mature and become more accessible, allowing their applications to **expand into new domains**

Chart 1: Global AI Market Size (QAR Bn, 2020-2030F)[6]

*The global AI market is projected to reach **QAR 3,026** billion by **2030**, growing faster than Internet-of-Things (IoT) and public cloud sectors.*

The global AI market is projected to reach QAR 673 billion by the end of 2024 and QAR 3,026 billion by 2030, exhibiting a compound annual growth rate (CAGR) of 28.46% (Chart 1). This growth outpaces other technology sectors including, IoT (19%) and public cloud (16%), respectively[7].

Leading this growth is Generative AI (GenAI), projected to reach approximately QAR 132 billion in 2024. In comparison to other AI technologies, it is reshaping global markets, enhancing efficiencies, and creating new opportunities across various sectors, making it a key focus of our analysis.

GenAI's applications span across multiple sectors. In retail and consumer goods, major players like Macy's and Coca-Cola are using GenAI to scale marketing efforts and enhance customer experiences[8]. In the banking and financial services sector, this technology is being leveraged to improve risk management and strengthen fraud prevention mechanisms. GenAI's influence is pervasive, with leaders in healthcare, technology, energy, and other industries developing customized solutions to meet their specific needs.

[6] Statista – Artificial Intelligence - Worldwide, Team Analysis
[7] Statista Artificial Intelligence – Worldwide
[8] Cognizant – GenAI Research Report

Global GenAI Market (QAR Bn, 2020-2030F)

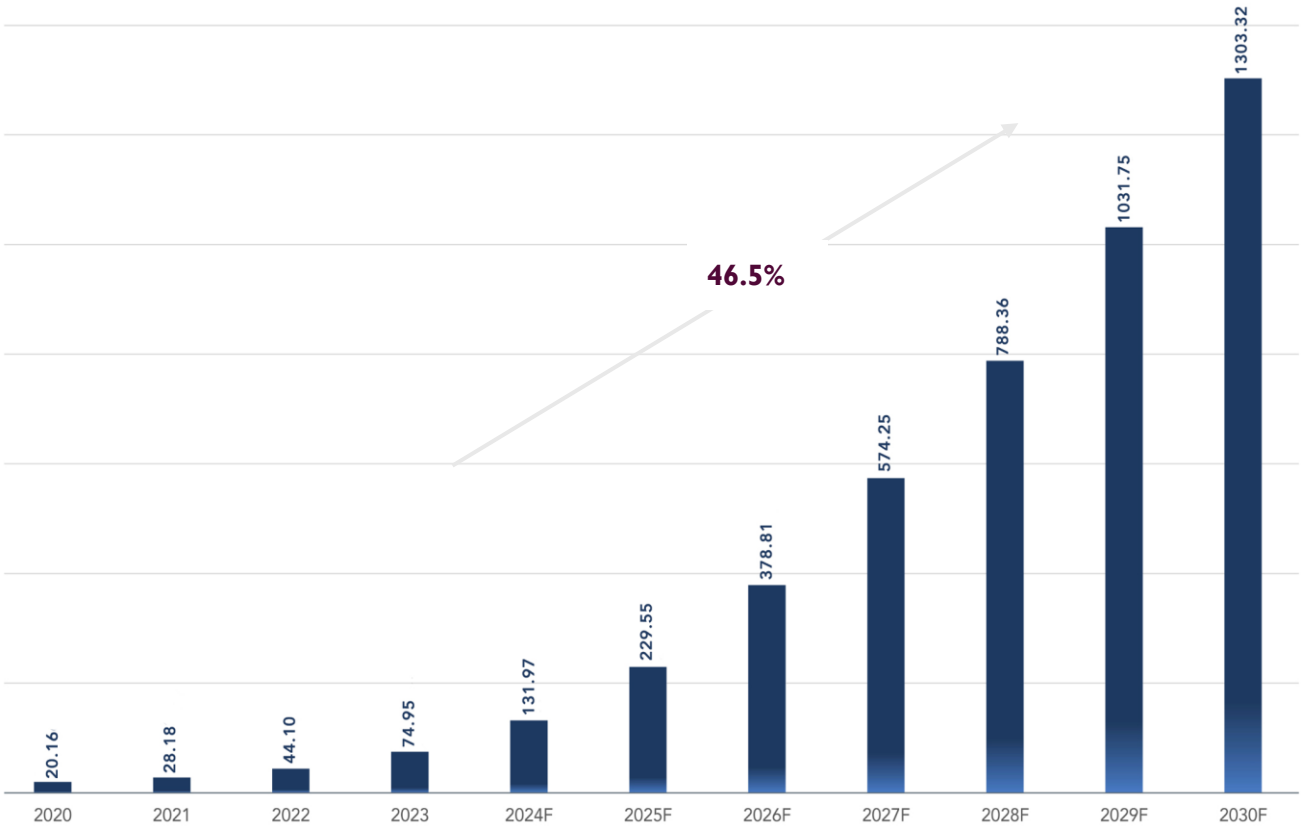


Chart 2: Global GenAI Market (QAR Bn, 2020-2030F)[9]

Given its widespread applications, the sector is projected to grow at a CAGR of 46.5%, potentially reaching around QAR 1,303 billion by 2030 (Chart 2). GenAI is revolutionizing industries by automating tasks, thereby enhancing efficiency and allowing businesses to concentrate on strategic initiatives.

*Generative AI is projected to account for approximately **43%** of the total global AI market by **2030***

[9] Statista – Generative AI - Worldwide, Team Analysis

The following figure illustrates the transformative journey of generative AI:

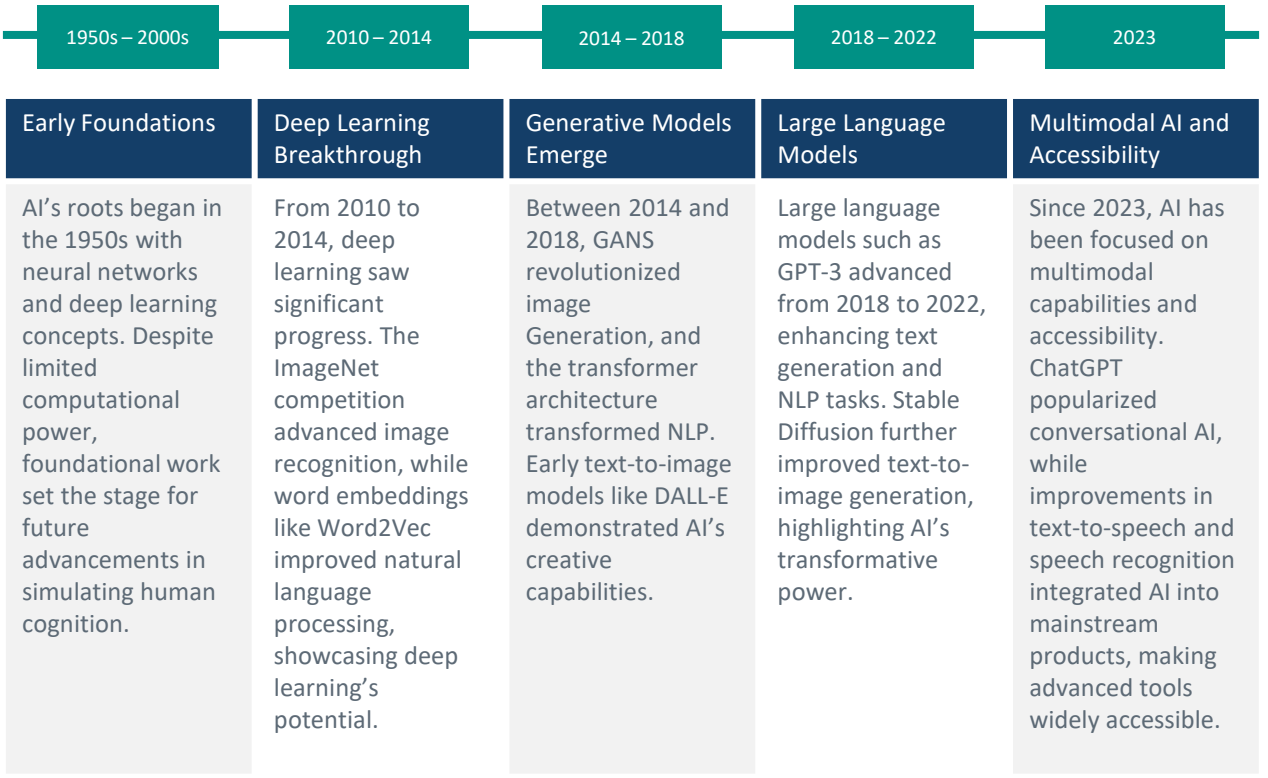


Figure 4: The Evolution of Generative AI[10]

By adopting GenAI, industries not only position themselves at the cutting edge of technological advancement but also contribute to significant economic and societal progress.

This rapid expansion in the GenAI market is driven by increased investments, higher adoption rates, rapid advancements in machine learning, and a rising demand for personalized solutions[11].

[10] Public Sources, Team Analysis
[11] Forbes – AI Statistics

2.3 The Investment Landscape

To fully capitalize on AI's potential, substantial investments in physical, human, and digital capital are essential for enhancing labor productivity and efficiency[12]. Central to this growth is the surge in investment in GenAI tools such as ChatGPT and GitHub Copilot, which showcase the diverse applications and vast economic potential of AI.

In 2022, venture capitalists invested approximately QAR 5.014 billion in GenAI startups across 78 deals, surpassing the total investment of the previous five years combined[13]. This trend is expected to continue, with major players such as Microsoft, Amazon, OpenAI, and Together AI leading innovation and development efforts.

*AI adoption is expected to yield a **7%** increase in benefits over a decade, equating to about **QAR 25.5 trillion** – Goldman Sachs*

Private Investment in AI (QAR Bn, 2023)

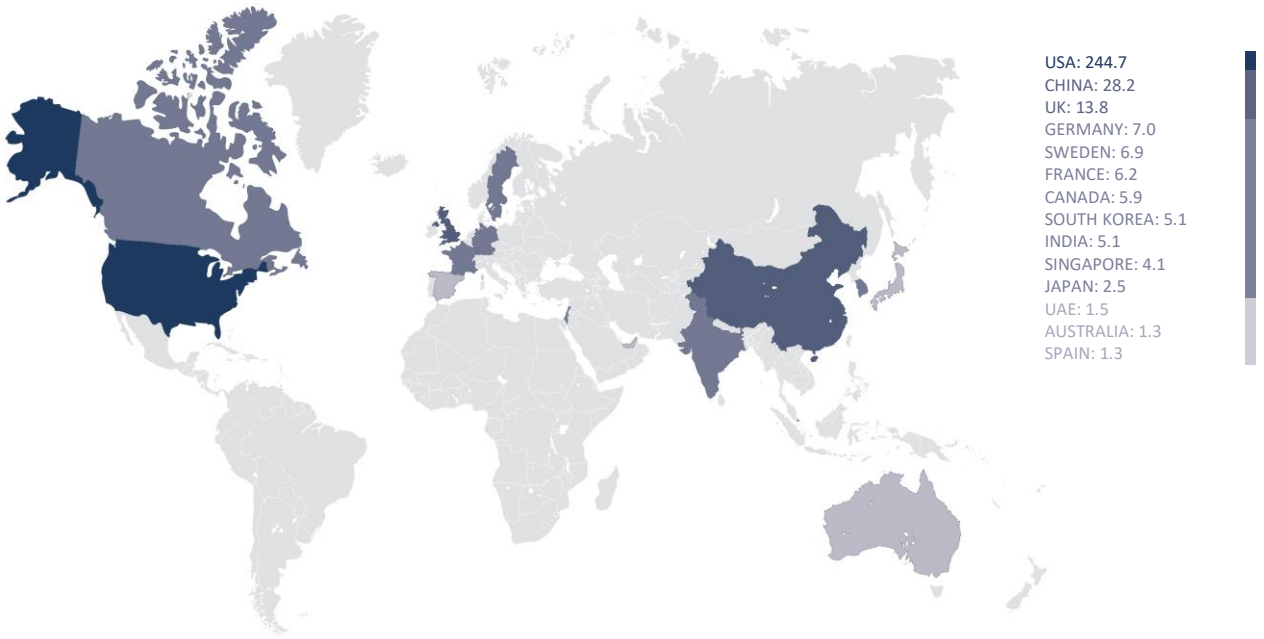


Chart 3: Private Investment in AI (QAR Bn, 2023)[14]

The United States invests the most in AI, with Silicone Valley giants such as, Microsoft, OpenAI, and Nvidia at the forefront. Specifically, increased private investment in AI is also reflected in the surge in private investment in GenAI, which nearly quintupled from 2022, reaching QAR 92.3 billion in 2023. Leading companies such as OpenAI and Anthropic raised significant sums. The United States led with QAR 245 billion, followed by China with QAR 28 billion (Chart 3)[15]. Additionally, the proportion of companies' budgets allocated to AI has risen significantly, with 52% of firms dedicating more than 5% of their digital budgets to AI in 2022, up from 40% in 2018[16].

[12] Goldman Sachs – AI Investment Forecast
[13] Pitchbook – Generative AI Venture Capital Investment
[14] Stanford University – 2023 AI Index Report, Team Analysis
[15] Stanford University – 2023 AI Index Report
[16] McKinsey & Company – 2022 State of AI

2.4 Leading Global Players

Leading companies in the global AI market include Microsoft, Google (Alphabet) and OpenAI, each playing a pivotal role in shaping the industry's landscape.

Google has intensified its AI efforts by launching Gemini, a model utilizing machine learning and natural language processing for text, image and audio generation[17]. Google has also integrated AI across its products and supports developers through the Gemini Application Programming Interface (API) and Vertex AI cloud.

Meta, with the launch of Meta AI, has made significant strides with Llama (Large Language Model Meta AI), a family of open-source models that power various applications in natural language processing[18].

Microsoft has integrated OpenAI's LLMs into its Azure AI platform and enterprise data tools. Azure AI delivers solutions with enhanced data protection and customizable applications[19]. Microsoft is also expanding AI integration across its product suite, including Office 365, and promoting other AI models, such as Llama 2.

Amazon, with Amazon Web Services (AWS), offers a suite of AI tools such as Sage Maker, a platform for building, training, and deploying machine learning models, and Recognition, which provides image and video analysis capabilities[20].

NVIDIA produces GPUs and other hardware that support AI research, development, and deployment. In addition, it offers NVIDIA AI Enterprise, a cloud-native software platform that streamlines and accelerates the creation of GenAI applications, making AI development more accessible and efficient[21].

OpenAI has been a dominant force in the AI market since the release of ChatGPT in November 2022, leading the industry with the largest market share and pioneering AI technology development. The initial success of ChatGPT was quickly followed by enhancements like GPT-3.5 and GPT-4[22].

[17] Google – Gemini Ecosystem
[18] Meta – Llama
[19] IoT Analytics – Leading Generative AI Companies
[20] IoT Analytics – Leading Generative AI Companies
[21] NVIDIA – NVIDIA AI Enterprise
[22] AWS – Sagemaker, AWS – Rekognition

3. Overview of The GCC's AI Market

3.1 The AI Landscape in the GCC

The GCC AI market is set to expand rapidly, with projections showing growth from QAR 12.44 billion in 2024 to QAR 56.36 billion by 2030, representing a robust CAGR of 28.6%[23] (Chart 4). This surge is driven by increasing AI adoption across sectors like financial services, healthcare, and smart cities, fueled by strong government initiatives and a focus on digital transformation. The region is positioning itself as a key hub for AI innovation, with countries like Qatar playing a pivotal role in this development.

Recognizing the transformative potential of AI technologies, most GCC member states have established comprehensive national AI strategies (Figure 5)[24]. Notably, Qatar, Saudi Arabia, and the United Arab Emirates (UAE) launched their strategies before the emergence of the groundbreaking language model ChatGPT. These national strategies outline strategic objectives designed to cultivate robust data ecosystems and foster a thriving AI landscape within each country.

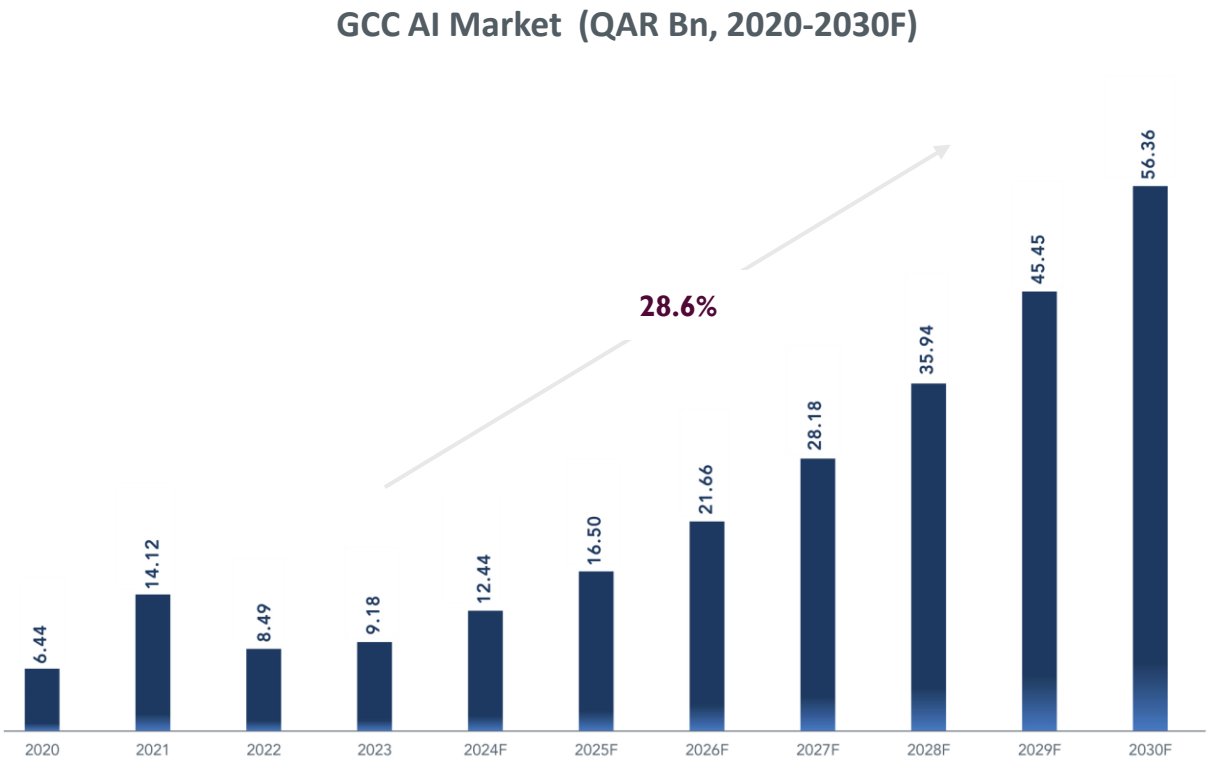


Chart 4: GCC AI Market (QAR Bn, 2020-2030F)

[23] Statista – GCC's AI Market, Team Analysis
[24] McKinsey & Company – State of AI in GCC

GCC State	National AI Strategy	Key Government Body	Notable Education Initiative	Global AI Readiness Index (2023)
UAE	National Strategy for Artificial Intelligence	UAE Artificial Intelligence, Digital Economy and Remote Work Applications Office*	Mohamed bin Zayed University of Artificial Intelligence (MBZUAI)	70.42
KSA	National Strategy for Data & AI (NSDAI)	Saudi Data & AI Authority (SDAIA)*	King Abdulaziz University of Science of Technology (KAUST)	67.04
Qatar	Qatar's National AI Strategy (2019)	Qatar's AI Committee (Led by the Ministry of Communications and Information Technology (MCIT))	Hamad Bin Khalifa University (HBKU)	63.59
Oman	The National Program For AI And Advanced Technologies	Ministry of Transport, Communications and Information Technology	Sultan Qaboos University	58.94
Bahrain	N/A	Information & eGovernment Authority	Nasser Artificial Intelligence Research and Development Centre (NAIRDC)	56.13
Kuwait	Kuwait's National AI Strategy	Central Agency for Information Technology (CAIT)	Kuwait College of Science & Technology (KCST)	49.86

Figure 5: GCC's AI Strategic Direction[25]

The GCC member states are progressing in their AI readiness, as indicated by Oxford Insights 2023 Global AI Readiness Index. The UAE holds the highest score at 70.42, followed by Saudi Arabia at 67.04 and Qatar at 63.59[26]. Qatar's AI strategy centers on six pillars: education, data access, employment, business, research, and ethics. It seeks to develop AI applications and a supportive business environment, while promoting responsible AI use through education, ethical guidelines, and sound laws. As the sector continues to grow, Qatar's AI strategy is anticipated to be updated to address the increasing demand for AI adoption and ensure alignment with emerging trends and needs. Meanwhile, Saudi Arabia aims to create 300 AI-driven startups and attract USD 20 billion in investment by 2030. And, the UAE's comprehensive AI strategy focuses on eight objectives, including deploying AI in priority sectors, fostering talent, advancing research, strengthening governance, and building a robust AI ecosystem[27].

*Government entity dedicated to AI

[25] National Strategy Documents, KSA – National Strategy for Data & AI

[26] Oxford Insights – AI Readiness Index 2023

[27] UAE – National AI Program

*The GCC region stands to gain significant economic value from **AI**, with conservative estimates suggesting it could generate up to **QAR 546 billion**, or approximately **7%** of the region's combined Gross Domestic Product (GDP)*

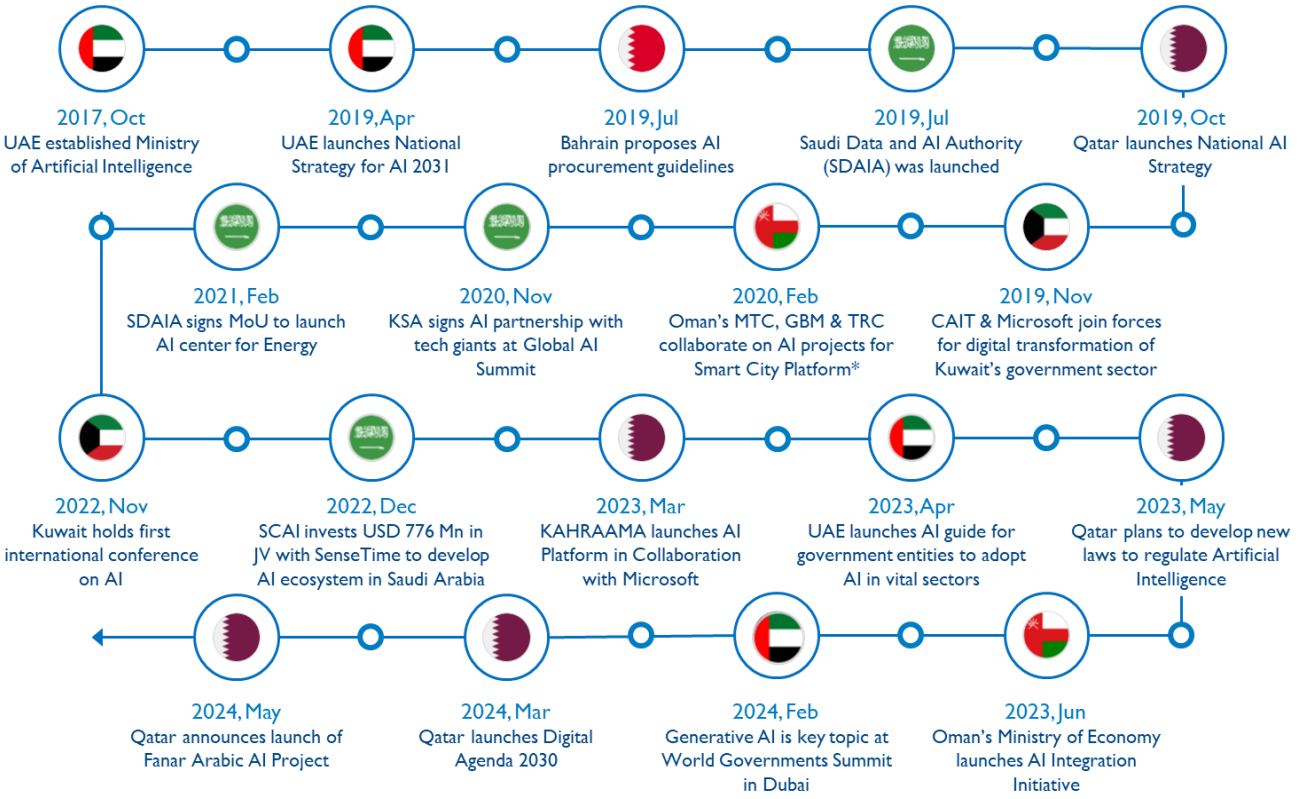


Figure 6: GCC AI Initiatives[28]

The GCC states have made notable progress in advancing their AI capabilities, with each country implementing strategic initiatives to foster innovation and economic diversification. The UAE has established the Ministry of Artificial Intelligence in 2017 and launching the National Strategy for AI 2031. Saudi Arabia has also taken significant steps, including the creation of SDAIA and investments in AI ecosystems. Qatar has focused on integrating AI into its national development plans, exemplified by the launch of its National AI Strategy and the Fanar Arabic AI Project. Bahrain, Kuwait, and Oman are also actively developing their AI frameworks through various projects and collaborations. These efforts collectively underscore the GCC's commitment to leveraging AI for sustainable growth and technological advancement, supported by ongoing investments and international partnerships.

*"Qatar aspires to lead the **Middle East & North Africa (MENA)** region in the Global AI Readiness Index." – Ministry of Communication and Information Technology (MCIT)*

[28] Public Sources, Team Analysis

3.2 AI Adoption & its Impact in the GCC

Globally, the GCC is recognized as a prominent region for AI adoption, with 62% of respondents in a 2023 McKinsey survey indicating the use of AI, surpassing North America's 59%.

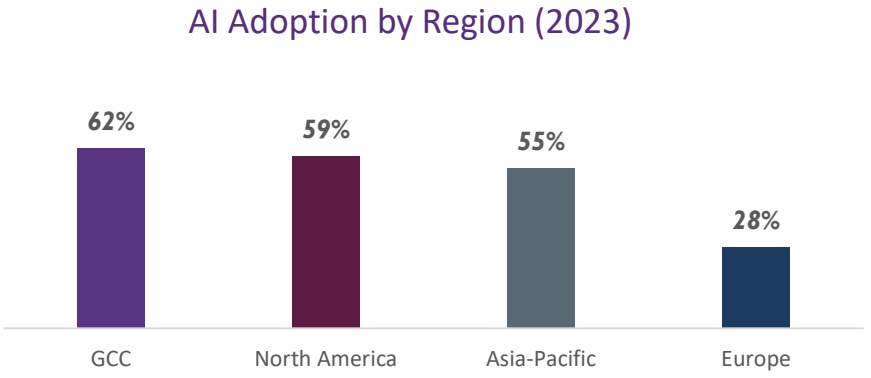
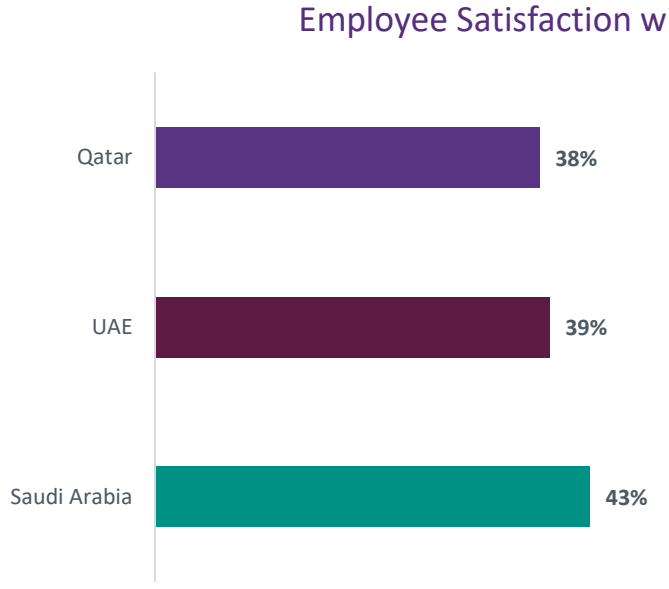


Chart 5: AI Adoption by Region (2023)[29]

Studies have also identified a gap between the strong employer interest in AI-powered solutions and the training provided. Although there is considerable workforce engagement with GenAI tools, the level of support and training offered by employers is reported to be inadequate[30] .



A study by Oliver Wyman indicates an opportunity for growth in the training of GCC-based employees on AI tools, with satisfaction levels at 39% in the UAE and 43% in Saudi Arabia. In Qatar, 38% of workers find their AI training sufficient. This presents a valuable opportunity for companies to enhance their training programs and better equip employees with AI skills across the region.

Chart 6: Employee Satisfaction with AI Training at Workplace (2023) [31]

[29] McKinsey & Company – State of AI in GCC
[30] Oliver Wyman – Global Consumer Sentiment – Generative AI
[31] Oliver Wyman Forum – GCC is a World Leader in AI Usage

The GCC's strong interest in AI adoption is challenged by insufficient training, creating dual issues for businesses. This limits the full potential of AI and raises data security risks, as employees with inadequate training handle sensitive information. Closing these training gaps is crucial for maximizing AI benefits and ensuring robust data protection.

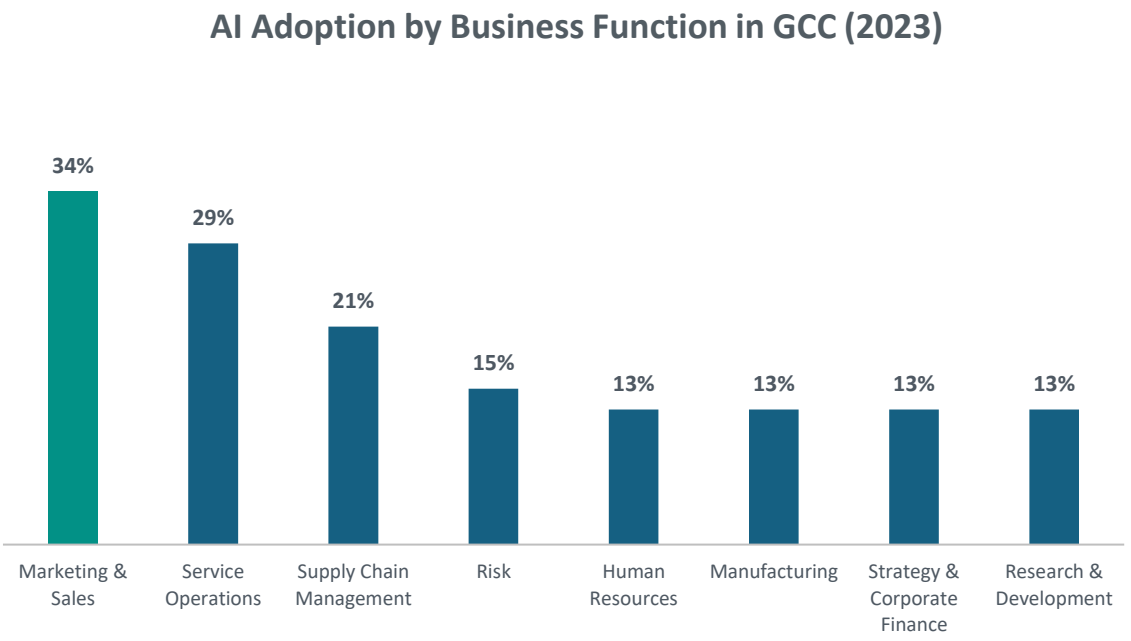
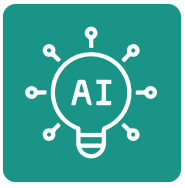


Chart 7: AI Adoption by Business Function in GCC (2023)[32]

AI adoption in the GCC varies across business functions, with Marketing and Sales leading at 34%. This dominance is due to the inherently data-driven nature of marketing, where customer insights are routinely analyzed. Additionally, the applications of AI, particularly GenAI, are more universal and accessible in this area. For example, generating catchy slogans or AI-created images requires minimal investment but offers high impact.

In contrast, other functions like manufacturing face greater financial and technical considerations. Manufacturing requires a robust IoT infrastructure to gather data for AI models. Even with this infrastructure, advanced AI techniques demand specialized talent, adding another layer of complexity.



***62%** of organizations in the GCC use **GenAI** in at least one business function*[33]

[32] McKinsey & Company – State of AI in GCC
[33] McKinsey & Company – State of AI in GCC

While AI adoption is higher in certain areas, the GCC still holds substantial potential for broader AI implementation. This potential is increasingly being realized, with government investments and efforts to attract global AI leaders to the region.

KEY TAKEAWAYS

AI has been adopted across economies within the GCC, yet it grapples with challenges such as insufficient employee training and sector-specific implementation hurdles. Despite these obstacles, the region is advancing through significant government support and initiatives to attract global AI expertise, positioning itself for continued growth and innovation in the AI space.

3.3 GCC Players

Players across the GCC include **G42**, **AIQ**, **Mozn** and **SCAI**. These companies provide AI solutions to the local market.

G42, a technology company in the UAE, focuses on AI and cloud computing, offering solutions across sectors like healthcare, energy, finance, and telecommunications to improve decision-making and operational efficiency. With initiatives in genome sequencing and smart city projects, G42 uses AI to support innovation and societal development, establishing itself as a prominent player in the region's tech industry[34].

AIQ, a UAE-based company specializing in AI solutions for the energy sector, is a joint venture between Abu Dhabi National Oil Company (ADNOC) and G42[35]. AIQ focuses on developing AI technologies to optimize oil and gas operations, enhance predictive maintenance and improve overall efficiency. The company leverages machine learning, data analytics, and AI-driven insights to support decision-making and drive innovation in energy production and management.

Mozn is a KSA-based technology company specializing in AI and machine learning solutions. It is known for its work in developing advanced AI technologies that enhance business operations and decision-making processes[36]. Mozn's expertise spans various applications of AI, including natural language processing, predictive analytics, and automated data insights.

Saudi Company for Artificial Intelligence (SCAI) focuses on delivering cutting-edge AI and machine learning solutions. It is recognized for its expertise in creating sophisticated AI models that drive innovation and efficiency across various sectors. SCAI's work encompasses a range of AI applications, including deep learning, computer vision, and automated decision-making systems[37].

[34,35,36,37] Company Websites

3.4 Microsoft's AI Leadership in the GCC

The most prominent regional player in the GCC, in line with global trends, is **Microsoft,** which has assisted in implementing AI strategies and establishing entities in the field. Figure 7 below outlines some of the key initiatives led by Microsoft in the GCC region:

GCC State	Microsoft's Contributions
	Microsoft plays a crucial role in **Qatar's** AI ecosystem through its collaboration with key government stakeholders, including MCIT and the Qatar Science and Technology Park (QSTP)[38]. This partnership has enabled Microsoft to provide advanced AI models to organizations across Qatar, driving AI adoption in government processes. Additionally, Microsoft supports startups through its Startups program, which invests in AI and tech ventures in Qatar, facilitated by QSTP.
	In **Bahrain**, Microsoft helped launch the Artificial Intelligence Academy at Bahrain Polytechnic[39], a platform aimed at training and qualify students and teachers across Bahrain in AI.
	In **UAE**, Microsoft has partnered with G42, promising an investment of USD 1.5 Mn for a minority stake in G42[40]. The partnership aims to deliver advanced AI solutions with Microsoft Azure, a cloud computing platform, for various industries in the UAE and across the Middle East, Central Asia and Africa.
	Microsoft has partnered with **Kuwait** to accelerate E-services in the country using AI. It is assisting Kuwait's digital transformation toward the Vision 2035 goal of 'New Kuwait', serving as a strategic partner to address crucial areas such as citizen services, workforce empowerment, cybersecurity, and legislation[41].
	In collaboration with PwC, Microsoft has launched an AI Centre of Excellence to nurture and develop next-generation AI talent selected from premium universities in Kingdom[42]. As part of the agreement, Microsoft will provide expertise, training resources and access to cutting-edge AI technology platforms.

Figure 7: Contribution of Microsoft to GCC AI Landscape

[38] Primary Interviews
[39] Microsoft – News
[40] Reuters
[41] Microsoft - News
[42] Microsoft - News

Spotlight – Azure AI

The establishment of Microsoft's presence in the region benefits SMEs in the AI space by improving access to Microsoft's premier AI platform, Azure AI. This suite of cloud-based services offers tools to build, deploy, and manage AI applications, allowing businesses to leverage AI for various needs, from integrating it into existing operations to developing tailored models.

QDB partnered with Microsoft to foster innovation and accelerate the digital transformation of SMEs. This collaboration provides entrepreneurs with a comprehensive suite of products and services, including Azure, empowering them to drive innovation and development. Through this partnership, SMEs can leverage Microsoft's powerful computing capabilities to enhance performance, boost productivity, reduce costs, and develop innovative AI-powered solutions.

Figure 8: Microsoft Azure AI[43]

For SMEs, Azure AI eliminates the need for expensive on-premises infrastructure, reduces development time, and provides access to state-of-the-art AI models, boosting productivity and driving innovation.

[43] Company Website, Team Analysis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4. Overview of Qatar's AI Market

4.1 Qatar's Value Chain Analysis

Qatar's AI sector value chain encompasses a series of interconnected stages, from foundational hardware and infrastructure to product development and integration of AI solutions. Figure 9 below illustrates Qatar's AI value chain analysis, providing a comprehensive breakdown and identifying the varying levels of potential opportunities for SMEs in each segment.

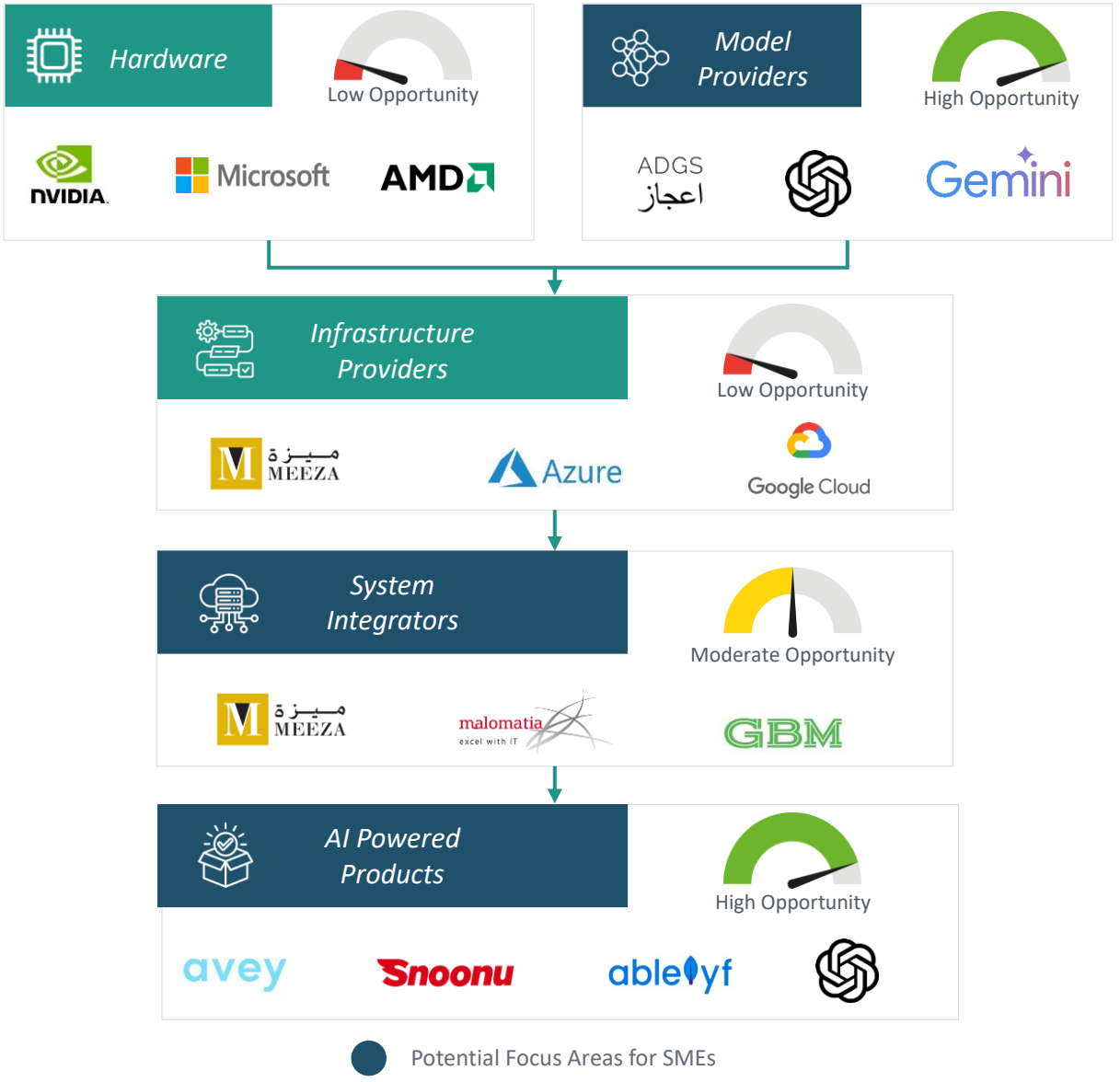


Figure 9: Qatar's AI Value Chain Analysis[44]

[44] Team Analysis, Primary Research

Please note the list of entities provided is not exhaustive.

Hardware

The **Hardware** segment is dominated by tech giants such as NVIDIA, Microsoft, and AMD. These companies provide advanced GPUs, CPUs, and AI accelerators essential for AI processing tasks.

The hardware phase presents limited opportunity for local SMEs due to high capital expenditure, specialized expertise requirements in semiconductors, and globalized economies of scale create significant barriers, resulting in limited scope for local SMEs to thrive in this segment.

Model Providers

Model Providers rely on hardware for training and optimizing AI models. Despite featuring global entities such as OpenAI, local clients demand tailored AI solutions, creating opportunities for specialized providers

SMEs can leverage this high-opportunity phase by developing customized AI models for key sectors. Also supported by Qatar's proactive AI initiatives and the need for data sovereignty, allows SMEs to fill critical gaps that global entities cannot efficiently address. For example, ADGS develops AI models for local clients based on a business-centric approach, such as pandemic simulations for the government

Infrastructure Providers

The **Infrastructure Providers** are the essential link between hardware and model providers, transforming raw hardware and AI models into accessible, scalable services. This segment is also dominated by major cloud players like Microsoft Azure and Google Cloud.

This segment presents limited opportunities for SMEs due to the high capital expenditure required for building and maintaining cloud infrastructure, data centers, and cybersecurity. Furthermore, global cloud providers benefit from significant economies of scale, making it difficult for local SMEs to compete on price or scale, especially given the relatively small local market for cloud infrastructure.

System Integrators

System Integrators connect technology and business by integrating AI for process optimization. There is a growing demand for system Integrators to implement tailored AI solutions. Information and Communications Technology (ICT) entities such as Meeza and Malomatia are actively engaged in digital business transformation within this space.

Despite the presence of established ICT firms, moderate opportunities exist for SMEs to differentiate themselves through specialization in niche industries, leveraging local knowledge, and providing agile, responsive services. The comparatively low entry barriers, in conjunction with Qatar's ongoing digital transformation initiatives, enable SMEs to establish a market presence by defining specific use cases and implementing customized AI solutions.

AI Powered Products

The **AI Powered Products** segment involves developing and deploying products and services that solve real-world problems and offer potential for innovation and growth. Local players such as Avey, Snoonu, and Ablelyf have incorporated AI to enhance their services, highlighting the potential for other SMEs to develop AI-powered products across a range of applications.

This phase offers high opportunity as proven by local, successful SMEs (mentioned above), who have leveraged AI to enhance business operations. The nation's push for a diversified, knowledge-based economy creates fertile ground for AI adoption.

4.2 The Local AI Ecosystem

Qatar's AI ecosystem is evolving, fostering a diverse network of stakeholders. This collaborative effort aims to drive innovation, economic growth, and improved quality of life through the adoption of AI technologies. The ecosystem comprises multiple stakeholders, including government and policymakers, industry and businesses, academic and research institutions, technology providers, investors and funding organizations, and incubation and training institutions. These groups, depicted in Figure 10 below, collaborate to ensure that Qatar remains at the forefront of AI development, innovation and implementation. The ecosystem is structured as follows:

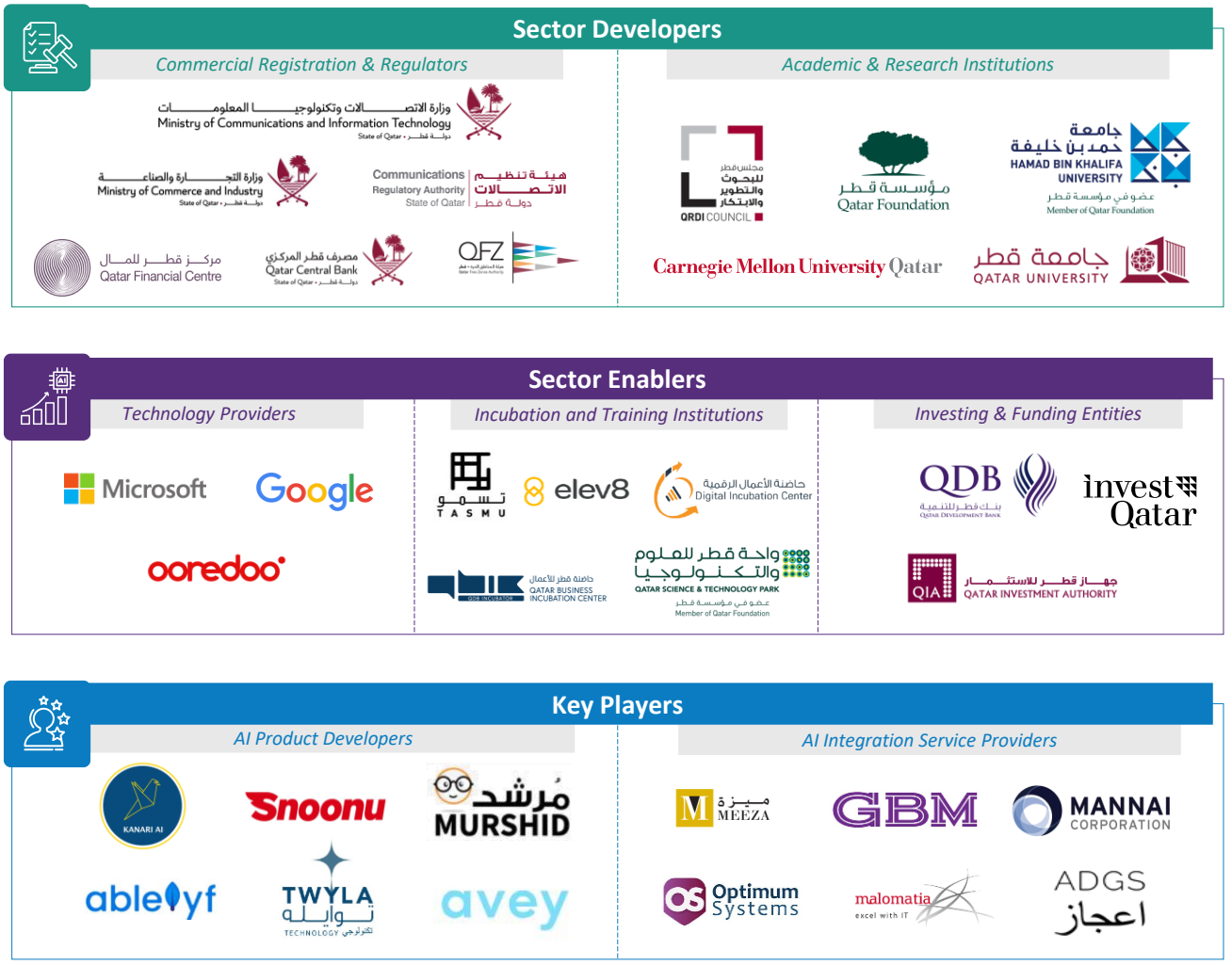


Figure 10: Qatar's AI Ecosystem[45]

[46] Primary Research, Team Analysis

Please note the list of entities provided is not exhaustive.

Sector Developers:

This group formulates policies that establish industry standards, ensure regulatory compliance, and facilitate licensing platforms. Academia drives research and educational programs to nurture talent and develop a skilled workforce. Entities like the Qatar Research Development and Innovation (QRDI) Council and HBKU's Qatar Computing Research Institute (QCRI) contribute to the research, development, and application of AI in Qatar. Universities provide academic programs, and research opportunities in AI, machine learning, and big data analytics.

Sector Enablers:

Sector Enablers provide the infrastructure, talent development and incubation support to foster AI development in the region. Leading technology entities such as Microsoft and Google offer infrastructure and AI technologies across multiple industries. Talent development initiatives, such as those operated by Elev8, focus on equipping the workforce with necessary skills. Entities like the Qatar Business Incubation Centre (QBIC) and TASMU provide incubation services and workshops. Invest Qatar and QDB facilitate access to funding by providing support to startups and SMEs, enabling them to pursue innovative AI ventures.

Key Players:

These entities play a key role in the application and commercialization of AI technologies. They leverage AI in sectors such as healthcare, e-commerce, and Information Technology (IT) services, enhancing operational efficiency, customer experience, and well-being. AI product developers create tailored AI solutions like Murshid and Kanari.ai, monetizing via SaaS or sales, while AI integration providers like Malomatia offer custom AI services for businesses, charging project or consulting fees. Local e-commerce player, Snoonu, has used AI to optimize its logistics system.

Key Strategies

Qatar's National AI Strategy

- Qatar's National AI Strategy aims to make Qatar a global leader in AI through a comprehensive framework with six pillars: education, data access, employment, business, research, and ethics.
- The strategy focuses on developing AI talent, offering financial incentives for AI adoption, and making strategic investments to accelerate integration.
- These initiatives create a promising environment for SMEs to develop and implement AI solutions.

Third National Development Strategy (NDS3)

- Qatar's NDS3 emphasizes the IT and digital services cluster to support startups in adopting AI technologies.
- Initiatives include National Applied Programs for Emerging Technology, the National Data & Analytics Program, and advancing the SMEs & Enterprises Digital Transformation Program.
- Goals include achieving a startup funding-to-GDP ratio of 0.1% by 2030 and a one-day business startup period.

Digital Agenda 2030

- Launched in 2024, Qatar's Digital Agenda 2030 accelerates transformation with a strong focus on AI.
- It targets six strategic areas: Digital Infrastructure, Technologies, Government, Economy, Innovation, and Society.
- This agenda supports Qatar's National AI Strategy, providing a practical roadmap to achieve AI-driven objectives.

Qatar Central Bank (QCB) Guidelines

- QCB introduced comprehensive guidelines and principles to ensure the safe, secure, and efficient use of AI by the entities it regulates.
- Under these regulations, companies using AI must develop a clear strategy aligned with their objectives and risks, establish governance policies, and implement mandatory human oversight to manage and mitigate AI-related risks.

Figure 11: Key Strategies and Regulations[46]

"Qatar aims to position itself as a leader in digital government. A specialized Centre of Excellence for data and emerging technologies, such as AI, will be established" – NDS3

It should be noted that the MCIT is currently exploring the development of an advanced regulatory framework for AI to address the associated ethical and legal challenges effectively[47]. MCIT has, however, developed principles and guidelines for the ethical use of AI in Qatar, which have been detailed in Figure 12.

[46] Qatar Central Bank – Artificial Intelligence Guideline,(2024), MCIT – Digital Agenda 2030 (Released 2024), NPC – NDS3 (2024), MCIT – National AI Strategy (2019)

[47] The Peninsula – MCIT Developing AI Regulatory Framework

MCIT's Principles for the Ethical Use of AI

Principle	Summary of Guidelines
1. Safeguard Personal and Organizational Data	**Privacy is crucial for users of AI systems**, protecting sensitive personal or organizational data from misuse. Key measures to uphold privacy include **sharing minimal personal information necessary for the AI's function** and **preventing information from being traced** back to individuals.
2. Comply with Relevant Laws and Regulations	To ensure compliance with Qatar's regulations, users of AI systems should **adhere to data protection laws**, respect user agreements, and follow intellectual property (IP) regulations. This includes **maintaining data security**, aligning with terms of use, conducting IP checks, providing proper attribution, and **obtaining necessary permissions for AI-generated content**.
3. Ensure the Wellbeing of Individuals and Society	AI systems should be used **ethically** and responsibly, **avoiding harm, rights violations, or misinformation**. Users must consider the impact of their actions, prioritizing safety, well-being, and stakeholder rights. Key measures include **evaluating risks to identify harms** and **prioritizing safety and well-being** in all AI-related decisions.
4. Assume Accountability	**Users must take responsibility** for understanding and overseeing the ethical and **societal implications of the AI systems** they use. This involves **demanding transparency** from providers, **engaging in informed decision-making** regarding the role of AI in outcomes, and **considering ethical implications** to avoid harm or discrimination.
5. Acknowledge AI's Capabilities & Limitations	**Understanding the boundaries and limitations** of AI systems is essential for informed and responsible use. Users should identify the specific capabilities and constraints of AI, acknowledge **algorithmic limitations such as biases and inaccuracies**, and recognize **contextual constraints like data quality and relevance**.
6. Do Not Use AI Systems to Perpetuate Bias	AI systems can **inherit biases from their training data or design**, potentially leading to discrimination or **unfair treatment based on personal characteristics**. To reduce bias, users should research AI tools known for minimizing bias, **test for biases**, seek AI solutions with **explainable decision-making processes**, and evaluate the diversity of the training data used.

Figure 12: MCIT's Principles for the Ethical Use of AI[48]

AI is central to Qatar's long-term goals. The TASMU Smart Qatar Program, launched in 2018, exemplifies this focus by aiming to connect global innovators with local market needs to drive digital transformation. This initiative is supported by the DA 2030 framework, which addresses current and future AI demands across various industries in Qatar.

The Government is developing a comprehensive AI strategy to promote innovation and strengthen Qatar's position in the regional and global AI landscape.

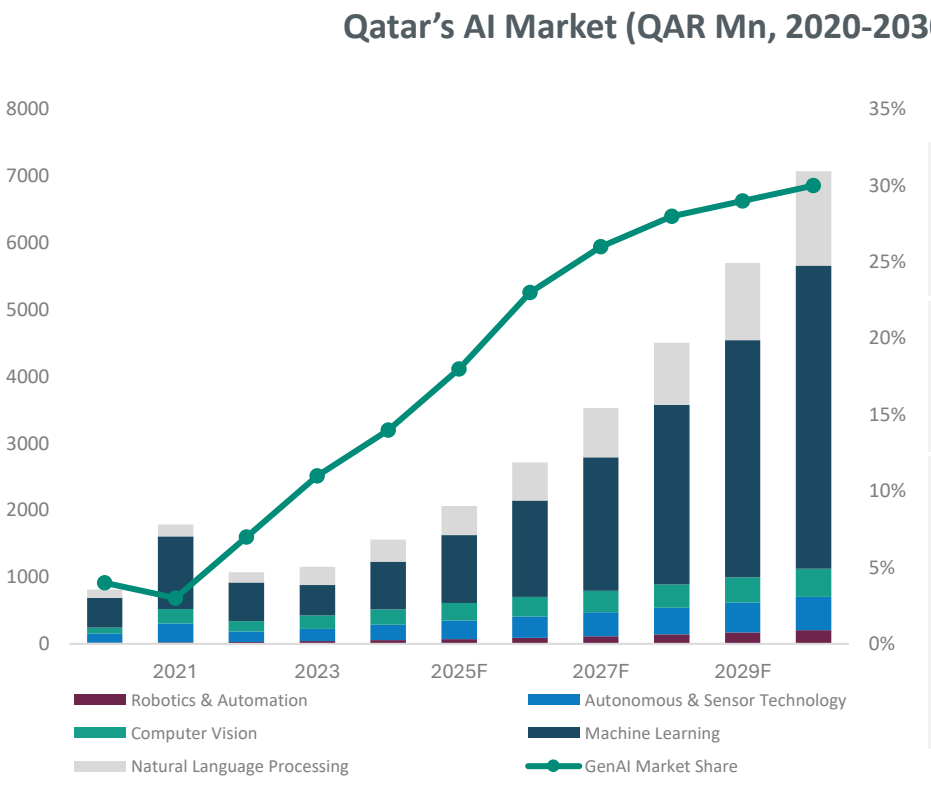
This strategy focuses on building in-house capabilities through training and skill-building initiatives, complemented by bringing in international subject matter experts to accelerate the growth of Qatar's nascent AI sector.

These efforts are expected to foster a robust AI industry capable of offering diverse AI services, including proprietary solutions developed locally. This environment will support startups and SMEs, encouraging them to establish operations in Qatar and contribute to the nation's vision of becoming a key player in the AI space.

[48] MCIT - Artificial Intelligence in Qatar—Principles and Guidelines for Ethical Use

4.3 The Local AI Market Landscape

This section presents the growth trajectory of Qatar's AI market. The chart below illustrates the projected market size from 2020 to 2030, highlighting the significant potential for growth and investment in various AI segments.



Key Insights

Qatar's AI market is projected to grow at a CAGR of **28.66%** from 2024 to 2030, highlighting potential investment opportunities

Machine Learning dominates Qatar's AI market, offering SMEs tools for analytics, insights, and optimization.

GenAI is rapidly growing and is expected to become prominent after 2026, with major potential in content creation and personalized marketing. It impacts all AI verticals by enhancing machine learning, NLP, and automation, driving innovation across industries.

Chart 8: Qatar's AI Market (QAR Mn, 2020-2030F)[49]

MCIT has created a supportive environment for AI innovation, contributing to an estimated market size of QAR 1,559 million by 2024. This market is projected to expand to QAR 7,072 million by 2030, with a CAGR of 28.66% while the share QAR 1,559 million by 2024 of which GenAI will grow to 30% (Chart 8)[50]. Key market indicators used to analyze and forecast the size of the AI market include GDP, telecommunications, exchange rates, and macroeconomic forecasts aligned to Qatar's business cycle.

[49] Statista – Qatar's AI Market
[50] Statista – Qatar's AI Market

4.4 Local Players

Local players in the AI space can be broadly divided into two key areas: AI Powered Products Developers and System Integrators.

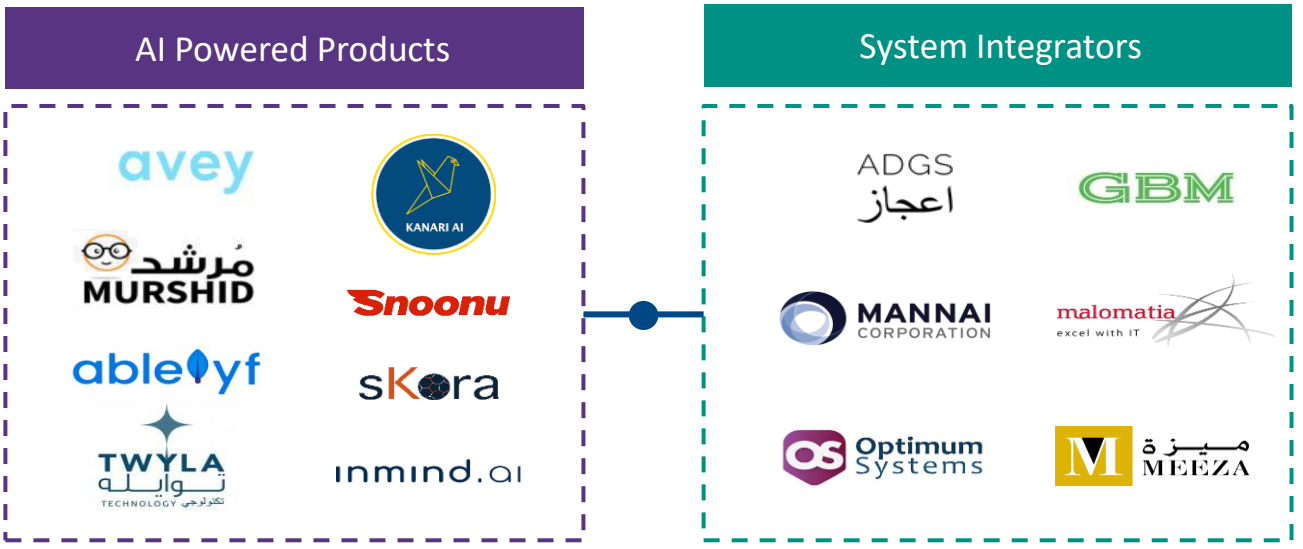


Figure 13: Types of Qatar AI Companies

AI Powered Products

This segment focusses on creating AI-powered products tailored to solve specific business problems or enhance processes. Examples include Murshid, a student career guidance app; sKora, an AI sports agent; and Kanari.ai, a multilingual speech technology that converts speech to text and vice versa. These companies typically monetize through SaaS subscriptions or direct sales. Businesses like Snoonu integrate AI to optimize logistics and delivery operations, improving efficiency.

System Integrators

This segment leverage their AI expertise to develop customized solutions for businesses seeking to enhance their internal AI capabilities. Examples include Malomatia and Mannai ICT, which offer strategic advice, custom AI development, and integration services. These firms monetize through project fees, retainers, and consulting fees.

Please note the list of entities provided is not exhaustive.

4.5 Licensing and Registration

When setting up an AI SME in Qatar, businesses have three main registration and licensing options through Qatar Financial Centre (QFC), QSTP, and the Ministry of Commerce and Industry (MOCI):

MOCI provides a standard business registration option. AI-related businesses are often classified under "software designing and programming" (code 6201020) under IT services.

QFC offers a registration process that does not require prior local partnerships with a timeline of one week.

QSTP's registration process involves documentation on research and development activities, staffing, and funding plans. This process is typically intended for entities focused on research and innovation.

Figure 14: Registration and Licensing Paths in Qatar[51]

Note - This section provides a general overview of licensing and registration options in Qatar. It is not intended as legal or professional advice. Specific requirements and procedures may vary depending on the nature of the AI business.

[51] Entity Websites, Primary Interviews

4.6 Support for SMEs in Qatar

Qatar offers a multifaceted support system for AI SMEs, providing essential resources for their success. SMEs benefit from this comprehensive support in the following ways:

Financial Support

In addition to retail banking institutions, QDB offers support through technology financing, including "Minha for Digital Transformation" for emerging firms and "Technology and Digitalization Solution Financing" for mature set ups. Furthermore, QSTP provides funding for innovative digital projects, depending on their specific nature and development stage.

Advisory & Mentorship Services

The entities listed under sector enablers in Qatar's Local AI Ecosystem (Figure 10) provide support to SMEs. Additionally, QDB and its subsidiaries, such as QBIC, offer comprehensive assistance to SMEs throughout their development journey in enabling sectors. QSTP and MCIT also support SMEs in the AI space, including prototype development and mentorship through QSTP's XLR8 program, as well as incubation via MCIT's Digital Incubation Center.

Infrastructure & Technological Resources

The entities listed under Technology Providers in Qatar's Local AI Ecosystem (Figure 10) highlight key contributors to local infrastructure and resources. Additionally, Qatar supports AI through initiatives such as the Ooredoo-NVIDIA AI collaboration, QSTP's advanced labs for AI development, Microsoft's data center region, and Google's cloud region, in partnership with MCIT and the Qatar Free Zones Authority (QFZA).

Education, Training & Networking

Local institutions play a key role in AI training and research, with QCRI at HBKU and Qatar University leading initiatives in AI research. The Ministry of Education plans to integrate AI into the national education system, while the HBKU-Huawei AI ICT Hub supports growth and innovation among SMEs. Networking opportunities in the market are facilitated by events such as the Qatar Web Summit, and the MCIT National Skilling Program focuses on advancing digital upskilling initiatives.

Figure 15: Support for SMEs in Qatar[52]

[52] QSTP – Startups Funded Using Digital Solutions

4.7 AI Disruption and SME Opportunity Identification

AI has been a powerful tool behind transformational changes both regionally and globally, disrupting industries in today's rapidly evolving economies. This trend is also evident in Qatar, which continues to lead the way in its AI journey, ranking 4th in the MENA region according to the Government AI Readiness Index 2023[53]. MCIT has spearheaded the development of the AI sector, promoting governmental support for both existing SMEs to enhance their capabilities and for new SMEs looking to establish themselves in the country.

To conduct a thorough analysis on the disruption potential of AI across sectors in Qatar, several key factors were considered: AI strategic relevance, innovation adoption readiness, regulatory compliance and guidelines, automation impact on workforce, sectoral efficiency enhancement, and AI investment allocation. Findings indicated that Healthcare and Financial Services in Qatar have transformative potential for disruption by AI[54].

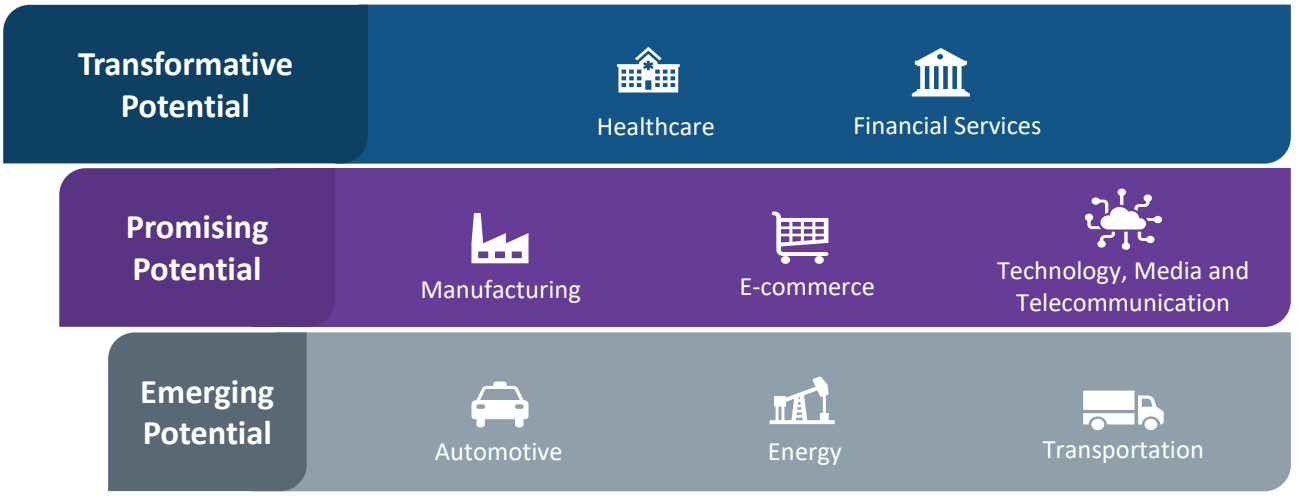


Figure 16: AI Disruption Potential for SMEs[55]

[53] Oxford Insights – AI Readiness Index
[54] Team Analysis
[55] Team Analysis

Transformative Potential for Disruption

A) Healthcare

Qatar's healthcare sector has seen investments from both government and private sectors. This focus on enhancing healthcare facilities and integrating cutting-edge AI technology aligns with the broader goal of economic diversification. In line with Qatar National Vision 2030 (QNV), the government and private sector have made investments in enhancing healthcare and integrating AI technology. This move highlights Qatar's leadership in healthcare and commitment to innovation.

Disease Diagnosis & Treatment

- AI-powered systems demonstrate superior accuracy compared to humans in tasks such as radiology interpretation.
- AI has accelerated biomedical research and drug development for chronic diseases.
- GenAI is transforming healthcare with advancements in computational power, especially in precision medicine.

Clinical Workflows & Patient Care

- AI integration reduces time spent on documenting patient visits and managing reimbursement-related communications.
- AI alleviates administrative burdens on clinicians, allowing them to focus more on patient care.
- Incorporation of AI in health analytics improves patient care quality and risk handling.

Figure 17: AI Adoption Benefits – Healthcare[56]

[56] Team Analysis

SME Innovations in Healthcare AI

SMEs are investing in AI capabilities to develop new solutions and achieve operational gains in innovative medical services. These gains include improved clinician and patient engagement, as well as lower overall costs[56].

ablelyf	**Ablelyf –** Ablelyf leverages AI-driven solutions to support individuals with special needs. Utilizing advanced technologies like computer vision, IRIS and LIDAR, Ablelyf assists those with autism through personalized therapy plans, real-time progress monitoring, and interactive learning activities, ensuring tailored interventions for each user.
avey Empowering health	**Avey –** Avey is a HealthTech SME recognized for its 92% accurate AI Medical Diagnostic model, tackling doctor shortages and healthcare access with its advanced enterprise AI solutions.
MedivAI	**MedivAI –** MedivAI utilizies AI to innovate patient monitoring and care with 24/7 wearable technology. It offers precise, continuous tracking of blood pressure and pulse.
eyeTech	**eyeTech –** eyeTech empowers users to enhance their diagnostic skills with AI-powered eye-tracking technology for electrocardiogram (ECG) analysis, setting them apart in the healthcare practice.

Figure 18: Qatar AI SMEs – Healthcare[58]

Potential for Qatar

The integration of AI into Qatar's healthcare sector is set to bring about improvements in quality of life for Qatar's citizens. In patient care, AI's ability to process and analyze vast amounts of data quickly and accurately can lead to earlier and more accurate diagnoses, personalized treatment plans, and continuous health monitoring. These advancements result in better patient outcomes and higher satisfaction levels.

AI technology can also streamline various administrative and operational processes within healthcare facilities.

Automation of routine tasks such as documentation, claims management, and scheduling can reduce the workload on healthcare professionals, allowing them to focus more on patient care. Additionally, the efficiency gained from AI integration can lead to substantial cost savings, making healthcare services more affordable and accessible. This focus on healthcare excellence supports the QNV 2030, which aims to create a healthy, educated, and prosperous society.

[57] Bain & Company – Generative AI Global Healthcare Private Equity Report 2024
[58] Company Websites, Primary Research

B) Financial Services

Qatar's financial services sector is a key contributor to the country's GDP, ranking second after the oil and gas sector. The country's positive economic growth has spurred an increased demand for financial services, reinforcing its status as a financial hub in the GCC region. Efforts to further develop this sector, led by key entities like the QFC and Qatar FinTech Hub (QFTH), align with Qatar's goal of creating a robust and competitive ecosystem.

Customer Service Improvements

- AI-based solutions improve efficiency through process automation, robust risk management, fraud identification, and enhanced customer service.
- AI enables banks, insurance companies, and Asset Management Companies (AMCs) to effectively use data for improved product offerings, which are essential for regional and global competition.
- Banks like Qatar Islamic Bank and Dukhan Bank use GenAI to meet evolving customer needs and face competition.

Data Analytics & Decision Making

- AI-powered solutions enhance data analysis, supporting better decision-making in credit, cybersecurity, and compliance, thereby building customer trust.
- Advancements in AI facilitate more accurate financial forecasting and better risk management.
- Improved compliance with regulatory requirements is achieved through AI-driven decision-making.

Figure 19: AI Adoption Benefits - Financial Services[59]

[59] Company Websites, Primary Research

SME Innovations in Financial AI

The transformative disruption potential of AI technology in the financial services sector is evident, particularly in the development of AI capabilities for SMEs, enabling businesses to enhance customer-facing chatbots, prevent fraud, and streamline time-consuming tasks like developing code and summarizing regulatory reports.

By adopting AI, Qatar's financial institutions are positioning themselves at the forefront of digital innovation, aligning with the nation's broader goals of technological advancement and economic diversification. Successful AI adoption has provided competitive advantages, including increased revenue, reduced costs, and substantial innovation.

The examples in Figure 20 below illustrate the impact of AI-driven disruption in the financial services sector:

	Peqal, offers AI-powered models that conduct extensive risk assessments, matching borrowers with lenders to foster growth and innovation. Peqal's approach leverages AI to deeply evaluate and consider the prevailing economic and financial conditions, enhancing the crowdsourcing experience.
	FinanceGPT Labs, formerly IPOXCap AI, uses quantitative GenAI and machine learning to enhance financial forecasting and stock price predictions, offering a range of solutions designed for the finance and investment industries in frontier markets.

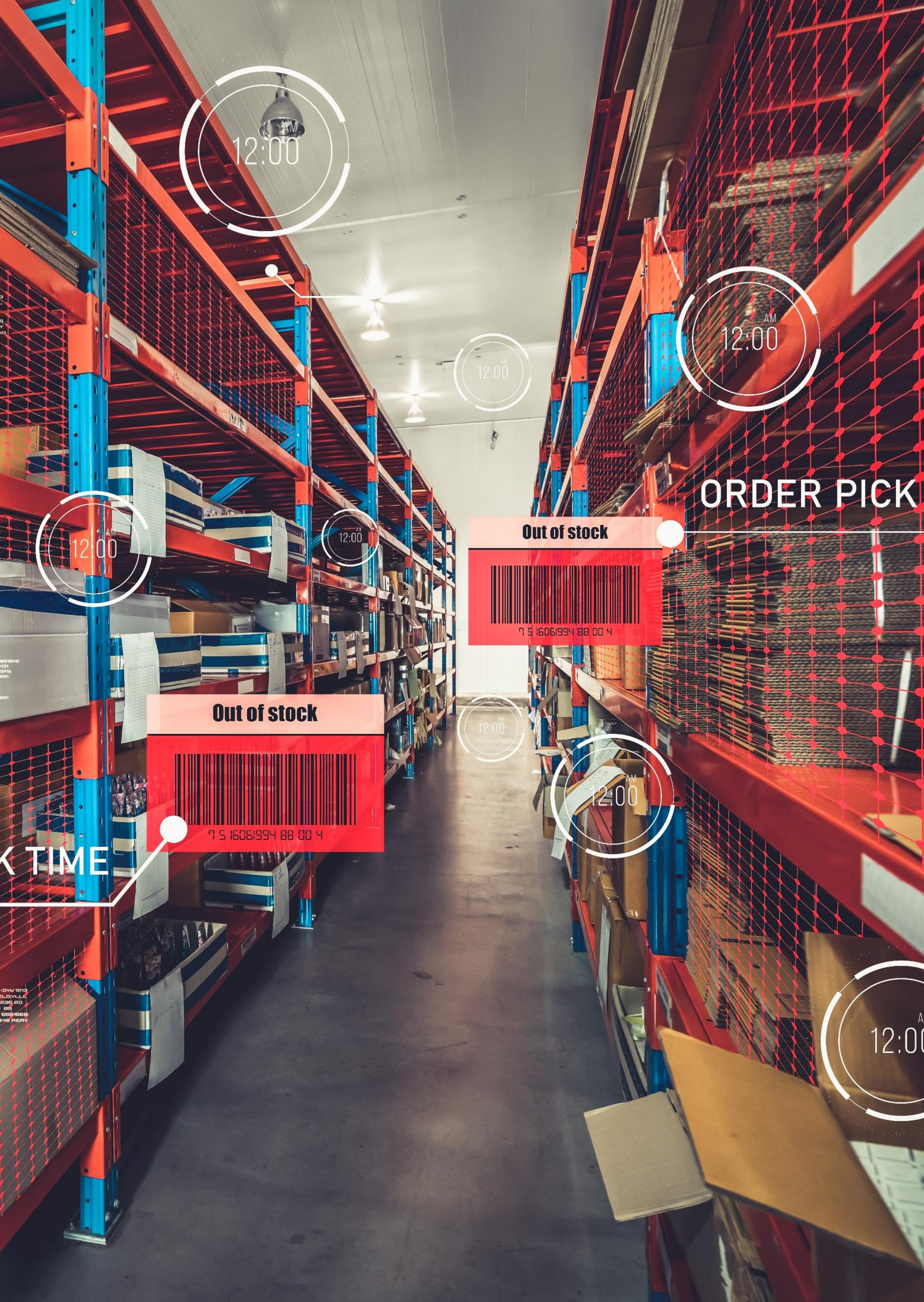
Figure 20: Qatar AI SMEs -- Financial Services[60]

Potential for Qatar

The QCB's Third Financial Sector Strategic Plan highlights AI as an advanced digital solution with the potential to drive growth in the digital finance ecosystem. Qatar can incorporate advanced chatbots like QDB's Sanad to enhance customer satisfaction and operational efficiency in contact centers. AI can also streamline Know Your Customer (KYC) processes by automating reviews and generating insights.

Machine learning holds the potential to boost worker productivity, tailor content and offerings to customer needs, and enhance service levels. Both public and private stakeholders in Qatar are actively aligning risk and regulatory frameworks to transform their operations. While traditional AI solutions have been used in the financial services sector for over 40 years, GenAI introduces new capabilities that drive efficiency and innovation, representing a platform shift and enabling a fundamentally new way of interacting with technology[61].

[60] Qatar Financial Centre Regulatory Authority – Third Financial Sector Strategic Plan
[61] Bain Capital Ventures – State of Generative AI in Financial Services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Promising Potential for Disruption

A) Manufacturing

The manufacturing sector presents promising opportunities for progress through the adoption of AI, especially with the rise of smart manufacturing enabled by Industry 4.0. AI can enhance efficiency, stabilize supply chains, forecast demand, reduce operational costs, and minimize waste via predictive maintenance.

Supply Chain Stability

- AI enhances supply chain stability with real-time insights, allowing manufacturers to predict and respond to disruptions.
- AI-driven analytics optimize inventory management, accurately forecast demand, and streamline logistics.
- This predictive capability mitigates risks, reduces downtime, and ensures consistent production levels for a more resilient supply chain.

Predictive Maintenance

- AI-powered predictive maintenance uses machine learning to analyze data from equipment sensors, identifying potential failures before they occur.
- This proactive approach optimizes maintenance scheduling, reducing unplanned stoppages and repair costs while extending equipment lifespan.
- Predictive maintenance enhances operational efficiency and ensures smooth production line operations.

Figure 21: AI Adoption Benefits – Manufacturing[62]

Potential for Qatar

The global AI in manufacturing market was valued at USD 3.2 Bn in 2023 and is projected to grow to USD 20.8 Bn by 2028[63]. However, high integration costs, including investments in specialized software and compatible hardware, present challenges to AI adoption in the industry. Legacy systems and the diverse range of machines using different software complicate seamless AI integration. Additionally, AI's effectiveness relies on high-quality data, which may require manufacturers to modify their IoT systems. The evolving regulatory landscape also necessitates policies to ensure responsible AI deployment and address potential biases.

Qatar has launched the Smart Manufacturing Exhibition to accelerate the conversation regarding AI in manufacturing, which aims to bring together industry leaders to catalyze digitization efforts[64]. Additionally, in 2024, Qatar signed a collaboration agreement with the World Economic Forum (WEF) to establish a Centre for the Fourth Industrial Revolution (C4IR). This autonomous non-profit organization focuses on policy and governance for emerging technologies, emphasizing sustainable development and economic competitiveness.

[62] Company Websites, Primary Research
[63] World Economic Forum – AI in Manufacturing
[64] Qatar Smart Manufacturing – Exhibition 2024

B) E-commerce

Qatar's consumer habits are shifting due to the growing trend of digitalization, compelling traditional businesses to transition online to stay relevant and competitive in the evolving market. AI holds a promising potential to transform Qatar's E-commerce sector. Use cases are outlined in Figure 22 below.

Personalized Experiences

- Retailers can adopt an omnichannel strategy to enhance customer engagement.
- Leveraging data analytics enables personalized experiences and product recommendations.
- Targeting consumers with tailored content drives sales and improves customer satisfaction

Inventory Management

- AI transforms inventory management by predicting demand patterns, helping retailers avoid overstocking or understocking.
- This predictive capability enhances operational efficiency and reduces costs.
- Improved inventory management leads to better performance beyond the topline in retail.

Customer Service

- AI-powered chatbots and virtual assistants resolve customer disputes and answer frequent queries quickly.
- This technology frees human agents to handle complex issues, ensuring more personalized service.
- AI also streamlines the checkout process, the preferred checkout system for many customers.

Figure 22: AI Adoption Benefits – E-Commerce[65]

Potential for Qatar

E-commerce companies utilizing AI experienced significant growth in 2023, with sales increasing by 14.2% and profits by 8.1%. This outpaced companies not using AI, which saw sales and profit growth of 6.9% and 3.1%, respectively[66]. SMEs can leverage AI in various ways to enhance their operations. These include personalized marketing through customer segmentation and targeted campaigns, improved customer service through chatbots and virtual assistants, and optimized inventory management through demand forecasting and automated replenishment. In Qatar, Snoonu, a Qatari delivery and e-commerce platform, utilizes an AI-powered logistics system. This system optimizes delivery operations by automating tasks such as driver tracking and order allocation, contributing to efficient and timely deliveries.

[65] Company Websites, Primary Research
[66] Statista – AI & ML Impact on Retail Performance

C) Technology, Media and Telecommunication

Technology, media and telecommunication is one of the most active sectors in terms of AI-related activity. The influence of AI in this sector goes beyond mere automation. Use cases are outlined in Figure 23 below.

AI Chatbots & Virtual Assistance

- AI-powered chatbots and smart assistants transform customer service by swiftly handling routine queries, cutting response times, and allowing human agents to focus on complex issues.
- These AI systems learn from interactions, delivering personalized user experiences that enhance customer satisfaction.
- They play a pivotal role in generating advertising revenue for tech companies by targeting users with tailored content based on their preferences.

Personalized Recommendations

- AI analyzes user data, such as browsing habits, to offer personalized content and targeted advertising, enhancing user engagement.
- AI-powered advertising, exemplified by Meta's Advantage+, boosted revenue for the parent company by 27% year-over-year in Q1 2024, showcasing significant financial benefits.
- This technology demonstrates potent monetization potential by optimizing ad delivery based on detailed user insights gathered through AI analysis.

Creative Assistance

- AI aids in scriptwriting and storytelling by analyzing scripts to provide insights on plot points, character development, and scene settings.
- This assistance enables screenwriters and directors to explore diverse creative possibilities and refine their narratives.
- While AI enhances the creative process, it complements rather than replaces human artistic expression in scriptwriting and storytelling.

Voiceovers & Animation

- AI generates realistic voices for characters in animation, videos and audiobooks, useful for multilingual translations and emotive variations.
- It analyzes video data to create special effects and animations based on prompts, cutting production times and costs for films.
- AI's capabilities in voice generation and animation streamline production processes while enhancing creative flexibility in multimedia content creation.

Figure 23: AI Adoption Benefits – Technology, Communication and Entertainment[67]

Potential for Qatar

AI holds promising potential to transform Qatar's communication technology and entertainment sectors by enabling smarter communication, creative innovation, and immersive storytelling. By integrating advanced AI solutions in Content Recommendation Systems, Customer Relationship Management (CRM) tools, Sentiment Tracking, and Graphic Design Automation, Qatar can drive efficiency, streamline processes, and support personalized content and targeted advertising strategies. These innovations can support revenue growth and enhance the development of the country's tech and creative sectors.

[67] Company Websites, Primary Research

Emerging Potential for Disruption

A) Transport and Logistics

AI is modernizing the transport and logistics sector by enhancing efficiency, reducing costs, and improving customer experiences. It achieves this through predictive analytics, autonomous vehicles, and enhanced supply chain management. The integration of AI in these areas is leading to smarter decision-making, optimized operations, and a more resilient logistics infrastructure.

Predictive Analysis

- AI-powered predictive analytics enhance demand forecasting and route optimization by analyzing historical data, market trends, and external factors.
- Accurate predictions enable logistics companies to maintain optimal inventory levels and plan efficient delivery routes, reducing operational costs.
- Improved demand anticipation and route optimization enhance resource allocation and customer satisfaction through timely deliveries.

Autonomous Vehicles & Drones

- Autonomous vehicles and drones automate transportation, reducing delivery times and costs, especially for last-mile deliveries.
- Self-driving trucks operate continuously, increasing delivery speed and reducing labor costs.
- AI in autonomous vehicles enhances safety and fuel efficiency, contributing to a more sustainable and efficient transportation network.

Figure 24: AI Adoption Benefits (Transport and Logistics)[68]

Potential for Qatar

While AI can promote logistics automation, particularly in warehousing, the anticipated impact on the transport and logistics workforce in Qatar is expected to be relatively lower. While some routine tasks, such as stock picking and sorting, may be automated, the overall workflow still requires human oversight and expertise. Additionally, AI adoption could potentially create new jobs in areas like system management for AI-powered logistics solutions and data analysis for optimizing operations.

This suggests a potential for job transformation rather than outright displacement within the and logistics sector. Qatar's current transport and logistics infrastructure offers opportunities for enhancement to better support advancements in AI. Factors such as the need for broader digital infrastructure integration and workforce upskilling are areas where progress can be made. Addressing these aspects will pave the way for more effective AI adoption and maximize the potential for innovation in the and logistics sector.

[68] Company Websites, Primary Research

B) Energy

Energy is an emerging potential sector for AI disruption. Entities like Qatar Energy have access to high-quality and deeply granular operational data from Liquified Natural Gas (LNG) extraction that can be used to develop customized and niche AI solutions for the Oil & Gas sector in Qatar.

Predictive Maintenance

- AI can continuously monitor energy assets to identify potential faults early.
- Predictive maintenance replaces reactive approaches with proactive fault detection.
- This shift prevents unexpected breakdowns and optimizes maintenance scheduling.

Demand Supply Forecasting

- AI forecasts energy supply and demand, which is crucial for weather-dependent renewable sources.
- It accurately predicts weather conditions and power output, optimizing energy production.
- Matching energy supply with demand patterns maximizes the value of renewable energy.

Figure 25: AI Adoption Benefits (Energy)[69]

Potential for Qatar

SMEs in Qatar's energy sector can capitalize on AI by developing niche solutions, such as predictive maintenance for renewables, building energy optimization, or AI-powered tools for oil & gas operations. Aligning with government initiatives, like those at the Qatar Environment and Energy Research Institute (QEERI), provides access to research and development opportunities, thereby maximizing the impact of SME contributions to Qatar's sustainable energy goals.

[69] Company Websites, Primary Research

C) Automotive

Artificial Intelligence has a relatively high potential to disrupt the automotive industry, principally due to its role of automation in the vehicle manufacturing and assembly process. The integration of AI has the potential to cause the greatest disruption in the following areas:

Quality Control

- AI in quality control surpasses human accuracy, reducing errors and saving time.
- Enhanced efficiency boosts productivity in automotive assembly lines and reduces recall costs.
- AI analyzes inspection data to predict and prevent potential quality issues proactively.

Demand Supply Forecasting

- AI's rapid data analysis enables accurate unit demand forecasts, minimizing underproduction and overproduction risks.
- Demand and supply analysis adapts to market changes, optimizing production plans.
- Efficient resource allocation is achieved through AI-driven insights.

Figure 26: AI Adoption Benefits (Automotive)[70]

Potential for Qatar

While AI carries emerging potential for disruption in the automotive industry, the transferability of this impact to the Qatari market in its current state is limited owing to the nascent state of automotive manufacturing and assembly parts activities in the country.

[70] Company Websites, Primary Research

4.8 SWOT Analysis

The SWOT analysis of Qatar's AI sector highlights strengths in infrastructure, government support, and talent, along with challenges and growth opportunities, as illustrated in the following figure.

Strengths

The local AI sector benefits from an established technological infrastructure and proactive government support. The government's QAR 9 billion investment in AI and partnerships with companies like Microsoft can drive innovation and integration.

Weaknesses

Qatar's AI sector faces challenges like reliance on imported technology and limited pool of skilled professionals in AI implementation, highlighting the need for local talent development and retention.

Threats

Threats include lagging behind global and regional AI leaders due to capability gaps. Additionally, the presence of these players and the remote nature of AI services pose challenges for local companies.

Opportunities

Qatar, with 99% internet penetration and 2.7 million users, offers an AI-conducive environment. Opportunities include developing tailored AI solutions in transformative sectors like healthcare and financial services, investing in local talent, and leveraging government support and initiatives to foster AI research, innovation, and entrepreneurship.

Figure 27: SWOT Analysis of Qatar's AI Sector[71]

SWOT Analysis Key Takeaways

Qatar has an established technological infrastructure with advanced data centers, bolstered by strategic government initiatives like Qatar's National AI Strategy and substantial investments in AI. Institutions like Elev8 and HBKU play a key role in building a skilled workforce, strengthening Qatar's capacity for innovative AI applications. Additionally, the presence of global players like Microsoft and Google offer valuable collaboration opportunities for local SMEs.

Risks in the sector include reliance on international expertise, underscoring the importance of talent retention. Additionally, the presence of global and regional players, remote delivery of AI services and dependence on imported technology pose challenges for local companies. However, SMEs can capitalize on investing in local talent and take advantage of high internet penetration across the country to develop AI solutions tailored to local consumers.

[71] Team Analysis

4.9 Porter's Five Forces Analysis

Porter's Five Forces analysis outlined in Figure 28 below examines the competitive dynamics and growth opportunities in Qatar's AI sector.

Supplier Power	Global AI leaders play a key role in Qatar's AI market by providing specialized talent and technology. Their influence shapes pricing and service terms, underscoring their importance in supporting local firms.	 High
Threat of New Entrants	High AI infrastructure costs and the need for skilled talent create barriers for startups in Qatar's AI sector. Initiatives like Elev8Tek's upskilling programs and TASMU's SMART Qatar can support to address this challenge.	Moderate
Industry Rivalry	The sector is marked by strong competition between local SMEs and global players, driving innovation to meet regional demands and remain competitive globally.	 High
Threat of Substitutes	While traditional IT solutions remain viable, AI's advancing capabilities reduce the need for alternatives. Its growing suitability for complex tasks ensures a low threat of substitutes.	 Low
Buyer Power	Qatar's tech-savvy population and government support drive demand for advanced AI solutions across high potential transformative sectors. The Buyers can shape market dynamics by prioritizing on niche and tailored AI solutions	 Moderate

Figure 28: Porter's Five Forces of Qatar's AI Sector[72]

Porter's Five Forces Analysis Key Takeaways

Qatar's AI sector thrives on competition between local SMEs and global giants like Microsoft, creating a dynamic market where innovation is key to meeting regional demands and maintaining global competitiveness. High entry barriers, such as infrastructure costs and the need for skilled talent, ensure market stability, while initiatives like Elev8Tek's upskilling programs aim to expand the local talent pool and reduce barriers. Incremental adoption of cloud-based solutions can also help manage costs.

Global leaders like Microsoft influence the market by providing specialized talent and technology, shaping pricing and service terms. Strong government support and a tech-savvy population drive demand for advanced AI solutions across sectors, solidifying AI's position as the preferred technology for transformative applications.

[72] Team Analysis

4.10 Global Data Practices

Adhering to data practices is crucial for developing and deploying AI technologies responsibly, ethically, and effectively. By following globally recognized standards, SMEs can maximize AI benefits while mitigating risks. Business leaders, governments, and academics must weigh AI's opportunities and challenges to establish safe, secure, and trustworthy AI systems. The figure below outlines the four key best practices and their relevance to Qatar's SMEs:

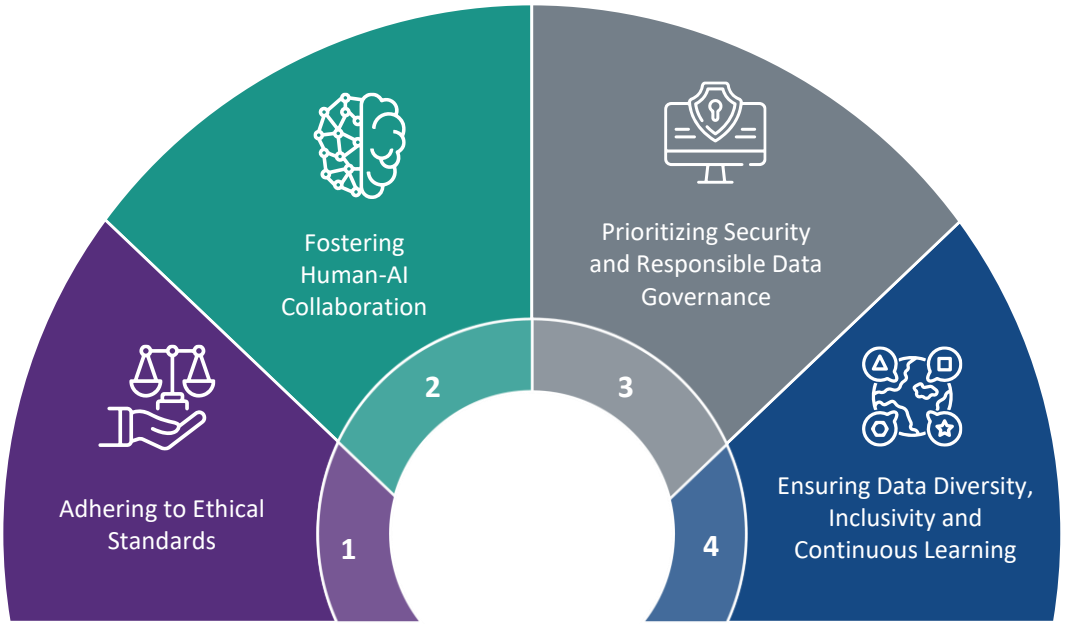


Figure 29: Global Exemplary Practices[73]

Adhering to Ethical Standards

Adhering to ethical AI guidelines promotes access to high-quality, diverse datasets and open data initiatives while ensuring privacy and security. Ethical standards emphasize fairness, transparency, accountability, and safety to foster public trust through inclusive engagement. For instance, the European Union's AI Act emphasizes transparency, accountability, and ethical considerations[74]. As part of ongoing efforts to foster responsible AI, Qatar's MCIT is developing the AI Principles and Guidelines, while the QCB has laid down guidelines for safe AI development and deployment for entities it regulates[75]. SMEs should adhere to Qatar's MCIT AI guidelines and stay updated on developments in the field.

[73] Team Analysis
[74] European Parliament – EU AI Act
[75] Sharek – Artificial Intelligence in Qatar

Fostering Human-AI Collaboration

Human-AI collaboration is crucial as AI should augment human capabilities, not replace them. Collaborative interaction drives innovation and enhances productivity. Interdisciplinary collaboration ensures the relevance of AI applications. For example, NVIDIA's partnerships with medical professionals to develop AI tools for medical imaging highlight this importance[76]. In Qatar, initiatives like the Qatar AI Summit bring together industry and academia to drive innovation and provide value for SMEs[77].

Ensuring Data Diversity, Inclusivity and Continuous Learning

Ensuring data diversity, inclusivity, and continuous learning is vital for developing effective AI models. Training AI on diverse datasets avoids biases and promotes fairness. Continuous learning keeps AI technologies current. Qatar's initiatives, such as the QNV and the National AI Strategy, emphasize continuous education and training to ensure a diverse and inclusive data environment[78].

Prioritizing Security and Responsible Data Governance

Robust security and responsible data governance are essential for protecting IP, data integrity, and privacy. Implementing stringent security measures ensures compliance with data protection regulations and builds customer trust. IBM's AI security products, such as AIShield, safeguard data against attacks[79]. Similarly, Microsoft's AI principles emphasize strong data governance aligned with global laws like the General Data Protection Regulation (GDPR)[80]. Qatar is reinforcing its cybersecurity infrastructure through the National Cyber Security Strategy, which includes measures to protect digital assets and information, ensuring responsible data management practices[81]. These initiatives should be leveraged by SMEs to ensure compliance with data governance best practices.

[76] NVIDIA – Medical Imaging
[77] Qatar AI Summit – 2024 Summit
[78] MCIT – National AI Strategy
[79] Bosch AI Shield – Partnership with QRadar
[80] Microsoft – Generative AI Guide for the Public Sector
[81] National Security Archive – Qatar National Cyber Security Strategy

4.11 Success Story – A Case Study of Avey

Avey, a HealthTech company, has developed an AI Medical Diagnostic model with high levels of accuracy. This model boasts an impressive 92% accuracy rate, validated through clinical studies published in the Journal of Medical Internet Research (JMIR)[82]. This accomplishment not only surpasses global competitors but also addresses critical challenges such as doctor shortages and limited access to healthcare.

Building on the success of its AI Medical Diagnostic model, Avey has developed a comprehensive suite of enterprise AI healthcare solutions. These solutions leverage several proprietary AI models to empower healthcare providers to deliver the highest quality care to their patients.

Avey Enterprise AI Healthcare Solution

The Avey Enterprise AI Healthcare Solution was created with the vision of empowering healthcare providers by freeing doctors from tasks that distract them from direct patient care. Guided by this vision, the Avey Healthcare Solution includes the key products outlined in Figure 30 below:

Avey Collaborator
Empowers doctors during clinical consultations by providing real-time diagnostic insights and personalized patient recommendations. It predicts symptoms from clinical conversations, suggests critical diagnostic questions to prevent medical errors, and recommends tailored investigation and medication plans for patients.

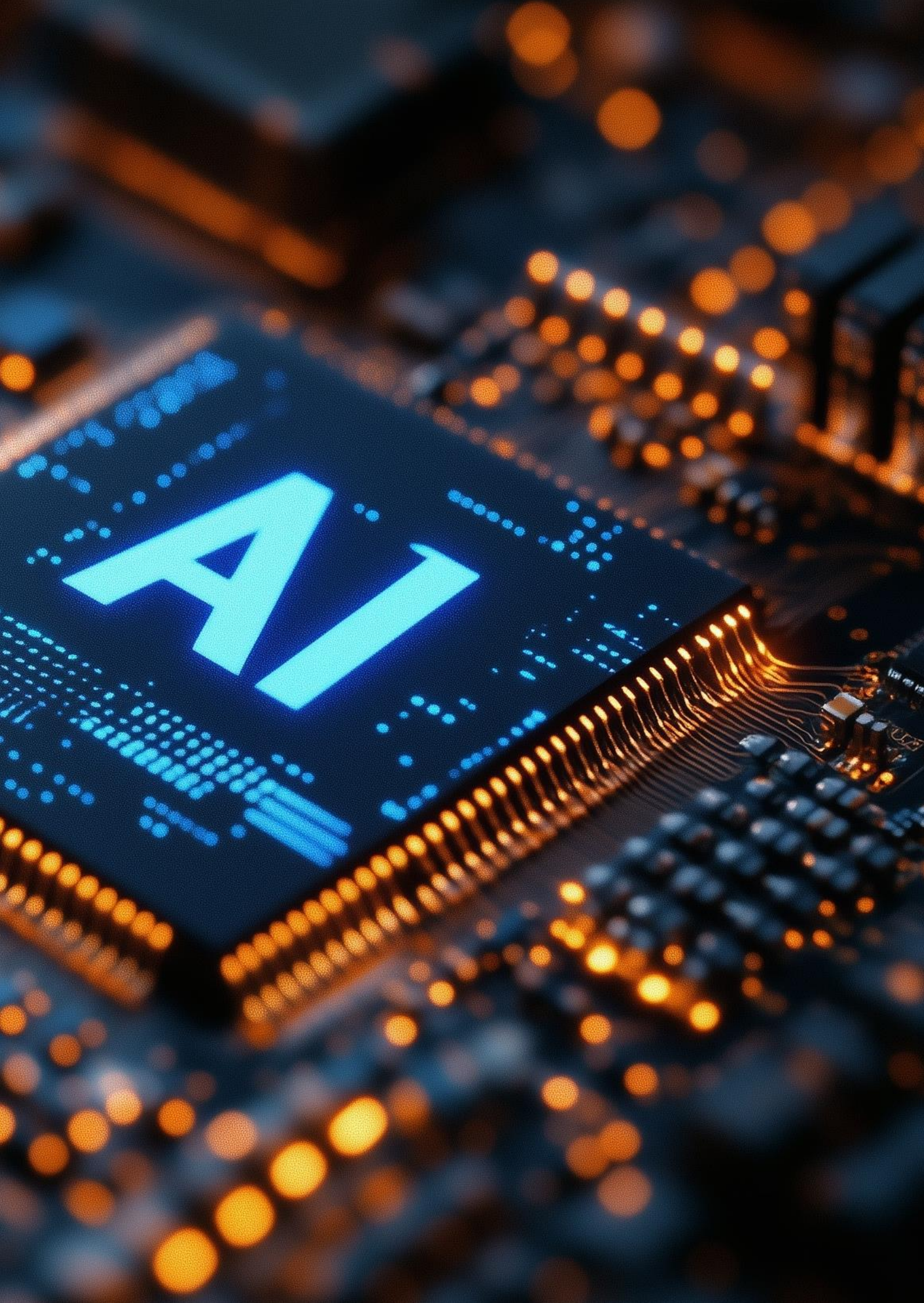
Avey Cowriter
Transforms the clinical experience by easing documentation tasks, allowing doctors to focus on patient care. After a clinical conversation, it generates a comprehensive Subjective, Objective, Assessment and Plan note, significantly reducing documentation time and enabling doctors to see more patients while delivering superior care.

Avey Coder
Boosts revenue and streamlines operations for insurance companies with AI-driven claim generation, medical coding, and auditing. It automatically codes symptoms, diagnoses, procedures, and medications and quickly generates and adjudicates claims to minimize billing errors and reduce rejection rates.

Figure 30: Avey Features[83]

Through strategic partnerships with distinguished entities such as the Ministry of Public Health in Qatar, Hamad Medical Corporation, Aamal Medical Holdings, and Naseem Medical, Avey has expanded its impact and visibility. These collaborations demonstrate how SMEs in Qatar can integrate AI to achieve operational excellence and global competitiveness. Avey's tailored AI solutions reflect a commitment to innovation and customer-centric service, showcasing the transformative potential of AI in healthcare.

[82] Avey – Product Features
[83] Primary Research


AI

4.12 Way Forward & Strategic Recommendations

Qatar's AI future is promising, with strong government support and a conducive ecosystem creating a highly favorable environment for AI success.

Strategic Investments

Qatar has positioned itself as an important participant in the MENA and global AI landscapes, developing AI solutions that align with its long-term strategic objectives. The adoption of AI across sectors like healthcare, financial services, and transportation marks a significant transformation in the country's technological infrastructure.

Government Support

The Government is heavily investing in AI to harness its transformative potential. At the Qatar Economic Forum, the Government announced a QAR 9 billion (USD 2.47 billion) incentive package aimed at boosting investments in technology, innovation, and AI, driving Qatar's digital transformation[84].

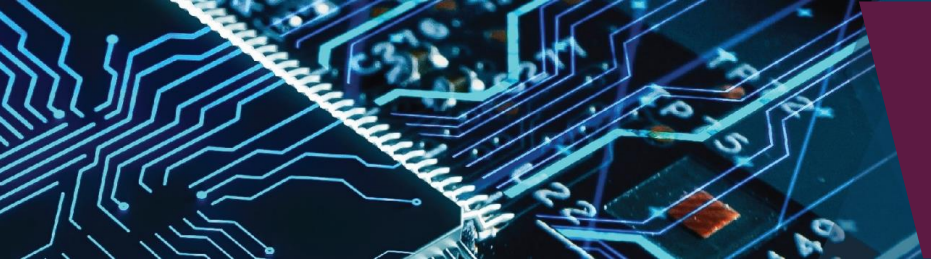
Smart City Initiatives

Qatar is advancing its Smart City initiatives with AI to drive innovation and efficiency. The Google Cloud region in Doha boosts AI capabilities, while the Municipality's Smart Cities Solutions project uses AI to improve infrastructure[85]. The "Smarter Qatar" report and discussions at the Katara Tech Forum highlight AI's role in digital transformation and urban development, positioning Qatar as a leader in smart city advancements[86].

Arabic Language Focus

As an Arabic-speaking nation, Qatar prioritizes AI for Arabic language processing, leveraging its extensive Arabic content for AI model development. Initiatives like QCRI's Arabic speech-to-text tools, the Farasa suite, and the "Fanar" project are enhancing linguistic models and preserving Arab identity in AI applications, underscoring Qatar's strategic focus on this area.

[84] The Peninsula – Qatar's Incentive Package for AI
[85] QNA – Smart Cities Solution Project
[86] QNA – Katara Tech Forum



Recommendation 1: Leverage Government Support

SMEs can benefit from government support through advisory services, training programs, government-led AI initiatives, and networking events. Additionally, aligning business models with Qatar's National AI Strategy, NDS3 and the DA 2030 can support SMEs grow and sustain within the AI landscape.

Recommendation 2: Target High-Potential Sectors

SMEs should target industries with high AI transformation potential, such as healthcare and financial services. Developing AI solutions that address specific challenges within these sectors and collaborating with established players can provide valuable industry insights and facilitate market entry. Additionally, addressing local market needs by developing Arabic language AI capabilities and culturally relevant solutions ensures relevance and acceptance within Qatar.

Recommendation 3: Invest in Talent Retention

While Qatar has taken steps to cultivate a skilled workforce, the nascent state of the local sector presents opportunities for improvement in workforce retention. SMEs should partner with Qatari academic institutions to facilitate direct talent acquisition, offer internships and training programs specifically designed to cultivate local AI expertise, and increase retention of skilled professionals in the sector.

Recommendation 4: Adopt Ethical AI Practices

Prioritizing ethical AI practices by adhering to Qatar's ethical AI guidelines as published by MCIT, implementing robust data protection and privacy measures, and staying informed about evolving regulatory frameworks is essential for building trust and ensuring compliance. Additionally, fostering transparency in AI systems by acknowledging potential biases in AI models and engaging with stakeholders on their ethical implications will further strengthen public confidence in these technologies.

Recommendation 5: Build Partnerships and Innovate

Building strategic partnerships can enhance an SME's capabilities and market reach. Collaborating with larger tech companies and research institutions, joining AI-focused business networks and associations, and engaging in knowledge-sharing initiatives with other SMEs can create synergistic opportunities and drive innovation. Moreover, embracing continuous innovation by investing in ongoing research and development, regularly updating AI models and technologies, and quickly adapting to emerging trends will help SMEs maintain a competitive edge.

By implementing these strategic recommendations, SMEs can effectively engage with Qatar's AI market, build sustainable businesses, and contribute to the country's digital transformation.


Ai
ADS

Glossary

- **AI Disruption Potential:** The capacity of AI technologies to cause transformative changes in industries, often by improving efficiency, reducing costs, or enabling new capabilities.
- **AI Fanar:** An Arabic generative AI project aimed at localizing large language models (LLMs) for the Arabic-speaking world, aligning with Qatar's goal of preserving cultural identity in AI.
- **AI Robotics:** The application of AI in robotics to enable autonomous task performance and decision-making by robots.
- **Artificial Intelligence (AI):** The simulation of human intelligence in machines, enabling them to perform tasks such as learning, reasoning, problem-solving, and decision-making.
- **Azure AI:** Microsoft's AI platform offering tools for AI model development, deployment, and management, widely adopted in Qatar for AI innovations across various sectors.
- **Chatbot:** An AI-powered system designed to interact with users via text or voice, often used for customer service and other automated support tasks.
- **Computer Vision:** A field of AI focused on enabling machines to interpret and process visual data from the physical world, such as images and videos.
- **Data Privacy Laws:** Regulations governing the collection, storage, and use of personal data, crucial for ensuring ethical AI development and compliance with Qatar's legal frameworks.
- **Deep Learning:** A subset of machine learning that uses artificial neural networks to model complex patterns in data, widely used in AI applications such as image recognition and speech processing.
- **Digital Agenda 2030:** A program launched in 2024 to drive Qatar's transformation into an advanced digital economy, with AI playing a pivotal role in achieving national goals.
- **General Data Protection Regulation (GDPR):** a comprehensive data protection law enacted by the European Union (EU) establishing rules for how personal data is collected, processed, stored, and shared.
- **Generative AI Market:** A segment of the AI industry focusing on the development and deployment of AI systems capable of generating new content, with a projected high growth rate globally and in Qatar.
- **Generative AI:** A subset of AI that creates new content—such as text, images, or music—based on the patterns it has learned from data. Examples include ChatGPT and DALL-E.
- **Generative Pretrained Transformer (GPT):** A type of AI model used for tasks in natural language processing, known for its ability to generate human-like text. GPT-4 is one of the most advanced versions.
- **Hamad Bin Khalifa University (HBKU):** An academic institution in Qatar with a strong focus on AI research and education, playing a key role in developing the country's AI talent and innovation.
- **HealthTech:** A broad term that refers to the use of technology to improve healthcare delivery, enhance patient outcomes, and streamline medical processes.

- **Machine Learning (ML):** A branch of AI that allows machines to learn from data and improve their performance without being explicitly programmed.
- **National Cyber Security Strategy:** Qatar's national cybersecurity strategy which aims to establish Qatar as a global leader in cybersecurity and a pioneer in the safe use of emerging technologies.
- **Natural Language Processing (NLP):** An AI field that deals with the interaction between computers and humans through natural language. NLP enables machines to understand, interpret, and generate human language.
- **Predictive Maintenance:** The use of AI to analyze data from machinery and predict failures before they happen, improving efficiency and reducing downtime.
- **Qatar AI Strategy:** A national framework designed to position Qatar as a leader in AI by focusing on six pillars: education, data access, employment, business, research, and ethics.
- **Qatar Computing Research Institute (QCRI):** A leading AI research institution in Qatar, focusing on the development and application of AI technologies to address challenges in various sectors.
- **Qatar Economic Forum:** The Middle East's leading news-driven event focused on global business and economic issues.
- **Qatar Mobility Innovations Center (QMIC):** A research center focused on developing intelligent mobility solutions using AI and IoT technologies, supporting Qatar's AI ecosystem.
- **Qatar National Vision 2030 (QNV):** A strategic framework for Qatar's future development, emphasizing technology as key drivers for achieving a diversified, knowledge-based economy.
- **Qatar Science and Technology Park (QSTP):** A hub for technology innovation in Qatar, providing resources and support to startups and companies working on AI and other emerging technologies.
- **Qatar Web Summit:** Web Summit Qatar is the Middle East's premier technology conference, bringing together global tech entrepreneurs, innovators, investors, and industry leaders.
- **Smart City Framework:** A government initiative aiming to develop AI-driven smart city solutions, including AI applications for urban planning, infrastructure, and governance.
- **Stable Diffusion**: An AI / deep learning-based generative model primarily used for creating images from text descriptions.
- **TASMU Digital Valley:** An initiative under Qatar's National AI Strategy aimed at fostering a digital ecosystem and accelerating innovation, particularly in AI.
- **TASMU Smart Qatar Program:** A key government initiative aimed at leveraging digital technologies, including AI, to achieve national strategic objectives related to economic and social development.
- **Third National Development Strategy (NDS3):** A framework focusing on economic diversification through emerging technologies, including AI, with an emphasis on supporting SMEs and fostering innovation.