Emerging Technologies Adoption Readiness in Government Agencies

2024

Digital Government Authority — هيئة الحكومة الرقمية

Emerging Technologies — تبني التقنيات الناشئة

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Content

Preamble

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1. Preamble

Based on the decision of the Council of Ministers No 418 dated 25 07 1442AH, issued with the approval to organize the Digital Government Authority, which stipulated in Article (Fourth 5 10 that the Authority shall issue the measurements, indicators, tools, and reports to measure the performance of government entities and their capabilities in the field of digital government, and the satisfaction of the beneficiary thereof, and provide support to government entities regarding digital government services, to adopt and enable modern technologies.

In line with the Authority commitment to effectively support government entities to achieve their goals and to comply with the provisions of the "Digital Government Policy" that promotes the integration of emerging technologies into government entities to accelerate digital transformation across various sectors, the Authority issued the Emerging Technologies Adoption Readiness Index with the aim of assisting government entities by evaluating their current readiness for adopting emerging technologies, identifying gaps and improvement opportunities, and providing the necessary plans to build capabilities that align with their individual needs and ensure the strategic and sustainable realization of desired benefits.

This report was issued for the year (2024) to review the results recorded by government entities in the second cycle of assessing the emerging technologies adoption readiness for the year (2024). This report briefly highlights a few success stories, classifying them into the following four capabilities:

Research	Communicate	Prove	Integrate

Saudi Arabia places a high priority on adopting emerging technologies to drive economic growth and development with a focus on artificial intelligence, renewable energy and digital transformation within the Vision 2030 initiatives.

Statement by H.E. the Governor of the Digital Government Authority

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His Excellency Ahmed Bin Mohammed Alsuwaiyan

Governor, Digital Government Authority

Saudi Arabia places digital transformation at the forefront of its work to enhance government performance, to achieve a clear goal of turning Vision 2030 into a tangible reality by providing advanced government services centered around the beneficiary first.

Saudi Arabia embraces the era of digital transformation and emerging technologies, aware of the pivotal role they play in shaping the future. While it is very keen to promote innovation and continuous development, Saudi Arabia is directing its efforts towards harnessing technologies to enhance economic diversification and sustainable growth. Saudi Arabia's commitment to Vision 2030 is evident in the strategic investments it is making in emerging technologies such as artificial intelligence, the Internet of Things, blockchain, metaverse, and others.

As we embark on our journey towards achieving an ambitious future, we support development and innovation by taking advantage of the latest technologies and solutions with the aim of effectively forming the government of the future. The Digital Government Authority undertakes to implement these tasks, as it measures the readiness of government entities to adopt emerging technologies. This includes not only providing the necessary support, but also identifying impactful and sustainable technologies, investing in them strategically, and deploying them effectively. Together, these efforts aim to improve the beneficiaries' experience to ensure that their needs are met or even exceeded thanks to seamless integration with advanced solutions.

This report reviews some success stories of emerging technologies, where the ambitious shift has taken place from traditional work methods to innovative solutions in digital government services. By highlighting the government entities that are best in this field, the report emphasizes their readiness and capabilities, and also reflects the strengths in various sectors. These success stories highlight the most significant achievements in the adoption of new technologies and showcase the broader shift towards more forward-looking and effective practices across government services.
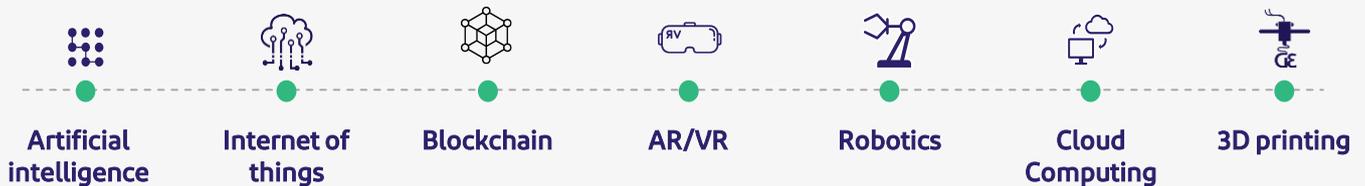
Introduction

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3. Introduction

3.1. Overview of emerging technologies globally

3.1.1 Emerging technologies

Emerging technologies are advanced or cutting-edge technologies capable of bringing changes in various businesses and transactions and having a significant impact on social and economic fields. Adopting emerging technologies allows achieving unprecedented changes in various sectors, enhancing performance in multiple aspects. These technologies also play a pivotal role in shaping the future landscape of sectors, enhancing efficiency and achieving positive results to serve their goals.

Top emerging technologies

Artificial intelligence	Internet of things	Blockchain	AR/VR	Robotics	Cloud Computing	3D printing

3.1.2 Global impact of emerging technologies

Rapid progress in emerging technologies is reshaping the global landscape across sectors, having a significant impact on economies, societies and the environment. For example, artificial intelligence and automation are revolutionizing sectors by streamlining processes, enhancing efficiency and creating new job opportunities. However, this technical progress raises concerns about job displacement and the need to sharpen the skills of the workforce. According to a report by the World Economic Forum, AI integration is expected to contribute significantly to economic growth, with estimates indicating a 14% increase in global GDP by 2030.

In addition to the economic impact, the integration of emerging technologies plays a pivotal role in addressing global challenges. For example, technical progress makes it possible to provide innovative solutions to climate change, healthcare and education, and to promote sustainable development, such as in the field of precision agriculture with the Internet of Things or diagnostic medical treatments with data analytics. In this context, it is worth noting the need to deal with these developments ethically and comprehensively to ensure that the benefits are distributed fairly and that a technologically enhanced future is achieved for all without exception.

In turn, adopting emerging technologies enables governments to enhance their efficiency, improve the services they provide to citizens, and stay at the forefront of innovation. Embracing these developments is not just an option, but a strategic necessity to enhance economic growth, ensure national resilience, and meet the changing needs of the digital society. Therefore, integrating emerging technologies allows governments to catalyze positive change in a rapidly evolving global landscape.

3.1.3 Emerging technology trends for the coming years

Addressing trust, risk and security in AI models

Manage constant exposure to threats
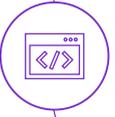
Sustainable technologies

Platform engineering

Artificial intelligence-enhanced development

"By 2026, companies that implement controls to address trust, risk, and security in AI models will enhance decision-making by removing 80% of false and illegitimate information."

"By 2028, 75% of enterprise software engineers will use an AI assistant, compared to less than 10% in early 2023."

"By 2025, 70% of CEOs will have sustainability-related KPIs integrated into their dashboards."
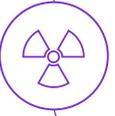
"By 2025, entities that adopt vulnerability management will reduce the time between initial breach and detection by 50%."

By 2026, the number of organizations using APIs and generative AI models or deploying applications powered by generative AI in production environments will exceed 80%, compared to less than 5% today.

3.1.4 Technical decisions for the next three years

Addressing trust, risk and security in AI models

Promoting widespread access and application of artificial intelligence technologies

Drive AI-enhanced development

Use smart apps

3.1.5 Technical trends at government level

Generative AI can play a key role across government entities, helping to summarize large documents and papers, suggest content for review, and extract information from many policies in a short time.

The **Industrial Metaverse** revolutionizes factories through digital twins, interactive guides and 3D spaces and provides a smarter and safer working environment. **Web 3.0** paves the way for future applications such as remote surgery and AI-powered security, all controlled by a single, well-connected agent.

On the other hand, adopting a progressive "**Digital Wellbeing**" approach ensures that proactive updates are prioritized based on the impact of technologies on core objectives. Examples include conducting regular checks on IT systems, ensuring that upgrade and modernization needs are identified early and investing in self-healing techniques to avoid any problems in the future.

3.1.6 Technical debt

Entities are no longer just tolerating technical debt; they are also actively working to build a flexible and adaptable technology stack for the future. This requires a comprehensive preventive approach that focuses on "**digital wellbeing**," long-term safety and performance rather than short-term fixes.

In the world of mature emerging technologies, the concept of "**technical debt**" takes center stage, the cumulative cost attributed to poor code quality and unaddressed issues within a digital system. Like interest accrued on debt, this form of indebtedness appears in future development and maintenance expenses.

Technical debt is classified into three pivotal aspects:

A barrier to innovation
Technical debt negatively impacts agility and adaptability, hindering the rapid adoption of advanced technologies and the implementation of rapid changes.

One of the reasons for increasing costs
Inefficient code and outdated architectures cause high maintenance and bug fixing costs and prevent opportunities from being leveraged.

A threat to systems stability
Debt threatens systems reliability due to poor code quality and fragile architecture and may lead to business outages and data loss.

The following methodologies will help government entities in managing and reducing the technical debt effectively::

- **Measure technical debt** to help prioritize refinement efforts and monitor progress

- **Prioritize addressing critical issues** that impact functionality, performance, or security

- **Adopting flexible practices** through incremental development and continuous improvement of operations, thus reducing future/potential debt accumulation

- **Prioritize** quality and manage technical debt effectively

3.2 Most important goals and milestones in the digital transformation journey in Saudi Arabia

3.2.1 The digital transformation journey in 2024

Digital government is a major element in Saudi Arabia long-term strategic directions due to its effective role in further revitalizing the economy, supporting its sustainability, and developing public service sectors. In this regard, the year 2024 is an important chapter in the digital journey in the Kingdom of Saudi Arabia, as spending on communications and information technology is expected to exceed $34.5 billion. Increasing the amounts allocated to information technology is related to enabling Vision 2030 and supporting the ambition of the digital kingdom. Digital transformation in Saudi Arabia is closely linked to infrastructure development, which major projects aim to develop and expand the digital economy. Thus, each of the previously mentioned factors contributes to the Kingdom's technological and economic prosperity.

The 2024 LEAP Conference is evidence of Saudi Arabia 's commitment to stimulating innovation in the technology sector, as it provides the opportunity for international technology companies to share their ideas and collaborate on projects.

3.2.2 Major projects

- Saudi Arabia has launched several "major projects" to promote the innovation, sustainability and sectors based on emerging technologies and supporting its ambitions related to digital transformation and innovation.

- One of the most important objectives of major projects that have a significant impact in the long term is to stimulate national economic growth and renew the country's digital infrastructure.

- It is expected that the implementation of these giant projects will lead to the prosperity of the national economy, as Saudi Arabia expects to receive investments and government spending worth $7 trillion.

3.2.3 Infrastructure and Communications

- Deploying the fifth generation Internet network throughout Saudi Arabia : with more than 45% coverage and speeds of up to 75 Mbps, describing this investment as the basis for digital progress in the future.

- Expansion of digital infrastructure through fiber optic networks, cloud computing platforms and data centers

- Smart city initiatives with intelligent transportation systems, e-government services, and smart grids

3.2.4 Radical changes in traditional sectors

- Saudi Arabia is currently witnessing a remarkable transformation, with more than half of Saudi institutions and companies changing their traditional business models to keep pace with digital practices

- The focus is on specific sectors such as healthcare, financial services, retail and education

- Adopting AI and IoT technologies is reshaping operations

- Saudi Arabia community of youth and those interested in technology plays a pivotal role in this development, and initiatives are launched that focus on providing Saudis with basic skills and opportunities.

- Changes in traditional sectors are evident in Saudi Arabia's efforts and most prominent goals. These changes have contributed to the emergence of new priorities, such as the digital economy, which supports Saudi Arabia's directions.
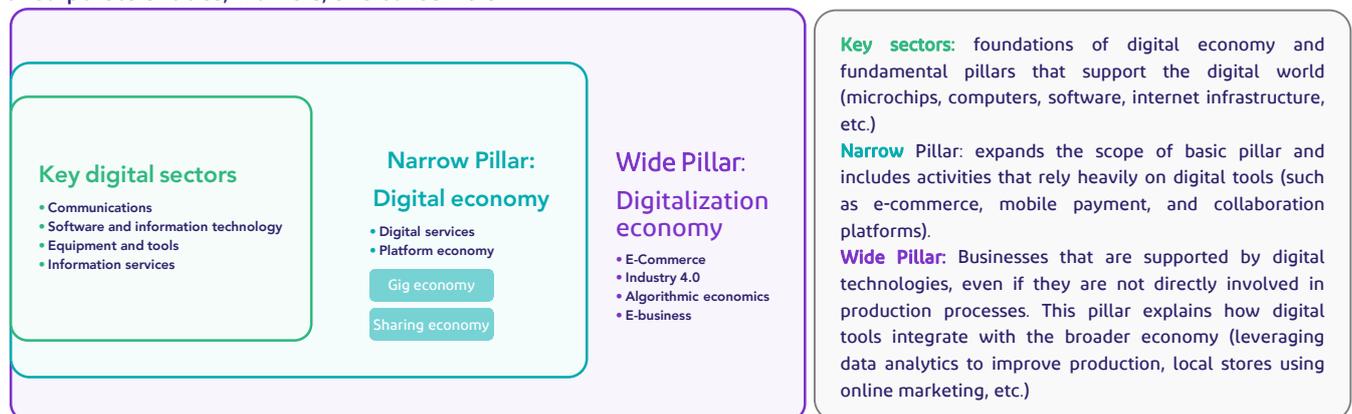
3.3 Saudi Arabia digital economy journey
3.3.1 Digital economy

3.3 "The digital economy includes all economic activities that depend on the use of digital inputs or are significantly enhanced using digital inputs, including digital technologies, digital infrastructure, digital services and data. This applies to all producers and consumers who use these digital inputs in their economic activities, This includes government entities" - OECD

3.3.2 Levels of digital economy

The digital world includes economic activity created by producers and service providers across three levels, namely the key sectors and the narrow and broad pillars. Enabling the digital economy focuses on digital economy and key digital sectors. Between the gig and narrow axis, we find the gig and participatory economy. The sharing economy in the context of government refers to a social and economic system in which individuals use platforms to share resources, goods, and services, posing regulatory challenges while providing opportunities for economic growth and meeting societal needs. The gig economy is the economic system through which the workforce engages in self-employment. The gig economy consists of corporate entities, workers, and consumers.

Key digital sectors
- Communications
- Software and information technology
- Equipment and tools
- Information services

Narrow Pillar: Digital economy
- Digital services
- Platform economy

Gig economy

Sharing economy

Wide Pillar: Digitalization economy
- E-Commerce
- Industry 4.0
- Algorithmic economics
- E-business

Key sectors: foundations of digital economy and fundamental pillars that support the digital world (microchips, computers, software, internet infrastructure, etc.)

Narrow Pillar: expands the scope of basic pillar and includes activities that rely heavily on digital tools (such as e-commerce, mobile payment, and collaboration platforms).

Wide Pillar: Businesses that are supported by digital technologies, even if they are not directly involved in production processes. This pillar explains how digital tools integrate with the broader economy (leveraging data analytics to improve production, local stores using online marketing, etc.)

3.3.3 Most important goals related to digital economy journey in Saudi Arabia

- Saudi Vision 2030: Saudi Arabia large plan and focus on digitization as a top priority
- 5G Internet and Artificial Intelligence: Fast Internet and smart software work together to bring about sector-level changes. "With the Internet penetration rate reaching 98%, society is ready to embrace the digital world."
- AI-Friendly Ecosystems: Special areas that enable the establishment, expansion, and growth of AI companies
- Data Analytics and Smart Cities: Using information to make better decisions and manage cities efficiently
- AI contribution to the economy of $135.2 billion: The amount AI is expected to add to the economy by 2030
- The importance of partnership and cooperation to achieve Vision 2030: These alliances unlock new opportunities for companies and entrepreneurs and ensure alignment between policies and regulations.
- Tech-savvy workforce: The government is investing $1.2 billion to train 100,000 students in digital skills and thus build a future based on technical intelligence.
- E-commerce: As secure blockchains enable online payments, fast delivery drones revolutionize business and operations

Overview of **Emerging Technology Adoption** Readiness Index
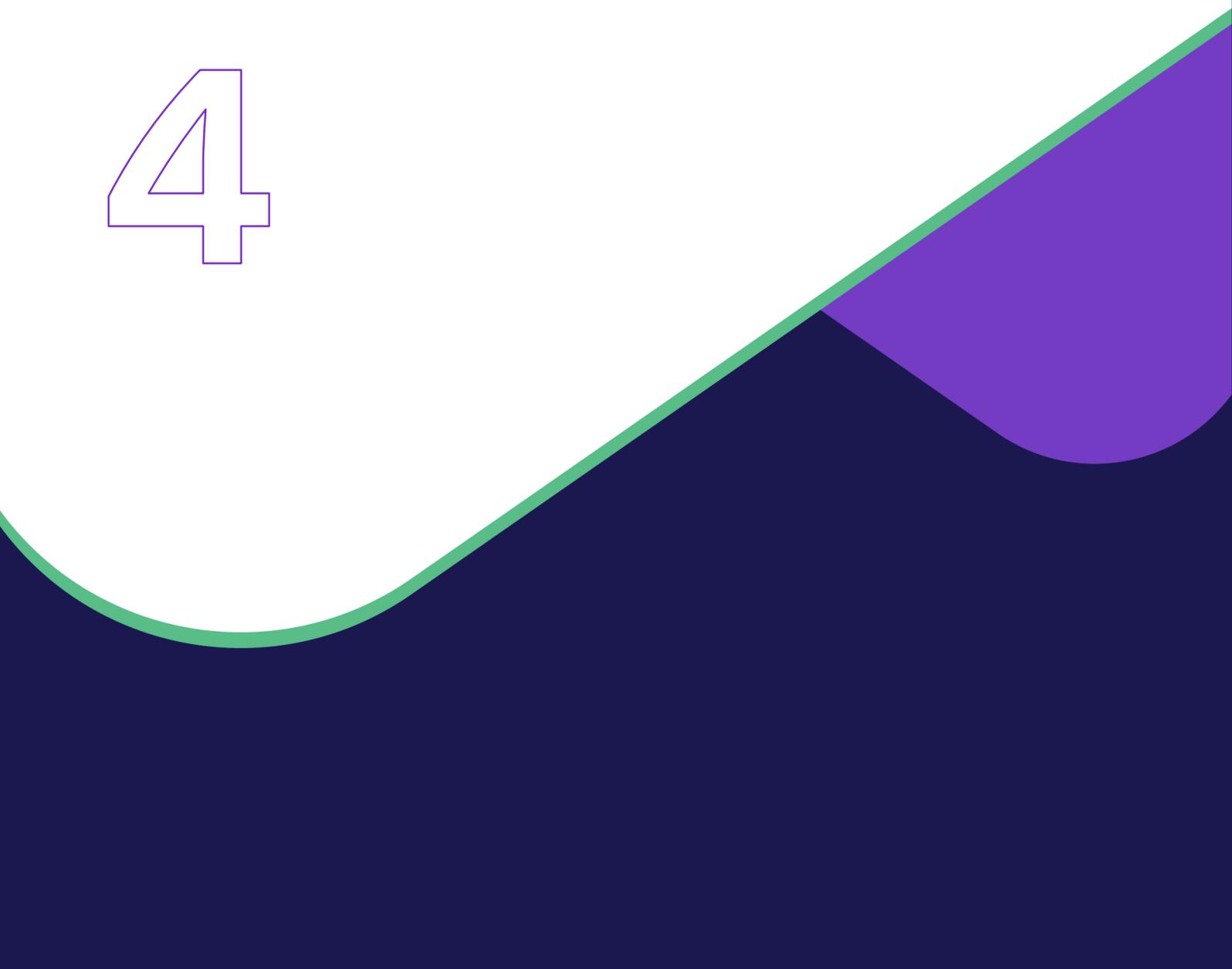
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4. Overview of Emerging Technology Adoption Readiness Index

4.1 Emerging technologies adoption readiness in the public sector

Emerging technologies are one of the most important drivers of transformation and development in public sector, as these technologies could radically modernize and improve government operations. Which contributes to enhancing the efficiency of services provided to citizens and achieving the strategic goals of governments. The impact of emerging technologies in the public sector ranges from improving communication and interaction with citizens to developing public policies and improving service performance. Enhancing transparency and effectiveness in resource management and service delivery is one of the key aspects that reflects the importance of emerging technologies in the public sector. By using big analytics, artificial intelligence, and cloud computing, governments can improve decision-making processes and data analysis to achieve better and faster results.

The Authority emerging technologies adoption readiness index comes as a periodic assessment conducted through a measurement methodology based on four basic capabilities (research, communication, proof, and integration). In general, this assessment can be relied upon by the departments responsible for research, development, technical affairs and innovation in **the agency, as its results** help them determine the current level of readiness to adopt emerging technologies, monitor the gaps, and plan the steps that should be taken to build capabilities that guarantee success when adopting these technologies to achieve the desired benefits. .

4.2 Objectives of the ET Adoption Readiness Index in the public

Emerging Technologies Adoption Readiness Index seeks to achieve several important objectives at the level of government entities in the public sector:

Accelerating the realization of benefits from Emerging Technologies

**Supporting** government entities in their journey to adopt Emerging Technologies

Contribute to achieving the strategic objectives of Digital Government*

4.3 Emerging Technologies Adoption Readiness Index Framework

4.3.1 Emerging Technologies Adoption Readiness Index Framework for the year (2024)

The adjacent figure shows the framework that was developed and designed to assess the readiness of government entities to adopt emerging technologies. This framework consists of four key capabilities (research, communication, prove, and integration), from which ten elements branch from which nineteen standards also branch, with four intersecting dimensions that fall within each standard.

| Capabilities | Elements | Standards | Common dimensions |
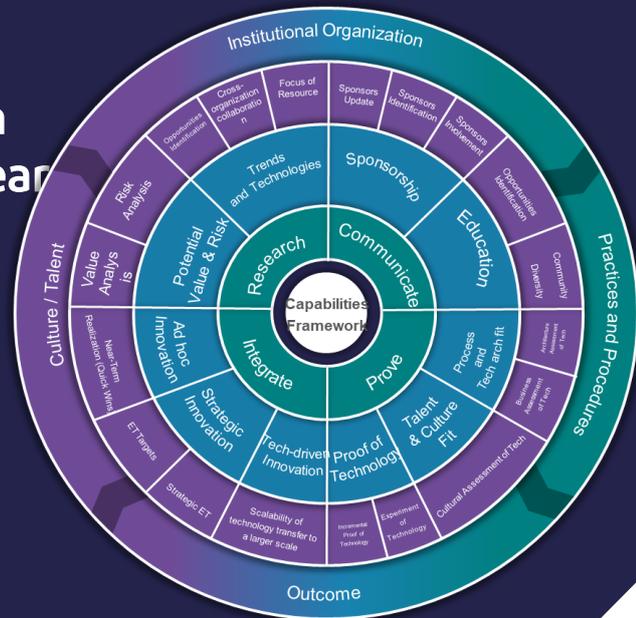
The four key capabilities that are assessed
Within the framework of the Emerging Technologies Adoption Readiness Index

Research:

Due to the rapid rate of change, it is essential to allocate resources to the wide monitoring of several forms of trends, such as those involving beneficiaries, competitors, markets, or technologies, as well as the information technology that allows each of these types of trends. In addition, it is crucial that researchers work together across their organizations and with partners to capture these patterns, identify possibilities for each developing technology, and then allocate each opportunity to either the short or long term.

Communicate:

Emerging Technology research cannot survive for long without clear and consistent lines of communication, such as slide shows or reports, in which targets and results of technology trend analysis are presented in a simplified manner to the recipient. It is necessary to direct the appropriate information toward the appropriate audience on the one hand and to differentiate the process of providing general education in order to engage stakeholders from the practice of providing particular communication in order to pursue investment on the other hand.

Prove:

In order to express an opportunity in a way that is persuasive to others, it needs the knowledge and expertise that can only be obtained via actual hands-on experiments. With the aid of the "prove capability," the agency will not only be able to determine whether the technology is ready to meet the requirements but also whether the agency is ready for the technology.

Integrate:

Innovations that are strategic in nature are those that pursue medium/long-term emerging technology opportunities that align with the agency 's broad objectives. This capability assesses how well the agency is equipped to operationalize emerging technologies on large scales in a way that supports the strategic objectives while also being economical and practical in its implementation.

4.3.2 Evaluation mechanism

Emerging technologies adoption readiness was assessed according to the following three stages:

First Stage: Current State Assessment

This stage involves assessing the current state of participating entities and defining the entities' Readiness to Adopt Emerging Technologies. This assessment is based on the data and evidence provided by the covered entities during the evaluation sessions that were held.

Second Stage: Readiness Level Determination

At this stage, readiness levels were determined by analyzing the data collected during the first stage, processing the inputs, and calculating points within each of the four capabilities, where the level of readiness progress in each **agency** was determined based on the result of assessing its current situation, and applying the readiness determination equation. Which shows the **agency**'s capabilities within the five levels of readiness.

Third Stage: Recommendation and Action Plans

At this stage, recommendations and action plans for improvement were presented, which include suggestions and recommendations on specific action elements that fall within each of the dimensions analyzed, in order to support the **agency** in progressing through the five levels. In addition, the **agency** can view the **emerging technologies adoption guidelines** and understand the various factors necessary to organize efforts and achieve the desired results, while reducing the risks surrounding the journey of adopting emerging technologies.
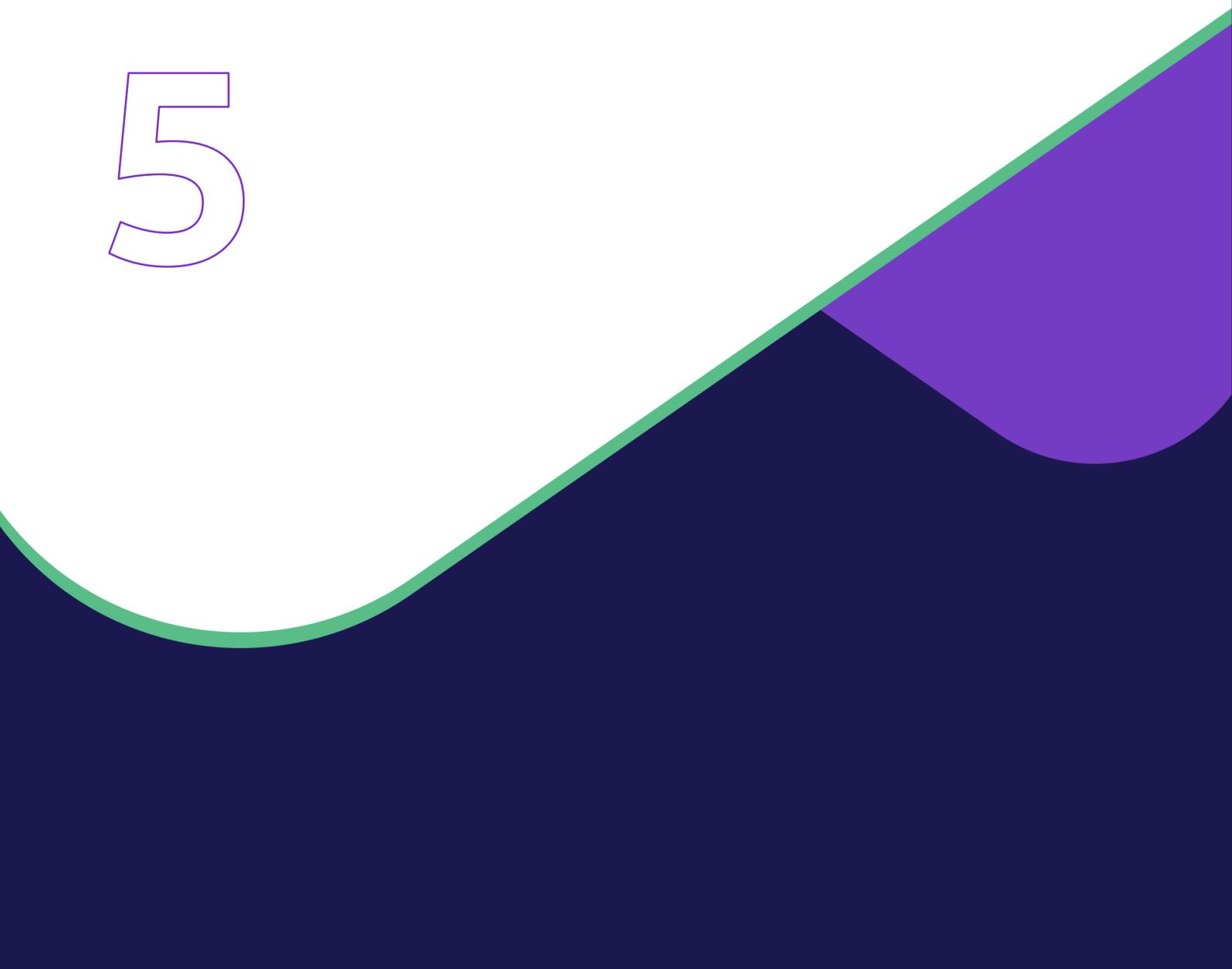
4.3.3 Classification of emerging technologies adoption readiness level

The level of government entities readiness is determined according to the result of emerging technologies adoption readiness index, according to the capabilities and their sub-criteria in each measurement cycle within one of the following five levels:

Level 1

ناشئ
Emergent

An emerging **agency** faces challenges in multiple key dimensions and needs to work on different aspects to develop and improve its readiness to adopt emerging technologies

Level 2

متطور
Developed

The advanced **agency** is aware of the areas of growth and plans to develop initiatives that focus on adopting emerging technologies effectively by establishing the necessary basics

Level 3

متمكن
Competent

An empowered **agency** that possesses skills in most aspects of emerging technology, and works to align with best practices

Level 4

متقدم
Advanced

Advanced in all elements of Emerging Technologies and business evaluated and implemented most of the recommended best practices

Level 5

متميز
Exceptional

Exceptional in maintaining a continuous evolution of Emerging Technologies initiatives based on the latest tech trends and leading best practices within a defined governance structure

Sectors represented
in the second cycle 2024

5

5. Sectors represented in the second cycle 2024

5.1 Second cycle of the ET Adoption Readiness Index 2024

The Digital Government Authority has worked on developing the mechanism for the second cycle of the Index after its announcement on February 9, 2023 by improving several elements to make them clearer and more comprehensive. The second cycle of the Index was launched in 2024 and targets several government entities, which were selected based on the following criteria

## 5.2 Sectors represented in the second cycle of the year 2024

Intern and foreign affairs and judicial sector	Environment, Water and Agriculture Sector	Education sector	Transport and logistics sector
Communications and Information Technology Sector	Public Finance Sector	Energy, industry and mining sector	Social Development Sector
Commercial Sector	Health and safety sector	Municipalities and Urban Development Sector	Tourism, sports and entertainment sector

5.3 Criteria for selecting entities included in the index cycle

Diversity and inclusion of sectors and government entities

Diversity of services provided to beneficiaries

Adoption and scalability of emerging technologies

Enabling emerging technologies:
Success stories at the sector level

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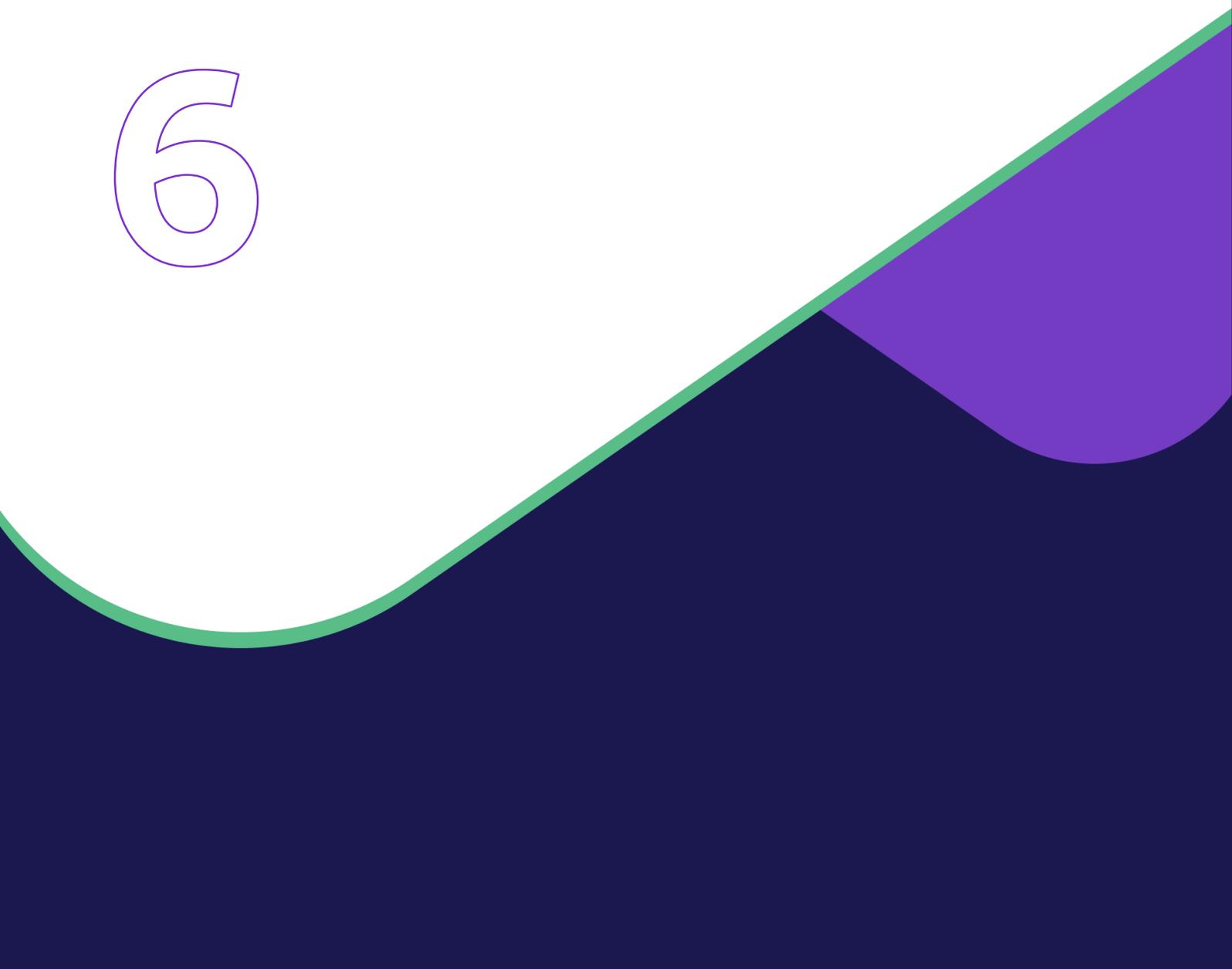
Interior and foreign affairs and judicial Sector

Interior and foreign affairs and judicial Sector

The **Ministry of Interior** has showed extensive digital transformation over the past decade, as it has benefited from the latest technologies with the aim of enhancing operational efficiency, providing advanced services to citizens, residents and visitors, simplifying operations and raising the level of comprehensive security procedures, ensuring the ministry's continuous technical progress.

Within the framework of this transformation, the "Absher Platform" emerged as a government digital platform, creating a pioneering success story in the field of digital services. Since its launch in 2010 to serve citizens and residents, this platform has redefined public services by following an innovative approach that focuses on the beneficiary. In addition to continuous improvement of the platform using the latest technologies. The success was reflected in the multiplicity of the platform's functions, as various services were collected in one easy-to-use platform to enable individuals to easily access a wide range of government services, simplify procedures, and reduce the time and effort required to complete them.

The Absher platform is distinguished by its adoption of the most prominent emerging technologies, as the platform integrates advanced features such as biometrics and facial recognition and helps enhance security and efficiency through user authentication processes. This type of technical innovation makes the Absher platform a model for modern and secure digital platforms. These initiatives also reflect a cohesive effort by the Ministry of Interior to optimally adopt technologies and raise the quality of services provided to its beneficiaries.

On the other hand, the Ministry of Foreign Affairs has embarked on a comprehensive digital transformation journey and demonstrated commitment to modernizing diplomatic operations and services, as this strategic initiative demonstrated the latest technologies to enhance operational efficiency, communications, and diplomatic outreach.

By using digital solutions, the **Ministry of Foreign Affairs** has succeeded in simplifying administrative procedures. This enhanced smoothness and efficiency of diplomatic interactions. The application of advanced communications technologies has facilitated real-time cooperation, both internally and with diplomatic missions around the world. And the digital approach not only accelerated decision-making processes, but also enhanced the Ministry's overall flexibility in responding to global developments.

These efforts included the important additions of automating the issuance of investor visas through robotic process automation. The robotic process automation system contributes to simplifying and accelerating the visa application process, thus making it easier for investors to plan trips within a short time frame and enhancing the ability to seize investment opportunities quickly.

RPA also contributes to reducing administrative fees, making travel to Saudi Arabia less expensive and thus increasing the number of incoming visitors. In addition, the system's ability to provide instant travel health insurance options from various providers adds another feature of convenience and customization.

Investors also benefit from the decision-making facilitated by the fast visa process, which provides a decisive competitive advantage. In turn, ease of access to Saudi Arabia could encourage a greater influx of foreign investment, driving economic growth. The Ministry of Foreign Affairs was able to facilitate many transactions by launching the "Vital Visa" service. This modern technology allows visitors to easily request a visa, as they can easily submit their requests via mobile applications. This service takes advantage of advanced technologies such as artificial intelligence, multiple methods for measuring fingerprint quality, and machine learning applications, which makes it more effective and easier, and contributes to improving the experience of Saudi Arabia visitors.

On the other hand, the Ministry of Justice's digital transformation initiatives are related to implementing innovative technologies to simplify legal procedures, facilitate dispute resolution, and improve comprehensive access to legal resources. By exploring automation in legal processes and considering the integration of artificial intelligence for advanced research and analysis, and through the strategic use of artificial intelligence tools, the ministry aims to enhance the accuracy and efficiency of legal decision-making and enhance the flexibility of the justice system in Saudi Arabia .

Success story

Simplifying and accelerating real estate document processes by adopting Optical Character Recognition (OCR) technology.

The Ministry of Justice's commitment to digital transformation extends to adopting the latest technologies, such as Optical character recognition, which has revolutionized the handling of Arabic texts in digitally archived real estate documents. Optical character recognition technology has contributed to simplifying and accelerating the processes of real estate documents and increasing the accuracy of extraction and verification of the information contained therein. Thanks to this advanced technology, it has become possible to improve the efficiency of administrative and legal work, and to provide more accurate and effective services to citizens and companies alike.

Beneficiary segment
- Auditors

Impact
- Increase productivity and reduce inspection time

Technology used
- Optical character recognition

Outcomes

900K
Scanned Pages

98%
Accuracy rate achieved

Commercial
Sector

Commercial Sector
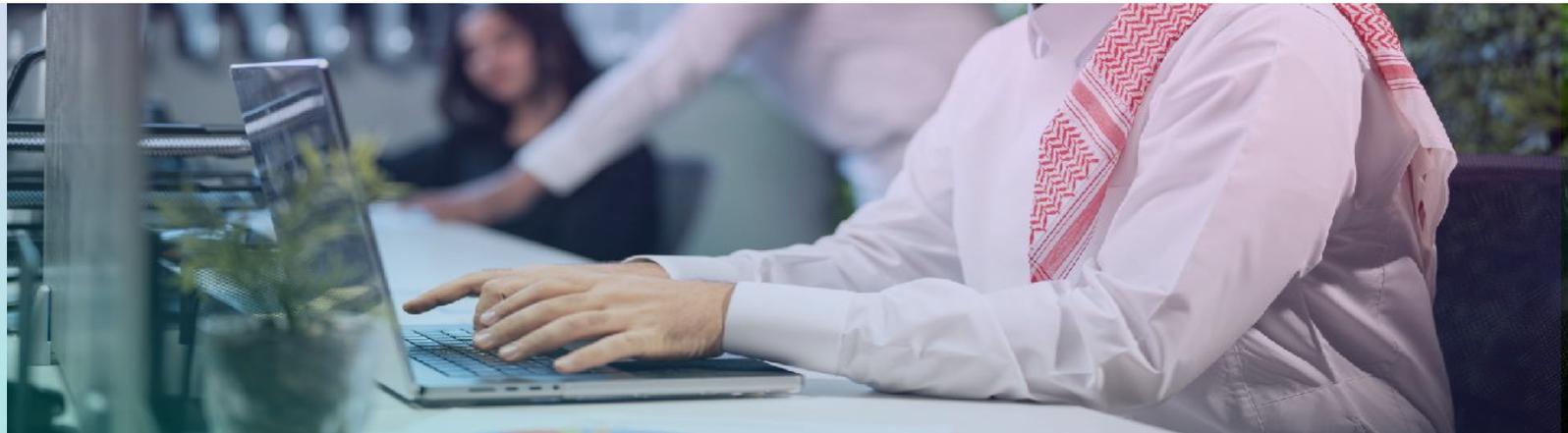
The **Small and Medium Enterprises General Authority (Monshaat)** plays a pivotal role in developing small and medium enterprises in Saudi Arabia . Within the framework of its mission to enhance competitiveness and contribute to economic growth, Monshaat provides financial support, advisory services, and training programs. Through workshops, mentorship initiatives and cooperation with various stakeholders, Monshaat has played an active role in many SME success stories, contributing significantly to creating job opportunities and promoting economic diversification. Recognizing the importance of emerging technologies, Monshaat works to support innovation within SME, with a focus on the adoption of digital tools. The Authority also ensures that small and medium enterprises have access to the latest technologies through strategic partnerships that make them able to thrive in a rapidly changing business environment. The Authority also launched the "WorkHunt" program, which allows companies to connect a supply and demand network, as hospitals use it to provide remote medical consultations, business incubators to provide consultations to incubates, and companies to connect their managers with employees remotely. This program contributed to an increase in customers and sales by 30%. The support provided by the "Thakaa" Center also helped organize the internal operations of the technical team by 50% and solve technical challenges. Which led to improved user experience and increased acquisition of more customers. This forward-looking approach enhances Monshaat role in nurturing the small and medium enterprise sector that is interested in technology and ready to take advantage of opportunities and contribute significantly to economic progress throughout Saudi Arabia .

Success story

Adopting "Thakaa centers" to empower institutions and entrepreneurs

Thakaa Centers (affiliated with Monshaat) operate as specialized centers in emerging technologies and focus on empowering institutions and entrepreneurs. These centers play a crucial role in achieving Saudi Vision 2030, by promoting innovative startups and improving the effectiveness of small and medium enterprises. While the centers specialize in driving technical innovation and promoting economic growth, they also work to stimulate the success of startups by providing them with essential support, resources and collaborative spaces. By creating an environment that encourages creativity and innovation, these centers contribute significantly to achieving the goals of Vision 2030, making Saudi Arabia play a amajor role in the global innovation scene. In addition, Thakaa Centers organize hackathon events in emerging fields, such as: the Internet of Things and cybersecurity, noting that these hackathons constitute dynamic platforms for individuals and teams to participate in collaborative problem solving, generating ideas, and developing experimental models.

Beneficiary segment
- Entrepreneurs
- SME owners

Technology used
- Internet of things
- Artificial intelligence and analytics

Outcomes

110+
Developed pilot models

45+
Established compagnies

Impact
- Thakaa Centers provide vital support, enhancing the growth of innovative startups.
- Thakaa Centers work to enhance the effectiveness of small and medium enterprises, thus enhancing economic growth and competitiveness in the market.
- Thakaa Centers lead efforts to raise Saudi Arabia's global standing through innovation and cooperation.

Communications and Information Technology Sector

Communications and IT Sector

Saudi Arabia has emerged as a leading global country in digital transformation within Vision 2030, as it has demonstrated a strong commitment to achieving the vision 2030 objectives, and this commitment is evident in developing the communications and information technology infrastructure, enhancing digital security, improving government services, and digital transformation on a large scale across vital sectors. The government has developed ambitious plans within its national transformation programs with the aim of strengthening the digital infrastructure and integrating technologies into routine operations, government operations and the economy. The **Communications, Space and Technology Commission** played a pivotal role in this success, especially as it launched initiatives that make use of artificial intelligence to monitor and address about 200 illegal signal boosters, affecting 1.4 million subscribers and contributing 11% of IMT tower revenues.

These efforts have created a highly reliable and interference-free network, significantly reduced dropped calls, and increased data connection speeds by 49%. This improvement enhances the overall user experience by raising the quality of service and communications efficiency throughout Saudi Arabia. At the same time, the Saudi Data and Artificial Intelligence Authority has become a driving force in leveraging data and artificial intelligence to achieve transformative results. Through a strategic focus on leveraging data, the Authority develops policies, strategies and initiatives related to artificial intelligence, unlocking new capabilities across various sectors. The "Estishraf" platform is one example of these initiatives that emphasize the efforts of the **Saudi Data and Artificial Intelligence Authority** in innovation and efficiency. It has achieved savings and revenues worth $51 billion, and more than 100 government entities have benefited from it. At the artificial intelligence and analytics, the Authority conducted analyzes of the social and economic impact in various sectors, which included assessing how resources were distributed and providing valuable insights in line with Saudi Arabia's Vision 2030. The Authority's efforts also extend to achieving spending efficiency and emphasizing its commitment to improving resources to achieve maximum of influence.

Through these initiatives, the Saudi Data and Artificial Intelligence Authority continues its efforts to enhance and accelerate the transformation of the Saudi digital landscape and ensure a sustainable and prosperous future through innovation and achieving strategic objectives.

In addition, the **King Abdulaziz City for Science and Technology** is a pioneer in employing emerging technologies to enhance innovation. It was established with the aim of promoting scientific research and technical development and has played an effective role in shaping the technical landscape in Saudi Arabia.

KAUST works to identify, sponsor and implement emerging technology projects that are compatible with Saudi Arabia's strategic objectives, with the support of specialized teams for emerging technologies. Along with dedicated departments and expert teams, KAUST demonstrates an unwavering commitment to remaining at the forefront of technological advancement.

As part of its commitment to strengthening the commercial sector for emerging technologies, KAUST has established strategic partnerships with technology industry leaders, including Google. It also cooperates with multiple programs and destinations, such as the Garage Accelerator Program; To support entrepreneurs in the field of technology and enable them to benefit from their capabilities effectively.

As for the Garage Accelerator program, it has been carefully designed to provide participating groups with the ideal environment, guidance, and comprehensive support necessary to achieve success. It is worth noting that this initiative succeeded in registering 49 startup companies across 3 groups and attracted talent and innovation from 8 diverse countries.

Success story

Identifying illegal signal boosters using AI techniques

The Communications, Space and Technology Commission played a major role in achieving and enhancing Saudi Arabia's global leadership in the field of digital transformation and innovation. Through initiatives such as monitoring illegal signal boosters using artificial intelligence, the authority ensures a reliable network; This reduces dropped calls and enhances communication efficiency in general.

Beneficiary segment
- All citizens and residents of Saudi Arabia

Technology used
- Artificial intelligence

Outcomes
%49 Improved communications

%54 Reduced customer complaints

Impact
- Enabling mobile network operators to save on network maintenance, troubleshooting and customer support costs

Education
Sector

Education Sector

The education sector in Saudi Arabia has witnessed sweeping transformations in recent years, reflecting Saudi Arabia's commitment to promoting knowledge, innovation and human development. With a strong focus on education as one of Vision 2030 pillars, the government has implemented various initiatives to raise the quality of education and prepare young people to face the challenges of the future.

One of key initiatives is comprehensive digital transformation in education and taking advantage of advanced technologies to enhance learning experiences. The **Ministry of Education** has launched interactive digital platforms and services to support students in their academic journey. Platforms such as "My Kindergarten" and "My School" provide diverse operating models for e-learning and distance education, ensuring accessibility and flexibility in educational delivery. In contrast, the virtual school meets the needs of students in remote areas, bridges geographical gaps, and promotes comprehensive education. Central examination platforms and information systems work to simplify administrative processes, contributing to efficient education management.

Digital transformation in the education sector in Saudi Arabia represents a forward-looking approach to education. By embracing technologies, the Ministry of Education not only enhances traditional learning methods, but also provides students with easier, more flexible and interactive learning opportunities.

Success story

Developing a "King Khalid University map" using GPS and augmented reality

King Khalid University underwent an important project to improve mobility within its new university city, and the advanced map was the focus of this innovative project. Advanced technologies such as indoor positioning, mobile applications and augmented reality were used to create the King Khalid University map that allows students and staff to pinpoint locations within buildings and get detailed directions. These pioneering technologies meet the needs of individuals with disabilities and newcomers, facilitating the transportation process and making it more comfortable and smoother in the modern university city of King Khalid University.

Beneficiary segment

- Students
- Faculty members
- Employees
- Visitors

Technology used

- Virtual Reality
- Mixed reality
- Augmented reality

Outcomes

80%
Improvement in beneficiaries' satisfaction rate

54%
Increased users benefiting from the chatbot since its launch.

Impact

- King Khalid University Map - The Internal Mobility Project is working to significantly improve mobility on the expanded King Khalid University campus. By taking advantage of augmented reality and internal GPS, it ensures accurate guidance, is particularly beneficial to users with disabilities, and enhances overall satisfaction.

Energy, industry and mining

sector

Energy, industry and mining sector

Saudi Arabia places great emphasis on energy, industry and mineral resources sectors, thus working to drive growth and promote economic diversification. Key entities, such as the Ministry of Energy, **the Saudi Authority for Industrial Cities and Technology Zones** (MODON), **the Ministry of Industry and Mineral Resources**, and the **Saudi Industrial Development Fund**, play essential roles in shaping and developing these vital sectors.

Vision 2030 is driving this transformation through a plan for economic diversification and sustainable development. The Ministry of Energy plays a major role in achieving this vision and gives priority to adopting emerging technologies in various sectors. On the other hand, the Ministry relies on renewable energy and digital transformation to improve operations, enhance transparency, and explores blockchain technology to simplify energy supply, while using advanced data analytics to improve resource allocations and forecast energy demand.

This proactive approach taken by the Ministry of Energy towards emerging technologies embodies its commitment to building a sustainable and innovative future for the energy sector in Saudi Arabia . By actively embracing these developments, the Ministry is setting a standard for government entities around the world, underscoring the enormous potential that emerging technologies hold in terms of revolutionizing traditional sectors and driving positive change. The Ministry has also achieved great success in improving power transmission across the GCC countries with artificial intelligence and transmission loss prediction solutions based on historical data and weather data as inputs.

As for the Saudi Authority for Industrial Cities and Technology Zones (MODON), it is committed to promoting economic development and sustainable growth and thus plays a crucial role in managing and developing industrial cities and technology fields. By focusing on providing an ideal economic environment, MODON follows a comprehensive approach to enhancing integrated services for industrial lands, ensuring their adherence to the highest international standards. One of the most important initiatives launched by "MODON" is the application of digital transformation and artificial intelligence in urban planning. In contrast, advanced scanning and asset modeling are used to design 3D maps, revolutionizing asset and infrastructure management. This approach provides a rich and interactive experience through virtual and augmented reality, helping investors discover growth areas and suitable locations and preventing costly mistakes. The project extends to inventorying assets in 22 industrial cities, displaying detailed geospatial data, and activating a central system to enhance efficiency. This use case was presented at the Saudi Food Manufacturing Exhibition under the supervision and sponsorship of "MODON", where this innovative approach resulted in enhancing performance and simplifying decision-making processes, which in turn contributed to attracting more than 100 investors as it reflects "MODON" commitment to advanced technologies for city marketing and efficient project management.

In an important step towards embracing the advanced industrial revolution, Saudi Arabia launched the "Factories of the Future FoF" program under the auspices of the Ministry of Industry and Mineral Resources, with the aim of supporting the industrial sector in Saudi Arabia over a period of 5 years, starting in 2022, with the aim of transforming 4,000 factories. By launching several initiatives, the Ministry of Industry and Mineral Resources is focusing its strategic focus on evaluating basic performance at the factory level, developing comprehensive transformation plans, and promoting the adoption of technologies. It is worth noting that these efforts bring together the Ministry and other partners in the system to ensure a comprehensive and effective approach to advancing the industrial sector in Saudi Arabia.

Success story

Local supply chain development initiative

The Ministry of Industry and Mineral Resources launched an initiative to promote the development of local supply chains, with the aim of creating interconnected, integrated and sustainable industrial networks. Its efforts included creating a comprehensive database and "platform" for analyzing products within industrial value chains and linking them through product coding and specifications. Through effective data monitoring, the initiative facilitates the analysis process and uses key performance indicators, including GDP growth, increased non-oil exports, and rising foreign direct investment, to evaluate potential investment opportunities. This strategic approach confirms the Ministry's commitment to improving and strengthening strong industrial supply chains.

Beneficiary segment
- Workers in the industrial ecosystem
- Investors
- Industrial researchers

Impact
- Increasing the rate of strategic products localization
- Identify opportunities for strategic product development
- Improve understanding of the economic impact of strategic products
- Increase the rate of identifying investment opportunities

Technology used
- Complex analysis processes
- artificial intelligence
- Blockchain

Outcomes

17 thousand industrial products
Enhancing the ability to analyze strategic products

9.4K detailed value chain
Store value chain data accurately and reliably

Environment, water and agriculture sector

Environment, water and agriculture sector

The Ministry of Environment, Water and Agriculture is at the forefront of using modern technologies to manage vital water resources and promote sustainable agriculture. Through strategic cooperation with universities, the Ministry of Environment, Water and Agriculture participates in partnerships that focus on targeted research areas that are in line with the objectives assigned to the Ministry. This reflects the Ministry's commitment to benefiting from academic expertise to address specific challenges and promote key initiatives in the areas of environment, water and agriculture.

On the other hand, the Saline Water Conversion Corporation (SWCC) operates desalination plants in Saudi Arabia. At the global level, SWCC is the largest producer of desalinated water in the world, with 6.6 million cubic meters per day to supply Saudi Arabia's cities and governorates and meet the water needs of the sacred sites. The Corporation operates 30 desalination plants with a production capacity of about 7.5 million cubic meters per day, in addition to 139 purification plants with a total capacity of about 4 million cubic meters per day, with the support of a team of more than 9,000 employees.

The growth of the Saline Water Conversion Corporation is fundamentally linked to the human element, as it is a pivotal factor that affects investment and strategic planning for future goals. While the organization is committed to adopting artificial intelligence and keeping pace with developments in the Fourth Industrial Revolution, it relies on virtual reality and augmented reality to train its workforce, enabling them to simulate operational processes, safety procedures, and diagnose faults. This approach enables engineers to effectively monitor, examine, and propose optimal solutions, while promoting creative thinking, skills development, and risk mitigation to ensure business continuity.

Success story

Using drone and artificial intelligence to address environmental challenges

The Saline Water Conversion Corporation is strategically leveraging emerging technologies, particularly drones, to enhance operational efficiency within its desalination plants. These smart terminals, a key component of the Fourth Industrial Revolution, integrate operational technology and information technology for self-diagnosis and fault alerting. The use of drone technology, combined with artificial intelligence, helps address environmental challenges such as the "jelly fish" phenomenon; Which enhances operational operations and also the commitment of the Saline Water Conversion Corporation to environmental control in the field of water desalination.

Beneficiary segment

- Employees of Saline Water Conversion Corporation

Impact

- Includes improving operational processes in safety and security.
- Enhancing maintenance and monitoring operations.

Technology used

- Drones
- Artificial intelligence

Outcomes

25%
increase in the ability to detect and analyze errors

5-10%
Improving the operational efficiency of stations

Public finance
Sector

Public finance Sector

The **Ministry of Finance** is the key agency responsible for managing the financial sector in Saudi Arabia , as it is mandated to formulate and implement financial policies, as it plays a major role in preparing budgets, monitoring the financial sector, and enforcing regulations, in addition to focusing on ensuring economic stability and transparency. As a major actor in the Saudi economic system, MoF contributes effectively to the strategic planning of the financial sector in line with the vision of economic diversification and comprehensive development. In contrast, the **National Center for Government Resources** is at the forefront of government entities using emerging technologies to radically change the decision-making process in the financial sector. The center's initiatives include using spatial intelligence and advanced data analytics to support place-related spending and investment decisions. Also, the center is committed to pioneering artificial intelligence solutions within the financial sector system, which is evident in the development of an artificial intelligence model that exceeded current standards in the distribution of spatial expenses by more than 40%. This success not only strengthened the position of the National Center for Government Resource Systems as a leader in the field of artificial intelligence-based innovations, but also facilitated the implementation of additional projects, an indication of the center's diversity and its influence on financial sector systems and the decisions made.

As for the **Zakat, Tax and Customs Authority**, it plays an important role in organizing and supervising tax-related matters, including zakat and customs. As part of the economic renaissance and digital transformation initiatives in Saudi Arabia, the Authority has adopted innovative solutions to enhance operational efficiency and compliance within Saudi Arabia. The application of electronic invoices in Saudi Arabia highlights a pivotal success story in the field of digital transformation. This initiative, which has revolutionized business processes, has completely automated the invoice issuance process and facilitated seamless sharing of invoices. Moreover, electronic invoices enhance transparency in transactions and contribute significantly to consumer protection. This progressive approach is consistent with Saudi Arabia's commitment to economic growth and digital progress.

The "E-Invoicing (Fatoorah)" program, which is the basis of the E-Invoicing initiative, has also achieved multiple benefits. At the financial level, it contributed to reducing bills, reducing concealment in the sector, increasing tax revenues, in addition to reducing the tax collection period, in addition to several benefits that were achieved for beneficiaries, including companies, such as: reduced administrative burdens and costs, improved transparency, and simplified tracking activities. The program promotes sustainability by reducing paper consumption and the risk of fraud associated with traditional billing procedures.

As a result, the "Fatoorah" program contributed to improving the Authority's operational environment, enhancing greater data reliability and accuracy, enabling new business models, and contributing to improving efficiency and speed. This success story confirms the modern and scalable approach taken by the Kingdom of Saudi Arabia in the field of electronic invoices, demonstrating its commitment to leveraging the latest technologies for the benefit of the economy and the business community.

The "Fatoorah" program has contributed to improving the Authority's operational environment, further enhancing data reliability and accuracy, enabling new business models, and contributing to improving efficiency and speed. The success story confirms the modern and scalable approach followed by Saudi Arabia in the field of electronic invoices. This demonstrates its commitment to leveraging the latest technologies for the benefit of the economy and the broader business community.

Success story

Using artificial intelligence technology to develop the user experience

The NCGR User Experience Lab is leading the transformation of user interactions through cutting-edge AI technology. Using innovative tools such as eye tracking and facial expression testing, the lab gains valuable insights into user behavior and emotions, facilitating optimal design improvements. This proactive approach has helped significantly increase user satisfaction, while promoting significantly improved product efficiency. The redesign of the ticket reservation service in the government transportation product also contributed to simplifying the reservation process. Which led to a noticeable decrease in user comments. The lab's initiatives emphasize the impactful fusion of artificial intelligence and user-centered design, which contributes to increased satisfaction and enhanced operational efficiency.

Beneficiary segment
- Users of NCGR products (government entities, private sector, and individuals)

Impact
- The laboratory's AI-based initiatives have significantly increased user satisfaction.
- By integrating artificial intelligence, the laboratory has succeeded in enhancing efficiency, streamlining processes and reducing resource consumption.

Technology used
- Artificial intelligence

Outcomes

90%
Increase in user satisfaction rate

75%
Improved product efficiency enhancement ratio

Health and
safety Sector

Health and safety Sector

Key players in the regulatory and healthcare landscape in Saudi Arabia , such as the Saudi Standards, Metrology and Quality Organization, the Saudi Food and Drug Authority, and the Ministry of Health, have strategically adopted digital transformation and benefited from emerging technologies that are reshaping their operating models. Regarding the Saudi Standards, Metrology and Quality Organization in particular, being the key standards-setting body in Saudi Arabia, it benefited from digital transformation to simplify and modernize its operations by building digital standards platforms, which in turn enhanced internal efficiency and provided companies with easy-to-use interfaces, which contributed to simplifying navigation. Through regulatory frameworks across diverse sectors. Likewise, the Food and Drug Authority, which works to ensure the safety and quality of food, medicines and medical devices, has integrated digital technologies to enhance its regulatory capabilities. In addition to their transformational initiatives, these key players have fostered a culture of innovation and collaboration through strategic partnerships with service providers and industry stakeholders. It also continues to explore cutting-edge solutions and keep up with the latest developments, so that its commitment to continuous research and development ensures that its digital ecosystems remain adaptable and flexible in the face of challenges.

These entities have also actively participated in public awareness campaigns to educate companies and the public about the benefits of emerging technologies in enhancing quality standards, ensuring food and drug safety, and improving access to healthcare. By enhancing the digital mindset and enhancing technical knowledge, the Saudi Standards, Metrology and Quality Organization, the Saudi Food and Drug Authority, and the Ministry of Health all contribute to achieving organizational success, in addition to broader societal understanding and acceptance of the digital transformation journey. This comprehensive approach makes Saudi Arabia a pioneer in leveraging technologies to improve regulatory practices.

Success story

Artificial intelligence model to predict diabetes

The Saudi Ministry of Health has succeeded in achieving a qualitative leap in improving health services by applying an artificial intelligence model to predict the incidence of diabetes. This step contributed to facilitating access to health services and improving the quality and efficiency of health care, in addition to enhancing prevention against health risks through a proactive screening service for beneficiaries with a high probability of contracting diabetes. This service was integrated with the services of primary care centers and family medicine programs, which led to enhancing comprehensive health care and achieving savings in health costs. The innovative use of technologies has enabled the Ministry to reach accurate rates of diagnosis and prediction, which has contributed to improving the quality of life for citizens and reducing the health burden on society.

Beneficiary segment
- Citizens

Impact
- Promoting the concept of using digital services to achieve proactive care via applications and digital platforms.
- Providing high-quality digital services that eliminate the need for the patient to go to the health facility to obtain health care.

Technology used
- Artificial intelligence
- Machine learning

Outcomes

53 cases identified
of a diabetic

990K
Proactive diagnosis of diabetes

Social Development Sector

Social Development Sector

The General Organization for Social Insurance, the Ministry of Human Resources and Social Development, and the Human Resources Development Fund are leading a technical revolution in social care.

At the forefront of this transformation, the General Organization for Social Insurance is strategically using digital platforms and data analytics to improve social insurance operations, ensuring rapid service delivery. On the other hand, the Human Resources Development Fund uses advanced technologies to empower the workforce through effective skills development and employment programs. These steps are in line with the commitment to systemic improvements, which is evident in the digitization of administrative processes and the adoption of data-driven policies. These entities work together within a cooperative system, making the social care sector in Saudi Arabia a global standard for progress, distinguished by its wise leadership in adopting technologies. Complementing this comprehensive technical approach, the Ministry of Human Resources and Social Development demonstrates a firm commitment to ensuring the well-being of the elderly in social care homes. Aware of the challenges faced by the elderly, especially those who suffer from difficulties in movement due to disability or old age, the Ministry is leading pioneering efforts that strategically take advantage of virtual reality technology and allow them to travel virtually and see parts of Saudi Arabia and the world.

In pursuit of this commitment, the Ministry engages in research, development, and design of innovative care methods to meet the unique needs and preferences of the elderly. While it proposes specialized project programs that suit the experiences of the elderly and their health conditions, the Ministry conducts extensive studies and cooperates with universities, centers and organizations specialized in elderly care.

In order to mitigate the impact of limited movement and difficult living conditions faced by the elderly, the Ministry is implementing a humanitarian initiative based on virtual reality technology, through which it provides an immersive experience that enables the elderly to travel virtually and explore various regions within Saudi Arabia and around the world. The content has been carefully curated to include visits to religious monuments, combining entertainment with psychological well-being.

By adopting this forward-looking approach, the Ministry of Human Resources and Social Development affirms its comprehensive commitment to the elderly. By seamlessly integrating technologies to enhance social care services, the Ministry embodies its dedication to providing comprehensive and compassionate support to this vital segment of society. This integrated approach ensures a more enriched and fulfilling life for elderly individuals in social care homes, reflecting the Kingdom of Saudi Arabia's dedication to leveraging innovation to improve the lives of its citizens.

On the other hand, the General Organization for Social Insurance is a pioneer in customer service with "Ameen," a digital human built using artificial intelligence. "Ameen" communicates seamlessly via voice and video tech, providing instant responses to customer inquiries without any restrictions on any category. By utilizing artificial intelligence and linking with Absher, Ameen provides accurate information about the insurance system while easily adapting to the diverse dialects of customers.

In addition to communicating information, Ameen guides customers with infographics, service links and educational videos, and offers personalized self-service options. "Ameen" impact extends to reducing costs and ensuring the availability of services 24 hours a day, 7 days a week, in addition to increasing operational efficiency.

In addition to the transformation in customer service brought about by the digital human "Ameen" through the comprehensive services it provides across categories, the General Organization for Social Insurance has used generative artificial intelligence technology, which in turn achieves an accuracy rate of up to 85%, which contributes to enhancing digital trust. Thus, through this work, GOSI is showcasing the power of artificial intelligence and digital interaction to redefine efficiency, accessibility and customer satisfaction in social insurance.

Success story

Assessing individuals' eligibility for social support using machine learning and artificial intelligence techniques

The Ministry of Human Resources and Social Development leads a proactive social support system that combines artificial intelligence and machine learning technologies to determine an individual's eligibility to benefit from social services, such as support, social protection, and security pension, in accordance with the conditions and controls specified in the social security system. Eligibility is evaluated accurately and quickly using machine learning and artificial intelligence techniques, enhancing efficiency and accuracy in the decision-making process. The proactive system is based on a model trained on 1 billion records, which facilitates the estimation of security pensions and improves the quality of social services. This integrated strategy reflects the Ministry's commitment to innovation and its vision for the future, as artificial intelligence plays a pivotal role in improving social development models and raising the level of services provided to citizens.

Beneficiary segment
- Beneficiaries of social care

Impact
- Evaluating individuals' eligibility for social services accurately and effectively contributes to enhancing the quality of services and improving the efficient direction of resources to groups with actual needs.

Technology used
- Artificial intelligence
- Machine learning

Outcomes

%99
rate of effective data processing and results extraction

5+ millions
rate of effective data processing and results extraction

Tourism, sports and entertainment Sector
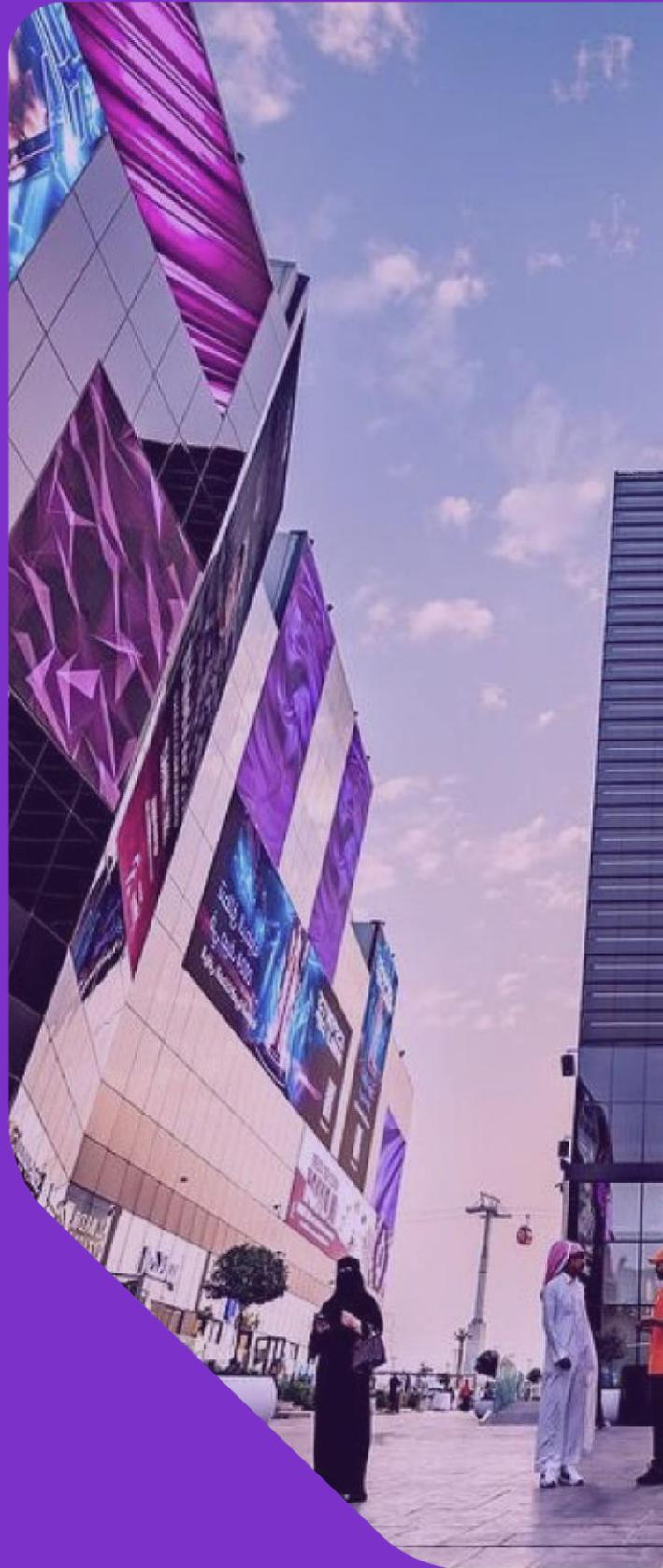
Tourism, sports and entertainment Sector
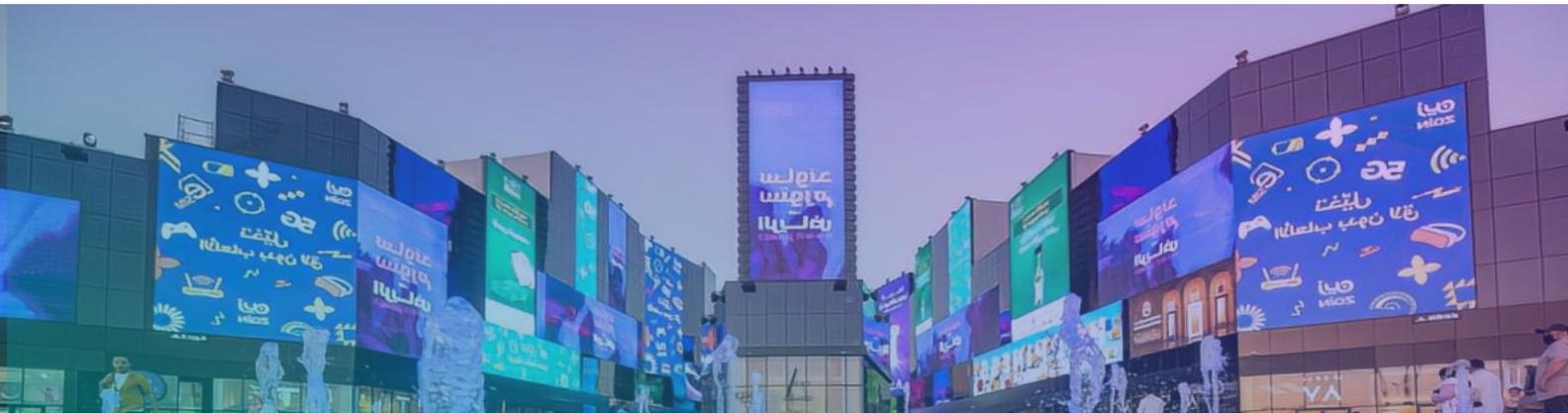
In line with Vision 2030 and efforts to transition from oil-based economy to non-oil-based economy, government entities in the sector such as the **Ministry of Tourism**, the Saudi Tourism Authority, the **General Entertainment Authority**, the **Ministry of Sports**, the **Ministry of Culture**, the **Ministry of Media**, and the **General Authority of Media Regulation** are collaborating and leading the direction of innovation and Economic growth and cultural development. Together, these entities embody the transformative spirit of Vision 2030 by harnessing emerging technologies.

The General Entertainment Authority is a pioneer in reshaping the entertainment sector, given its pivotal role in the non-oil economy. By taking advantage of advanced technologies, the Authority offers immersive experiences, virtual activities and digital platforms, providing a technologically advanced entertainment system. This strategic step contributes to diversifying revenue sources and disseminating cultural stories, in line with Vision 2030 objectives.

On the other hand, the Ministry of Tourism makes Saudi Arabia a leading tourist destination thanks to the strategic use of advanced technologies. Initiatives such as virtual tours, AI-based "travel assistants," and smart tourism play a crucial role in enhancing the overall visitor experience. Recognizing the importance of maintaining high-quality hospitality services, the Ministry's inspection team uses artificial intelligence and big data models to monitor violations and direct inspections based on tourists' comments, in addition to predicting potential future problems and providing proactive insights. This approach not only supports hospitality standards, but also ensures a smooth and enjoyable experience for the millions of tourists who visit Saudi Arabia annually.

The harmony between leveraging technologies to enhance the visitor experience and adopting artificial intelligence and big data for precise monitoring would confirm the commitment of these parties, as this multifaceted approach is consistent with the economic diversification goals of Vision 2030, which contributes to the growth of the non-oil sector and enhances the Kingdom of Saudi Arabia's position as a leading global tourist destination.

In its relentless pursuit of sporting excellence and creating a thriving sports sector, the Ministry of Sports integrates the latest technologies, with a special focus on digital stadiums. By embracing innovations from analytics to wearable devices and digital engagement platforms, technologies are being used strategically to enhance athlete performance and revolutionize the fan experience, thus gaining a global position in the sporting events ecosystem. These efforts are closely aligned with the core goals of Vision 2030, which are to promote a healthy and active society and contribute significantly to economic diversification.

The Ministry of Culture takes a leading role in the approval process for book publishing permits, incorporating cutting-edge technologies to ensure compliance with rules and regulations. Using AI technologies, every book received is automatically reviewed by the AI engine, analyzing the text and understanding the context. The results of the analysis are provided to the responsible party, indicating possible violations or inappropriate content based on pre-defined rules.

Books publication permits relies on the latest automation and artificial intelligence technologies to simplify procedures. The system establishes connections between various necessary systems, including access, active directory, and library systems. When a new book arrives, it is automatically directed to the AI engine to conduct a comprehensive review using text analysis and context understanding in both Arabic and English. The analysis results are then presented to system users, identifying any violations or inappropriate content based on previously defined rules within the engine.

And by enabling system users to make decisions about these situations, including accepting, rejecting, or modifying the meanings of words, the artificial intelligence engine integrates machine learning technology to continuously improve its handling of such situations. In return, the Ministry of Culture protects Saudi Arabia's cultural heritage and makes use of technologies to preserve it and provide access to it. Initiatives such as virtual museums, augmented reality-based exhibitions and digitization efforts contribute to showcasing the country's cultural richness globally, in line with Vision 2030's focus on cultural development for a diverse and vibrant economy.

These entities, along with the Ministry of Media, the General Authority of Media Regulatory and the Saudi Tourism Authority, embody the forward-thinking strategies required to move Saudi Arabia towards a prosperous non-oil economy. By using emerging technologies innovatively, the entities contribute to achieving the Vision 2030 objectives regarding economic and cultural transformation in Saudi Arabia.

Success story

Enhancing the digital experience for People with special needs using innovative tools

The Ministry of Culture's initiative "Enhancing the Digital Experience for People with special needs" used innovative tools such as the animated avatar to revolutionize digital accessibility. Aligned with universal design principles, this initiative has created user-friendly interfaces that meet a variety of specific needs. The Ministry's success was clear in terms of changing user behavior and promoting the shift towards digital services for people with special needs. The most prominent points included in this initiative are improving access to programs, which demonstrates the Ministry's commitment to breaking digital barriers and promoting inclusivity.

Beneficiary segment
- People with special needs

Impact
- This initiative has significantly contributed to increasing public access to digital services and has led to enhanced inclusivity.

Technology used
- Artificial intelligence
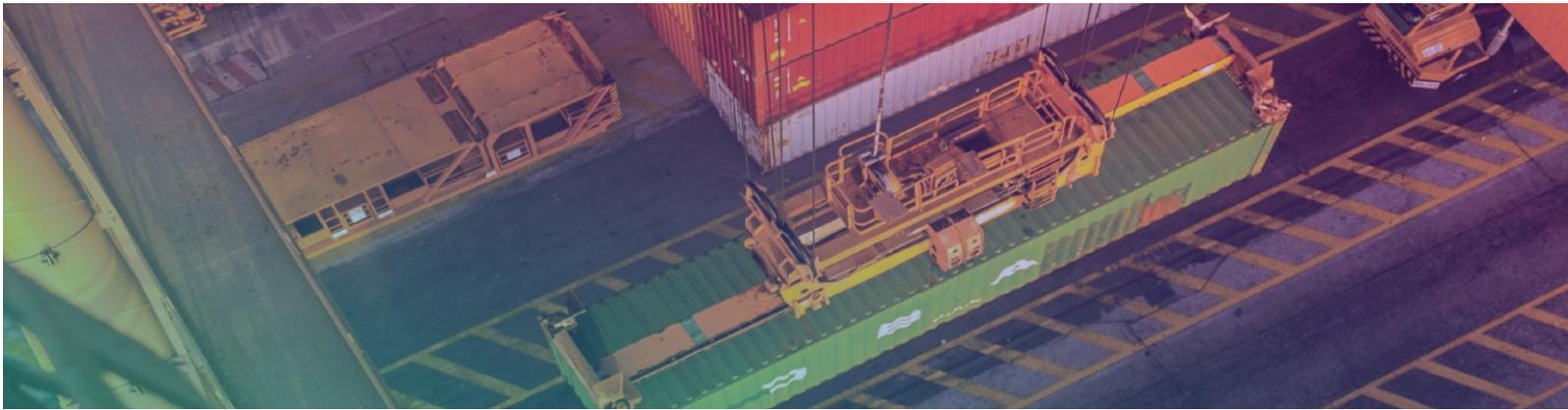- Virtual Reality

Outcomes
- Increase ease of access
- Promoting independence for people with special needs

Transport and logistics Sector

Transport and logistics Sector

The **Ministry of Transport and Logistic Services** s is cooperating with **Saudi Post** and the **Transport General Authority** to bring about a qualitative shift towards digital innovation in the transport sector, which is witnessing widespread development in Saudi Arabia . It is expected that these efforts will contribute to reshaping traditional methods, enhancing operational efficiency, and raising the quality of transportation services throughout Saudi Arabia.

The Ministry's autonomous vehicle project represents a major step towards enabling autonomous vehicles and emerging technologies in Saudi Arabia alongside these endeavors. This initiative aims to improve the quality of life through autonomous vehicle experiments, address congestion, and provide various transportation opportunities. This forward-looking initiative represents a solution for urban areas and airports as it provides convenient and sustainable public transportation options and thus promotes efficient and environmentally friendly mobility solutions.

As all three move towards reshaping the transport landscape, the autonomous vehicle project, in particular, lays a strong foundation for accelerating the adoption of autonomous vehicles. This confirms the Ministry's commitment to innovation and places Saudi Arabia at the forefront of the global movement towards autonomous and digitally advanced transportation systems. Together, these initiatives constitute a success story that reflects the nation's dedication to setting new standards of efficiency, safety and accessibility, in line with the goals of Vision 2030.

Success story

| Using smart solutions in a project to transform lighting infrastructure and address road safety

The Ministry of Transport and Logistics services launched a project to transform lighting infrastructure and address road safety and energy sustainability. This journey towards smart, energy-efficient solutions has in turn reshaped the landscape and become a beacon of success in smart transportation to combat the rising costs of traffic accidents. The Ministry repaired lighting systems in pursuit of a comprehensive solution in line with national strategies for digital transformation and adoption of renewable energy through cooperation with technology pioneers. The Ministry has developed a core smart lighting solution that includes IoT-based sensors and solar energy. These units have been carefully designed to suit all regions, and represent a qualitative leap in sustainable, technology-based transportation and a model to be emulated at the national level.

Beneficiary segment

- The public

Impact

- Enhancing operational procedures through a map of advanced technologies and integration
- Supporting maintenance spending decisions with high efficiency
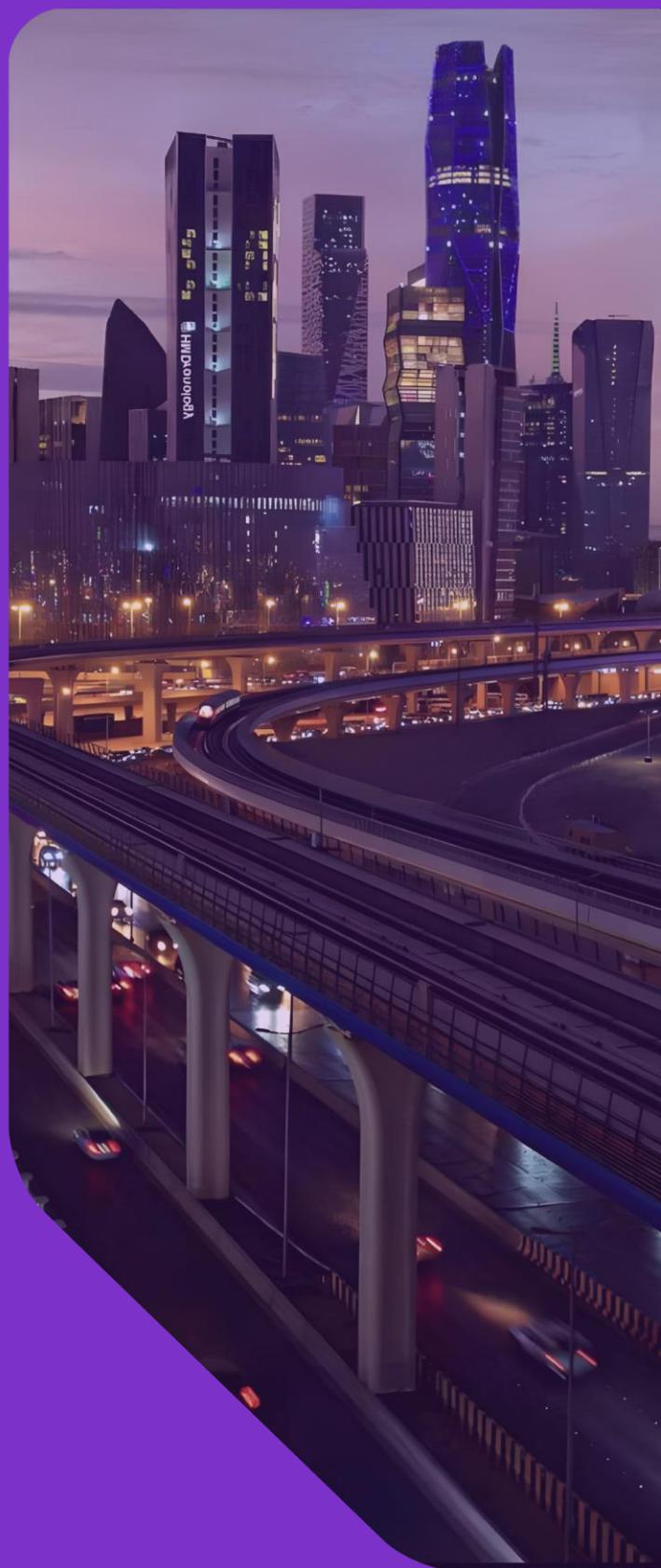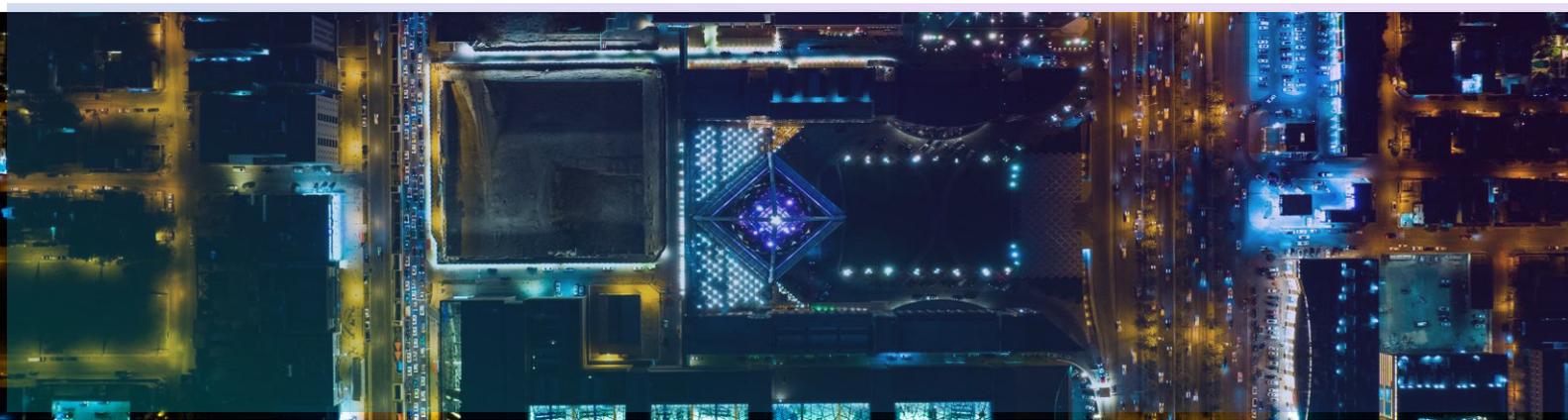
Technology used

- Internet of things

Outcomes

%93
Reduction in monitoring and supervision costs

%92
Reduction in traffic accident deaths

Municipalities and urban development
Sector

Municipalities and urban development Sector

In recent years, Saudi Arabia has showed a major transformation in management of Hajj and Umrah as key government entities have adopted new technologies. For example, the **Ministry of Hajj and Umrah** is leading the field of digital innovation through the provision of E-services and mobile applications, simplifying Hajj permit issuance procedures thanks to E-procedures for submitting applications, document sharing and real-time updates. Its role is not only to enhance communication, but also to improve the organization Hajj visitors. On the other hand, **Real Estate General Authority** is a pivotal force in shaping the real estate landscape in Saudi Arabia . It establishes and implements policies based on fairness and transparency that govern real estate activities, and monitors key indicators, market trends and property values to maintain a stable and sustainable real estate market. At the same time, the **Ministry of Municipal and Rural Affairs and Housing** initiated a pioneering initiative to monitor cities using drones. This initiative aimed to establish digital urban surveillance that would allow monitoring visual distortions and encroachments on public property and facilities.

The **Ministry's initiative** also leveraging the AI technology and machine learning algorithms to conduct advanced image analyzes to quickly identify and treat cases. This innovative approach has dramatically reduced reliance on manual and field monitoring, replacing it with a proactive monitoring system that anticipates potential problems and addresses them in real time. The seamless integration of drones and AI engines allows visual distortions to be automatically recognized, triggering instant alerts that are sent to the processing system for quick action. The ministry's initiative not only sets a new standard in urban monitoring, but also aligns with Saudi Arabia's broader commitment to leveraging technologies to enhance urban living conditions. The collective efforts of these government agencies demonstrate a clear and coherent strategy that works to harness technologies for the benefit of citizens and visitors alike.

Success story

Aerial photography and real estate map creation

The Real Estate General Authority is leading a pioneering initiative to revolutionize the real estate sector in Saudi Arabia through a comprehensive digital map. Using advanced aerial photography, the authority covers a diverse range of properties, thus confirming its commitment to enhancing efficiency and accuracy in property management using artificial intelligence to examine the quality of maps. This collaborative effort represents a milestone in the digital transformation of the real estate landscape, demonstrating the Authority's endeavors to achieve technical progress and improve services for real estate owners.

Beneficiary segment
- Real estate owners

Impact
- Promoting the real estate sector by ensuring accuracy and comprehensive coverage, which contributes to facilitating transactions, resolving disputes, and encouraging innovation in services and products.

Technology used
- Drones and artificial intelligence

Outcomes

%80
Increase in operational efficiency

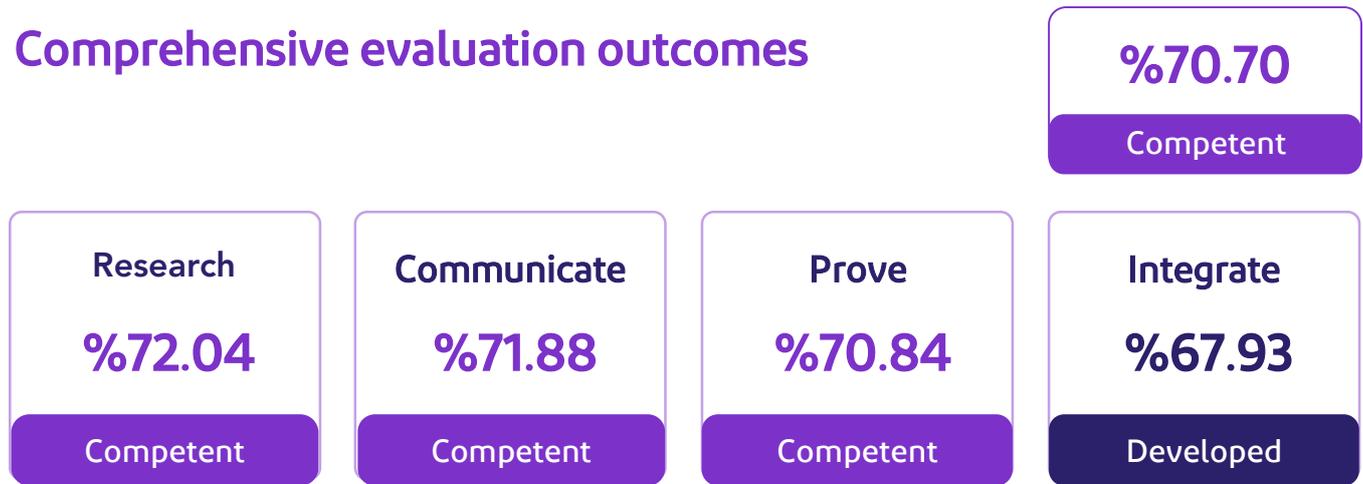%100
The accuracy rate achieved

Summary of government entities general evaluation and results

7

7. Summary of government entities general evaluation and results

Comprehensive evaluation outcomes

%70.70
Competent

Research	Communicate	Prove	Integrate
%72.04	**%71.88**	**%70.84**	**%67.93**
Competent	Competent	Competent	Developed

The overall result of the 2024 second cycle Emerging Technologies Adoption Readiness Index was (70.70%) at the "**Competent**" level, which included (35) government entities, according to the capabilities, elements and standards referred to in the report, and the results showed that these entities have developed most of its capabilities to adopt emerging technologies and they are ready to excel and deliver an innovative and integrated experience.

Government entities achieved (72.04%) in the "**research**" capability, reaching the "**Competent**" level. This reflects the entities' interest in analyzing and updating use cases and studying the required value and expected risks according to their directions, as well as aligning them with their strategic goals, and enabling internal teams to create and innovate by leveraging the emerging technologies.

On the other hand, government entities showed in the 71.88% in "**communication**" capability at the "**Competent**" level, and this indicates their ability to communicate the information through the media by organizing and sponsoring local and international conferences, exhibitions, forums and summits to focus on efforts and national achievements, as well as hosting the most prominent speakers in the fields of various technologies, especially emerging technologies.

Regarding the " **Prove** " capability, government entities achieved an "**Competent**" level of (70.84%). This indicates that government entities are continuing the journey of innovation, modeling, and development to verify the validity of initial concepts and products that can be developed and expanded, including seeking to diversify cases. Use and make it available to beneficiaries, improving the experience, and increasing efficiency.

As for the level of "**integrate**" capability, government entities achieved (67.93%) to reach the "**Developed**" level, which indicates that the entities realize the importance of strategic innovation in emerging technologies and are working to integrate them with their digital transformation and information technology strategies. They also constantly improving and developing prototypes to scale up, launch and communicate them mainly at the national level.

In conclusion, the Authority praises the efforts made by all government entities represented in the second cycle of the evaluation and their influential role in achieving a proactive digital government capable of keeping pace with the latest advanced and innovative technologies.

Summary of results of entities represented in the 2024 second cycle of Emerging Technologies Adoption Readiness Index

Classification	Government Agency	Percentage	Readiness level
1	Communications, Space and Technology Commission	%91.38	Exceptional
2	Saudi Authority for Industrial Cities and Technology Zones "MODON"	%91.21	Exceptional
3	Ministry of Energy	%87.54	Advanced
4	Ministry of Municipal and Rural Affairs and Housing	%86.60	Advanced
5	Saudi Authority for Data and Artificial Intelligence	%86.29	Advanced
6	Saudi Standards, Metrology and Quality Organization	%82.86	Advanced
7	Ministry of Industry and Mineral Resources	%81.60	Advanced
8	Food and Drug General Authority	%79.31	Competent
9	Saline Water Conversion Corporation	%77.65	Competent
10	Real Estate General Authority	%77.33	Competent
11	Ministry of Finance	%76.92	Competent
12	Ministry of Culture	%76.81	Competent
13	Small and Medium Enterprises General Authority	%76.29	Competent
14	Zakat, Tax and Customs Authority	%76.08	Competent
15	Ministry of Justice	%75.77	Competent
16	King Abdulaziz City for Science and Technology (KACST)	%75.25	Competent
17	Ministry of Human Resources and Social Development	%74.52	Competent
18	Ministry of Health	%73.17	Competent
19	Saudi Tourism Authority	%71.81	Competent
20	Ministry of Transport and Logistics Services	%71.29	Competent
21	Ministry of Tourism	%70.31	Competent

Summary of results of entities represented in the 2024 second cycle of Emerging Technologies Adoption Readiness Index

Classification	Government Agency	Percentage	Readiness level
22	Saudi Human Resources Development Fund	%68.94	Developed
23	General Organization for Social Insurance	%68.63	Developed
24	Ministry of Foreign Affairs	%66.96	Developed
25	Ministry of Interior	%66.02	Developed
26	Ministry of education	%64.56	Developed
27	Ministry of Environment, Water and Agriculture	%62.17	Developed
28	Ministry of Sports	%61.85	Developed
29	General Entertainment Authority	%59.46	Developed
30	Saudi industrial development fund	%55.44	Developed
31	Ministry of Hajj and Umrah	%54.15	Developed
32	Ministry of Media	%52.79	Developed
33	Saudi Post	%50.19	Developed
34	General Authority for Transport	%47.90	Developed
35	General Authority of Media Regulation	%34.35	Emergent

Research

The Communications, Space and Technology Commission, the Saudi Authority for Industrial Cities and Technology Zones (MODON), and the Saudi Data and Artificial Intelligence Authority excel in researching emerging technologies by focusing strategically on trends, technologies, potential value and risks. These entities maintain their leading position by allocating resources efficiently, following innovative organizational practices, and adopting a culture of talent enhancement. These entities give priority to cooperation, which enables them to benefit effectively from collective expertise. In the other hand, identifying opportunities is a core strength, supported by organizational practices and a culture of promoting innovation. In addition, a rigorous value analysis ensures alignment with national objectives, while an effective risk analysis framework allows challenges to be addressed proactively.

Communicate

The Communications, Space and Technology Commission, the Ministry of Energy, and the Ministry of Municipal and Rural Affairs and Housing all demonstrate exceptional communication ability, as the segments of society they communicate, interact with, and educate are diverse as well. And by following specific organizational practices and promoting talent growth, these entities achieve positive results and identify community-driven opportunities. They also excels at identifying and promoting partnerships and sponsors, maintaining effective communication and ensuring ongoing engagement and positive results.

Prove

The Communications, Space and Technology Commission, the Ministry of Energy, and the Saudi Standards, Metrology and Quality Organization
address the key elements related to technology trials by conducting trials effectively to demonstrate their commitment to regulatory practices and talent development to stimulate technical innovation. In addition, entities demonstrate the feasibility of technologies and evaluate their cultural suitability to ensure seamless integration of technologies with processes and alignment with organizational culture. Finally, entities form a comprehensive approach to the technology implementation process by looking at the compatibility of the available architecture with the requirements for implementing the technologies and the extent of their expected impact and the efficiency of departments' operations and their ability to provide value-added services.

Integrate

The Communications, Space and Technology Commission, the Saudi Authority for Industrial Cities and Technology Zones - MODON, and the Ministry of Municipal and Rural Affairs and Housing are showcasing the integration of advanced emerging technologies by prioritizing customized innovation and achieving tangible results in the near term. These entities are also actively engaged in understanding and integrating emerging technologies strategically, while demonstrating their commitment to technology-based innovation to ensure the long-term scalability and success of emerging technology projects and initiatives.

Top 3 developed entities compared to their results in 2023 first cycle

الهيئة العامة للغذاء والدواء
Saudi Food & Drug Authority

وزارة الـثـقـافـة
Ministry of Culture

وزارة السـياحـة
Ministry of Tourism

1st place	**2nd place**	**3rd place**
▲ 36.56%	▲ 29.81%	▲ 19.31%

الهيئة العامة للغذاء والدواء
Saudi Food & Drug Authority

The Saudi Food and Drug Authority achieved significant developments in enhancing its capabilities at the level of research, communication, prove, and linking emerging technologies, as it focused on basic elements such as researching trends and technologies, assessing potential value and risks, implementing educational initiatives through communities and partnerships, and demonstrating the development of technologies, talent, and culture. In addition to promoting customized innovation and strategic innovation from a technology-based perspective. The Saudi Food and Drug Authority witnessed a significant improvement in its scores, rising from 42.75% to 79.31% over the past year, which confirms its response to the recommendations related to progress and technical development emerging from the previous year's evaluation.

وزارة الـثـقـافـة
Ministry of Culture

Ministry of Culture has made significant progress and improvement, especially in strengthening its exceptional research and communication capabilities, highlighting the Ministry's commitment to promoting innovation in diverse fields. Including improvements in value and risk analysis, partnerships/sponsorship. Both abilities improved by 26% in research and 50% in communication.

وزارة السـياحـة
Ministry of Tourism

Ministry of Tourism showed significant improvement in its capabilities by prioritizing integration capabilities through customized, strategic and technology-driven innovation. In addition, significant improvements have been made in the areas of education, partnerships, technology experiments, and finally in talent and emerging technology culture at the ministry level. This intensive work led to significant progress over the past year, as most capabilities were raised by two levels, moving from sophisticated or proficient to advanced. The overall progress is reflected in the increase achieved by the Ministry from 51% to 70.31% in its overall score.

هيئة الحكومة الرقمية
Digital Government Authority