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MEASURING THE IMPLICATIONS OF
AI ON THE ECONOMY

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STATISTICS

Forecasting the Digital Economy: Saudi Arabia's Roadmap for AI-Driven Growth

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AI adoption in Saudi Arabia

Saudi Arabia's National AI Strategy: Milestones & Global Standing

- **AI Strategy Launch**: National AI Strategy was initiated to position Saudi Arabia as a global AI leader, with a special focus on Arabic language technology.

- **Global Ranking Achievements (2024)**:

1st in Government Strategy for AI

10st in AI capacity globally

14st in the Tortoise Global AI Index

- **Institutional Initiatives:**

SDAIA & SCAI (PIF) drive national AI projects.	**G20 Leadership**: Led AI agenda in the 2020 G20 summit, proposed a UN AI Advisory Body.	Host of the **Global AI Summit in Riyadh** with ITU, World Bank, and UNESCO partnerships.	Launched **AI Readiness Framework** and **International Center for AI Research and Ethics** in collaboration with UNESCO.

AI Ecosystem, Technological Advancements & Education

- **Generative AI & Public-Private Collaborations:**
  - SDAIA Guide on LLMs for **public awareness**.
  - Partnerships with NVIDIA and Deloitte for **regional AI excellence**.
  - ALLaM (**Arabic LLM**) hosted on platforms like Azure and IBM Watson.

- **Technological Achievements:**
  - Estishraf Platform saved over SAR **50 billion** (USD 13.3 billion).
  - Tawakkalna App: **17.9 million users** and 240+ services.
  - Nafath Platform: **1.8 million daily** digital verifications.

- **Entrepreneurship & Sector Integration:**
  - GAIA Accelerator (2023): **USD 160 million** to support 120 AI startups.
  - Generative AI in sports: Used by NEOM McLaren Formula E and STC for **real-time content**.

- **Education & Research:**
  - KAUST Gen AI Center of Excellence: **Hosts top researchers** in AI.
  - Shaheen III **Supercomputer** supports LLM development.
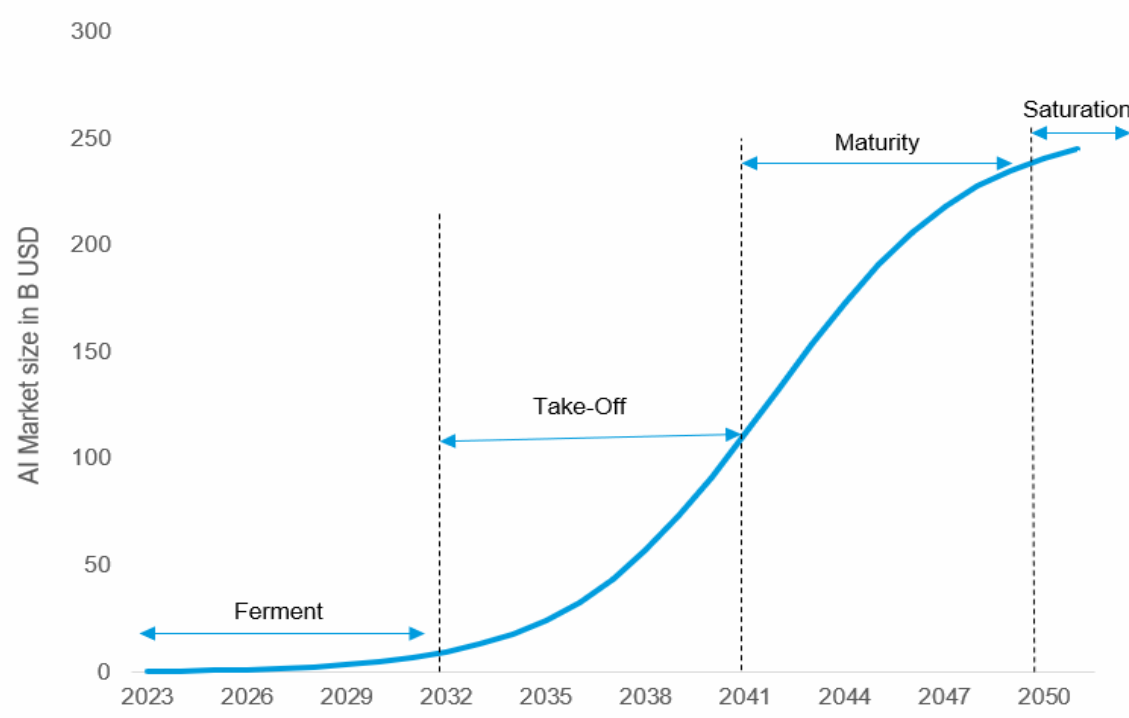 - AI courses integrated into **school curricula** for **future readiness**.

AI generated image
Immersive tourist experience in Al Ula.

ABNASIA.ORG

The measurement model

AI Market Size in KSA

The Technology Adoption Life Cycle (TALC)

- The Technology Adoption Life Cycle (TALC) stands as a model frequently employed to outline the adoption trends of pioneering technologies reflecting an S-shaped curve in its evolution (Stanford, 2023).

- **S-Curve Market Size Growth Equation:**

$$M(t) = \frac{TAM}{1 + be^{-kt}}$$

where,

- **TAM**: Total Addressable Market,
- **K:** Growth Constant,
- **B:** Integration Constant,
- **t:** time (in years).

- **Data**:
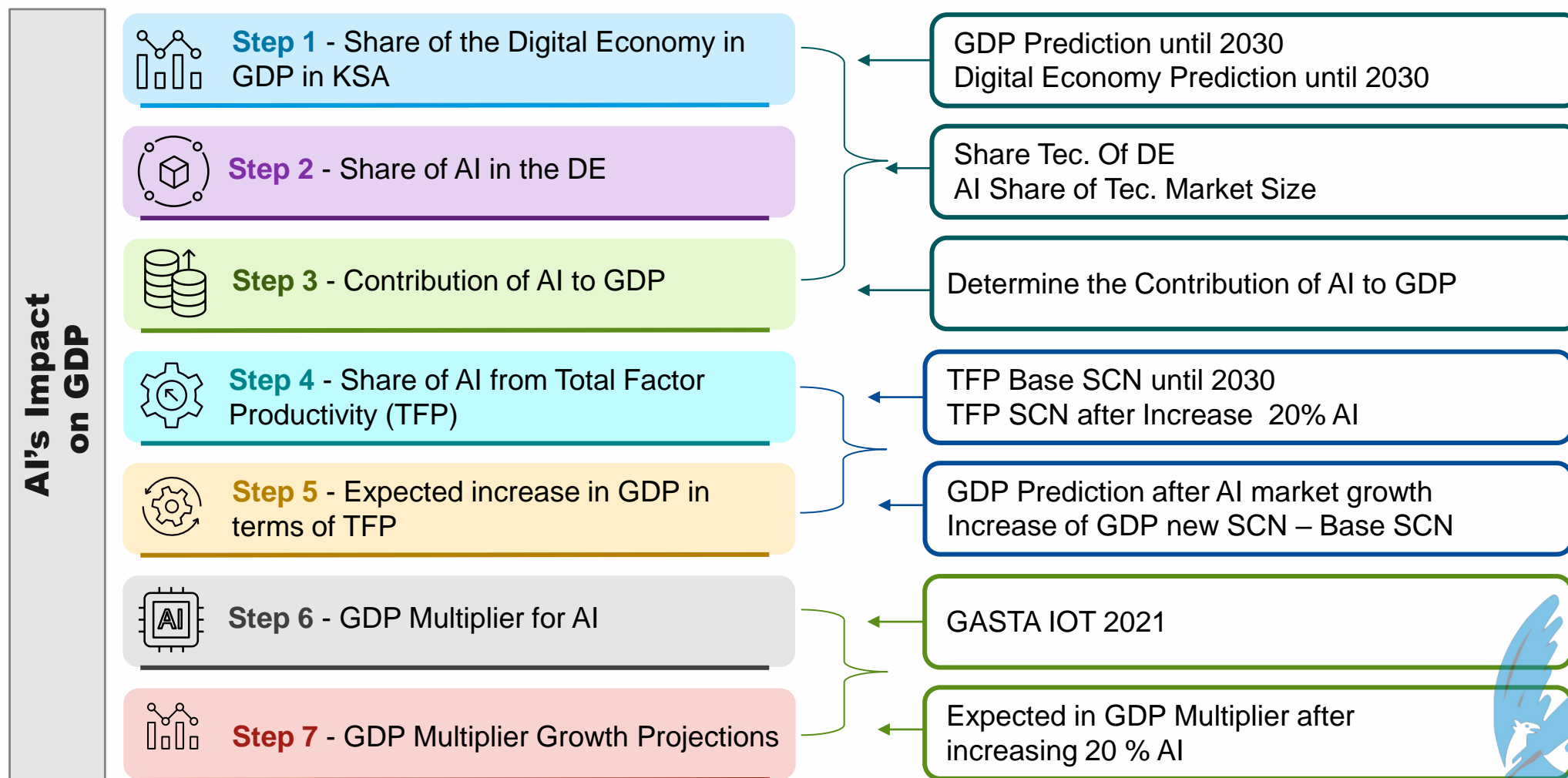 - The AI market size in Saudi Arabia was approximated to be around **USD ~513 million in 2023** and is anticipated to escalate to approximately **USD ~5.1 billion by 2030**. (IDC)
  - TAM, top down approach based on experts view and estimated as **USD 257 billion on 2050**.

- **Result**:
  - The AI market size is expected to grow at 25.3% CAGR to reach around USD 241 billion by 2050.

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Foresight Methodology

AI's Impact on GDP

Step 1 - Share of the Digital Economy in GDP in KSA

GDP Prediction until 2030
Digital Economy Prediction until 2030

Step 2 - Share of AI in the DE

Share Tec. Of DE
AI Share of Tec. Market Size

Step 3 - Contribution of AI to GDP

Determine the Contribution of AI to GDP

Step 4 - Share of AI from Total Factor Productivity (TFP)

TFP Base SCN until 2030
TFP SCN after Increase 20% AI

Step 5 - Expected increase in GDP in terms of TFP

GDP Prediction after AI market growth
Increase of GDP new SCN – Base SCN

Step 6 - GDP Multiplier for AI

GASTA IOT 2021

Step 7 - GDP Multiplier Growth Projections

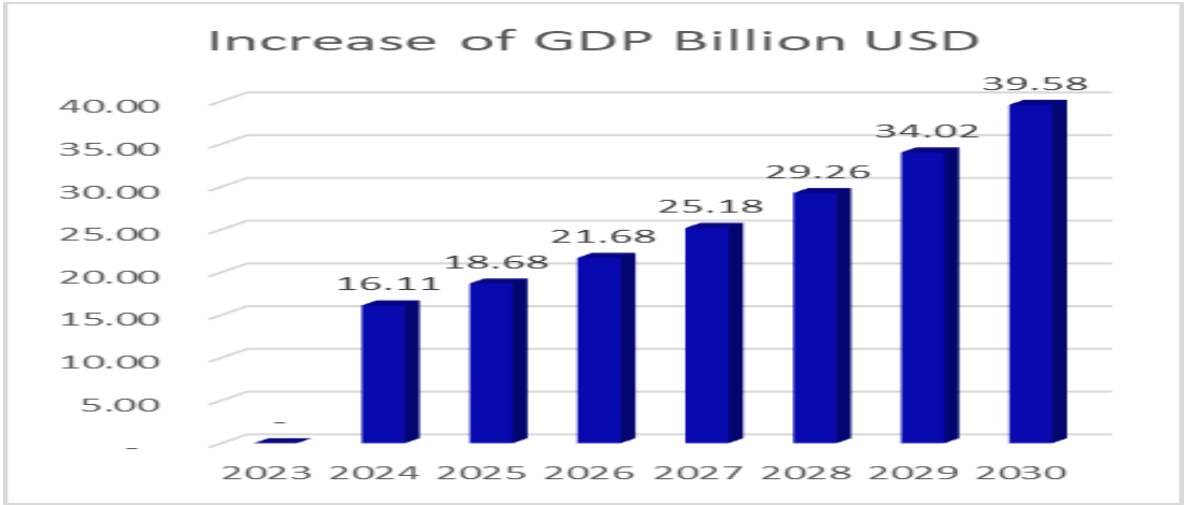Expected in GDP Multiplier after increasing 20 % AI

Data

- Share of DE in GDP (GASTAT)
- Share of technology in DE (IDC)
- Share of AI in technology market size (IDC)
- Prediction of DE and GDP (CGE MCIT)
- Share of TFP in GDP (CGE MCIT).
- Input output table (GASTAT 2021)

Model assumptions:

1. The share of Technology in the Digital Economy in 2023 is about 56%, with an expected increase to 60% by 2030 (based on MCIT's ICT programs and initiatives).

2. The target for AI's share to the Technology market in 2030 is set to reach 5% (based on MCIT's ICT programs and initiatives).

Result

Increase of GDP Billion USD

Assumptions		Remark
		Source: IOT 2021 Gastat Assumption
Increase in AI market growth	20%	

	2023	2024	2025	2026	2027	2028	2029	2030
GDP Prediction Billion SR (Constant price 2010)	2,994.64	3,117.69	3,237.66	3,366.72	3,502.71	3,645.80	3,796.99	3,957.82
Digital Economy Prediction Billion SR	460.80	490.76	522.66	556.63	592.81	631.34	672.38	716.08
Share Tec. Of DE Billion SR	261.28	280.52	301.17	323.35	347.17	372.73	400.18	429.65
AI Share of Tec. Market Size (57% of Total Market Size)	2.32%	2.58%	2.88%	3.22%	3.59%	4.01%	4.48%	5.00%
TFP Base SCN	2.093	2.103	2.112	2.128	2.142	2.155	2.1670	2.180
TFP SCN Increase 20% of AI market size	2.093	2.113	2.125	2.142	2.158	2.172	2.186	2.202
GDP Prediction after AI market growth Billion SR (Constant price 2010)	2,994.64	3,133.80	3,256.34	3,388.40	3,527.90	3,675.06	3,831.00	3,997.39
Increase of GDP Billion SR	-	16.11	18.68	21.68	25.18	29.26	34.02	39.58

AI GDP Multiplier Effect	0.8
Total Increase of GDP Billion SR (2024 - 2030)	184.51
Increase of GDP %	0.60%
Increase of AI GDP Multiplier Effect	6%

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Impact of AI on Human Capital

Displacement Effect

- Automation replaces certain tasks previously performed by humans with machines.
- Leads to job losses (job destruction).

Productivity Effect

- Automation creates new jobs and tasks, increasing productivity.
- Enhances value for consumers, leading to higher demand and more employment.

Task-Effects Approach

- Analyzes the potential of tasks to be automated or improved by AI.
- Professions where a large proportion of tasks can be automated are vulnerable to AI replacement.
- Professions with a majority of non-automatable tasks have the potential to be improved, not replaced (e.g., managers vs. office workers).

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Data and Assumptions

- **Input output table (GASTAT 2021)**

- **60% of jobs are highly vulnerable to AI (IMF study).**

  — Half have high improvement potential (enhanced by AI).

  — Half face high automation potential (job replacement).

- **41% of work activities could be automated** (Source: WEF Future of Jobs Report).

- Demand for new roles focusing on productivity enhancement and specialized skills.

- **Estimated 24,000 new jobs** to be created from AI initiatives between 2024–2030 (23% of total IT sector jobs).

Human Capital Results

AI's Impact on Employment in Saudi Arabia based on previous studies:

- AI Replacement Potential: 20.5% of jobs can be replaced by AI.
- AI Improvement Potential: 20.5% of jobs have the potential to be improved by AI.
- New Jobs Creation: AI will create approximately 23% new jobs.

Results (Using the Input-Output Model):

- Employment Multiplier in AI Sector: 0.84 workers per million riyals of spending.
- Expected Increase in Employment Multiplier 2.5%.
- AI is expected to have a positive effect on employment in Saudi Arabia.

Note:

— Changes in the skill composition of the workforce can lead to shifts in employment structures and wage patterns, subsequently influencing other economic variables. This aspect may require detailed and separate analysis to understand the broader implications of these changes.

Recommendations

# Recommendations

Implement a Continuous Monitoring System

- Track AI performance, economic impact, and labor market shifts.
- Allow for dynamic adjustments to the AI strategy based on real-time data.

Regularly Update the AI Strategy

- Reflect emerging trends, technologies, and global developments.
- Ensure Saudi Arabia remains at the forefront of the digital economy.

Policy Implications

- Better allocation of budgets for AI strategies.
- Prioritization of training programs to equip the workforce with necessary skills.

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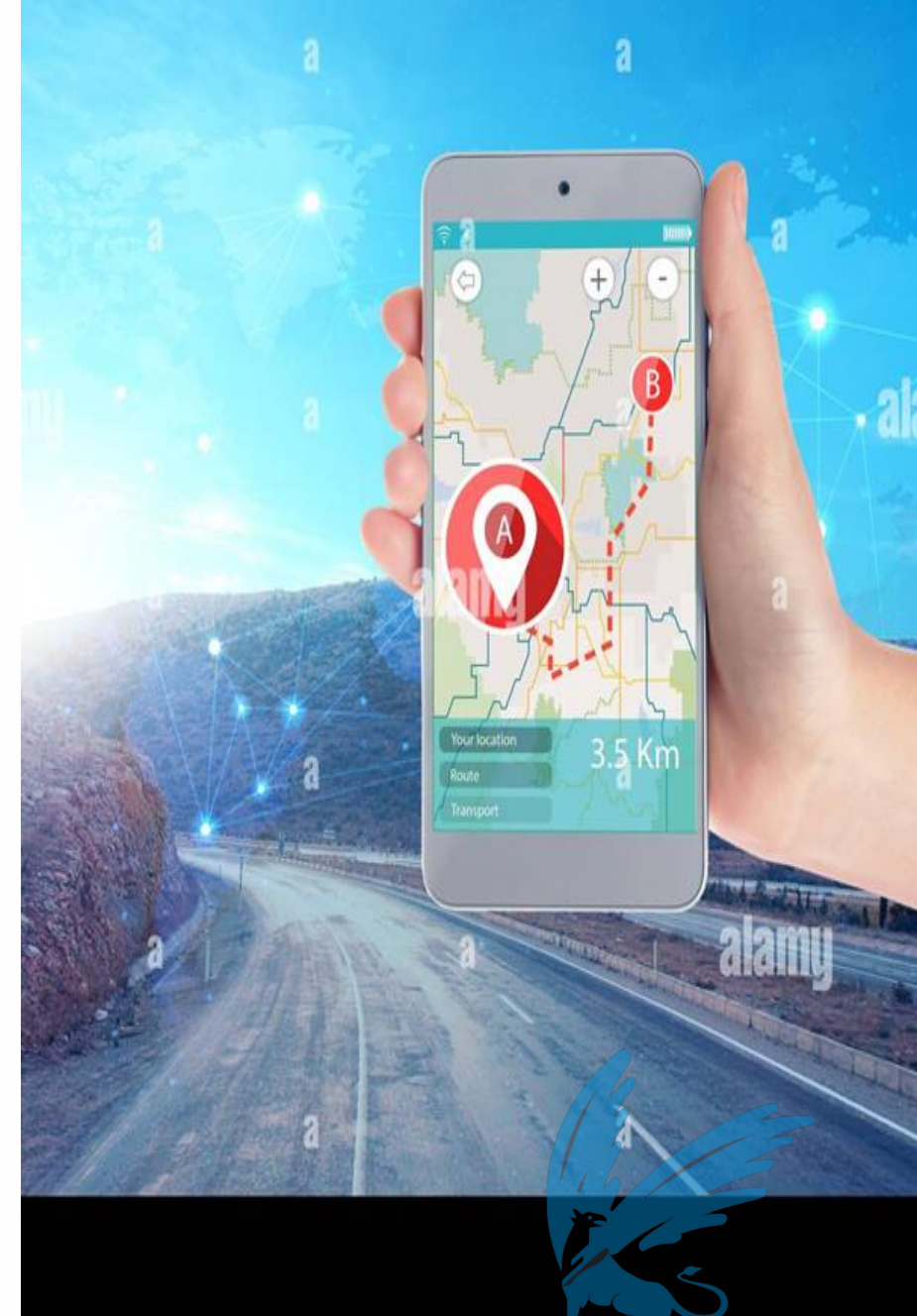
Conclusion

Develop a Clear AI Roadmap

- Based on research measuring and forecasting the digital economy's impact on GDP and human capital.

Identify Global Best Practices

- Compared Saudi Arabia's AI efforts with international standards.
- Highlighted areas needing improvement.
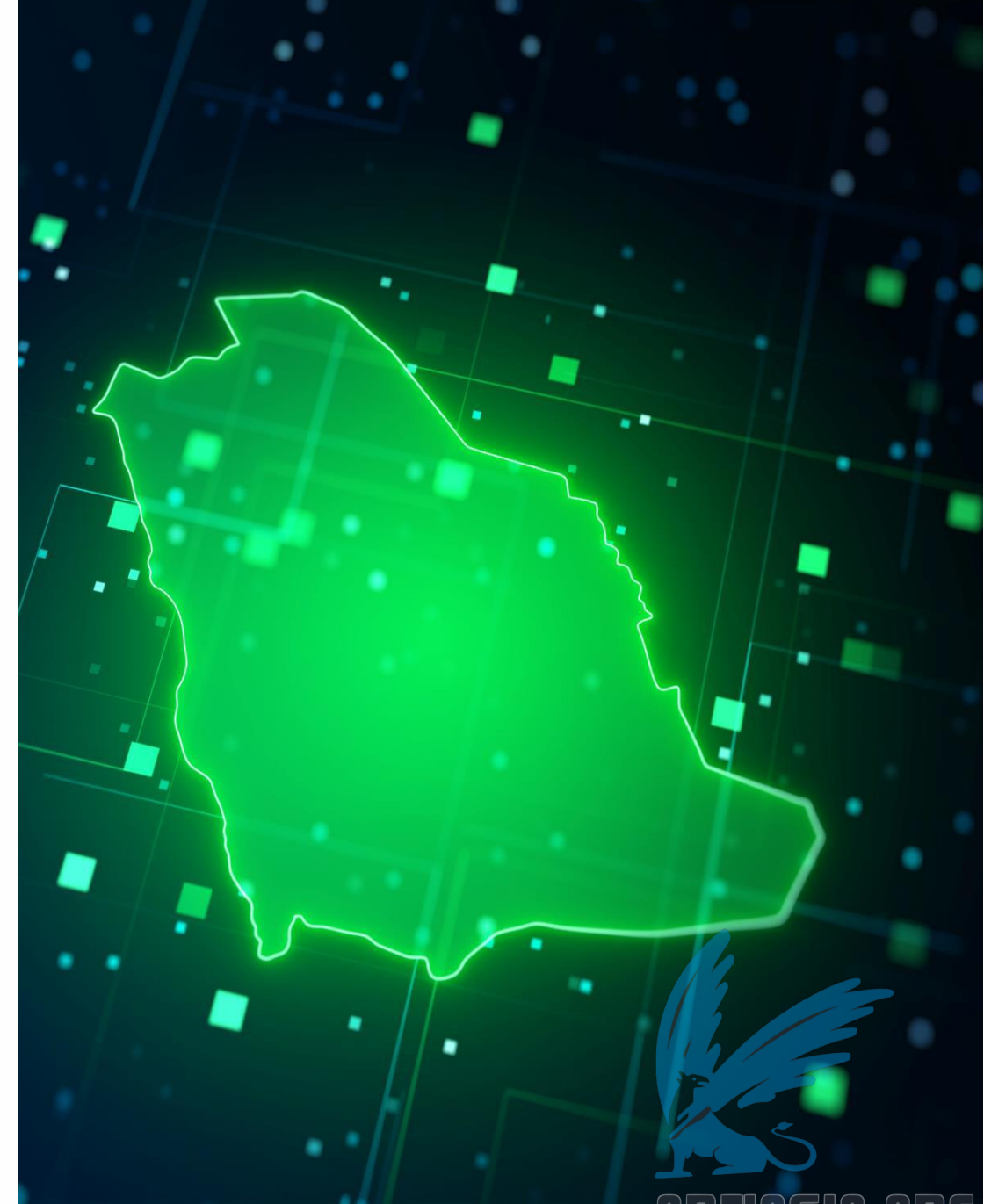
Economic Impact of expanding AI applications

- Significant increase in productivity.
- Support for economic diversification.

Assess AI's Impact on the Labor Market

- Estimated job creation through various initiatives and policies
- Aligned workforce development with the needs of an AI-driven economy.

Final Thoughts

- By adopting global benchmarks and focusing on AI's economic and labor impacts, Saudi Arabia can:
  - Boost GDP
  - Create jobs

Thank you
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