

Artificial Intelligence and the next generation of entrepreneurial innovation: A cross-regional study of smart startups in Silicon Valley, Singapore, and the Arab World

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Abstract

This study examines Silicon Valley, Singapore, and Arab innovation frameworks to determine how AI affects intelligent enterprises. The study structurally analyzes Silicon Valley's capital and talent cycle, Singapore's political leadership and digital infrastructure, and the Arab region's investment-driven strategic transformations. AI is needed for rapid experimentation, efficiency, and localized issues like finance, digital health, and Arabic language processing. Flexible funding, skilled labor, and good data governance work best, says the analysis. Public-private collaborations, digital education and skills, and integrative regulatory frameworks that balance innovation and security are recommended in the report. These regulations will help Arab startups compete globally in the digital economy.

Key words: Artificial intelligence; innovation; smart startups; Silicon Valley; Singapore; Arab world.

Jel Codes Classification : C55 ; O31 ; M13 ; O51 ; O53 ; O55

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الذكاء الاصطناعي والجيل القادم من الابتكار الريادي: دراسة إقليمية للشركات الناشئة الذكية في وادي السيليكون، سنغافورة والعالم العربي.

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ملخص

تهدف هذه الدراسة إلى استكشاف نماذج الابتكار في وادي السيليكون وسنغافورة والعالم العربي، مع التركيز على دور الذكاء الاصطناعي في تسريع نمو الشركات الناشئة الذكية. يبدأ البحث بتحليل هيكلي لمكونات كل نموذج: دورة رأس المال والمواهب في وادي السيليكون، والقيادة الحكومية والبنية التحتية الرقمية في سنغافورة، والتحول الاستراتيجي القائمة على الاستثمار في العالم العربي. تُظهر النتائج أن الذكاء الاصطناعي أداة محورية لتعزيز التجارب السريعة، وتحسين الكفاءات، ومعالجة التحديات المحلية مثل التكنولوجيا المالية، والصحة الرقمية، ومعالجة اللغة العربية. كما تكشف المقارنة أن أنجح الأنظمة تجمع بين التمويل المرن، ورأس المال البشري، والحوكمة السليمة للبيانات. توصي الدراسة بتعزيز الشراكات بين القطاعين العام والخاص، والاستثمار في التعليم الرقمي وتنمية المهارات، ووضع أطر تنظيمية متكاملة توازن بين الابتكار والأمن. سيتمكن اعتماد هذه السياسات الشركات الناشئة في المنطقة العربية من أن تصبح لاعباً عالمياً في الاقتصاد الرقمي.

الكلمات المفتاحية: ذكاء اصطناعي؛ ابتكار؛ مؤسسات ناشئة ذكية؛ سيليكون فالي؛ سنغافورة، العالم العربي.

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Introduction:

The world is going through changes that have never happened before because of the expanding use and adoption of artificial intelligence (AI). AI has sped up the expansion of several industries through innovation. AI is currently mostly used in colleges and universities, but by 2025 it will be a strategic player that actively shapes corporate models. This means that AI is a force for big changes that affect how people work and how they buy things. The case studies in this research show that each location has its own distinctive model, which is based on the role of human resources, the contribution of infrastructure, and the entrepreneurial culture that is most common there.

Many researchers think that 2025 will be a very important year for the artificial intelligence (AI) business because of all the big changes that have happened so quickly. AI is the main reason that almost all businesses are using it. This is because AI speeds up progress in areas like generative modeling, robotics, data analytics, and intelligent automation. The worldwide AI market is worth between \$391 billion and \$758 billion right now. Experts say it will reach trillions of dollars in the next ten years, which will have a huge effect, similar to previous industrial revolutions. **(Frackiewicz, 2025)**

According to the Tech Nation UK AI Sector Spotlight report, 3 out of 4 UK technology leaders say AI is having a positive impact on their organizations' growth, and 1 out of 2 have improved their products and services as a result of AI, from voice generators to self-driving cars. For example, UK AI companies are making a significant contribution to boosting the UK technology sector, with UK AI startups raising \$1.03 billion in venture capital investments in the first quarter of 2025, the largest first-quarter funding round in the past three years. **(Tech nation, 2025)**

Around the world, these trends are the same. More than 73% of businesses are utilizing or testing AI in their main operations. At the same time, people are starting to trust AI more: 56% of people throughout the world now think AI will make their lives better in the next 10 years. However, 68% of people also want AI systems to be more regulated **(Tech nation, 2025)**

This research attempts to reach multiple objectives, most especially exploring the distinctions and key characteristics of the business models of Silicon Valley, Singapore, and the Arab world, while focusing on the role of smart startups in driving innovation in these regions.

The research is significant because it analyses at how companies may shift from their approaches to smart models and how they can be more innovative. It illustrates how artificial intelligence can be a strategic tool to quicken this transformation and make startups smarter. Furthermore, it additionally assists to understand the way the Arab region's potential to overcome challenges related to skills and governance, and to transform its weaknesses into opportunities.

The research's methodology employs comparative analysis, examining the latest international and regional reports and studies, monitoring practical experiences and models, and studying government legislation and initiatives, while also leveraging global innovation and competitiveness indicators.

Based on the preceding, the following main question comes up:

How can AI help smart startups in Silicon Valley, Singapore, and the Arab East come up with new ideas?

This major question gives rise to these sub-questions:

- What changes has AI made to the world of innovation?
- Why is the Silicon Valley model better at copying successful businesses throughout the

world than other models?

- How has Singapore been able to create a successful ecosystem for innovation through startups even if its market is small?
- How can Arab countries use what they have learned from the rest of the world to help the startup industry become more innovative by using AI?

To attempt to answer these questions, the following hypotheses can be formulated:

- Organizations that effectively invest in AI and utilize it in their innovation processes will be able to achieve faster progress;
- Startups in Silicon Valley rely heavily on flexible venture capital and an entrepreneurial culture;
- Singapore relies on developing human capital and digital skills to transform investments into sustainable added value; Adapting the experiences of both Silicon Valley and Singapore to the Arab environment will enhance the competitiveness of emerging institutions, expand growth opportunities, and promote the transition towards a sustainable knowledge economy.

I- Artificial Intelligence: The most important global transformations:

I-1- A look at the most important statistics:

In 2024, private investment in artificial intelligence (AI) in the United States surged to \$109.1 billion, making it 12 times China's \$9.3 billion and 24 times the UK's \$4.5 billion. Generative AI was extremely strong, resulting \$33.9 billion in private investment worldwide, an 18.7% increase from 2023. AI adoption in business is also progressively: 78% of businesses reported using AI in 2024, up from 55% the previous year. at the same time , several researches confirm that AI boosts productivity and, in most cases, helps bridge skills gaps in the workforce.(**Standford university, 2025**)

Statistics indicate that approximately 80% of companies are using or testing artificial intelligence (AI). However, the technology is no longer exclusive to large tech companies; it has become a strategic tool across various sectors. Furthermore, 35% of companies have adopted AI in at least one function, reflecting the transition from the experimental to the practical application phase. The remaining 13% of companies still have no plans to adopt AI, which can be attributed to either a lack of infrastructure or an unclear return on investment. The remarkable 600% growth in the number of AI companies in the UK highlights the effectiveness of government policies in supporting innovation and creating an attractive environment for AI

I-2- Size and growth prospects of generative artificial intelligence:

Just over a year, ChatGPT has 100 million monthly active users. this is the quickest growth of a consumer technology in digital history, with 4 billion commands being produced daily, revealing the scale of interaction and high reliance on large language models. The integration of generative AI features into more than 300 enterprise tools indicates that the technology has become part of the operational architecture of companies, not just a utility.

The projected economic impact of \$1.3 trillion annually by 2030 supports the hypothesis that generative AI will be an economic force comparable to the Fourth Industrial Revolution. This growth is attributed to the expanding use of generative AI, increasing demand for automation and predictive analytics solutions, and the entry of emerging markets into the race. The following table summarizes key global statistics related to generative AI.

Table n°1: General statistics on generative artificial intelligence

Indicator	Value
Monthly active users of ChatGPT in 2023	Over \$100 million
Number of daily commands in large language models	Over 4 billion orders
Number of enterprise tools incorporating generative AI features	300 devices
Expected economic impact of generative AI in 2030	\$1.3 trillion annually
2025	\$391 billion
2030	\$1.81 trillion

CAGR (2025–2030)

35.9%

Source : (Standford university, 2025)

II- Artificial intelligence as a mechanism to accelerate innovation: Key characteristics

Organizational innovation is the process of developing with new products, services, or practices that have short- or long-term value. It generally occurs through four stages: coming up with and testing ideas, experimenting, and generating with marketing. In the beginning, people need to be creative and solve problems a lot. In the end, tasks are more structured and systematic.

AI has a lot of potential to enhance or replace human activities, but for now it is mostly used for small, narrow tasks that need data processing, classification, aggregation, and prediction, not creative thinking. Its biggest strength is that it can quickly digest a lot of information, save money, and help with jobs that are cognitively demanding but not very subjective.

So, AI is most useful right now in the later stages of the innovation process, where it can help with testing, refining, and marketing. **(Truong & Papagiannidis, 2022)**

AI, or artificial intelligence, is an important technology that opens up new possibilities in many areas and for new businesses. Its transformative impact stems from several core capabilities.

II-1- Accelerating the innovation cycle:

A field study with 44 organizations in the US and Europe shows that employing AI in prototyping and product validation is closely linked to getting products to market faster. In fact, case studies demonstrate that development time can be cut in half. Despite these benefits, approximately 75% of companies have yet to implement any AI in product development, revealing a gap and a strategic opportunity for early adoption **(Cooper & Brem, 2024)**

II-2- Increase innovation success rates:

Recent studies suggest that artificial intelligence (AI) has a big role in speeding up and improving new ideas. A study of 558 new product development projects indicated that those that used AI in the design and testing phases were more than twice as successful as traditional initiatives. This was especially true in the early stages, including finding opportunities and coming up with ideas. **(Haili ZhangXiaotang & Song, 2021)**

Studies have also demonstrated that artificial intelligence (AI) can speed up research and development (R&D) in fields that make up around 80% of all R&D investment around the world. In fields that depend on intellectual property or scientific research, the rate of innovation can double. In fields that include complicated manufacturing, the speed of development can range from 20% to 80%. AI may speed up innovation by up to \$360 billion to \$560 billion a year, which would have a big effect on the economy as a whole, not just on individual businesses. **(Isherwood & Chandra, 2025)**

II-3- Supporting strategic decision-making:

Artificial intelligence is an important tool for making better choices regarding the project and innovation portfolio. Combining predictive modeling with machine learning algorithms makes "go/don't go" decisions more accurate, raises the chances of project success, and makes portfolio management better by lowering risks and speeding up responses to changes in the market. **(Troilo, De Luca, & Guenzi, 2022).**

In this capacity, the idea of decision intelligence comes to light. It uses predictive analytics and AI technologies that are connected to each other to directly change behaviors. By 2025, it is expected to be one of the most important tools for corporate intelligence. For instance, AI-powered supply chain systems that look at sales, weather, transportation, and inventory data to determine the best purchase orders and logistics services would automate operational choices and make them more efficient. **(The Strategy Institute, 2025)**

II-4- Virtual experience and digital twin

With virtual simulations and digital twins, artificial intelligence makes it possible to change the way experiments are done. This lets businesses evaluate products and processes in

a digital setting before putting them into action. Studies show that even using these technologies a little bit can make innovation happen faster and decisions better, as well as lower research and development expenses and make the whole innovation ecosystem more efficient. (Cooper & Brem, 2024)

II-5- Boosting productivity at the enterprise and sector levels

At the micro level, economic data from German companies reveals that the adoption of artificial intelligence is causally linked to a significant increase in company productivity, a finding verified using analytical tools to address bias (Czarnitzki, 2023)

At the macro level, a study of Chinese companies – which included more than 43,000 AI-powered patents – showed that these innovations are positively correlated with higher overall factor productivity, particularly in large companies and labor-intensive sectors. (Shaoxuan & Liu, 2023)

However, these localized gains have not yet translated into broad growth in overall productivity, a phenomenon known as the "productivity paradox". (Giustina , Claudia , Johanna , & Vincenzo , 2024).

A study also found that AI-powered customer service agents can answer 13.8% more questions per hour than traditional techniques and do a better job by 1.3%. Also, using AI-generated tools improves performance by an average of 66%, and even more for activities that are more difficult. (Syracuse University School of Information Studies, 2025)

III- Artificial intelligence and smart startups: The nature of the relationship

III-1- The difference between startups and smart startups:

Startups are generally defined as newly established companies or projects that aim to develop a unique product or service to offer to the market, and are characterized by rapid growth and the search for a scalable and replicable business model. (Rios-Campos , Zambrano , Vargas , & Merino , 2024) These organizations seek to solve a specific problem or fill an unmet market need, and they rely on innovation as a key element to achieve their goals. Startups may use various technologies, but their use of technology may not be central to their business model or core product.

AI-powered startups, on the other hand, are a specialized type of startup that integrates artificial intelligence into the core of its business model, products, or services. (Tang , Du , & Deng , 2025) The fundamental difference is that AI is not just a tool or a piece of technology; it is the most crucial factor that enables these groups find their own unique solution.

The company may utilize data analytics to enhance its marketing more efficient. A smart startup, on the other hand, might use AI to build a brand-new product that grows from data, like a smart recommendation engine or a complicated chatbot. Businesses that apply AI in this way can handle a lot of data, perform difficult tasks and give customers customized service. This helps them do more effectively in today's marketplace and expand rapidly. (Kumar & Singh, 2025)

III-2- Artificial intelligence and investment in smart startups:

Investing in AI is rising faster than almost any other field of technology. People were anxious about the economy as a whole, but in 2025, funding for AI startups went up a lot. This was because there were big rounds of funding for platforms that make AI, apps that are particular to certain industries, and AI models for the government. Funding for AI businesses went up 28% to \$107 billion. This means that people are starting to believe more in the possible profits of AI companies. AI got 26% of all venture capital funding, which shows that it is a big deal for investors all around the world. In 2025, AI startups also garnered half of all financing rounds. (Frackiewicz, 2025)

Table n°2: The world's leading artificial intelligence startups

Company	Country	Sector	2025 Round Size
OpenAI	USA	Foundation Models	\$2.5B+
Mistral AI	France	LLM Infrastructure	\$640M
Anthropic	USA	Safety-focused LLMs	\$2.75B
Synthesia	UK	Video GenAI	\$150M
Character.AI	USA	Chat AI	\$100M
Glean	USA	Workplace AI	\$200M
Runway	USA	AI Video	\$141M
Covariant	USA	Robotics + AI	\$100M+
Aleph Alpha	Germany	Sovereign LLMs	€500M+
DeepL	Germany	NLP Translation	€300M

Source: (Founders Forum Group, 2025)

IV- Key business models of global startups:**IV-1- Silicon Valley: An American business model built on innovation:**

The Silicon Valley model is considered the most advanced incubator environment for startups in the world, and it continues to offer valuable lessons, success stories, and connections with different regions around the world.

IV-1-1-General information:

Historically, Silicon Valley's roots go back to the post-World War II period, when Friedrich Terman at Stanford University encouraged technological entrepreneurship and in 1951 contributed to the founding of Stanford Industrial Park, which attracted companies such as Hewlett-Packard. In 1956, the founding of the Shockley Semiconductor Laboratory marked the beginning of the semiconductor industry, and the term Silicon Valley first appeared in the media in 1971 to reflect the region's identity as a global technology center. **(S. Engel, 2015)**

Silicon Valley is still a leader today because universities, entrepreneurs, and venture capital have all come together. The area drew roughly \$90 billion in venture capital investments in 2024, which is nearly 57% of all US investments. **(Bort, 2025)**

Artificial intelligence received the largest share of this funding, accounting for nearly a third of global investments, with an increase of over 80% compared to the previous year 2024 **(Ng, 2025)** A report by Silicon Valley Bank (SVB) in August 2025 also confirmed that artificial intelligence companies accounted for 36% of all deals and 58% of total investment in the United States. **(SVB, 2025)**

Thus, it can be said that Silicon Valley is not just a geographical location, but a global ecosystem that links knowledge, capital, and entrepreneurial experimentation, and leads the artificial intelligence revolution that is reshaping industries and accelerating innovation at the global economic level.

Figure n°1: Silicon Valley Geography

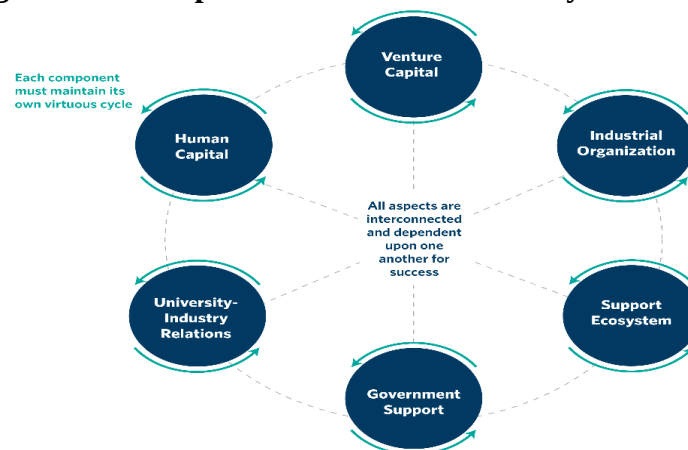
Source: (Mobile technomogy news, 2014)

IV-1-2- Components of the Silicon Valley business model:

Compared to other global innovation models—such as those in Europe, Asia, and emerging markets—Silicon Valley stands out for its mature venture capital ecosystem, integrated academic relationships, risk-tolerant culture, and predominantly private-sector-led innovation, creating a powerful engine for high-growth, technology-driven startups. Some other models might put greater emphasis on government support, sustainability, social innovation, or more formal planning than Silicon Valley's flexible, market-oriented approach.

- **Venture capital:** a key funding mechanism for high-growth startups;
- **Human capital:** flexible and reliant on global talent;
- Strong and multifaceted links between universities and industry;
- **Government support:** direct and indirect;
- **A symbiotic industry structure:** between large corporations and startups;
- A robust support system for professional services firms: such as law firms, accounting firms, accelerators, incubators, and startup support organizations.

Figure n°2: Components of the Silicon Valley model's success



Source: (Kushida, 2024)

IV-2- Singapore business model (Southeast Asia):

IV-2-1- Singapore's national artificial intelligence strategy

With an area of 720 square kilometers, Singapore is Southeast Asia's smallest and most densely populated country, with a density of 8,919 people per square kilometer in 2023. Urban growth and migration in recent decades have led to overcrowding, increased pressure on infrastructure, and rising housing costs.

In contrast, Singapore has successfully established itself as a leading hub for artificial intelligence and digital innovation thanks to strong government policies and a sophisticated digital infrastructure. It started its first National AI Strategy in 2019, which led to the formation of about 150 research and development teams and 900 new businesses in the field. Building on this momentum, the government launched its second strategy (NAIS 2.0) in 2023 to further enhance its leadership and maintain its excellence in digital innovation.

(Singapore Government Agency Website, 2025)

Figure n°3: Dimensions of the Singapore government's artificial intelligence strategy



Source: (Singapore Government Agency Website, 2025)

Singapore's big AI transition needs a mix of public and private money—S\$1.6 billion from the government and US\$26 billion from tech companies. This makes Singapore the third-largest AI country in the world, after the US and China.. The small city-state contributes 15% of NVIDIA's quarterly revenue (around US\$2.7 billion), equivalent to US\$600 spent per person on NVIDIA chips—surpassing both the US and China. Consequently, the government has pledged over S\$1 billion over the next five years to further develop AI infrastructure, expertise, and deployment. **(Singapore Digital Economy Report, 2024)**

Table n°3: Artificial Intelligence Indicators

Indicator	Value/Year	Note
AI Adoption by Large Enterprises (Non-SMEs)	44.0% (2023)	The percentage of non-small/medium-sized enterprises (SMEs) that have adopted AI has doubled from 16.7% in 2018.
AI Adoption by SMEs	4.2% (2023)	A slight increase from 3.5% in 2018.
Percentage of Companies Implementing At Least One Digital Area (Out of 6 Areas Including AI)	94.6% (2023)	An improvement of 0.5 percentage points compared to 2022.
Technical Jobs in the Economy (Including Cybersecurity, AI, and Data Roles)	208,300 Jobs (2023)	Represents 5.2% of total employment; 3.4% year-over-year growth.
Digital Economy's Contribution to GDP	\$113.2 Billion 17.7% of GDP (2023)	Measuring the value added to the digital economy (DE):
Business Spending on Digital Innovation R&D (BERD)	\$1.058 Billion (2021)	Up from S\$535 million (2018); a compound annual growth rate of 25.5%.
Number of Digital I&C Tech Startups		Up from 1,920 (2018); representing 53% of all tech startups.
Benefits of AI Adoption for Enterprises	2,580 Companies (2022)	Also, nearly two-thirds of large companies reported cost reductions.
National AI Strategy (NAIS 2.0)	Productivity/Operations Improvement: 96.2%	Focused on the goals of excellence and empowerment across 3 ecosystems, 10 enablers, and 15 actions.
AI Governance and Trust (AI Verify Foundation)	Launched December 4, 2023	A national open-source initiative for testing and ensuring the reliability of AI systems.

Source: (Singapore Digital Economy Report, 2024)

Table n°4: Major global companies invest in Singapore

The company	Investment Value	Period	Notes
Amazon Web Services (AWS)	Adding \$12 billion (over \$11.5 billion historically)	2024–2029	Expanding the cloud architecture in the AWS Asia Pacific (Singapore) region
Google	\$5 billion (total in Singapore)	Until 2024	Completing the data center and cloud region expansion
GlobalFoundries (GF)	US\$4 billion	2023/2024	Expanding the 300mm wafer factory (Fab)
Micron	\$7 billion (≈\$9.5 billion)	2025	Advanced packaging facility (HBM) (AI computing)
Vanguard (TSMC) + NXP	\$7.8 billion (≈\$10.5 billion)	Construction begins H2 2024; Production begins 2027	12-inch shared wafer factory in Singapore
Meta (Facebook)	\$1.4+ billion	Ongoing (Document 2025)	Multi-story data center in Singapore
Apple	\$250 million (≈\$340 million)	2024	Expanding the Apple campus in Ang Mo Kio
Apple	Approximately \$400 million	2020–2023 (Opening 21 November 2023)	Singapore's Innovation and Smart Production Center
Sanofi	€400 million (≈\$638 million)	2021–2026 (Five years)	EVF vaccine facility (digital/flexible unit)
BioNTech	Undisclosed (CAPEX)	2022–2023	Singapore's first mRNA facility
Singtel + NVIDIA	Undisclosed (AI Architecture Partnership)	2024–....	Acquisition/transformation of the Novartis site

Source: Prepared by researchers based on a range of sources

IV-2-2- Singapore's pillars for supporting innovation in light of the adoption of artificial intelligence:

Singapore's plan for using technology and innovation to promote long-term economic growth is built on a holistic approach that includes building a strong digital infrastructure, providing targeted government support, protecting the environment, and creating a complete ecosystem.

This method enables Singapore's economy stay strong while making progress toward a future that is greener, smarter, and more sustainable. Key ways Singapore utilizes technology and innovation for sustainable growth include:

Strategic government investment in research, development, and innovation: Singapore invests a lot of money—about 1% of its GDP every year—into research, innovation, and enterprise (RIE) for creating new technologies, especially in the field of semiconductors, bio sciences, and artificial intelligence. Singapore is an international innovator because it continues to invest money into things that make it an enjoyable place to make scientific discoveries and do business. (H/Advisors Klareco, 2025)

- **The Smart Nation Initiative and Digital Economy Development:** Through the Smart Nation program and its evolution into Smart Nation 2.0, the government is leading the digital transformation across various sectors, enhancing business

opportunities, public services, and citizen engagement. The goal of this program is to give people and businesses the tools they need to use technology to create new ideas and make progress, which will help the economy stay strong and be open to everyone (Singapore Government Agency Website, 2025)

- **Advanced Digital Infrastructure:** Singapore has the best digital infrastructure in Asia. It has fast internet, lots of data centers, and the ability to use cloud computing. Singapore is the best place in Asia to create advanced digital infrastructure, according to the Digital Transformation Index. It has more than 60% of Southeast Asia's data centers. This has helped its digital economy grow by 12.9% a year and its GDP grow by more than 17%. Singapore has spent money on exceptionally dependable communication networks, a single digital identity (Singpass), and strong cybersecurity measures to make sure users can trust the internet. This strong technology base has helped it become a regional hub, where 46% of Asia's business headquarters are located. This is a common way for South Asian countries to construct infrastructure that will support their digital progress. (Sadhotra, 2025)
- Singapore intends to employ technology to make cities use less energy and help the environment. For instance, they look to establish smart grids, cities that are good for the environment, and data centers that use less energy. The Green Plan 2030 intends to cut down on carbon emissions, make buildings more eco-friendly, and add additional green spaces. It will use AI, smart sensors, and the Internet of Things to do this. The Tengah Eco-City project does well for the environment and helps individuals deal with trash, energy, and water. These efforts could assist people live in and use communities in a way that is beneficial for the environment.
- **Rules and rewards that are in line with sustainability:** Policies like carbon levies and legislation that protect data privacy help firms come up with innovative low-carbon innovations and help digital businesses grow steadily. Incentives help firms stay competitive while also encouraging decarbonization by using energy-efficient technologies and cutting down on emissions. It's also very important to grow talent and work in the ecosystem. (Meleshkina, 2024)
- The Global Innovation Alliance and deals between companies in Singapore's innovation ecosystem make it easier to share knowledge, identify new markets, and manufacture new technology. It helps the ecosystem flourish and work well all around the world. (Sadhotra, 2025)

IV-3-The Arab world model:

IV-3-1- Current situation:

- **Digital connectivity:** By 2023, almost 69% of people in the Arab States region will be able to connect to the internet. There are a lot of people that could use AI-based solutions (ITU, 2023)
- **Digital Government Maturity (GEMS 2024):** The average maturity index for e-government and mobile services in the Arab world went from 43% in 2023 to 45% in 2024. In 2024, there was a huge gap of 95 percentage points between countries with "very advanced" and "early" maturity. The report also says that it's still not particularly usual to use new technology to create services)GEMS(2024 ‘
- **Global Comparison (EGDI 2024):** The UAE's EGDI score of 0.9533 (11th in the world) reflects how well its government information infrastructure (online services, communications infrastructure, and human capital) is performing. (UN, 2024)

- **Regional Policy Framework:** The Arab Digital Agenda 2023–2033 forms a regional framework for coordinating policies, governance, and the digital economy, and emphasizes interoperability, privacy protection, and open data as foundations for enabling digital innovation. (ESCWA, 2023)
- **Research and Innovation Capacity:** UNESCO/UIS data shows that only about 10 countries account for ~80% of global research and development spending; while many Arab countries register R&D spending intensity below the global average, which is reflected in the transformation of knowledge into data-driven products. (UNESCO, 2025)
- **Official forward-looking visions for artificial intelligence:** The “Futures of AI for the Arab Region” report presents strategic pathways for enabling artificial intelligence until 2040, linking it to local, linguistic, and cultural priorities in the region. (ESCWA, 2023)

IV-3-2- Horizons:

- **Investing in digital government platforms:** GEMS maturity provides data channels, digital identity, and standard interfaces (APIs) that enable businesses and governments to design AI-by-design services in health, education, and public services; the index assesses 100 core services and offers a replicable measurement methodology. (ESCWA, 2023)
- **The digital market can grow:** 69% of people have access to the internet, which makes mobile-first business models and data-efficient AI services that can reach a wide range of people and organizations possible. (ITU, 2023)
- **Enhancing trust through Arab-approved ethics:** The adoption of the ALECSO Charter for Artificial Intelligence Ethics (June 2025) provides an Arab reference for ethics and responsible governance, a crucial competitive advantage in sensitive sectors.) ALESCO(2025 ‘
- **Directing investment and skills according to official visions:** The ESCWA 2025 report identifies realistic pathways (aligning global technologies with local needs, building an Arabic language/culture ecosystem, and accelerating AI applications for development goals), which helps prioritize investment in data, computing infrastructure, and skills. (ESCWA, 2023)

IV-3-3- Successful examples of employing artificial intelligence in Arab startups:

Artificial intelligence (AI) is making headway in the Arab world, but there are still a lot of challenges, especially with infrastructure, human capital, and norms and regulations. Saudi Arabia and the United Arab Emirates, two of the most important countries, are spending a lot of money on digital infrastructure and data centers to assist AI grow. But a lot of other countries still need to create these kinds of foundations if they want to be competitive.

There still aren't enough certified AI experts, which is a big concern, especially when it comes to making AI better at Arabic and using it in ways that are culturally appropriate. Governments are trying to make STEM education and training better, but they still have a long way to go. The regulations and laws regarding AI are getting clearer in the Gulf States and other areas. These regulations try to find a balance between new ideas and concerns about privacy and morality. The area still needs a better way to be run.

Several AI-based startups have emerged as regional role models, leveraging AI to meet specific market needs and expand into various sectors. (Arab tech gate, 2025)

- **Synapse Analytics (Egypt):** Uses AI and other types of data to assist people get loans and get more people involved in the financial system.
- **Yassir (Algeria):** A leading AI-powered app for banking, ride-hailing, and delivery services that is swiftly spreading to many countries.
- **DX Wand (Egypt and the UAE):** Makes chatbots and voice assistants that can be used in both Arabic and English-speaking markets. These bots take care of customers and get information from data that isn't structured.
- **Ogram (UAE):** An AI-powered recruiting platform that automatically checks and rates freelancers' skills and links them with businesses. This helps to digitize the workforce.
- **One Mena (Saudi Arabia):** This group is interested in AI tools that might help the economy evolve in line with Saudi Vision 2030.
- **Noon** is an EdTech firm based in Saudi Arabia that uses AI to create personalized learning experiences and gives teachers real-time data on how their students are doing.
- **Cura (Saudi Arabia):** A telemedicine platform that uses AI to recommend treatments and look at medical records to improve healthcare.

These startups embody the rapid growth in the adoption of artificial intelligence in the Arab world, particularly in the areas of financial technology, mobility, digital health, and education, driven by a combination of private investment, government support, and strategic partnerships with global technology companies.

V- Comparison:

V-1- Silicon Valley: The power of venture capital and talent:

- **The model:** The strategy is founded on a lot of venture capital, a lot of smart people from all over the world, premier research universities like Stanford and UC Berkeley, and the reality that startups and big tech companies work together. Venture funding is flexible and is typically utilized by organizations that are growing quickly and taking a lot of risks, especially in the fields of digital technology and artificial intelligence
- **The innovation ecosystem:** A lot of connections between institutions and businesses, a lot of networks, and a culture of entrepreneurship. Startups do better when they have experienced mentors, incubators, accelerators, and a complex support system. The success stories of firms like Google, Apple, and Nvidia make this ecosystem stronger and bring in more money.
- **Smart startups:** Concentrated on technologies that cause problems. Artificial intelligence, big data, and automation are important parts of how they do business. The ecosystem encourages people to try new things quickly, take risks, and aim for global success.

V-2- Singapore: Significant government support:

- **Model:** The “Asian Silicon Valley,” but one designed according to the government’s strategy. Since the 1990s, Singapore has invested in venture capital funds, streamlined business regulations, established science and technology hubs (such as Block 71), and provided significant incentives for digital innovation and global headquarters.
- **Innovation Ecosystem:** Strong government leadership encourages networking, research, and development. Public-private partnerships are now a part of the system, with a focus on education, startup incubators, and technical infrastructure that works together. Singapore is the Asian headquarters for many big global companies, such Google and Metaverse.
- **Smart startups** get help from government policies that are proactive, help people grow their skills, and provide them access to global markets. AI is quite popular, and government financing and open innovation platforms help digital solutions and smart city projects.

V-3- The Arab world: A new transformation:

- **Model:** Rapid leaps shaped by ambitious government strategies, massive infrastructure investments (particularly in Gulf countries like Saudi Arabia and the UAE), and partnerships with global technology leaders.

- **Innovation Ecosystem:** Smart startups are growing faster than ever, especially in Saudi Arabia and the UAE, where governments are giving billions of dollars to AI and startup funding. But the government still doesn't spend enough on research and development or cooperation between universities and businesses
- **Smart Startups:** The Arab region is supporting new businesses that solve problems in their area. Big firms like Synapse Analytics and DXwand are using local knowledge and AI to reach Arabic-speaking markets. Government assistance is really important, and it typically comes from working with big firms throughout the world

VI-Conclusion:

A comparison between Silicon Valley, Singapore, and the Arab world revealed that artificial intelligence has become a strategic component in shaping innovation models for smart startups, but through different mechanisms: the first relies on the dynamism of venture capital and an entrepreneurial culture, the second on state leadership and policy integration, while the third seeks to achieve a qualitative leap through massive investments and global partnerships. The results show that smart startups are the common engine linking these models, representing a tool for realizing technological potential and transforming it into practical solutions across multiple fields. The study also showed that an ecosystem's success depends on more than just money; it also has to have good data governance, finance, and skilled workers.

From this, we may make the following suggestions to speed up and keep AI-enabled innovation going

- Adopting policies that support AI-enabled innovation: This involves establishing clear and adaptable regulatory frameworks that keep pace with rapidly evolving AI technologies and foster trust among stakeholders, particularly in emerging Arab institutions;
- Strengthening AI research and development by encouraging investments in AI research and tailoring them to the specific context of each environment, especially the Arab environment;
- Building collaborative platforms between the public and private sectors by establishing multilateral innovation centers. We should use these collaborations to create strategic AI projects that build multinational alliances and networks that make it easier to share best AI practices, find new talent, and collaborate on projects together to increase innovation and market access.
- Putting money into education and ongoing training. The only way to make this happen is to fully integrate AI education into formal education at all levels, from elementary school to college, so that there is always a pool of skilled workers.
- Reaffirming the significance of embracing global models while adjusting them to the Arab context;
- Asking for action to create an integrated Arab system for smart innovation through smart startups.

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