Implication of AI Technology

on Thailand's Economic Growth & Productivity

2024 The 2ⁿᵈ RIN Online Workshop Series,

Strategies for the Ideal Future Stage of Development in East Asia

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Abstract

- Artificial Intelligence [AI] technology has advanced its capability rapidly, especially **the massive adopted Generative AI**. The adoption of AI technology has economic implications for the country's productivity. The extent to which AI can be incorporated to boost productivity depends on the speed and scope of AI adoption by businesses, workers, and government agencies. The **interlinkage between the human workforce and AI technology** plays an important role in raising labor productivity. Thailand is in an early stage of AI technology adoption with a few studies on AI impacts on the Thai economy and labor market such as **Sutivong [2024]**.

- This study follows how **Chui et al [2023]** estimates economic values of Generative AI utilization by categorizing **sources of benefits based on business functions**, ordered from high to low economic values as marketing and sales, customer engagement, research and development, and software engineering. Then, the **Total Factor Productivity** [TFP] is estimated by utilizing the **firm-level datasets** from the Business and Manufacturing Industry Census, along with the Labor Force Survey to understand the labor market insights.

- Policy recommendations are to support the country's **national strategy's goal**: boosting the **AI ecosystem's collaboration** and raising the **country's competitiveness**.

Keywords: Digital transformation [DX], AI technology, and innovation

Reference: Chui, M., Hazan, E., Roberts, R., Singla, A., and Smaje, K., 2023. "The economic potential of generative AI". McKinsey.
Sutivong, A. 2024. "Generative AI and its implication on Thailand's economic development and data security". Research project. National Defense College. Forthcoming.

Artificial Intelligence [AI], What is ?

"Artificial Intelligence"

The technological evolution aimed at creating artificial intelligence in inanimate objects, developed from the knowledge of IT and engineering, combined with other fields such as linguistics, psychology, and biology, **to enable thinking, analyzing, and problem-solving in place of humans.**

"Generative AI"

AI designed specifically for the capability to **'generate new content'** using Generative Model algorithms, which can be applied to a variety of tasks.

- **Text Processing**

- **Images Generation**

- **Animation Creation**

- **Music Composing**

- **Coding**

AI: Impacts & Opportunities at the Macro Economic Level

- Gen AI would raise Global GDP > **7%** [around 7 Tn. USD.]

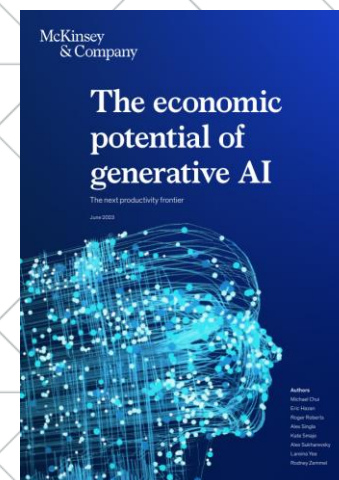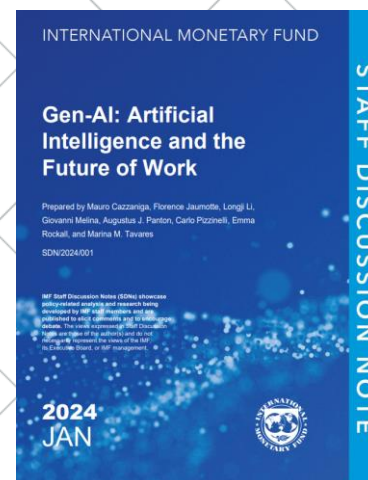- By Uplifting Productivity Growth **1.5%** within a decade
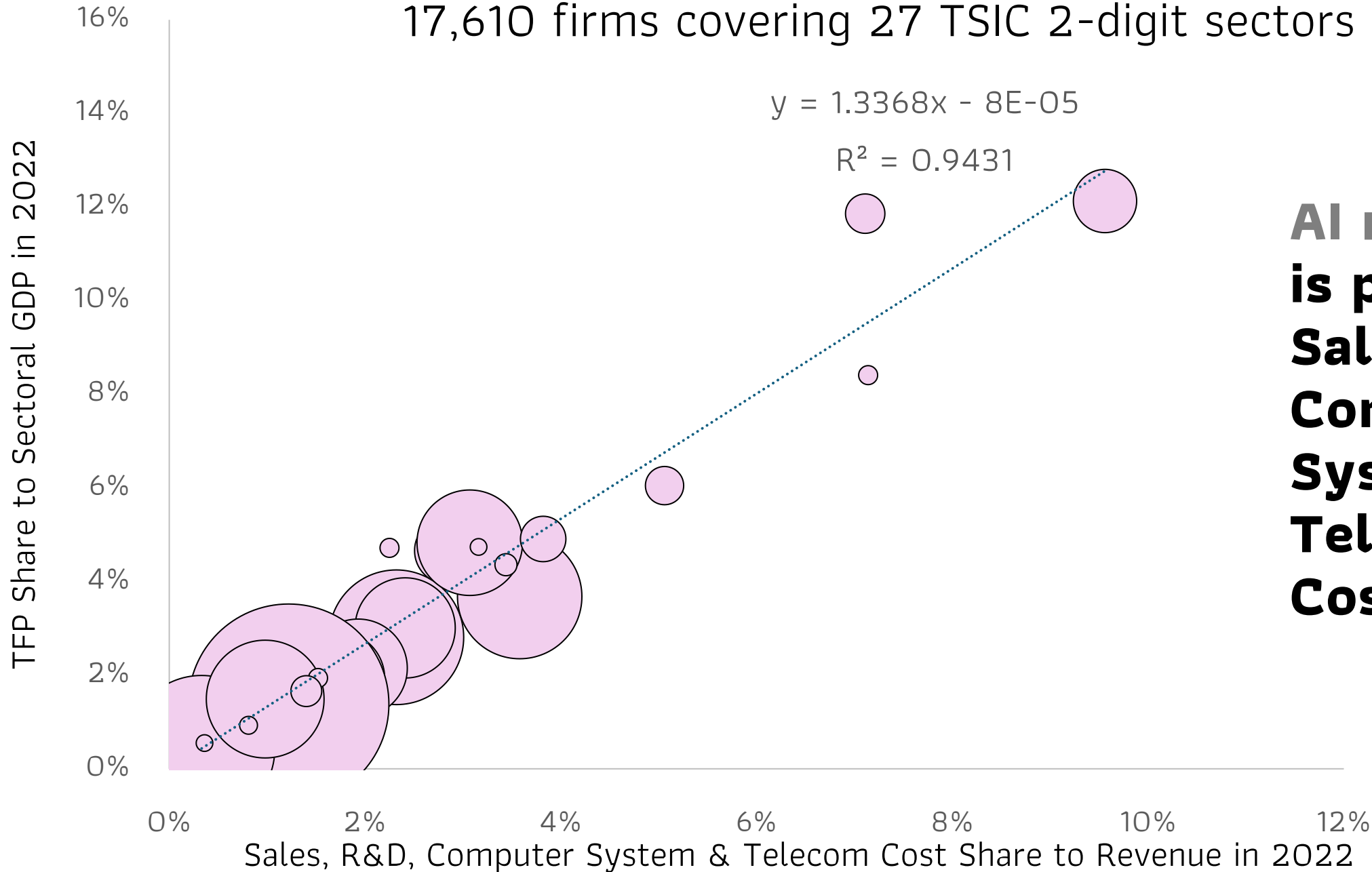
- > **40%** of Global Labor Market already Impacted by AI Adoption

- **AI** & **Automation** would reduce Working Hours by **60% - 70%**

Goldman Sachs Intelligence

ARTICLES

Generative AI could raise global GDP by 7%

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Topic: ARTIFICIAL INTELLIGENCE

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STAFF DISCUSSION NOTE

Gen-AI: Artificial Intelligence and the Future of Work

Prepared by Mauro Cazzaniga, Florence Jaumotte, Longji Li, Giovanni Melina, Augustus J. Panton, Carlo Pizzinelli, Emma Rockall, and Marina M. Tavares

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McKinsey & Company

The economic potential of generative AI

The next productivity frontier

June 2023

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Michael Chui
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17,610 firms covering 27 TSIC 2-digit sectors

$y = 1.3368x - 8E-05$

$R^2 = 0.9431$

TFP Share to Sectoral GDP in 2022 (y-axis)

Sales, R&D, Computer System & Telecom Cost Share to Revenue in 2022 (x-axis)

AI readiness is proxied by Sales, R&D, Computer System & Telecom Costs
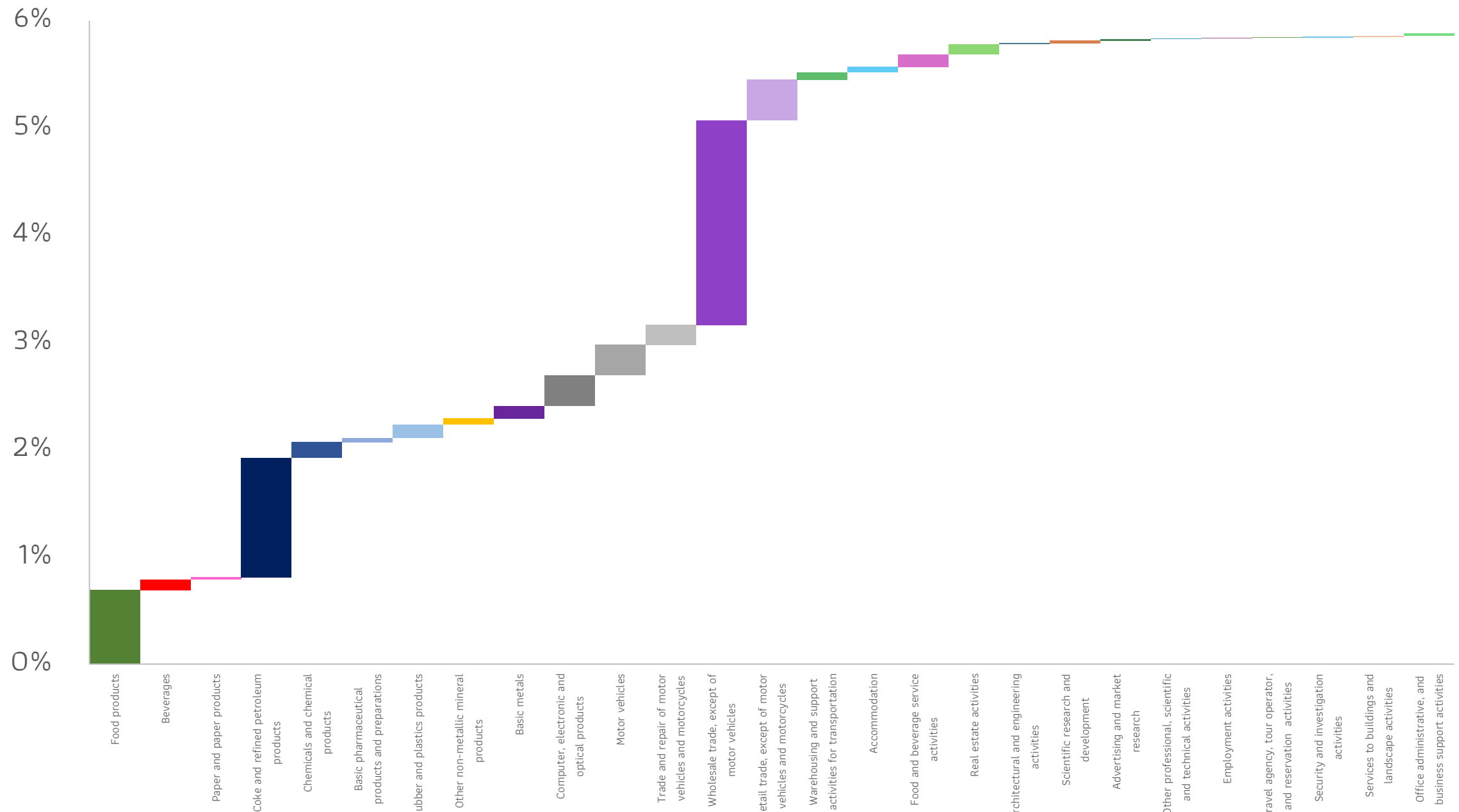
Manufacturing Sector	Sales	R&D	Computer System	Telecom	Sum
Food products	2.53%	0.07%	0.11%	0.14%	2.86%
Beverages	1.61%	0.11%	0.08%	0.30%	2.10%
Textiles	2.39%	0.14%	0.10%	0.31%	2.94%
Wearing apparel	2.62%	0.10%	0.12%	0.17%	3.00%
Leather and related products	2.49%	0.21%	0.20%	0.14%	3.04%
Wood and of products of wood	2.46%	0.11%	0.08%	0.16%	2.80%
Paper and paper products	4.50%	0.44%	0.14%	0.14%	5.22%
Printing and reproduction of recorded media	3.94%	0.18%	0.15%	0.25%	4.52%
Publishing activities	2.43%	0.35%	0.49%	0.58%	3.85%
Coke and refined petroleum products	3.40%	0.03%	0.05%	0.32%	3.79%
Chemicals and chemical products	2.37%	0.27%	0.11%	0.19%	2.93%
Basic pharmaceutical products and preparations	8.98%	1.03%	0.20%	0.24%	10.45%
Rubber and plastics products	1.90%	0.06%	0.17%	0.15%	2.28%
Other non-metallic mineral products	9.82%	0.30%	0.22%	0.57%	10.91%
Basic metals	0.67%	0.02%	0.01%	0.19%	0.90%
Fabricated metal products	2.60%	0.13%	0.11%	0.21%	3.05%
Computer, electronic and optical products	1.27%	0.09%	0.12%	0.10%	1.57%
Electrical equipment	1.57%	0.18%	0.05%	0.14%	1.93%
Machinery and equipment	1.23%	0.07%	0.10%	0.14%	1.54%
Motor vehicles	1.26%	0.10%	0.06%	0.08%	1.49%
Other transport equipment	2.16%	0.04%	0.09%	0.08%	2.37%
Furniture	2.95%	0.05%	0.09%	0.16%	3.26%
Other manufacturing	1.53%	0.28%	0.30%	0.45%	2.56%
Repair and installation of machinery	1.54%	0.16%	0.11%	0.30%	2.11%
Electricity, gas, steam and air conditioning supply	2.70%	0.05%	0.13%	0.10%	2.98%
Water collection, treatment and supply	0.56%	0.49%	0.02%	10.99%	12.05%
Waste collection, treatment and disposal activities	1.55%	0.06%	0.11%	0.11%	1.83%

Thailand's Manufacturing Sectors with AI readiness based on Sales, R&D, Computer System & Telecom Costs

Service Sector	Advertising	R&D and Training	Computer System	Telecom	Sum
Construction of buildings	0.74%	0.01%	0.03%	0.27%	1.05%
Civil engineering	1.83%	0.12%	0.03%	0.16%	2.15%
Specialized construction activities	3.54%	0.08%	0.27%	0.79%	4.69%
Trade and repair of motor vehicles and motorcycles	0.73%	0.03%	0.05%	0.30%	1.11%
Wholesale trade, except of motor vehicles	1.08%	0.05%	0.03%	0.37%	1.53%
Retail trade, except of motor vehicles and motorcycle	2.08%	0.04%	0.05%	0.19%	2.36%
Land transport and transport via pipelines	0.21%	0.01%	0.09%	2.82%	3.13%
Water transport	0.00%	0.00%	0.01%	0.58%	0.60%
Warehousing and support activities for transportation	0.43%	0.07%	0.04%	0.50%	1.04%
Postal and courier activities	0.00%	0.00%	0.09%	1.08%	1.17%
Accommodation	1.56%	0.80%	1.03%	1.33%	4.72%
Food and beverage service activities	0.17%	0.01%	0.04%	1.25%	1.47%
Motion picture production, and sound recording activ	3.32%	4.14%	1.10%	0.85%	9.41%
Programming and broadcasting activities	0.01%	0.43%	0.13%	0.88%	1.46%
Telecommunications	0.00%	0.00%	0.04%	0.05%	0.10%
Computer programming and consultancy activities	2.33%	0.84%	0.78%	5.55%	9.51%
Information service activities	0.39%	0.02%	0.07%	0.20%	0.68%
Financial services, except insurance and pension fundi	6.56%	0.14%	0.16%	0.42%	7.27%
Activities auxiliary to financial services and insurance	0.02%	0.01%	0.00%	2.76%	2.79%
Real estate activities	0.57%	0.12%	0.03%	3.71%	4.43%
Legal and accounting activities	0.11%	0.78%	1.81%	6.37%	9.08%
Head offices; management consultancy activities	0.82%	0.39%	0.37%	1.16%	2.74%
Architectural and engineering activities	3.57%	0.22%	0.35%	0.72%	4.86%
Scientific research and development	0.45%	0.73%	0.13%	0.29%	1.59%
Advertising and market research	0.83%	0.08%	1.19%	1.38%	3.48%
Other professional, scientific and technical activities	0.27%	0.02%	0.07%	0.23%	0.60%
Rental and leasing activities	0.54%	0.01%	0.29%	0.40%	1.24%
Employment activities	0.30%	0.14%	0.11%	0.43%	0.98%
Travel agency, tour operator, and reservation activiti	0.80%	0.80%	0.53%	2.44%	4.58%
Security and investigation activities	0.63%	3.15%	0.97%	3.59%	8.34%
Services to buildings and landscape activities	1.50%	0.55%	0.11%	2.45%	4.61%
Office administrative, and business support activities	3.47%	0.38%	0.04%	0.71%	4.61%
Education	0.40%	1.61%	0.55%	2.73%	5.29%
Human health activities	2.69%	0.26%	0.13%	0.51%	3.59%
Creative, arts and entertainment activities	0.15%	0.11%	0.12%	0.68%	1.06%
Sports activities and amusement and recreation activit	2.94%	0.53%	1.80%	2.24%	7.51%
Repair of computers and personal and household go	1.70%	0.03%	0.19%	0.36%	2.28%
Other personal service activities	0.27%	0.08%	0.20%	0.42%	0.97%

Thailand's Service Sectors with AI readiness based on Sales, R&D, Computer System & Telecom Costs

Sectoral Contribution of Gen AI Adoption to Thailand GDP by 2030

AI Readiness & Firm-level Productivity Level (I)

	(1) OLS_all	(2) 2SLS_all	(3) OLS_Manu	(4) 2SLS_Manu	(5) OLS_Trade	(6) 2SLS_Trade
Sales	1.354 (2.864)	1.049 (2.894)	1.725 (1.511)	1.634 (1.520)	5.906 (5.366)	4.974 (5.721)
RD	0.644 (1.251)	0.423 (1.343)	0.513 (5.789)	-0.481 (6.162)	-2.404 (7.436)	-2.401 (8.605)
Comp	4.898 (3.972)	4.611 (4.173)	27.15* (15.83)	26.94* (15.66)	-3.780 (7.186)	-5.879 (7.141)
Telecom	20.45*** (2.787)	21.34*** (3.055)	16.72 (22.83)	19.32 (23.90)	28.61*** (4.889)	30.06*** (5.432)
wage_avg_LN	2.043*** (0.158)	2.781*** (0.634)	0.958** (0.458)	1.464 (0.994)	2.123*** (0.192)	3.465*** (0.502)
2.SME	-0.925*** (0.127)	-1.203*** (0.193)	-1.360*** (0.226)	-1.503*** (0.341)	-0.727*** (0.170)	-1.254*** (0.178)
3.SME	-1.405*** (0.164)	-1.730*** (0.273)	-1.876*** (0.262)	-2.071*** (0.433)	-0.682*** (0.238)	-1.278*** (0.269)
N	17610	17610	3641	3641	11162	11162
adj. R-sq	0.128	0.117	0.067	0.063	0.118	0.080

Standard errors in parentheses
* $p<0.1$, ** $p<0.05$, *** $p<0.01$

Source: Data from the NSO's Industrial and Business Census 2022 and MOC's Firm Registration Database 2022, calculated by the author

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AI Readiness & Firm-level Productivity Level [II]

	(1) OLS_Tran	(2) 2SLS_Tran	(3) OLS_Hotel_~s	(4) 2SLS_Hotel~s	(5) OLS_Real	(6) 2SLS_Real
Sales	-26.71**	-27.37***	-22.12**	-23.41**	-4.446**	-4.476**
	(11.26)	(10.58)	(10.98)	(10.93)	(1.966)	(1.878)
RD	41.69	52.60*	-12.64	-11.64	-11.73	-11.84
	(30.05)	(27.66)	(13.94)	(12.77)	(11.12)	(10.96)
Comp	11.90	14.90	25.41*	26.37*	-2.470	-2.685
	(24.54)	(21.38)	(13.32)	(13.97)	(9.279)	(8.871)
Telecom	8.458	8.544	5.289	4.685	18.66**	18.75**
	(9.519)	(9.588)	(7.489)	(7.669)	(8.032)	(7.951)
wage_avg_LN	4.577***	5.871***	1.586***	1.221	2.300***	2.364***
	(0.850)	(1.243)	(0.435)	(0.872)	(0.546)	(0.834)
2.SME	-1.016	-1.293	0.848	1.104	-1.086	-1.105
	(1.677)	(1.598)	(0.824)	(0.916)	(0.770)	(0.749)
3.SME	-2.557	-2.999*	-2.668	-2.460	-1.012	-1.046
	(1.733)	(1.737)	(2.635)	(2.726)	(0.911)	(0.909)
N	85	85	678	678	486	486
adj. R-sq	0.157	0.139	0.104	0.101	0.169	0.169

Standard errors in parentheses
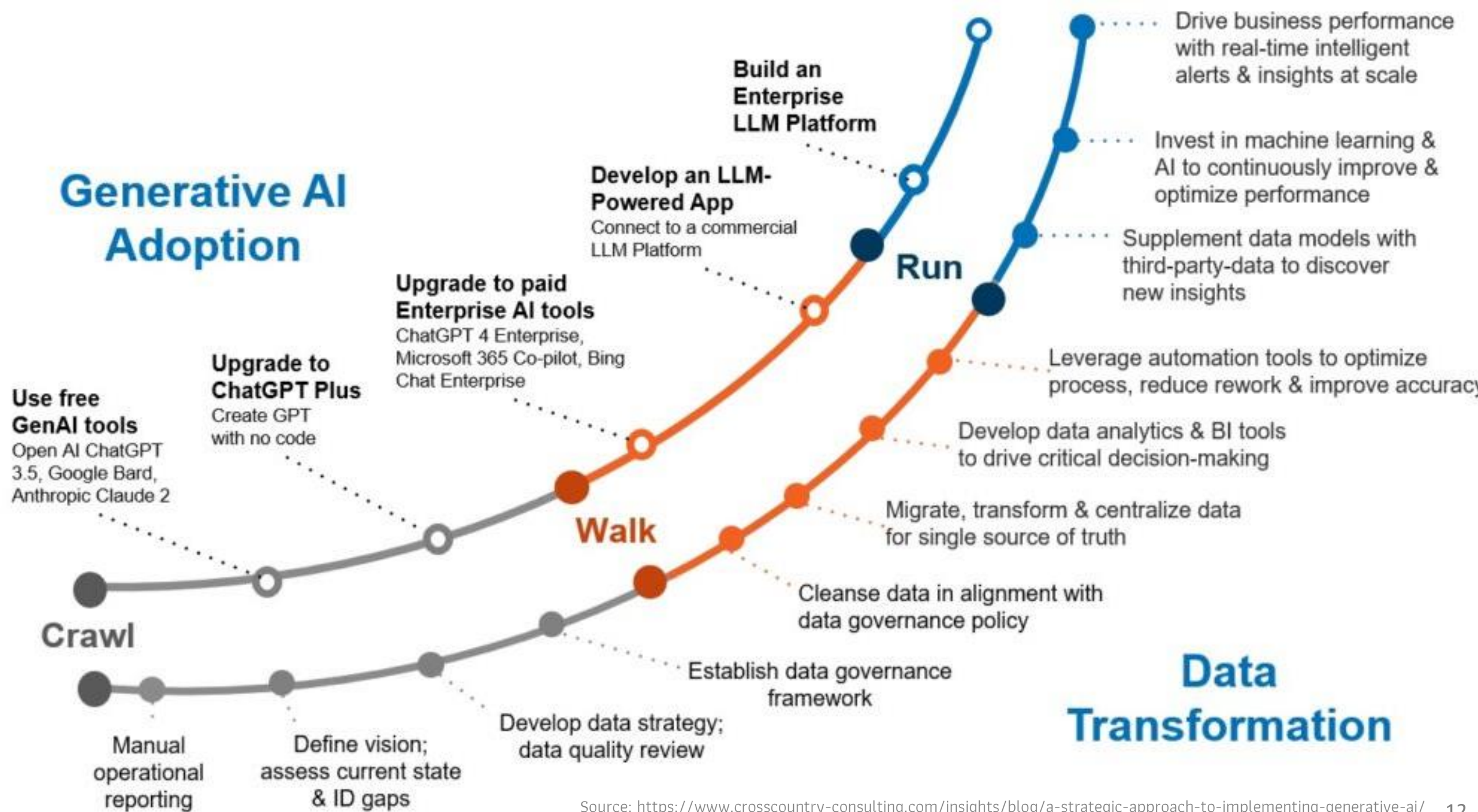* p<0.1, ** p<0.05, *** p<0.01

AI Readiness & Firm-level Productivity Level (III)

	(1) OLS_Research	(2) 2SLS_Resea~h	(3) OLS_Support	(4) 2SLS_Support
Sales	-11.20 (8.066)	-11.46 (7.753)	0.336 (3.690)	-2.935 (3.926)
RD	2.132* (1.160)	1.781 (1.282)	1.086 (1.751)	1.784 (2.236)
Comp	-0.757 (2.776)	-1.135 (2.847)	12.96*** (4.269)	15.28*** (4.870)
Telecom	6.764 (5.951)	7.355 (6.077)	10.93*** (3.508)	11.13*** (3.709)
wage_avg_LN	1.909*** (0.351)	2.340*** (0.897)	2.113*** (0.414)	3.521*** (0.795)
2.SME	-1.726*** (0.518)	-1.826*** (0.552)	0.554 (0.492)	0.0211 (0.555)
3.SME	0.281 (0.666)	0.114 (0.711)	0.464 (0.791)	-0.328 (0.838)
N	514	514	1044	1044
adj. R-sq	0.127	0.123	0.234	0.190

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Generative AI Adoption / Data Transformation — Crawl, Walk, Run roadmap

Generative AI Adoption

Use free GenAI tools
Open AI ChatGPT 3.5, Google Bard, Anthropic Claude 2

Upgrade to ChatGPT Plus
Create GPT with no code

Upgrade to paid Enterprise AI tools
ChatGPT 4 Enterprise, Microsoft 365 Co-pilot, Bing Chat Enterprise

Develop an LLM-Powered App
Connect to a commercial LLM Platform

Build an Enterprise LLM Platform

Drive business performance with real-time intelligent alerts & insights at scale

Invest in machine learning & AI to continuously improve & optimize performance

Supplement data models with third-party-data to discover new insights

Leverage automation tools to optimize process, reduce rework & improve accuracy

Develop data analytics & BI tools to drive critical decision-making

Migrate, transform & centralize data for single source of truth

Cleanse data in alignment with data governance policy

Establish data governance framework

Develop data strategy; data quality review

Define vision; assess current state & ID gaps

Manual operational reporting

Crawl

Walk

Run

Data Transformation

Creativity to Embark on an AI Journey will Shape Thailand's future

SCBX's AI-first Organization Blueprint

1. **AI-FIRST is PEOPLE-FIRST**
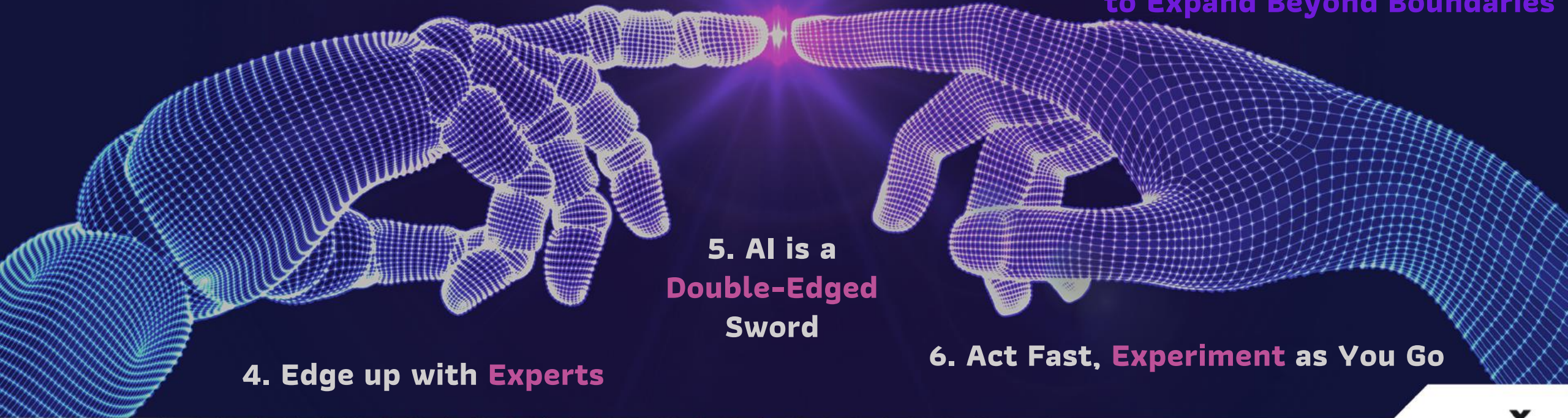
2. **Always Start with a BIG WHY**

3. **Change Begins at the Top**

Broad AI Adoption
Beyond Awareness, Culture Matters

Deep AI Development
Find the winning Zone, Defining Strategic Areas to Expand Beyond Boundaries

5. **AI is a Double-Edged Sword**

4. **Edge up with Experts**

6. **Act Fast, Experiment as You Go**

SCB^x

AI is here to stay:

01
Assess business needs and readiness

- Technology Infrastructure
- People, Skills & Corporate Culture
- Data Governance

02
Leaders must lead the change and willing to experiment

- Openness to AI & Innovation Adoption

03
Build people capabilities and the technology culture

- People, Culture & Operation are key Success Factors to Technology Application

04
Beware of cost and expertise

- Technology Utilization as needed by Business Functions

05
Keep up with the emerging regulations

- Ethical & Responsible Usage of Data & Technology