Artificial Intelligence and Industrial Transformation

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AI to address development challenges in diverse sectors

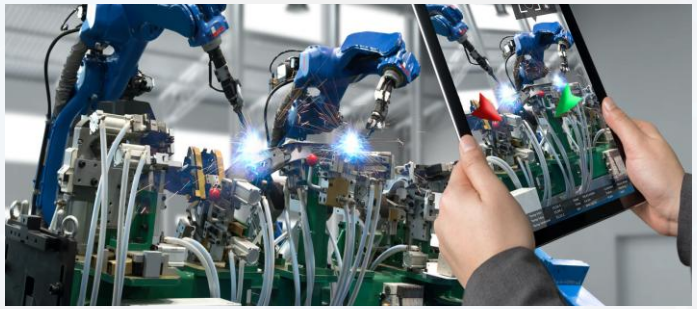
+ Agriculture: crop-whisperer, help farmers increase productivity
+ Healthcare: doctor's sidekick, assist professionals provide effective & efficient services
+ Education: revolutionize learning by providing personalized grading, feedback, help with personalized tutoring, customizing therapy & learning for children with learning disorders
+ Finance: humane banker, provide access to formal credit for those excluded
+ Energy & Infrastructure: wizard by improving energy efficiency, traffic management, road infrastructure monitoring, power grid monitoring, water infrastructure

While AI may not be a panacea for all development challenges faced, it is an essential tool that can make a significant difference (WB 2024)

Top Industries Impacted by AI

AGRICULTURE

computer vision and machine learning to detect soil shortages and crop diseases, as well as "precision agriculture" where AI forecasts trends to maximize schedule of planting.



MANUFACTURING

AI-enabled methods to increase efficiency and production. GenAI in predictive maintenance of line machines.

BUSINESS PROCESS OUTSOURCING

automation of tasks, minimizing errors freeing workers up for strategic tasks requiring creativity and human judgment.

HEALTHCARE

machine-led surgeries which may operate around the clock, are less intrusive and more exact, and have a lower margin of error; medical diagnosis, detecting dangerous medical conditions more quickly and accurately

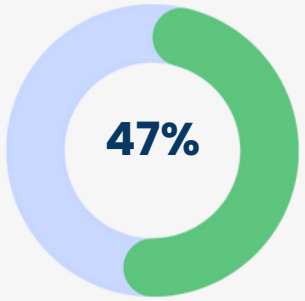
RETAIL AND E-COMMERCE

utilize consumer data to drive more targeted sales efforts, behaviors of customers highlighting patterns, trends, needs, preferences.

EDUCATION

repetitive, data-intensive operations, make or digitize study materials and lectures, and create customized learning modules

56% of PH workers will potentially use Generative AI between 5-20% of their regular work activities



Of potential gains will come from manufactring and retail

$79.3B Increase in Productive Capacity for the Philippines

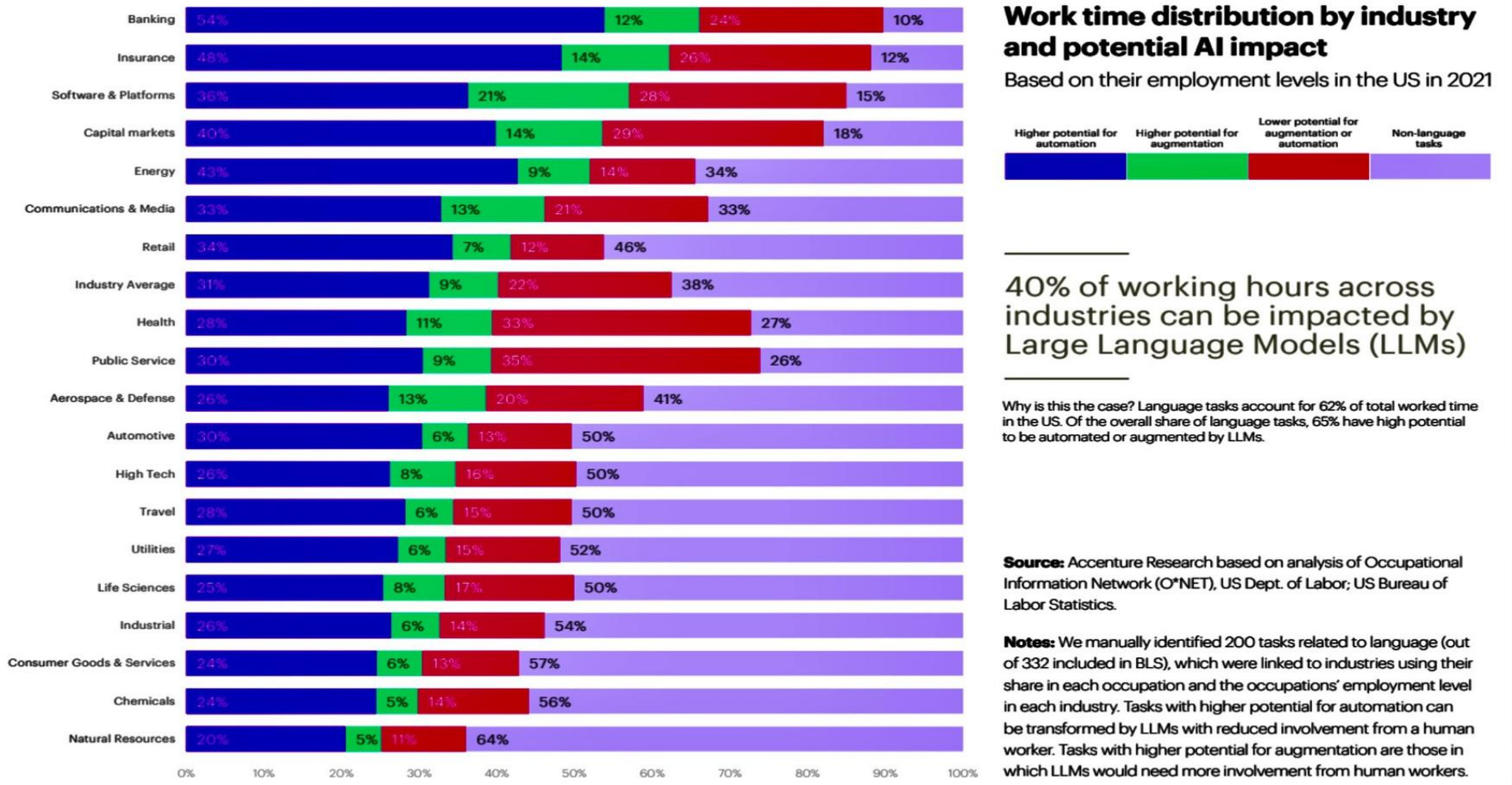
Industry Contribution of Generative AI (USD Billions) and %

Source:Microsoft, KPMG

While AI offers many benefits, it also presents risks that need to be carefully managed

+ bias & discrimination: AI models can perpetuate & exacerbate existing biases if trained on unrepresentative or biased datasets
+ Increased carbo emissions & potential environmental degradation : AI model supply chain consumes a huge amount of energy, water, & other natural resources; need for sustainable practices in AI deployment
+ Risks from job automation & labor market disruptions: 40% of jobs in emerging markets, 60% in low-income countries exposed to AI, 60% advanced countries (IMF)
+ Misuse of AI & trust erosion: misinformation, deepfakes, conducting cybercrime, interfering with elections, facilitating fraud & scams
+ Inequality & access: growing gaps in inclusion and widening inequality based on differential access to AI technologies
+ Cybersecurity vulnerabilities

Roles for AI and machine learning specialists, data analysts and scientists, and digital transformation specialists are expected to grow rapidly



AI is expected to change how we spend our time at work. Image: Accenture

Many clerical or secretarial roles are likely to decline quickly

Fastest growing vs. fastest declining jobs

WORLD ECONOMIC FORUM

Top 10 fastest growing jobs

1.	AI and Machine Learning Specialists
2.	Sustainability Specialists
3.	Business Intelligence Analysts
4.	Information Security Analysts
5.	Fintech Engineers
6.	Data Analysts and Scientists
7.	Robotics Engineers
8.	Electrotechnology Engineers
9.	Agricultural Equipment Operators
10.	Digital Transformation Specialists

Top 10 fastest declining jobs

1.	Bank Tellers and Related Clerks
2.	Postal Service Clerks
3.	Cashiers and ticket Clerks
4.	Data Entry Clerks
5.	Administrative and Executive Secretaries
6.	Material-Recording and Stock-Keeping Clerks
7.	Accounting, Bookkeeping and Payroll Clerks
8.	Legislators and Officials
9.	Statistical, Finance and Insurance Clerks
10.	Door-To-Door Sales Workers, News and Street Vendors, and Related Workers

JOBS AI Could Create

Source
World Economic Forum, Future of Jobs Report 2023.

Note
The jobs which survey respondents expect to grow most quickly from 2023 to 2027 as a fraction of present employment figures

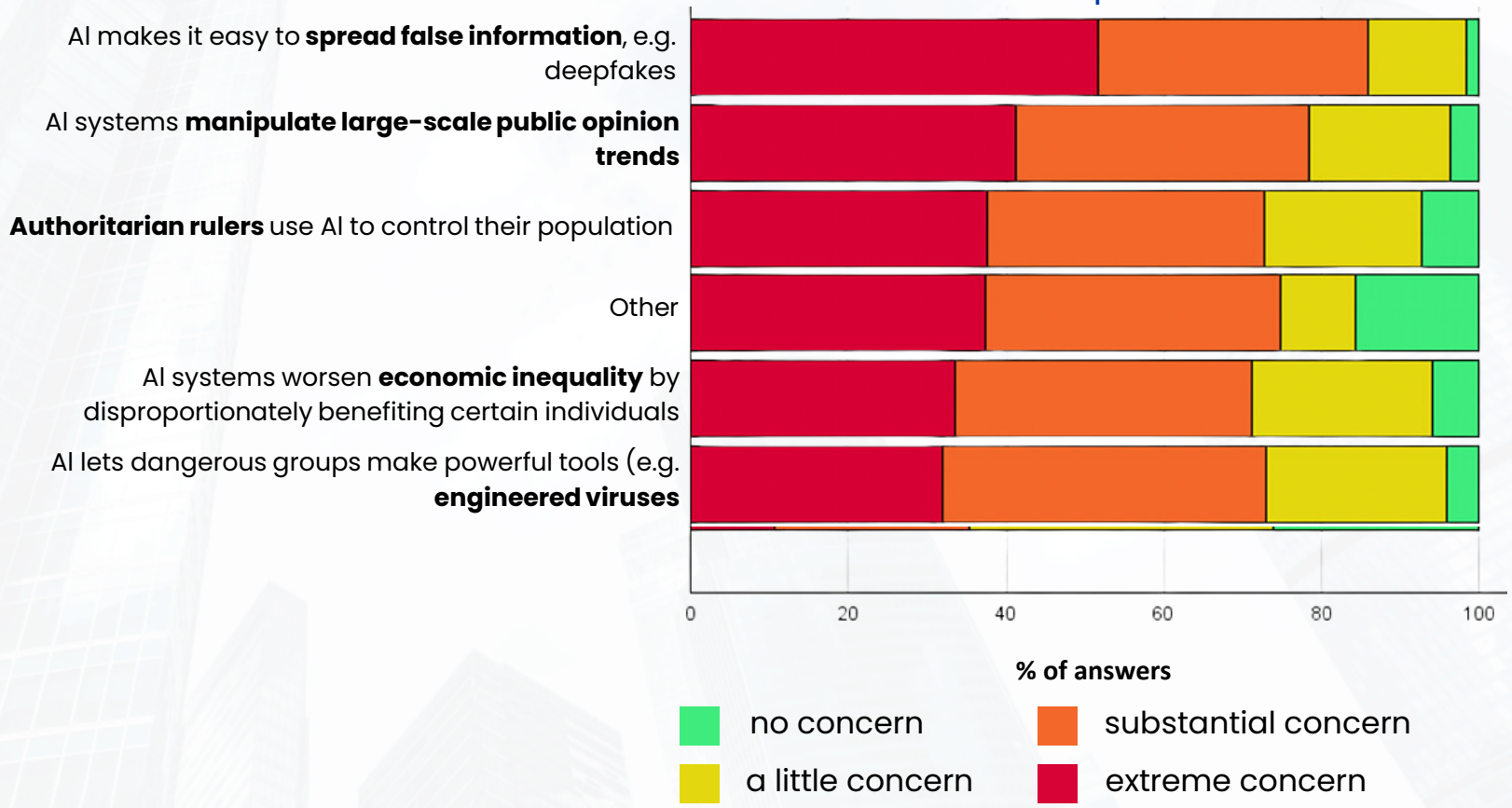
False information, public opinion manipulation, economic inequality, and destructive AI tools are the top AI issues for AI practitioners

Top Concerns About AI Development

- Disinformation
- Safety and security
- Losing human control over AI
- Ethical concerns
- Bias
- Instability
- Inacurate LLM predictions
- Unknown unknowns
- Job loss and social inequalities
- Environmental impact
- Industry concentration
- State overreach

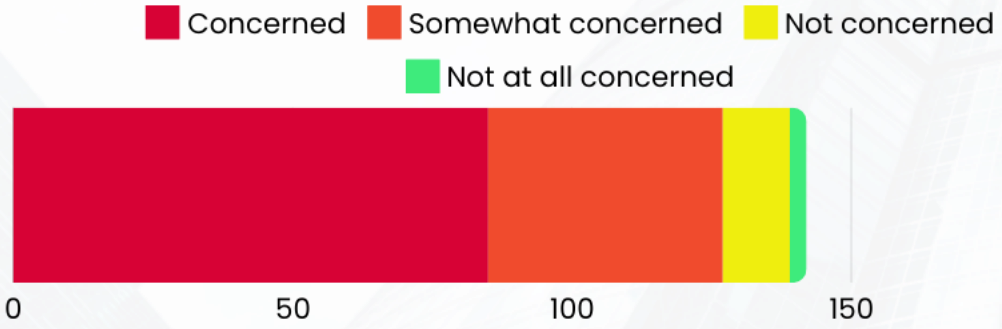
Source: Harvard Business Review (2024)

Survey of 2,778 AI researchers about the top concerns on AI development



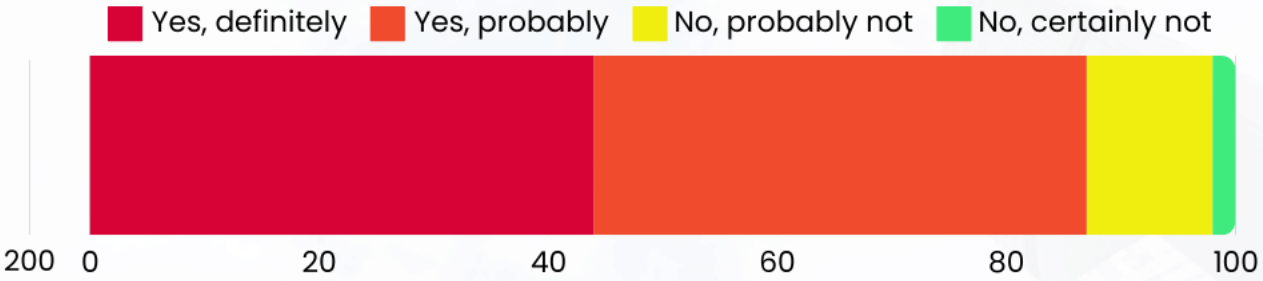
Source: Various Authors from AI Impacts Berkeley, University of Bonn, University of Oxford (2024)

85% of people globally are worried about online disinformation



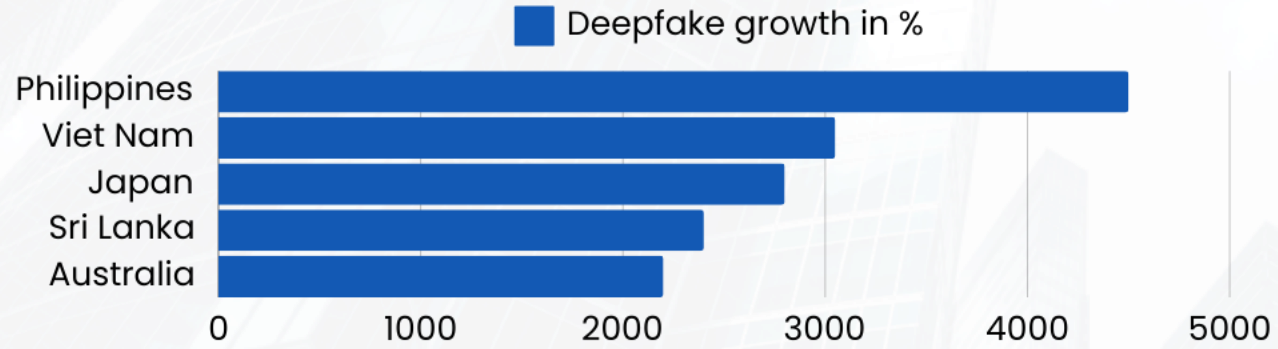
Sample size: 8,000 respondents from 16 Countries

87% believe it has already harmed their country's politics

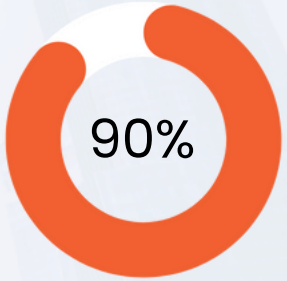


Sample size: 8,000 respondents from 16 Countries

1530% increase of deepfake in APAC (2022 to 2023), PH most vulnerable



Source: UNESCO (2023), Sum and Substance (2023),



estimate 90% of training data for popular LLMs in English

1.5 billion non-native English speakers globally

Source: Meta (2023), Zihao Li et al (2024)

Most Manufacturing PH MSMEs have very low and low technology utilization

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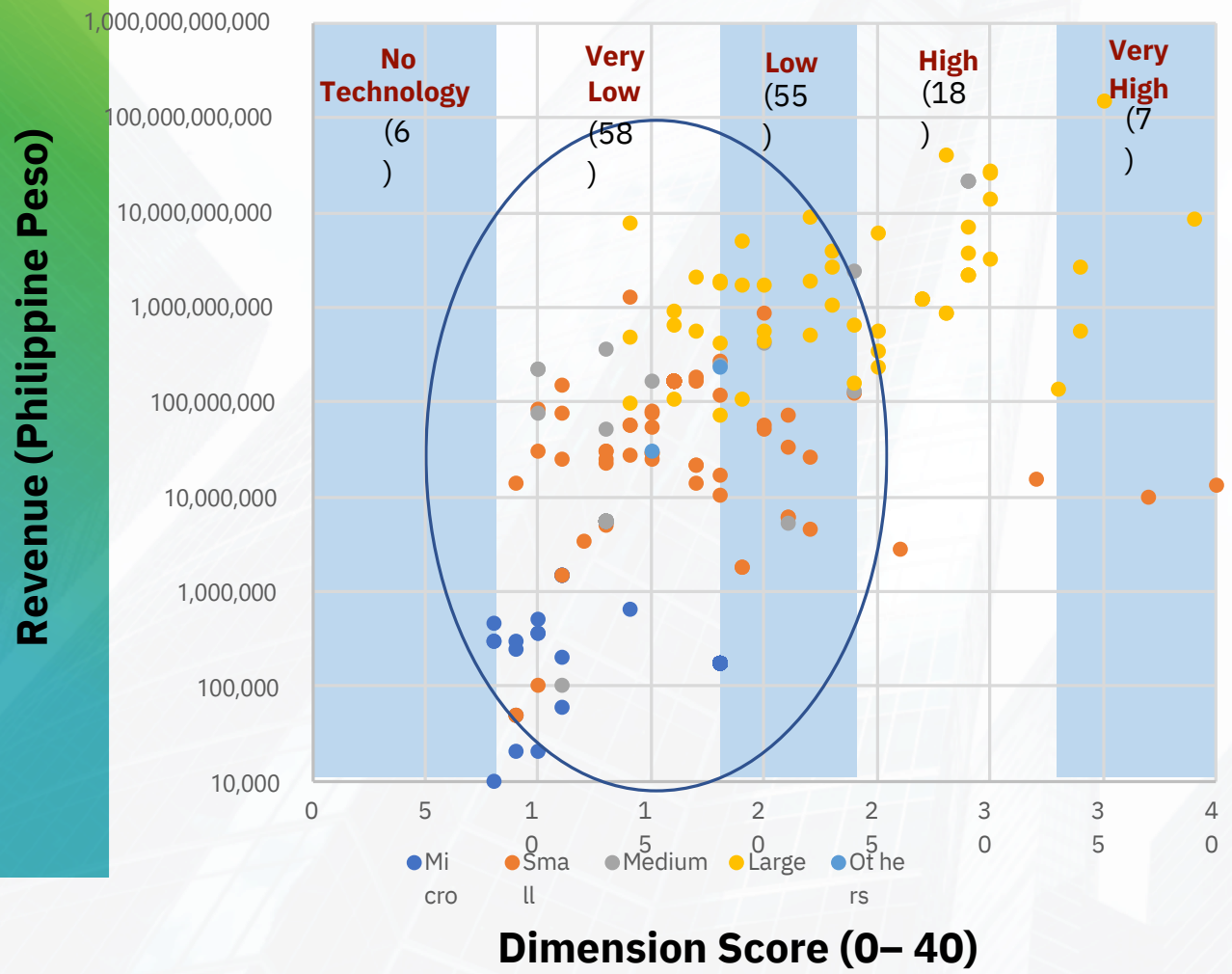
DTI's 2019 Survey on Technology Utilization of Manufacturing Companies in the Philippines

Data Summary of Respondents in the Survey



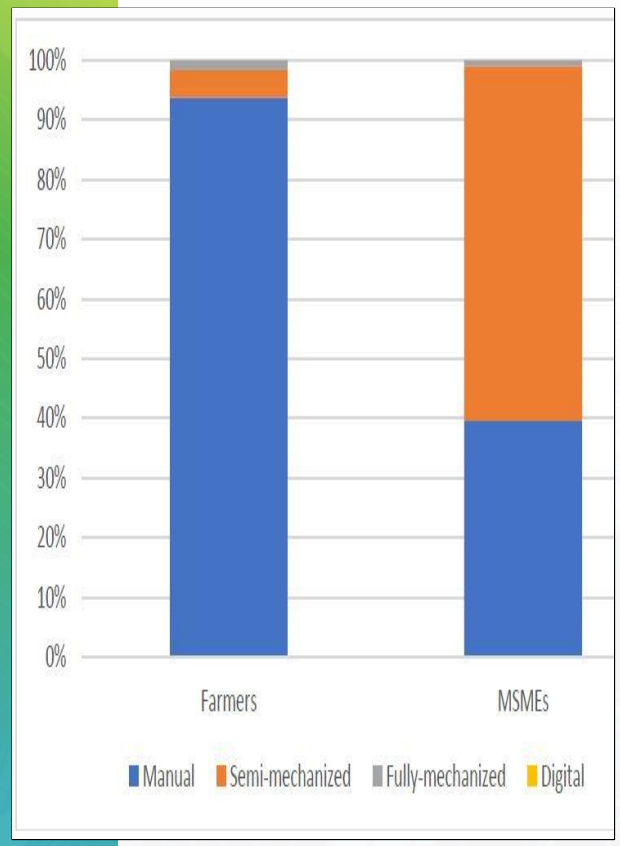
Technology Utilization across different manufacturing dimensions

	No Technology (0 – 8)	Very Low (9 – 16)	Low (17 – 24)	High (25 – 32)	Very High (33 – 40)
Micro	4	15	3	0	0
Small	1	2	2	2	2
Medium	1	6	2	1	0
Large	0	7	2	1	5
Others	0	3	1	0	0

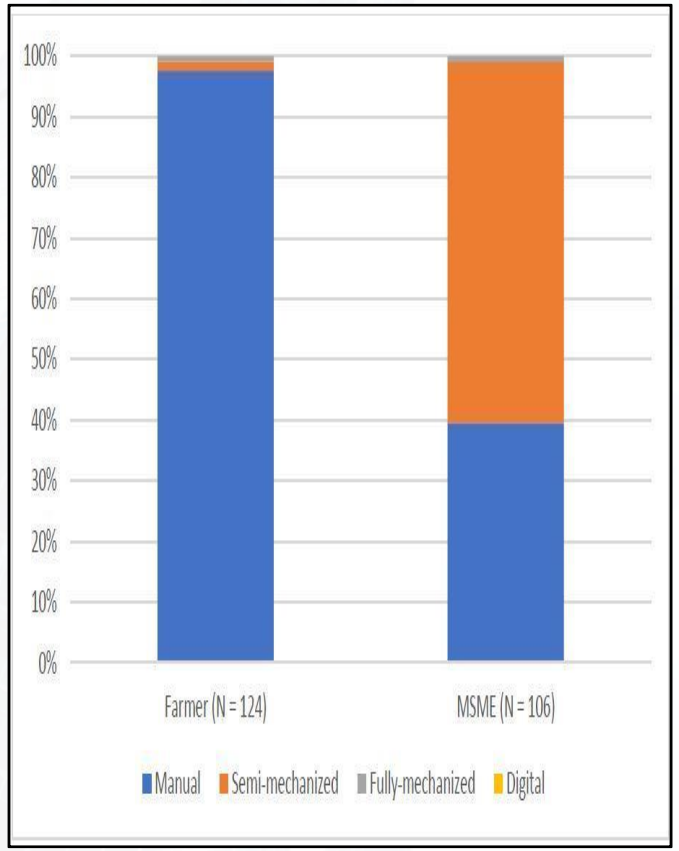
Note: Respondents with Negative and Zero Values under Revenue are dropped from the chart

Source: Survey on the Technology Utilization of Manufacturing Enterprises

Current technology use of farmers and MSMEs



CACAO



COFFEE

Technology Utilization Assessment of Agribusiness (Cacao and Coffee)

Only **1 out of 10** farmers utilizes mechanization technologies

Farmers continue to rely more on manual equipment in their production and post-production activities.

Only **4 out of 10** Agri MSMEs utilize mechanization technologies

MSMEs in both value chain utilize semi-mechanized technologies more than the farmers.

As MSMEs produce more value-added products **they shift away from manual equipment to more semi-mechanized technology**

Industrial transformation through AI

- AI should be embedded in an updated industrial policy that supports innovation, productivity, and competitiveness.
- **Sector-specific AI integration** in agriculture, manufacturing, electronics, creative industries, education, health, logistics
- **Support for MSMEs** through AI-as-a-service platforms, innovation hubs, and digital infrastructure;
- **Workforce Upskilling and Labor Market Readiness:** AI adoption demands a skilled and adaptable workforce
- **Education System Reform for the AI Era:** education sector must be reoriented to prepare students for an AI-enabled future; curriculum updates to include AI ethics, data literacy, and computational thinking; teacher training and integration of AI tools in pedagogy; education data governance to protect learner privacy

AI should be embedded in a forward-looking industrial policy

- India: high-end scalable AI computing ecosystem 1ith 10K GPUs through PPP, AI marketplace offering AIAAS, provide pre-trained models through OSS solution for critical AI resources, AI Innovation Center, AI Datasets Platform
- Korea: Data Dam to enhance data infrastructure, access to AI training data
- Develop a national AI marketplace or centralized digital platform offering access to pre-trained AI models, anonymized datasets, APIs, AI-as-a-service tools would democratize access to AI capabilities and encourage collaboration across public and private sectors
- Establish shared compute facilities: public-private partnerships – provide GPU clusters & high-performance computing resources to startups, universities, and MSMEs
- Provide early-stage funding, R&D grants, incubation programs for AI startups in key sectors like agritech, logistics, healthtech, edtech, and fintech

AI is not merely a technological shift— structural and industrial transformation

- Build the policy, institutional, and human capital foundations to ensure that AI becomes a force for empowerment, equity, and economic advancement
- Digital and data infrastructure investments in the medium-term expenditure framework
- AI innovation clusters and regulatory sandboxes in key sectors
- Expanded funding for workforce upskilling through TESDA, CHED, and LGUs
- Integrate AI into national curriculum and teacher development programs