MALAYSIA PRODUCTIVITY CORPORATION

AIProduktiviti

AI PRODUCTIVITY ROADMAP

NAVIGATING PRODUCTIVITY OF THE INDUSTRY IN THE DIGITAL AND AI ERA

Agro-Food Industry

AI Productivity Roadmap
Agro-Food Productivity Nexus

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Outline

Foreword Director General

To boost national productivity, we must harness the power of AI and digital technologies — every sector and every individual has a role to play by equipping themselves with the right knowledge, skills, and competencies to stay ahead."

Datuk Zahid Ismail
Director General
Malaysia Productivity Corporation

Foreword Champion

The agro-food sector must embrace digital innovation to overcome growing global challenges and ensure sustainable productivity. This roadmap outlines a collaborative path toward smarter agriculture through technologies like AI, IoT, and blockchain, bridging traditional practices with modern solutions. It serves as a guide to empower all stakeholders in building a resilient, efficient, and future-ready agro-food ecosystem.

Datuk Jeffrey Ng Choon Ngee
Champion
Agro-Food Productivity Nexus (AFPN)

Industry Overview and Digitalisation Challenges

The agro-food sector encompassing sub-sectors such as aquaculture, crop cultivation, poultry, and ruminant farming is a vital contributor to national GDP, supported by a wide range of agricultural establishments and a strong, diverse workforce. The sector's value chain includes input suppliers, feed and machinery providers, processors, logistics players, and distribution networks. While the adoption of digital technologies has significantly improved productivity and operational efficiency, challenges remain. These include:

- Interoperability gaps across sub-sector systems
- Hesitancy among farmers and workers due to limited digital skills and concerns over job displacement
- Frequent disruptions from new technologies that can impact supply chain reliability, product quality, and food safety

Industry Overview

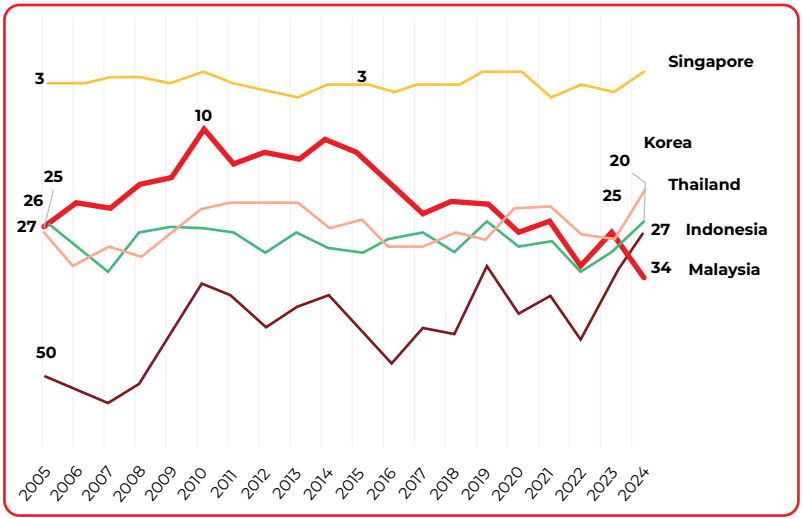
Number of Establishment	12,998 (2022)
Number of Employees	567,476 (2022)
Key Sub sectors	Poultry, Aquaculture, Crops, Ruminant
GDP Contribution	10.9% / RM50.66 billion (Q1, 2024)
Value chain/ Supply Chain	Production
	Harvest & Transport
	Process & Storage
	Distribution & Packaging
	Wholesale & Retail
Productivity Level/Growth	1.5% (RM95,542) - 2023p

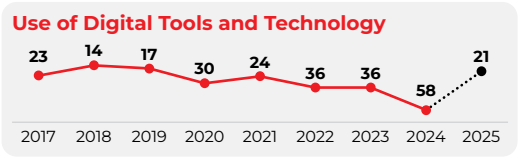
Challenges In Digitalisation

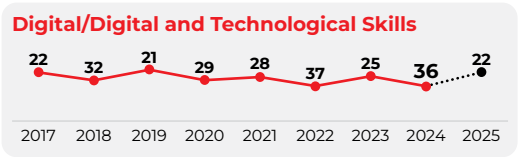
- High Initial Investment & Uncertain ROI
- Lack of Digital Literacy Among Workers
- Connectivity & Infrastructure Gaps
- Fragmented Systems & Lack of Interoperability
- Maintenance & Technical Support Limitations
- Cybersecurity & Data Privacy Concerns
- Regulatory and Compliance Complexity
- Cultural Mindset & Generational Divide

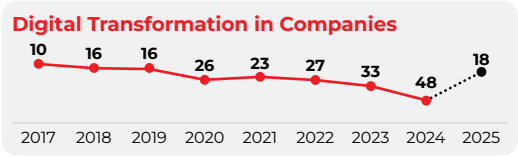
Accelerating Technology Adoption to Enhance National Competitiveness

Malaysia must urgently accelerate technology adoption to achieve its aspiration of becoming one of the top 12 most competitive nations by 2030.









Source: World Competitiveness Yearbook 2017-2024

Accelerating Productivity through Digitalisation via MPC's Digital Platform Network+

Business leaders can enhance productivity and strengthen the ecosystem by leveraging MPC's Digital Platform Network+ (DPN+), which provides access to affordable digital solutions and promotes skills enhancement to drive digital transformation.

Step 1

Digital Pledge (Business Leader/CEO): Commit to digital transformation and prioritize it in the business strategy.

Step 2

Supply (Digital Solution Providers): Ensure digital solutions are available, affordable, and scalable for businesses.

Step 3

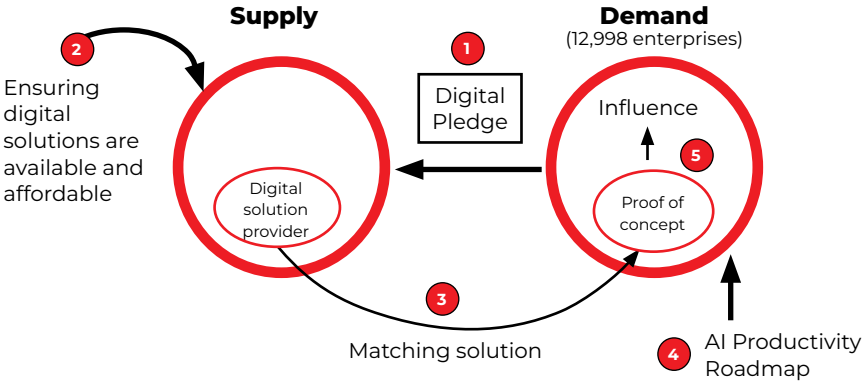
Matching Solution (MPC/Business Leader): Identify and match the right digital solutions to business needs.

Step 4

AI Productivity Roadmap (Business Leader/CEO): Create a clear, actionable plan for integrating digital technologies.

Step 5

Influence (Business Leader/CEO): Use proof of concept to drive adoption and build internal capacity for digital transformation.



AI and Digital Adoption in Agro-Food Industry

This table outlines the progressive stages of digital adoption across various functions in the agro-food industry, categorising them into **Basic, Intermediate, and Advanced** levels to illustrate the industry's transformation journey toward enhanced efficiency, automation, and AI-driven insights

Category	Functions in Services	Basic	Intermediate	Advanced
Poultry 	· Farm & Flock Management · Feed & Nutrition Planning · Health & Vaccination Monitoring · Regulatory Compliance · Production Performance Tracking	· Manual flock records · Paper feed logs · Visual health checks · Manual reporting for compliance	· Digital flock management tools · IoT feed dispensers · Mobile vaccination records · Cloud reporting	· AI for health prediction · Precision feeding algorithms · Automated compliance dashboard · Analytics for productivity
Ruminant 	· Herd Management · Breeding & Genetics · Health Monitoring · Feed Optimisation · Regulatory Compliance	· Manual animal tracking · Basic spreadsheets · Visual health checks · Offline logs	· RFID tagging & herd software · Digital health & breeding schedules · Cloud feed analysis	· AI-powered breeding programs · Real-time health alerts · Automated regulatory reports
Crop 	· Field Operations · Irrigation & Fertilisation · Crop Health Monitoring · Harvest Management · Market Access	· Manual logs for activities · Visual pest detection · Basic irrigation systems	· Farm management systems · Sensor-based irrigation/fertiliser · Mobile pest alerts · e-Marketplace	· AI for yield forecasting · Automated precision irrigation · Satellite & drone analytics
Aquaculture 	· Water Quality Monitoring · Stocking & Growth Tracking · Feed & Nutrition Management · Harvest Scheduling · Compliance & Sustainability Reporting	· Manual water testing · Spreadsheet tracking of stock · Paper feed logs	· IoT water quality sensors · Digital stock tracking apps · Feed scheduling tools · Compliance reports	· AI for biomass prediction · Automated water control systems · Blockchain traceability · Sustainability dashboards

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Poultry

This table outlines the progressive stages of digital adoption in Poultry in the agro-food industry, categorising them into Basic, Intermediate, and Advanced levels to illustrate the industry's transformation journey toward enhanced efficiency, automation, and AI-driven insights

Functions in Services	Basic	Intermediate	Advanced
• Farm & Flock Management • Feed & Nutrition Planning • Health & Vaccination Monitoring • Regulatory Compliance • Production Performance Tracking	• Minimal use of digital tools • Limited online presence • Basic email & manual transactions	• Digital CRM & customer service tools • Online booking & support- Digital marketing & advertising	• AI-powered customer engagement • Omnichannel integration • Predictive analytics for customer behavior
	<u>Suggested Tools</u> • Gmail, Google Drive, Microsoft Outlook, OneDrive- Trello, Slack	<u>Suggested Tools</u> • Google Workspace, Google Ads, HubSpot CRM • Microsoft Dynamics 365, Mailchimp, Calendly • AppSheet (for workflow automation & digitisation)	<u>Suggested Tools</u> • Google Looker, Google Analytics, Microsoft Power BI • ChatGPT, Drift, Pipedrive CRM • AppSheet (for advanced automation & AI-powered workflows) • Gemini (for AI-driven chatbots & customer insights)

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Ruminant

This table outlines the progressive stages of digital adoption in Ruminant in the agro-food industry, categorising them into Basic, Intermediate, and Advanced levels to illustrate the industry's transformation journey toward enhanced efficiency, automation, and AI-driven insights

Functions in Services	Basic	Intermediate	Advanced
• Herd Management • Breeding & Genetics • Health Monitoring • Feed Optimisation • Regulatory Compliance	• Manual record-keeping & payroll • Siloed operations • Limited regulatory compliance automation	• Cloud-based HRM & payroll automation • Data analytics for performance management • Basic AI in financial forecasting	• AI-driven HR & recruitment automation • Automated compliance monitoring • Predictive analytics for business insights
	Suggested Tools • Microsoft Excel, Google Sheets- QuickBooks, Wave Accounting (for finance) • Trello, Notion (for basic operations management)	Suggested Tools • Cloud-Based HR & Payroll: BambooHR, Zoho People, Deel • Data Analytics: Google Data Studio, Microsoft Power BI • Financial AI: Xero, FreshBooks	Suggested Tools • AI in HR & Compliance: Workday, SAP SuccessFactors • Predictive Analytics: Google Looker, Tableau, IBM Watson • AI Automation: Gemini, ChatGPT, AppSheet

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Crop

This table outlines the progressive stages of digital adoption in Corps in the agro-food industry, categorising them into Basic, Intermediate, and Advanced levels to illustrate the industry's transformation journey toward enhanced efficiency, automation, and AI-driven insights

Functions in Services	Basic	Intermediate	Advanced
• Field Operations • Irrigation & Fertilisation • Crop Health Monitoring • Harvest Management • Market Access	• Basic IT support • Minimal cybersecurity measures • No automation in procurement	• System integration for IT management • Partial process automation • Periodic cybersecurity risk assessments	• AI-driven cybersecurity • Full automation of internal processes • Blockchain for secure transactions
	<u>Suggested Tools</u> • Microsoft Defender, Avast for Business (basic cybersecurity) • Google Drive, Microsoft OneDrive (basic cloud storage) • Excel, Google Sheets (manual procurement tracking)	<u>Suggested Tools</u> • System Integration: Microsoft Intune, Google Workspace Admin, ServiceNow • Cybersecurity: CrowdStrike, Palo Alto Networks, IBM Security • Process Automation: AppSheet, Power Automate, UiPath (basic automation)	<u>Suggested Tools</u> • - AI & Cybersecurity: Darktrace, Microsoft Sentinel, Google Chronicle • Process Automation: RPA with UiPath, Automation Anywhere • Blockchain: IBM Blockchain, Hyperledger for secure transactions

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Aquaculture

This table outlines the progressive stages of digital adoption in Aquaculture in the agro-food industry, categorising them into Basic, Intermediate, and Advanced levels to illustrate the industry's transformation journey toward enhanced efficiency, automation, and AI-driven insights

Functions in Services	Basic	Intermediate	Advanced
• Water Quality Monitoring • Stocking & Growth Tracking • Feed & Nutrition Management • Harvest Scheduling • Compliance & Sustainability Reporting	• Basic IT support • Minimal cybersecurity measures • No automation in procurement	• System integration for IT management • Partial process automation • Periodic cybersecurity risk assessments	• AI-driven cybersecurity • Full automation of internal processes • Blockchain for secure transactions
	<u>Suggested Tools</u> • Microsoft Defender, Avast for Business (basic cybersecurity) • Google Drive, Microsoft OneDrive (basic cloud storage) • Excel, Google Sheets (manual procurement tracking)	<u>Suggested Tools</u> • System Integration: Microsoft Intune, Google Workspace Admin, ServiceNow • Cybersecurity: CrowdStrike, Palo Alto Networks, IBM Security • Process Automation: AppSheet, Power Automate, UiPath (basic automation)	<u>Suggested Tools</u> • AI & Cybersecurity: Darktrace, Microsoft Sentinel, Google Chronicle • Process Automation: RPA with UiPath, Automation Anywhere • Blockchain: IBM Blockchain, Hyperledger for secure transactions

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AI-Powered Digital Transformation Journey In Agro-Food Industry

Basic

Paper logs and manual field inspections

Intermediate

Sensor data and mobile monitoring apps

Advance

AI-based analytics, predictive monitoring

AI and digitalisation Use Cases: Enhancing Operational Efficiency

Helmy Agrisolutions Sdn Bhd is an agricultural company specialising in fertigation across a 10-acre farm.

Problem

The farm and plant needs are monitored manually.

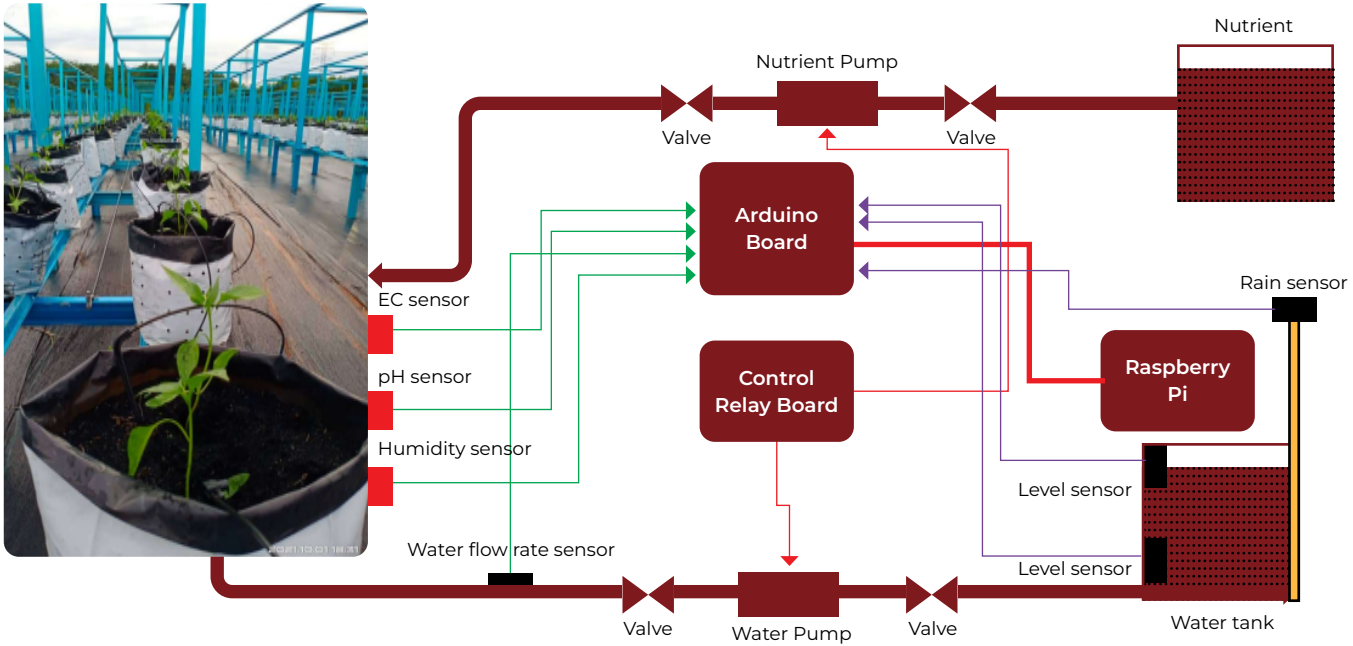
Solution

The use of sensors can prevent wastage of fertiliser and water in the farm.

Operation of machines and water pumps becomes more efficient.

Accuracy in nutrient mixing for crops.

Productivity Metric	Before	After
Efficiency and wastage prevention	Manually monitored & recorded	Monitoring using sensor



Value Creation

By implementing sensors on a 10-acre chilli farm, Helmy Agrisolutions can save on fertiliser, water, and labour costs, boosting yields by **10–20%**. This results in more efficient operations, healthier crops, and a stronger, more sustainable profit margin.

Cahaya Nurkasih Sdn Bhd (1044226-K) specialises in livestock management, focusing on poultry farming. The company operates a chicken farm that offers high-quality, hygienic broiler chickens for both wholesale and retail markets.

Problem

One of the biggest challenges faced:

Birds often die from heat or cold stress because it's impossible to monitor them 24/7 — most losses are only discovered the next day when it's too late.

High humidity levels can quickly spread diseases within the poultry house, making continuous monitoring essential to maintain flock health.

Solution

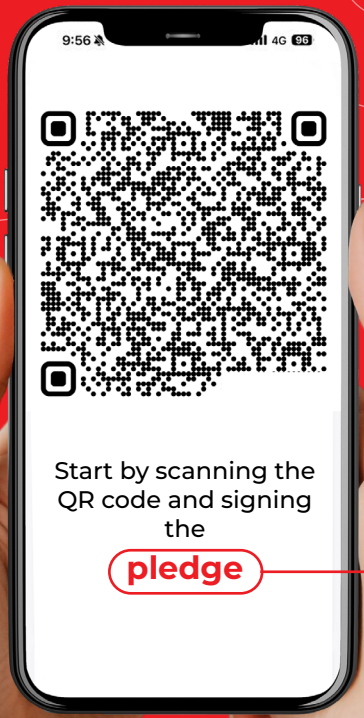
IoT sensors monitor the key environmental factors — temperature, humidity, and light — within a poultry house. The system provides real-time data and sends immediate alerts

Productivity Metric	Before	After
Mortality Rate	3,000 birds / year	Less than 20 birds / year

Value Creation

Due to heat stress, the farm is estimated to lose around 3 – 5% in damages. Implementing real-time environmental monitoring can help prevent these losses and significantly improve farm productivity and profitability.

How to Get Started?



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AgroFood Productivity NEXUS

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