DIGITAL PRODUCTIVITY ROADMAP

Agro-Food Productivity Nexus

OUTLINE

1. Foreword
2. Industry Overview and Digitalisation Challenges
3. Boosting Enterprise Productivity through Digital Roadmap
4. Building a Strong Digitalization Ecosystem for Enterprise Transformation
5. Digital Adoption In Agro-Food Industry
6. Digital Solutions for Enterprise Transformation
7. Digital Transformation Use Cases: Enhancing Operational Efficiency
8. Where and How to Start?

FOREWORD KP

Datuk Zahid Ismail
Director General
Malaysia Productivity Corporation

The Digital Productivity Roadmap for the Agro-Food Industry is a strategic initiative to accelerate digital adoption, boost productivity, and foster innovation across key sub-sectors including aquaculture, crop cultivation, poultry, and ruminant farming. As global food demands rise and sustainability becomes a central focus, digital transformation is no longer optional, it is essential. This roadmap provides a structured framework for agro-food stakeholders to harness digital technologies such as artificial intelligence, big data, and automation to enhance operational efficiency, ensure food security, and increase market competitiveness.

Malaysia's agro-food industry has long been the backbone of national food supply and rural development. However, to remain resilient and competitive in an increasingly digital economy, embracing digital productivity is critical. By integrating smart solutions, industry players can streamline production, improve traceability, reduce resource waste, and make data-driven decisions. Technologies such as IoT-based monitoring, precision farming, digital farm management platforms, and predictive analytics will be key enablers to ensure higher yields, better quality, and stronger market access; locally and globally.

MPC remains committed to supporting the agro-food industry throughout this digital transformation journey. Through stakeholder collaboration, policy facilitation, and industry capability-building programs, we will continue driving the adoption of digital best practices to uplift productivity and sector-wide competitiveness. I encourage all agro-food industry players to embrace this roadmap and work together toward a future where Malaysia's agro-food sector emerges as a global benchmark for digital innovation and sustainable food production

FOREWORD CHAMPION

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

The agro-food sector stands at the crossroads of transformation, where digital innovation is no longer optional but essential for sustainable growth and food security. As global challenges intensify, ranging from climate change to resource constraints, embracing technology-driven solutions becomes paramount. This digital roadmap serves as a blueprint to harness smart agriculture, precision farming, and data-driven decision-making, ensuring that the agro-food industry remains resilient, competitive, and productive.

Strengthening the Agro-Food Productivity Nexus (AFPN) requires collaboration between stakeholders, bridging gaps between traditional practices and modern advancements, and advocating for policies that empower farmers, agribusinesses, and communities. By leveraging digital tools such as AI-driven analytics, IoT-based monitoring, and blockchain for supply chain transparency, productivity can be optimized, waste minimized, and food quality enhanced, all while preserving natural ecosystems.

The success of this initiative depends on collective efforts between government agencies, industry players, research institutions, and digital pioneers must unite to drive a seamless digital transition. This roadmap serves as a guiding light for the agro-food sector’s future, paving the way for innovation-driven productivity and a more sustainable food system for generations to come.

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, and frequent disruptions from new technologies that can impact supply chain reliability, product quality, and food safety.

INDUSTRY OVERVIEW

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

CHALLENGES IN DIGITALISATION

1. High Initial Investment & Uncertain ROI
2. Lack of Digital Literacy Among Workers
3. Connectivity & Infrastructure Gaps
4. Fragmented Systems & Lack of Interoperability
5. Maintenance & Technical Support Limitations
6. Cybersecurity & Data Privacy Concerns
7. Regulatory and Compliance Complexity
8. Cultural Mindset & Generational Divide

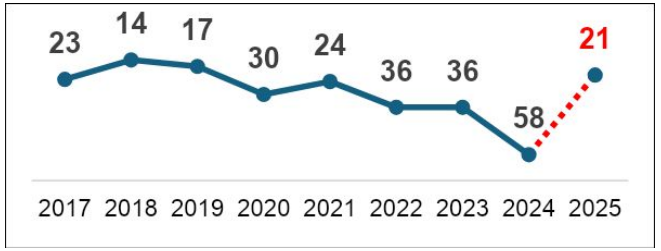
Boosting Enterprise Productivity Through Digital Roadmap

Malaysia's digital adoption has seen a worrying decline, as shown in the **Use of Digital Tools and Technologies, Digital Transformation in Companies, and Digital/Technology Skills** rankings. The **sharp drop in 2024** suggests businesses are struggling to adopt digital tools, scale transformation efforts, and build necessary skills. This downward trend highlights a growing gap in digital readiness, limiting enterprise competitiveness in an increasingly digital economy.

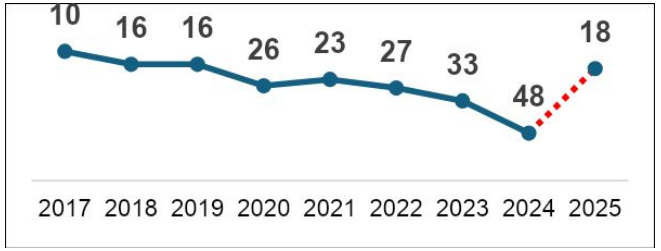
Key challenges include **high costs, lack of expertise, and inconsistent digital skills development**, which hinder businesses from fully embracing digitalisation. Without intervention, Malaysia risks falling behind global competitors. A structured approach is needed to support industries in adopting technology and strengthening their digital capabilities.

To tackle this, **MPC is launching the 'Boosting Productivity of Enterprises via Digital Roadmap' initiative.** This roadmap will provide guidance, industry-driven insights, and structured support to help businesses integrate digital solutions. By addressing gaps in **tools, transformation strategies, and workforce skills**, MPC aims to **revive digital adoption, enhance productivity, and drive Malaysia's enterprises toward global competitiveness.**

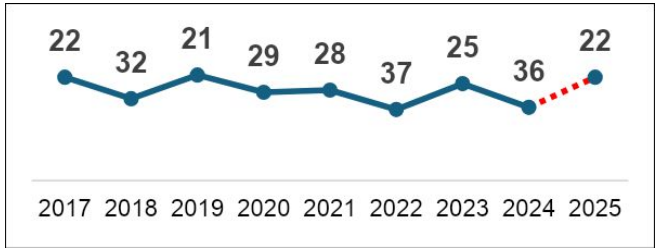
i) Use of Digital Tools and Technology



ii) Digital Transformation in Companies



iii) Digital/Technological Skills



Source: World Competitiveness Yearbook 2017-2024

Building a Strong Digitalization Ecosystem for Enterprise Transformation.

The figure illustrates a structured approach to strengthening the digitalisation ecosystem by aligning technology supply with industry demand.

Step 1 - The process begins with identifying the requirement profile of enterprises which is part of the 1.1million of overall number establishment in Malaysia, ensuring a clear understanding of industry needs

Step 2 - To address these needs, the availability and affordability of solution providers are assessed and strengthened through key enablers such as MDEC and KD

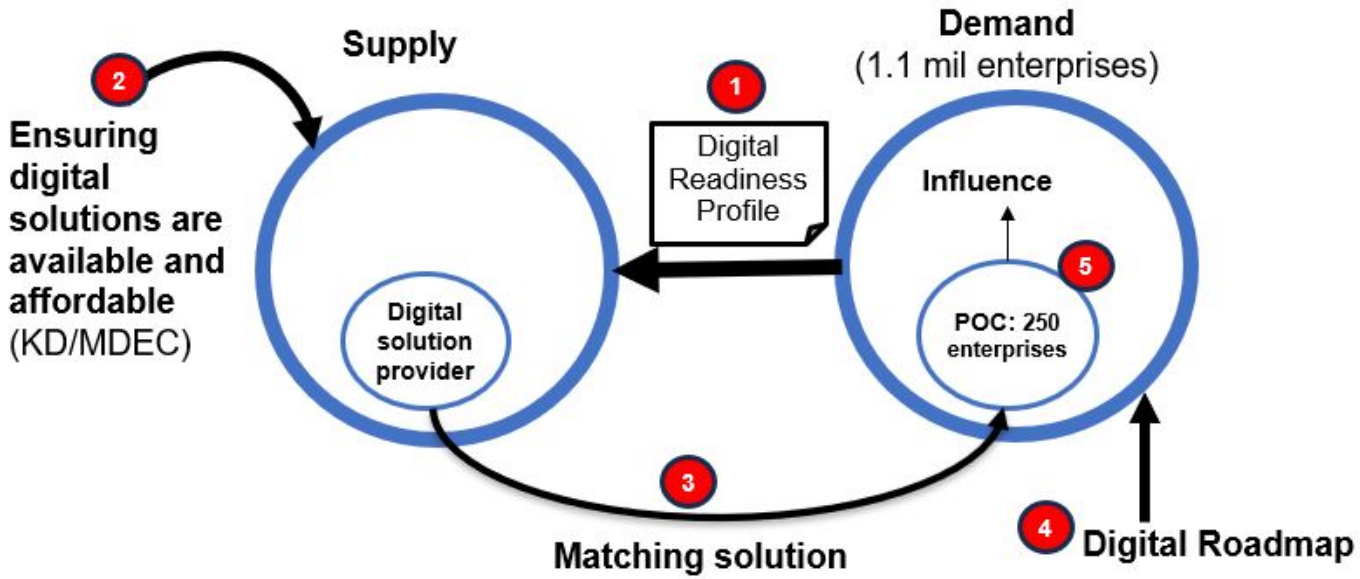
Step 3 – Digital solution providers then provide matching digital solutions tailored to industry demands, facilitating effective adoption.

Step 4 - To drive large-scale implementation, a Digitalization Roadmap is published to provide strategic guidance and best practices

Step 5 - A proof of concept (POC) involving 250 enterprises is conducted to demonstrate impact and influence broader industry adoption

This initiative fostering a robust ecosystem that accelerates digital transformation across enterprises.

Action: Improving the ecosystem to encourage adoption, transformation, and skill enhancement for technology utilization.



Digital Adoption In Agro-Food Industry

This table outlines the progressive stages of digital adoption across various functions in the agro-food industry, categorizing 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 Optimization 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 & Fertilization Crop Health Monitoring Harvest Management Market Access	Manual logs for activities Visual pest detection Basic irrigation systems	Farm management systems Sensor-based irrigation/fertilizer 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

For more info on the digitalisation tools, go here **https://www.mpc.gov.my/digitalplatformnetwork**

Digital Adoption In Agro-Food Industry

This table outlines the progressive stages of digital adoption in **Poultry** in the agro-food industry, categorizing 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	• 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
		Suggested Tools Gmail, Google Drive, Microsoft Outlook, OneDrive- Trello, Slack	Suggested Tools - Google Workspace, Google Ads, HubSpot CRM - Microsoft Dynamics 365, Mailchimp, Calendly - AppSheet (for workflow automation & digitization)	Suggested Tools - 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)

For more info on the digitalisation tools, go here
Or scan the QR code

https://www.mpc.gov.my/digitalplatformnetwork

Digital Adoption In Agro-Food Industry

This table outlines the progressive stages of digital adoption in **Ruminant** in the agro-food industry, categorizing 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
Ruminant	• Herd Management • Breeding & Genetics • Health Monitoring • Feed Optimization • 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

For more info on the digitalisation tools, go here

https://www.mpc.gov.my/digitalplatformnetwork

Or scan the QR code

Digital Adoption In Agro-Food Industry

This table outlines the progressive stages of digital adoption in **Corps** in the agro-food industry, categorizing 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
Crops	• Field Operations • Irrigation & Fertilization • 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
		Available Tools - Microsoft Defender, Avast for Business (basic cybersecurity)- Google Drive, Microsoft OneDrive (basic cloud storage)- Excel, Google Sheets (manual procurement tracking)	Available Tools - **System Integration:** Microsoft Intune, Google Workspace Admin, ServiceNow - **Cybersecurity:** CrowdStrike, Palo Alto Networks, IBM Security - **Process Automation:** AppSheet, Power Automate, UiPath (basic automation)	Available Tools - AI & Cybersecurity: Darktrace, Microsoft Sentinel, Google Chronicle- Process Automation: RPA with UiPath, Automation Anywhere- Blockchain: IBM Blockchain, Hyperledger for secure transactions

For more info on the digitalisation tools, go here

Or scan the QR code

https://www.mpc.gov.my/digitalplatformnetwork

Digital Adoption In Agro-Food Industry

This table outlines the progressive stages of digital adoption in **Aquaculture** in the agro-food industry, categorizing 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
Aquaculture	• 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
		Available Tools - Microsoft Defender, Avast for Business (basic cybersecurity)- Google Drive, Microsoft OneDrive (basic cloud storage)- Excel, Google Sheets (manual procurement tracking)	Available Tools - **System Integration:** Microsoft Intune, Google Workspace Admin, ServiceNow - **Cybersecurity:** CrowdStrike, Palo Alto Networks, IBM Security - **Process Automation:** AppSheet, Power Automate, UiPath (basic automation)	Available Tools - AI & Cybersecurity: Darktrace, Microsoft Sentinel, Google Chronicle- Process Automation: RPA with UiPath, Automation Anywhere- Blockchain: IBM Blockchain, Hyperledger for secure transactions

For more info on the digitalisation tools, go here

Or scan the QR code

https://www.mpc.gov.my/digitalplatformnetwork

Digital Transformation Journey In Agro-Food Industry

Basic

Paper logs and manual field inspections

Intermediate

Sensor data and mobile monitoring apps

Advanced

AI-based analytics, predictive monitoring

Digital Transformation Use Cases: Enhancing Operational Efficiency

This page highlights real-world examples of **successful digital adoption** across industries, showcasing how automation and technology integration drive **operational improvements, cost savings, and enhanced customer satisfaction**.

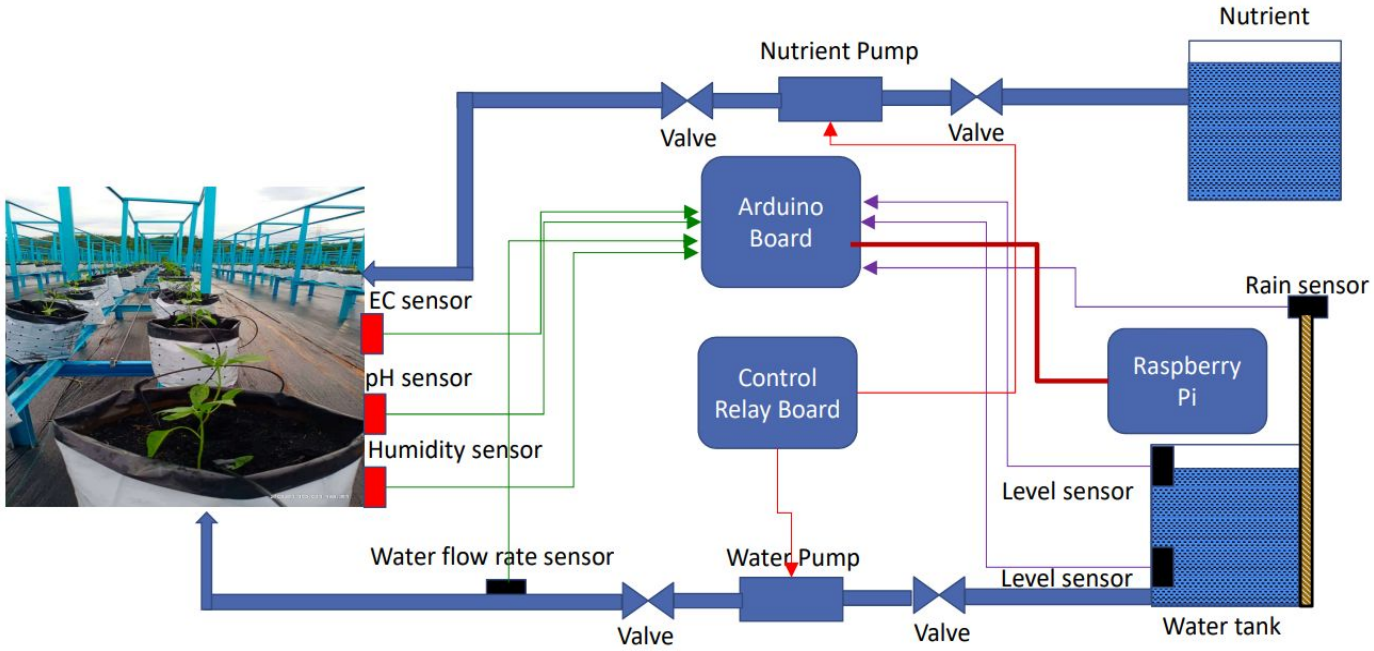
Helmy Agrisolutions Sdn Bhd is an agricultural company specialising in fertigation across a 10-acre farm.

Problem

The farm and plant needs are monitored manually.

Solution

1. The use of sensors can prevent wastage of fertiliser and water in the farm.
2. Operation of machines and water pumps becomes more efficient.
3. Accuracy in nutrient mixing for crops.



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

Source : MPC analysis based on DALIA's proof of concept

Value creation

By implementing sensors on a 10-acre chilli farm, Helmy Agrisolutions can save around **RM5,000–RM10,000** annually on fertiliser, water, and labour costs, while boosting yields by **10–20%**, potentially adding **RM20,000–RM40,000** in extra revenue. This results in more efficient operations, healthier crops, and a stronger, more sustainable profit margin.

Digital Transformation Use Cases: Enhancing Operational Efficiency

This page highlights real-world examples of **successful digital adoption** across industries, showcasing how automation and technology integration drive **operational improvements, cost savings, and enhanced customer satisfaction**.

Cahaya Nurkasih Sdn Bhd (1044226-K) specializes 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:

1. 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.
2. 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

Source : MPC analysis based on DALIA's proof of concept

Value creation

Due to heat stress, the farm is estimated to lose around 2,400–3,000 yearly and about **RM24,000** in damages. Implementing real-time environmental monitoring can help prevent these losses and significantly improve farm productivity and profitability.

HOW TO START?

Start by scan the QR code and signing the pledge
DIGITAL PLEDGE

For more info

https://www.mpc.gov.my/digitalplatformnetwork

LIST OF CONTRIBUTORS

	Name and Designation
MPC	1. YBhg. Datuk Zahid bin Ismail, Director General 2. Dr Mazrina Mohamed Ibramsah, Deputy Director General 3. Mohd Yazid Abdul Majid, Director 4. Safniwati Jasri. Deputy Director 5. Ahmad Mursyidi Adzmi, Assistant Manager
Agro-Food Productivity Nexus (AFPN)	1. Datuk Jeffrey Ng Choon Ngee, Champion of AFPN
Government	1. Ybhg. Datuk Zul Hadi Ahmad, Kementerian Ekonomi 2. Puan Intan Shahirah Ramli, Kementerian Ekonomi 3. Puan Noraishah Abd Manan, Kementerian Pertanian dan Keterjaminan Makanan 4. Ybhg. Dato' Nor Sam Alwi, Jabatan Pertanian 5. Puan Yazeereen A. Bakar, Jabatan Perikanan 6. Dr. Rozeita Binti Laboh, Institut Penyelidikan dan Kemajuan Pertanian Malaysia 7. Dr Suratan Bin Kamarudin, Jabatan Perkhidmatan Veterinar 8. Prof Dr Shaufique Fahmi Ahmad Sidique, Universiti Putra Malaysia
Industry Partners	1. Encik Chay Ee Mong, Pertubuhan Pekebun-Pekebun Sayur-Sayuran Malaysia 2. Encik Wong Seng Yee, Pertubuhan Pengusaha Bunga-Bungaan Cameron Highland 3. Encik Edmond Chow, The Federation of Malaysia Fruit Farmers Association 4. Encik Azmi Zainal, Farm Fresh Milk Sdn Bhd 5. Dr Yap Teow Chong, Federation of Livestocks Farmers Association of Malaysia 6. Encik Ng Yih Chen, Persatuan Kemajuan Akuakultur Malaysia 7. Encik Munir Ashim Abdullah, Grasicili Plt

MPC
MALAYSIA PRODUCTIVITY CORPORATION

AgroFood Productivity NEXUS

Nexus Photo

Nexus Photo

THANK YOU

TIMELINE
Boosting Enterprise Productivity via Digital Roadmap

Phase I

Develop Draft 0
by MPC

7 – 14 March 2025

Phase 2

Review Draft 1
with digital industry expert

15-31 March 2025

Phase 3

Review Draft 2
with Industry Stakeholders

1 April – 9 May 2025

Phase 4

Townhall session
Review Draft 3 with Digital Solution Providers and Stakeholders

15 May 2025

Phase 5

Design Layout
for publication based on Draft 4 by vendor

16 - 30 May 2025

Phase 6

Draft 5 review
submission of draft design by vendor

31 May 2025

Phase 7

Draft 6
Editing and Refinement

1 – 15 June 2025

Phase 8

Final Draft
Online Publication

16 June 2025

Phase 9

Printing and Distribution

17 – 30 June 2025

Phase 10

Outreach

July 2025 onwards