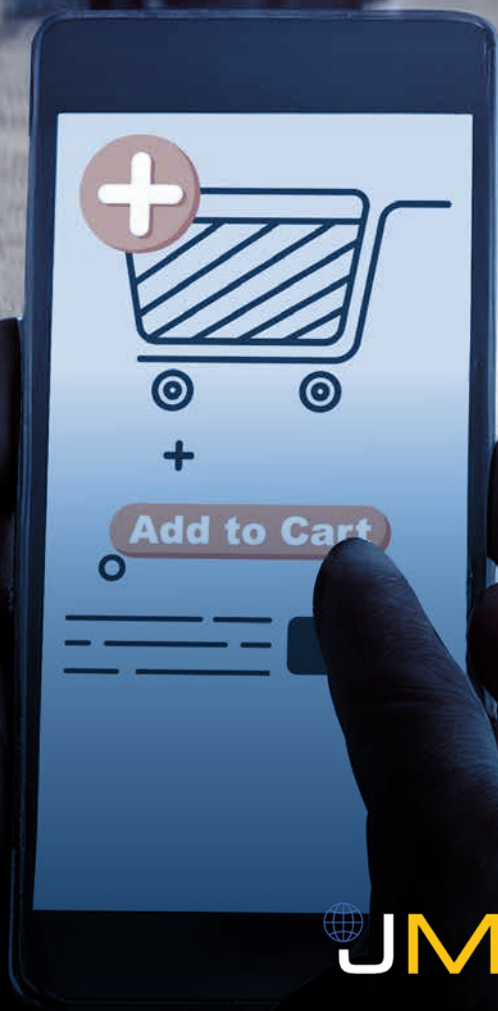


Nuanced complexities surrounding the adoption of e-commerce in the agri-input value chain

June 2026



Foreword

How do you communicate in a world where human beings are addicted to social media and attention spans are on the decline? You find ways to package new concepts and important information in exciting, novel, and easy-to-digest chunks.

While it is easy to blame emails and platforms like X and TikTok for the drop in attention spans from around '12 seconds in 2000 to 8.25 seconds in 2015' – roughly that of the average goldfish¹ – this does not tell the entire story. Our human brains are being inundated with information from the time we wake up to the time we – eventually – disconnect from our devices and turn off the light at night. That is a lot to process – even for a biological computer as sophisticated and efficient as our grey matter. So, is it any wonder that we are becoming more adept at skimming information and seeking out cognitive shortcuts?

The one thing that does seem to break through and hold us rapt is storytelling. Streaming services know only too well that if they create compelling content, they can capture an audience's undivided attention.² Storytelling matters. Immersion is critical. And making content 'snackable' keeps people engaged.

Henley Business School Africa arrived at this conclusion quite some time ago, when we observed how the overwhelming volume of content swirling around us triggers an attention disconnect. We wanted to share our ideas, communicate innovative thoughts, and encourage debate and involvement, so we began to publish punchy, to-the-point white papers that took out the pomp and ceremony you would expect from an academic journal article or paper, and packaged the same expert opinions into a snappy, digestible format.

We posed problems, set the context, outlined the prevailing views, and proposed groundbreaking solutions or fresh perspectives. It went down a treat. Using the white paper format has enabled us to close the gap between published journal articles and the topics we like to dissect in classrooms.

For busy executives, managers, and leaders, our white papers offer a quick, convenient read that captures the essence of an argument. For lifelong, inquisitive learners, white papers are an accessible way to dip into new information and

'Using the white paper format has enabled us to close the gap between published journal articles and the topics we like to dissect in classrooms.'

ideas, and to gain exposure to different perspectives and opinions.

The Henley Business School Africa white paper is also an effective way for us to share our observations, insights, and findings with our partners in business and with the world at large. This invites leaders, entrepreneurs, innovators, and business strategists to come and collaborate with us, to explore new ways to address the issues raised, and to develop products and services that answer critical social needs.

By taking care of the heavy lifting and packaging our white papers like a veritable Netflix miniseries, we are retaining attention, building interest, and inviting business leaders to take a front-row seat as we delve into novel thinking and emerging resolutions to existing, complex issues. Our white papers investigate noteworthy trends, question complex problems, and discuss solutions to these. Through our white papers, dialogue is stimulated, value is interrogated, and impact-driven research is spurred on.

Our aim is not to inundate busy leaders and executives with more to 'get through', but to hand them the valuable insights they need to make better, faster, and more agile decisions. That is what the world needs. It is what Africa needs and it is where we should all be directing our 8.25 seconds.

Jon Foster-Pedley

Dean: Henley Business School Africa

Associate Pro-Vice Chancellor (Global Engagement – Sub-Saharan Africa:
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¹ McSpadden, K. (2015) 'You now have a shorter attention span than a goldfish', *TIME*, 14 May. Available at: <https://time.com/3858309/attention-spans-goldfish/> (Accessed: 26 June 2024).

² Snow, S. (2023) 'Science shows: humans have massive capacity for sustained attention, and storytelling unlocks it', *Forbes*, 16 January. Available at: <https://www.forbes.com/sites/shanesnow/2023/01/16/science-shows-humans-have-massive-capacity-for-sustained-attention-and-storytelling-unlocks-it/> (Accessed: 26 June 2024).

White paper

Jenna Milane

This paper provides insight into the intertwined complexities of stakeholders' adoption of e-commerce within South Africa's agricultural input supply chain. Highlighting the challenges that threaten the opportunities arising from this radical change, the critical role of leadership in overcoming resistance and ensuring successful e-commerce integration is motivated.

This white paper is based on a Management Research Challenge submitted in partial fulfilment of the requirements for the degree of Master of Business Administration.

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Disclaimer



Aligned with our mission, 'we build the people who build the businesses that build Africa', we facilitate open, multi-perspective conversations and the generation of thought leadership pieces, such as this white paper. However, the views expressed in this white paper are held by the author and not necessarily held by Henley Business School Africa.



Abstract

This paper provides insight into the adoption of electronic commerce (e-commerce) in South Africa's agricultural-input supply chain, highlighting the significant challenges and abundance of opportunities associated with this technological shift. It draws attention to how imperative digital leadership and organisational transformation are in overpowering stakeholder resistance to change. Utilising qualitative research rooted in game theory, the study gathers invaluable insights from a diverse range of stakeholders. Interviews centred on the critical success factors for market performance, stakeholder perceptions regarding adaptations of traditional trade channels, and the role of leadership to facilitate a seamless transition. The research examines the feasibility, profitability, and barriers to adopting agri-input e-commerce, uncovering unique cultural and logistical complexities in the South African agricultural sector. While e-commerce offers numerous advantages, established relationships and regulatory hurdles present notable challenges that must be addressed. This paper argues that strong leadership is crucial to effective change management. This research's insights contribute significantly to academic discourse and actionable strategies within the sector.



Keywords:

agri e-commerce; agri-input e-commerce; agri-inputs manufacturers; digital leadership; input supply chain; strategic decision-making; game theory; South African agriculture

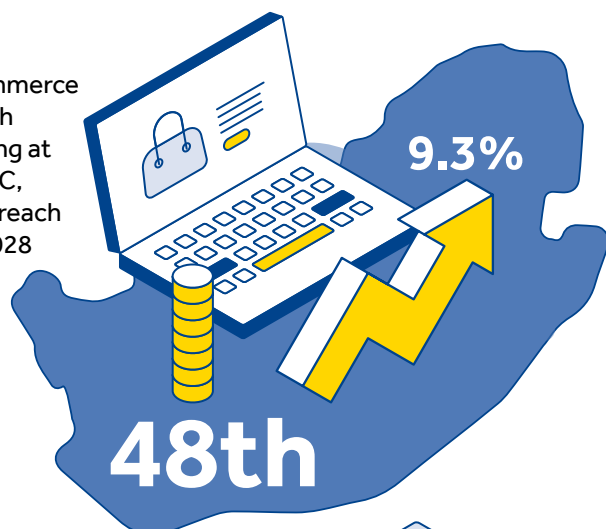


Introduction

E-commerce growth in Africa

Electronic commerce (e-commerce) in Africa is projected to grow at a compound annual growth rate of 14.4%, reaching US\$939.8 billion by 2032 (IMARC, 2024). This growth is driven by a young population (70% of millennials under 30), a rising middle class, and over 800 million mobile subscriptions (De Bruyn, 2024).

South Africa's e-commerce market is ranked 48th globally and is growing at 9.3% annually (IMARC, 2024) – expected to reach US\$6.49 billion by 2028 (ECDB, n.d.).



The agricultural sector's shift to agri e-commerce

→ Questioning existing frameworks

Globally, agriculture is a crucial economic sector (Associated Chambers of Commerce and Industry of India [ASSOCHAM], 2023) that depends on strong relationships within its supply chain (Environment for Development, 2023). However, challenges from globalisation, climate change, and

rising production costs are disrupting traditional models (ReportLinker, 2023b) and the only way for the agricultural sector to remain competitive is to explore novel technologies, including e-commerce (ASSOCHAM, 2023).



→ Adopting novel technologies

In 2023, the global agricultural e-commerce (agri e-commerce) value was estimated at around US\$80 billion (ReportLinker, 2023a, 2023b). Closer to home, policies in developing nations are intentionally encouraging digital transformation and enhancing market access for smallholder farmers through agri e-commerce (Chakravorti *et al.*, 2023). Currently, Nigeria is the leader in Africa in infrastructure investment, supported by favourable policies

and a dynamic start-up ecosystem. Kenya is also progressing rapidly due to its mobile money systems and logistics improvements (White, 2023). South Africa is cognisant of e-commerce's potential to boost gross domestic product (GDP) by increasing sales and lowering transaction costs. It is projected that its agri e-commerce sector will reach R20 billion by 2028 (Department of Agriculture, Land Reform and Rural Development [DALRRD], 2023).



→ Advantages of e-commerce

The advantages of online trade are substantial, not only enhancing market access, but also significantly improving operational efficiency (Goedde *et al.*, 2020). By reducing the number of intermediaries in the value chain (ASSOCHAM, 2023), online trade offers benefits that promote sustainable growth in a complex and evolving global agricultural landscape (Ji *et al.*, 2023).

Relevant terminology



The following terminology is part of the conversation when discussing agriculture's transition to e-commerce:

E-commerce is part of the Fourth Industrial Revolution (Smaje and Zemmell, 2022). It gained momentum during the COVID-19 pandemic, drastically shifting consumer preferences and internet adoption (GSMA, 2023).

Agri e-commerce is a farm management system that connects farmers to improve operational efficiency and supply chain performance (Goedde *et al.*, 2020). By diversifying product categories, these platforms reduce intermediaries and related costs and support consumer demands for quality and 'farm-to-fork' traceability (Wilburn and Wilburn, 2020).

Agricultural input (agri-input) products, in this paper, refer to the resources that farms use in production, specifically biostimulants, fertilisers, inoculants, adjuvants, and pesticides for crop production, nutrition, and protection.

Agri-input e-commerce encompasses the electronic trading of agri-input products – an evolving field in agriculture. It leverages electronic media to enhance accessibility and efficiency (ReportLinker, 2023b).

Agricultural technology (agritech) refers to the use of technology to enhance farming, including precision farming, smart irrigation, livestock monitoring and management, and using agricultural drones (ASSOCHAM, 2023; ReportLinker, 2023b).

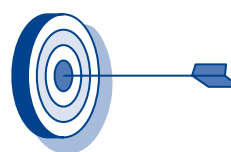
The agri e-commerce supply chain: majority of agri e-commerce comprises selling produce like vegetables, grains, fruits, and nuts. However, online sales of agri-input products (e.g., biostimulants, fertilisers, inoculants, adjuvants, and pesticides) are steadily increasing largely to benefit from the convenience and gain better access to products and suppliers (ReportLinker, 2023b). Essentially:

E-commerce has reshaped the supply chain for all agricultural produce and input products, creating a leaner ecosystem of role players

*(Goedde *et al.*, 2020; Chakravorti *et al.*, 2023).*



Aim of the paper



South Africa's agri-input e-commerce market is facing a challenging climate of volatility, uncertainty, complexity, and ambiguity (VUCA World, 2004; Agenpo, 2023), exacerbated by intense competition from multinationals (Dunham Trimmer, 2020) and the need to persuade stakeholders to abandon long-established practices. This paper attends to three issues:

- 1 The pertinent factors affecting the agri e-commerce distribution model for manufacturers and suppliers of agri-inputs in South Africa;
- 2 Key stakeholders' perceptions concerning the adoption of agri e-commerce for agri-inputs in South Africa; and
- 3 Business leadership principles and practices that are essential for adopting an agri e-commerce distribution model in South Africa.



Structure of the paper

A theoretical overview is first provided to establish a foundation for understanding the subsequent research report. The investigation involved a qualitative study conducted with stakeholders in the agri-input sector, concentrating on the adoption of e-commerce within agriculture's value chain. Individual interviews centred on the issues identified in the previous section.



Supporting literature

● The South African agricultural sector

South Africa's agricultural industry constitutes 2.45% of its GDP and provides 894 000 jobs (DALRRD, 2023). The industry's supply and demand include commercial and subsistence farming (ASSOCHAM, 2023), which prioritise quality and transparency and encourage innovation among existing and new businesses (ReportLinker, 2023a). The two sectors' distributions of agricultural products and inputs are similar, as shown in Figure 1, allowing insights from one sector to inform the other.

Unfortunately, data complexities in the agricultural supply chain make it difficult to assess the distribution of agri-input products separately.

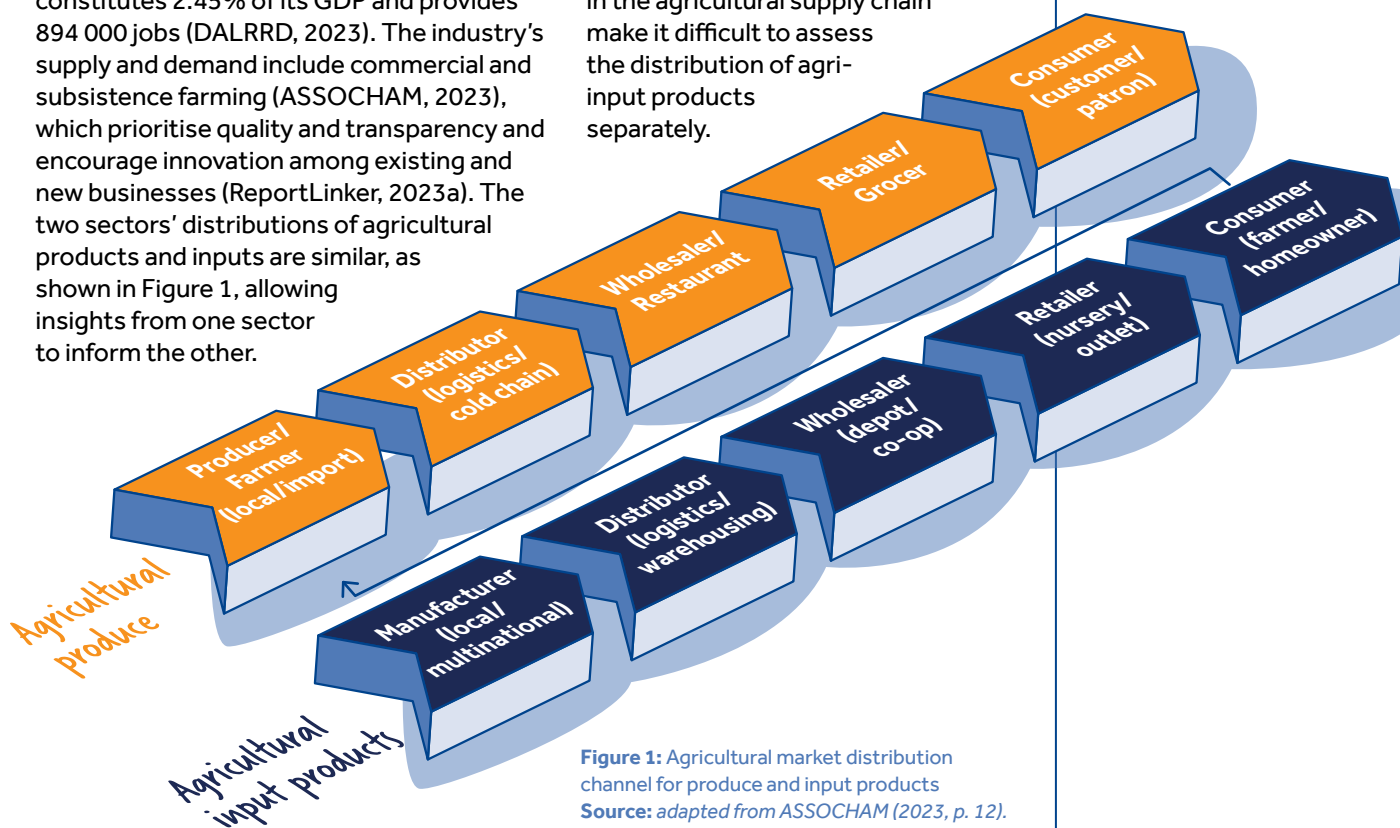


Figure 1: Agricultural market distribution channel for produce and input products
Source: adapted from ASSOCHAM (2023, p. 12).

South Africa's agricultural industry is similar to that of other BRICS countries like China, Brazil, and India, having to confront similar challenges, such as changing weather conditions, rising production costs, and limited resources (ReportLinker, 2023a), in addition to long supply chains with many intermediaries and overlapping operations (ASSOCHAM, 2023). Small farmers' main goals are to increase the value of their

products, support their communities by raising their incomes, and reduce poverty and hunger (DALRRD, 2023). In Africa, Asia, and South America, there is a growing awareness within the agricultural sector of the importance of agritech in boosting productivity in their agricultural supply chains is casting doubt on established practices (Joiner and Okeleke, 2019; Sears and Anderson, 2024).

The agri e-commerce supply chain: a win-win scenario

E-commerce can streamline the supply chain for agricultural and input products, connecting farmers and consumers, thus bypassing intermediaries, as shown in Figure 2. This creates a win-win situation for all, enhancing farmers' incomes, expanding market access, meeting consumer demands very efficiently, and contributing to socio-economic development (Ji *et al.*, 2023).

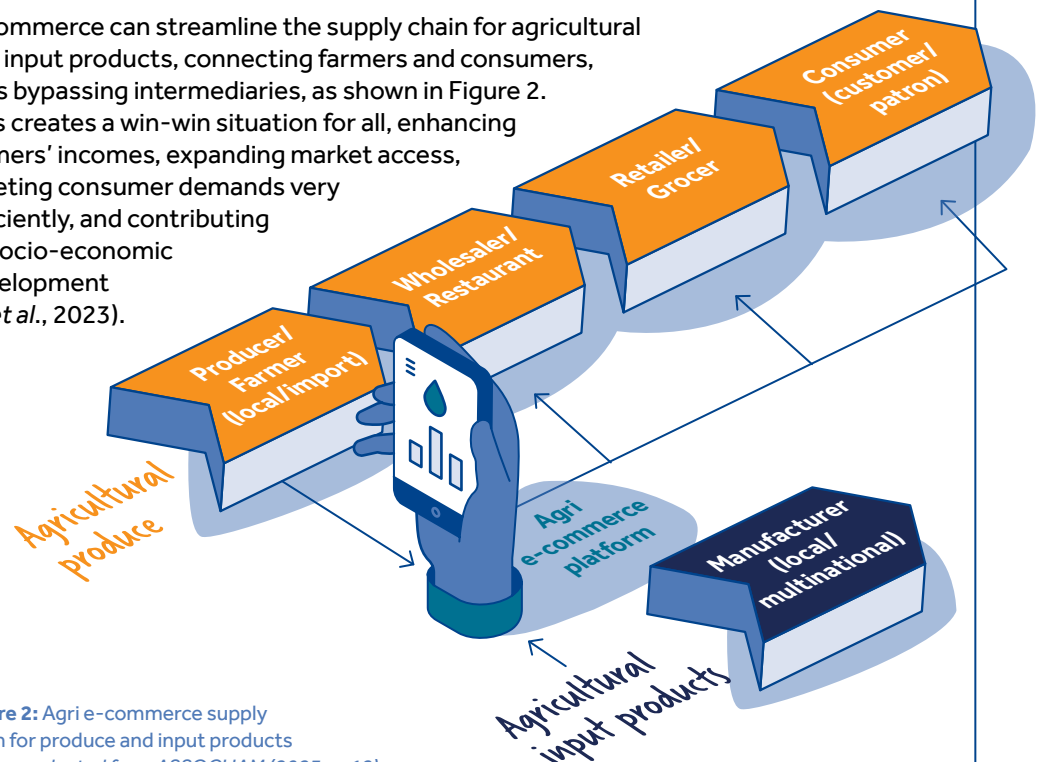


Figure 2: Agri e-commerce supply chain for produce and input products
Source: adapted from ASSOCHAM (2023, p. 12).

Drivers and challenges related to agri e-commerce

The significant socio-economic benefits of agri e-commerce could improve the livelihoods of smallholder farmers (Chakravorti *et al.*, 2023), though real-world challenges must be considered.

Figure 3 summarises the prominent drivers and challenges of agri e-commerce adoption, derived from recent literature (Joiner and Okeleke, 2019; ASSOCHAM, 2023; Chakravorti *et al.*, 2023; Ji *et al.*, 2023).



Benefits

- Access to new markets (imports and exports)
- Market penetration in existing markets
- Transparency in the value chain
- Shortening the distribution chains by bypassing intermediaries and streamlining processes
- Reducing produce wastage
- Closing the gap between producer and consumer
- Fairtrade and income for farmers
- Market information
- ESG reporting and carbon footprint reduction



Challenges

- Infrastructure (transport, technology, warehousing)
- Capital investment
- Technology knowledge
- Service delivery/interruption
- Regulatory gaps
- Enforcement
- Secure payments
- Transactional transparency
- Protection of financial and private data

Figure 3: Drivers and challenges of agri e-commerce adoption
Source: author's own.

E-commerce for agri-input products

→ A road less travelled...

Literature on manufacturers' use of agri e-commerce for input products (agri-input e-commerce) is sparse. Studies mostly discuss its use in a business-to-consumer context and relevance to high-level industry, government, and technology policy reports (ReportLinker, 2023b). Topics of discussion generally focus on market readiness and developments in selected countries or regions across Africa, Europe, and China (Fecke, Danne

and Musshoff, 2018). Supporting factors and adoption barriers for agri-input e-commerce, as discussed in literature, are summarised in Figure 4, extending Figure 3, which concerns agricultural produce in general (De Bruyn, 2024).

Supporting Factors

- Buying convenience
- Consilitation of fragmented customer base with diverse needs
- Escalating customer experience demands
- Development of new information management technology
- Intense competitive rivalry in the market
- Economic benefits
- Competitive pressures

Adoption Barriers

- Sales consultation/After-sales service
- Complex pricing structures
- Product complexities
- Multiple information layers
- System inefficiencies
- Resistance to change
- Security concerns (trust)
- Diminished roles of traditional dealers with whom farmers have personal relationships with
- Cultural and social barriers

Figure 4: Supporting factors and adoption barriers for agri-input products

Source: adapted from Barton (2003); Henderson, Dooley and Akridge (2004); Ackermann et al. (2018); Schulze Schwering (2021).

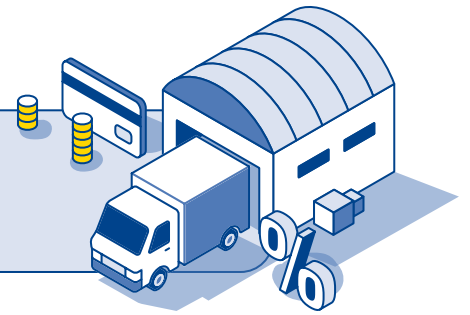
→ Core issues complicating agri e-commerce implementation

Implementing agri e-commerce is not straightforward and could be hindered by basic issues, such as:

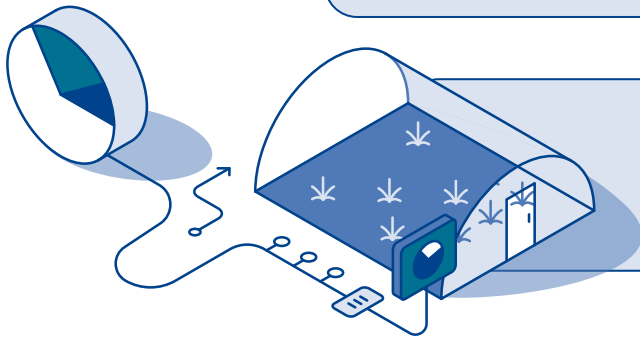
Limited internet access due to farmers' remoteness (De Bruyn, 2024).

Hardware issues, including availability and user preferences. Platform developers find this particularly challenging, as they are expected to accommodate users' technological competence and preferences (Barends-Jones, 2020; GSMA, 2023).

Cost-effectiveness, emanating from factors like product type, volume and scale/quantity of products needed, transport, and warehousing (Ackermann *et al.*, 2018).



Crop protection requirements per legislative and regulatory requirements to ensure compliance and proper application of input products on farms, and to achieve marketable produce standards (Fecke, Danne and Musshoff, 2018).



● Role players in the agricultural sector's digital transformation

Stakeholders in the agricultural industry jointly generate value through their relationships and unique expertise, while 'system orchestrators' refer to all the groups or stakeholders with a vested interest in creating a digital agricultural ecosystem and integrating diverse viewpoints to enhance agri-input e-commerce (Chakravorti *et*

al., 2023). Primary stakeholders in agri-input e-commerce refer to all the organisations, providers/suppliers, and farmers of interest to the agri-input e-commerce distribution model (Wei and Ruan, 2022). In the agricultural context, primary stakeholders influence organisations' conduct on three levels (Mitchell, Agle and Wood, 1997):



Power: regulators and government stakeholders can significantly influence the agri-input e-commerce market by means of policies and legal frameworks (DALRRD, 2023). Their impact is expected to increase as the market progresses (Wilburn and Wilburn, 2020; ReportLinker, 2023a).

Legitimacy: discretionary stakeholders, such as agri e-commerce platforms, aim to improve the distribution between farmers and manufacturers, while optimising resources, customer service, and data security (El Attoti *et al.*, 2019). Their impact on early market development is unfortunately limited by the persistence of traditional supply networks.

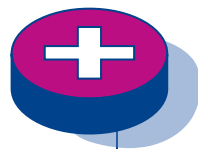


Urgency: agri-input distribution agents are vital in connecting manufacturers and farmers (Barends-Jones, 2020). With the growth of e-commerce, their focus may steadily shift towards sales and technical support for agri e-commerce platforms, and their future influence will depend on farmers' and manufacturers' engagement with their services (Kujala, Lehtimäki and Freeman, 2019).



Switching from established agricultural exchange processes: more than meets the eye...

The reality...



Challenges encountered when shifting to e-commerce affect the sector on very practical levels, due to:

- The **diversity of the agricultural community** in terms of cultures, languages, and business practices (Barends-Jones, 2020);



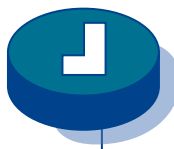
- The **close-knit nature of many farmers and agri communities**, who have become accustomed to concluding transactions based on personal relationships, rather than economic principles (Ackermann et al., 2018; Barends-Jones, 2020);



- Varying buying patterns** by farm type and market location (Wang and Huang, 2018; Schulze Schwering, 2021); and



- The **need for up-to-date product information**, which is not always easily attainable or part of established frameworks (Fecke, Danne and Musshoff, 2018).



However, the benefits of e-commerce make it worthwhile to pursue (Harbott, 2021), because users immediately benefit in multiple ways, for example:

- Economic benefits** are reaped because it becomes easier to buy goods and services, reducing costs;



- Improved access** is gained to a broader range of products from more destinations, which are brought within reach;



- Group buying** facilitates group transactions and bulk buying, lowering expenses; and



- Information access** is faster, more up to date, and more effective.



Going forward...

Important lessons can be learnt from a study that identified five buyer segments in the German agri-input (crop protection) market (Schulze Schwering, 2021). The study examined users' behaviour, attitudes, and adoption of digital sales channels, and identified distinct differences among the groups, which each accounted for 17%-22% of the market descriptors. It is noteworthy that none of the groups dominated the market. Therefore:

Differences among buyer segments are a reality that requires organisational understanding to effectively reduce barriers to e-commerce adoption

(Schulze Schwering, 2021).



A proposed agri-input e-commerce model



Understanding the predicament first

To develop user-friendly e-commerce platforms, supplier organisations must first understand users' online shopping behaviour and expectations (Henderson, Dooley and Akridge, 2004). Six key concerns that may discourage users' adoption of agri e-commerce, along with possible leader-driven solutions, are presented in Figure 5.

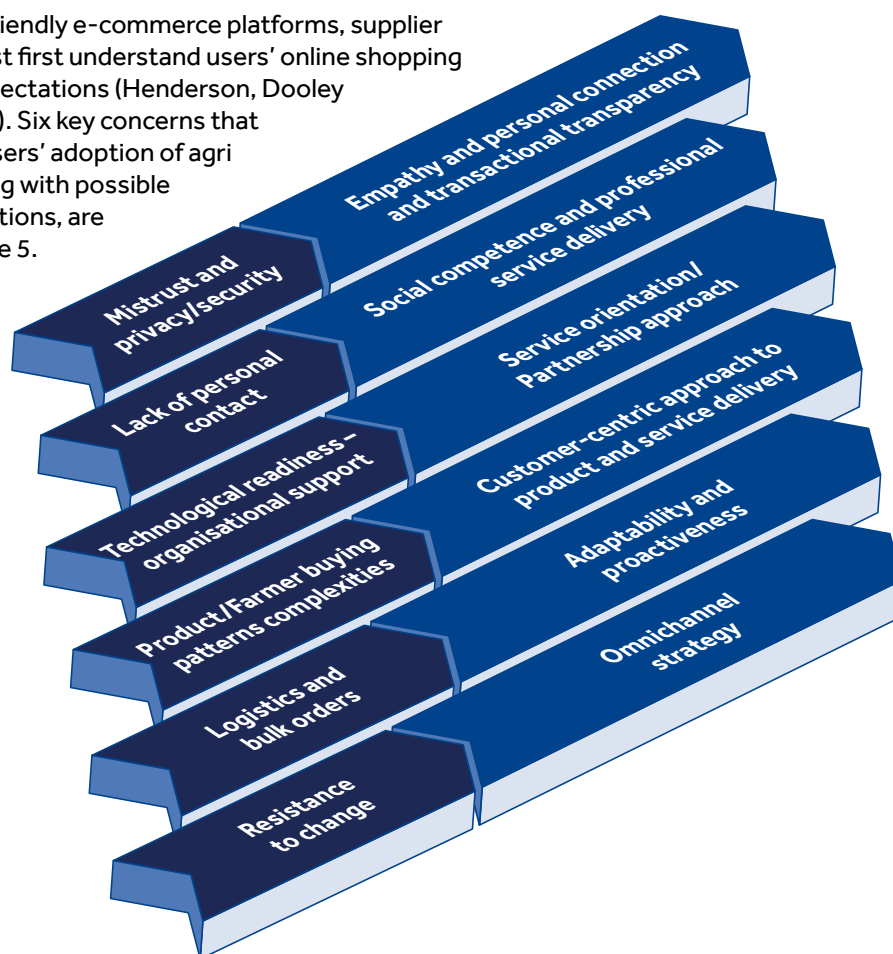


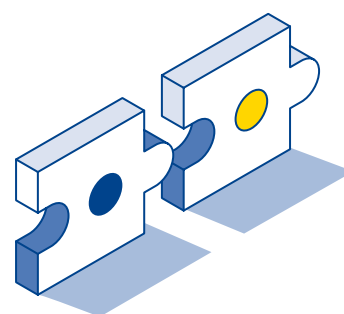
Figure 5: Agri e-commerce user concerns and relevant leadership strategies and actions

Source: adapted from Ackermann et al. (2018); Fecke, Danne and Musshoff (2018); Schulze Schwering (2021).



Taking action

Challenges are more easily countered when tackled jointly and when the respective parties accept responsibility (Fecke, Danne and Musshoff, 2018; Schulze Schwering, 2021). For instance:



Agri-input manufacturers and e-commerce platform leaders have to upskill and sharpen their capabilities according to market demands (Fecke, Danne and Musshoff, 2018; Schulze Schwering, 2021).



Organisations must accept and adopt digitalisation to ensure their competitiveness in the agricultural market (Schulze Schwering, 2021).



Farmers and consumers must embrace changes to increase confidence in navigating agri e-commerce to harness its benefits – even if it feels overwhelming (Schulze Schwering, 2021).



The revised approach

The agri-input e-commerce model proposed in Figure 6 captures the essence of scholarly findings. It consolidates functions, eliminating duplication in the traditional distribution model, including customer support, data management, logistics, and warehousing, streamlining and centralising processes to stakeholders' benefit.

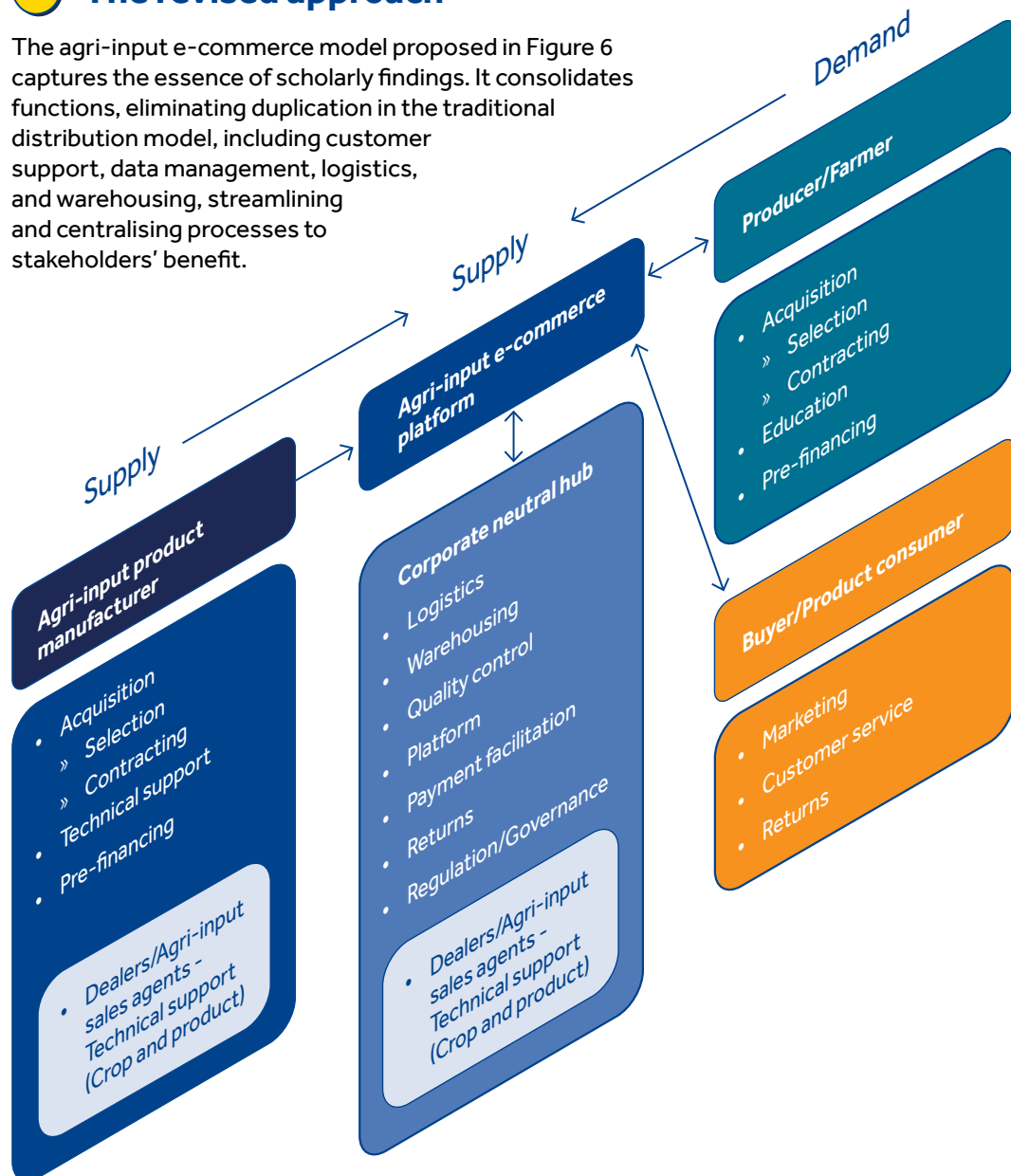


Figure 6: Proposed agri-input e-commerce model

Source: adapted from Akridge (2003, p. 6), Barton (2003, p. 19), and Nazhat, Jain and Kittur (2016, p. 9).

To explain Figure 6:

The **supply side**, on the left, captures processes involved in the **manufacturing of agri-input products** (e.g., fertilisers, biostimulants, remedies).

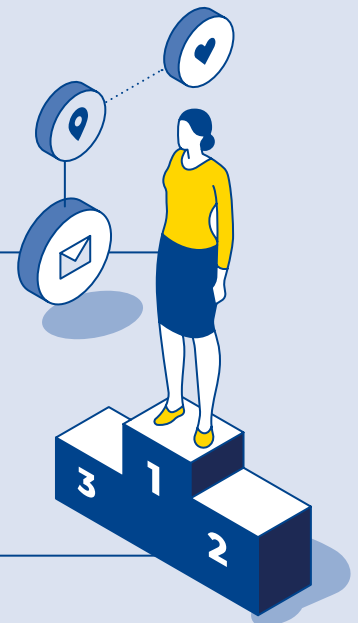
The **central hub** integrates the management of product supply and demand, quality control, payments, returns, and regulatory and governance functions using an e-commerce platform.

The **demand side**, on the right, distinguishes two elements. First, it depicts farmers' and buyers' sourcing of products from the central hub, optimising in-house logistics to manage products, services, and quantities in accordance with established quality control measures, and ensuring payment security in line with governance and regulatory requirements. Second, a **service-centric approach** is followed by sales agents to manage customer relationships (El Attoti et al., 2019).

Leadership's role during organisations' digital transformation

1 The crux of the matter

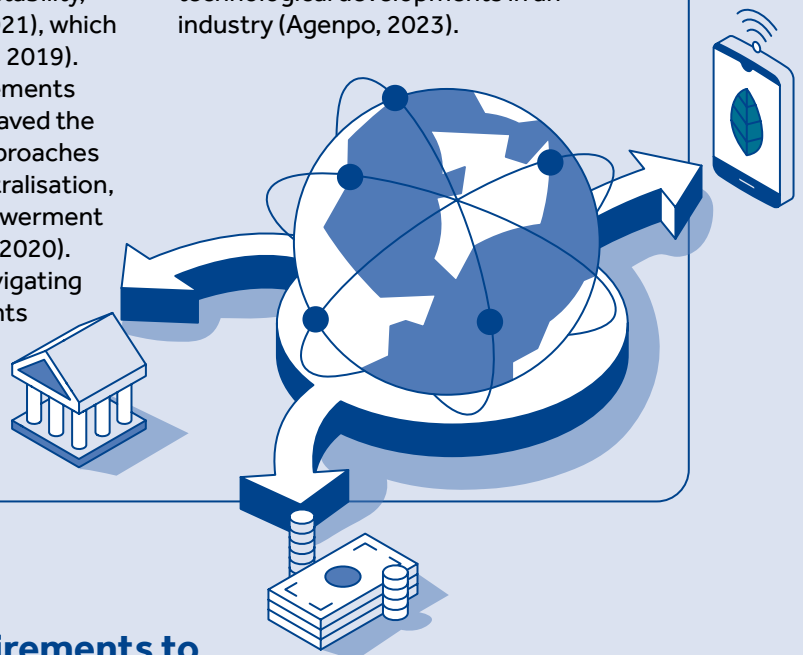
Organisational digital transformation goes beyond adopting new technology. It also requires upskilling employees and strong leadership. A capable chief executive officer (CEO) and management team can develop and implement a strategic plan aligned with an organisation's goals (Smaje and Zimmel, 2022), while maintaining the flexibility required to accommodate the company culture and make adjustments as required (Ackermann *et al.*, 2018).



2 Management styles: adapting the focus

Management is essentially about structure and execution (Harbott, 2021). Traditional management styles were characterised by efficiency, productivity, predictability, and standardisation (Harbott, 2021), which no longer suffice (Kidschun *et al.*, 2019). Presently, technological advancements and increased knowledge have paved the way for innovative leadership approaches that are more focused on decentralisation, independent thinking, and empowerment (April and Dalwai, 2019; Bratton, 2020). These shifts are essential for navigating unpredictable VUCA environments (April and Dalwai, 2019; Sinha and Sinha, 2020) – as well as PESTLE (political, environmental, social,

technological, legal, and economic) factors, stemming from globalisation and rapid change, such as rapid technological developments in an industry (Agenpo, 2023).

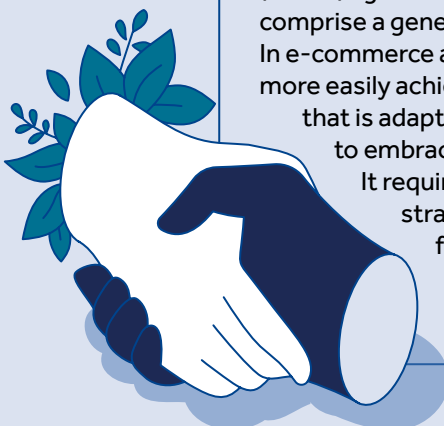


3 Leadership requirements to facilitate technological change

Leadership requirements in a complex (VUCA) agricultural environment do not comprise a generic list of competencies. In e-commerce adoption, success is more easily achieved under leadership that is adaptable, proactive, and able to embrace technological change.

It requires a clear vision and strategy for building service-focused partnerships, as well as the social skills and ability to

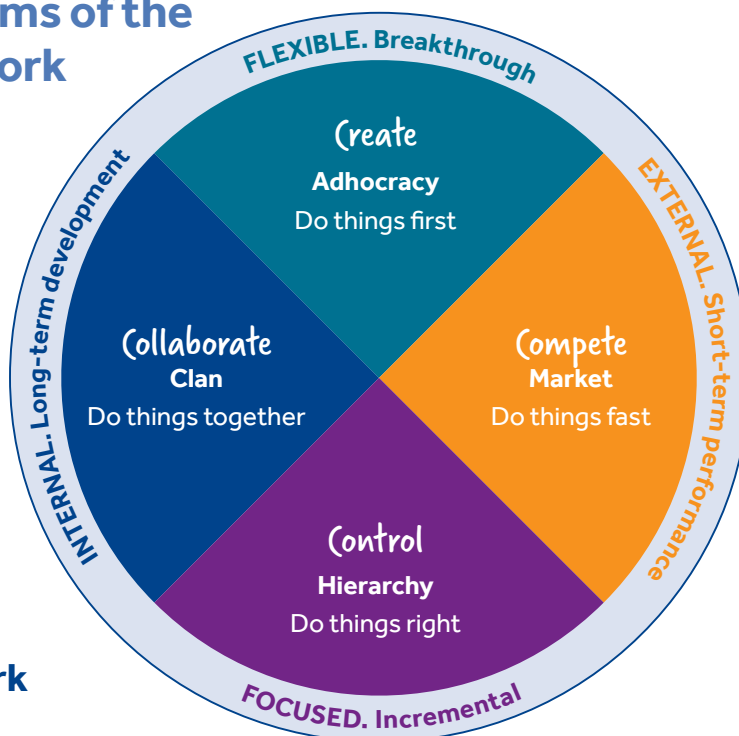
foster empathy, because implementing change is seldom straightforward (Schulze Schwering, 2021). Especially in the agricultural context, the often-overlooked role of culture is of utmost importance (Harbott, 2021), requiring social competencies and professionalism (Schulze Schwering, 2021) to ensure sincere, customer-focused, service-centric approaches; establish service partnerships; and build personal connections.



Framing discussions in terms of the competing values framework

Assumptions of the competing values framework

The competing values framework of Harbott (2021) explains the interconnection between leadership and culture in terms of two main dimensions: stability versus flexibility and internal versus external focus. Moreover, it outlines four culture types (i.e., **clan**, **adhocracy**, **hierarchy**, and **market**), each with its own values, leadership styles, ideas about success, and typical methods for facilitating change (Harbott, 2021).



Source: adapted from Harbott (2021)

Relevance of the framework

The framework's application lies in evidence that the cultural, leadership, and management traits of sectors differ significantly despite some similarities, which could lead to conflict unless understood and properly addressed. For example, the values and practices of

traditional agri-input distribution differ from those of input manufacturers, although they share similarities with agri-input e-commerce (Akridge, 2004).

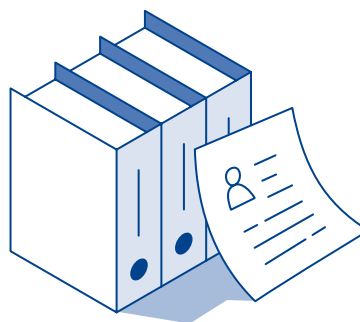
In the real world ...

During a transition to agri e-commerce, conflicts may arise because parties have a limited understanding of others' conduct and cultures. From an organisational perspective, management structures and expert leadership must be more agile to ensure the transition succeeds (Bratton, 2020).

When alignment gaps arise due to input distribution practices, collaborative effort is the answer to restoring trust and operational relationships.

The research project

Multiple factors indicate why e-commerce deserves attention and should be encouraged, including leveraging technology to increase market share, the convenience and effectiveness of using it, and the potential boost to competitiveness and profitability. However, in a sector with established principles and processes, such

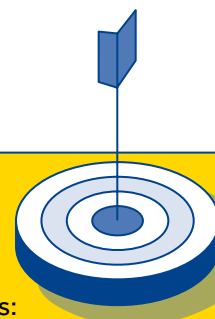


as the agricultural sector in South Africa, converting from established processes to e-commerce entails more than meets the eye.



Aim of the study

The investigation reported below focused on the South African context, examining three research questions:



- 1 Which prominent key market factors influence manufacturers' and suppliers' agri-input e-commerce distribution model?
- 2 How do stakeholders perceive the sector's conversion to agri e-commerce?
- 3 Which business leadership qualities are required to facilitate the sector's transition to an agri-input e-commerce distribution model?

Research methodology and design

On the premise that people's realities are socially constructed through their interactions and lived experiences (Alexander, 2021), individual interviews, applying the principles of game theory (Treacy and Rook, 2019), were conducted with stakeholders in the agri-input sector.



Sampling approach

Twelve participants* were recruited from the agri-input industry through purposive sampling. On average, they had 17 years of experience in the South African agricultural industry and eight years of leadership experience. The sample comprised: four senior regional sales representatives (P1-P3, P10), three national sales managers

(P4, P6, P7), one orders administrative controller (P5), three managing directors (P8, P9, P12), and one CEO (P11). Most of the participants had personal e-commerce experience, but only a few had been exposed to e-commerce or its applications for input products in the agricultural sector.

*When reporting the findings, the 12 participants' identities are withheld to ensure anonymity. Codes (P1-P12) are used to distinguish their contributions.

Interviews and data administration

The procedures

Interviews were conducted face to face or virtually, according to what suited the participants. A semi-structured interview guide was used, and interviews were recorded with participants' permission for later transcription by the researcher. Sessions concluded with a reflection and feedback question to provide an opportunity for additional comments (Dalton, 2021).



Theoretical anchor: game theory

To examine the intricacies of agri e-commerce within a local input distribution context, the data were structured in terms of game theory and interpreted inductively (AIOmari, 2024). Game theory

provided a suitable framework for understanding people's decision-making when strategically interacting with others (Bonanno, Van der Hoek and Wooldridge, 2008).



→ Elements of game theory in the research design

Game theory originally constituted a mathematical concept, but has evolved to also examine how strategies change over time and to understand how the choices of individuals or organisations can impact a wider group of stakeholders (Barton, 2003; Tlemsani, Matthews and Mohamed

Hashim, 2023). It is based on three central elements/concepts: **players**, **strategies**, and **payoffs** (ThinkLeap, 2024).

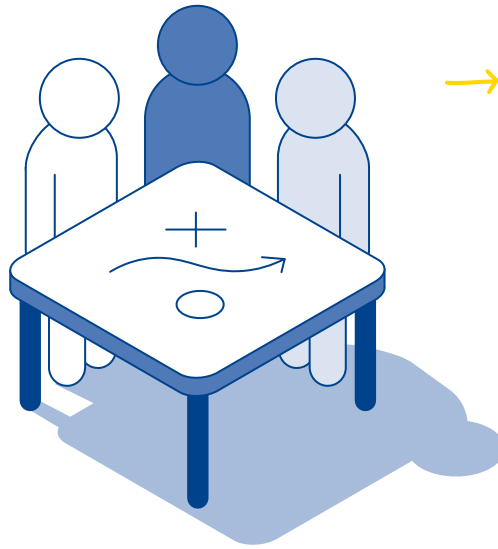
Two games were designed to explore in-depth and real-world organisational decision-making and strategies during the interviews (Jolly, 2014).

- 1 **Players**, in the context of this study, were the:
 - Users – farmers and agri-input distributing agents;
 - Suppliers/providers – manufacturers and agri e-commerce platforms that consider market competitiveness; and
 - Competitors – a formidable stakeholder group for e-commerce adoption (Mitchell, Agle and Wood, 1997).

- 2 **Strategies**, in this study (ThinkLeap, 2024), implied:
 - No e-commerce (zero-based non-collaborative);
 - Full e-commerce (zero-based non-collaborative); and
 - Integrated/Hybrid e-commerce (non-zero-based collaborative).

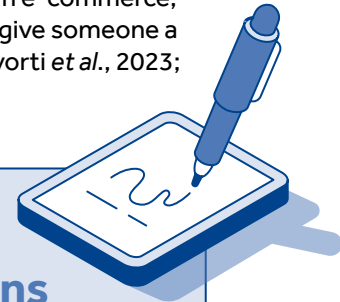
- 3 **Payoffs** referred to market share and profits, considering time and investment costs (Wang and Huang, 2018). **Other critical concepts included:**
 - **Decision-making type** (rational/irrational), assuming that irrational decisions challenge e-commerce adoption (Barends-Jones, 2020);
 - **Information type** (perfect/imperfect), which is imperfect in the domain of agri e-commerce for the distribution of input products (Akridge, 2004); and
 - **Equilibrium** (Nash/Stackelberg/Smith-Price) (ThinkLeap, 2024) at the meta-, intra-, and inter-organisational levels depends on multiple factors, including information availability and transparency as well as scenario complexity (AIOmari, 2024).





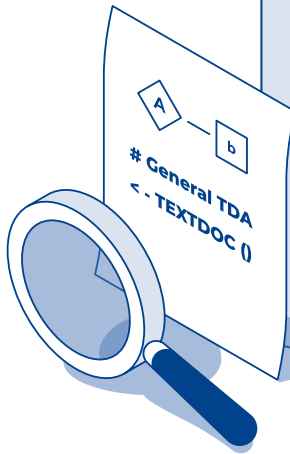
→ Implementation of game theory: simulating the classic 'prisoner's dilemma'

To understand e-commerce adoption in South Africa, the game challenged participants during the interviews to work together or 'go their own way'. The rules of the game held that collaborating could benefit everyone involved in e-commerce, while working alone might give someone a competitive edge (Chakravorti *et al.*, 2023; ThinkLeap, 2024).



Data analysis

Interviews were transcribed, coded, and systematically analysed using inductive techniques and thematic coding to identify relevant codes, develop categories (themes), and subcategories. Game theory principles (ThinkLeap, 2024) were incorporated to understand the strategic interactions and decision-making processes.



Ethical considerations

The research for this project was reviewed by the School's ethics committee and received a favourable ethical opinion for conduct. Accordingly, literature had to be cited properly and participants had to provide informed consent, confirm that they understood the research purpose, and acknowledge their rights regarding confidentiality, anonymity, and ability to withdraw at any time.

Barriers and limitations of the study

It was challenging to recruit a diverse group of participants in the agricultural sector. The researcher also had to explain unfamiliar terms during discussions. To reduce potential bias, reflexivity and triangulation were used. A translator facilitated communication when needed, which was arranged beforehand. Limited resources affected the scope of the research.



Results

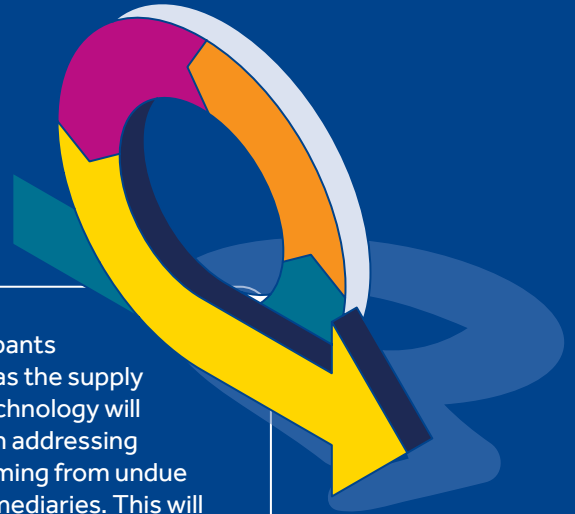
The context

South Africa's agri-input supply chain is complex and multifaceted, involving three stakeholders: farmers as the central, definitive stakeholders, and manufacturers and intermediaries as the dominant stakeholders. Although it used to be a stable supply chain, 'the

agricultural market has shifted over the last five to 10 years' (P11), due to technological progress that influenced the supply chain as well as intermediary relationships and roles. The results reported in this section are organised according to the research questions.



Question 1: market factors influencing agri-input e-commerce



Feasibility and harmony

According to industry stakeholders, the traditional supply chain for agri-inputs is burdened by several **challenges**, such as manufacturers depending on intermediaries for sales, service, and logistics to reach their markets and end users. These **deeply intertwined relationships** often create stakeholder tensions, increasing costs and conflicts among stakeholders (P1, P7, P11).

However, participants anticipated that as the supply chain evolves, technology will become pivotal in addressing challenges stemming from undue reliance on intermediaries. This will enhance direct connections with end users and drive future innovations (P1, P4, P5, P7, P8, P9, P12).

Developing trends

→ Younger generations' influence

Participants noted that technological advancements are 'accelerating daily' (P4), making new technology use 'increasingly necessary' (P7), as 'farmers and consumers seek more immediate, on-demand access to information and services' (P7) 'from input manufacturers' (P12). They believed that 'over the past decade, younger generations are driving efforts towards

greater technology adoption' (P7), 'gradually taking over family farms' (P1). Their purchasing journey generally 'started with search engines to gain direct access to manufacturers' products' (P12), appreciating 'handheld access to information' and 'quick tech tools that automate processes, reduce paperwork, and increase profitability' (P9).

→ Moving away from cumbersome traditional processes

Participants believed the traditional supply chain for agri-inputs in South Africa was too long: 'the whole process, from ordering to delivery on-farm, was too time-consuming' (P5). Two participants stated that when farmers' product and technical needs are not met immediately, they will go elsewhere (P2,

P7). Tightening the agri-input supply chain would accomplish three main goals: 'adding more value to the farmer' (P8); 'reducing the number of guys [the intermediaries] that need to be paid' (P9); and 'bringing manufacturers closer to the market' (P9).

→ Embracing automation

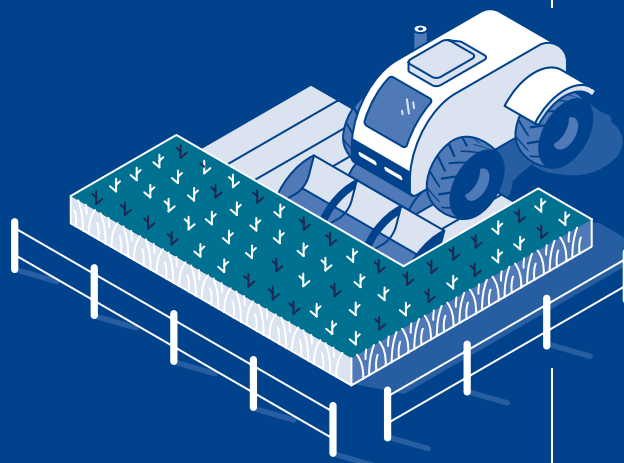
Participants agreed that technology-driven automation can fix issues in the input supply chain. It will enhance stock visibility and control, track trends in stock and sales, monitor drivers, manage digital signatures at points of sale, and calculate costs in real time.

For manufacturers, 'the cost of implementing a system is a fraction of the cost of mistakes that are traditionally made from manual, repeated and analogue processes' (P7), emphasising the need for digital talent within their organisations (P7, P8).



→ Promoting precision farming

Participants were aware that agritech advancements promote precision and smart farming, enhancing crop yield and quality (P2) more than supply chain automation does. 'Innovations like drones, thermal imaging, and input application technologies have modernised agriculture, increasing productivity and crop value' (P11). P2 and P6 noted that e-commerce platforms facilitate direct sales between farmers and consumers, expediting market access.



→ Applauding personalised services

Participants appreciated e-commerce for enabling farmers to access product information almost immediately and 'get personal guidance from knowledgeable sources' (P8), noting that 'personal contact makes a difference' (P4). For them, platforms like Google, YouTube, and WhatsApp

support information retrieval and communication, filling important procedural gaps (P1, P3). 'Suppliers, including input manufacturers and e-commerce platforms, must adapt to these demands and drive change' (P2).

→ Questioning existing supply chains

Consumers' demand for organic and naturally processed food created new demands, requiring farmers and manufacturers to comply. Therefore, the need for a so-called sustainable supply chain is evident, though establishing it takes time. According to P11, 'establishing a new norm or new model takes about three years', because 'organisations must ensure that their customers and staff are

comfortable and the system is refined' (P5). 'Farmers know they need to adapt, and they know it is coming' (P10). P9 was more doubtful, commenting that resale intermediaries remain 'ignorant, refusing to listen'. Another participant added: 'How it is implemented and what is being done are paramount organisational leadership considerations for the change in the input supply chain' (P6).

→ Establishing new relationships

Manufacturers rely on trust-based relationships with input distribution dealerships (intermediaries) that should be mutual and fair, and add value for farmers. These relationships are important in the agricultural sector and can influence prices. Perceptions were that 'money in the pocket of intermediaries undermines the input supply chain, increasing overhead costs for manufacturers and input costs for farmers' (P9). It was estimated that 'relationships account for 51% and price 49% of interactions' (P9). The four input manufacturers firmly believed that relationships were often superficial, demanding 'exclusivity' (P12) and 'special deals' (P2) on product lines and branding to differentiate themselves, whilst the 'loyalty is not reciprocated' (P8).

Accordingly, the role of manufacturers is becoming more pertinent to the detriment of intermediaries. P3 explained that 'everything is now linked to the manufacturer', with P11 adding that 'when end users encounter a problem or challenge based on product performance and transport, their first point of contact is typically the manufacturer'. Resale distribution agents, acting as intermediaries, are seldom contacted when users encounter problems. This was confirmed by the manufacturers (P2, P7, P12), who explained the trend that they have become the primary point of contact for product inquiries.

Personal and practical issues

Certain issues were somewhat complicated, even to the point of foregoing personal attachments. These are outlined next.

→ Honouring established cultural affiliations

A recurring theme during the interviews was the domination of the Afrikaans culture in South Africa's agricultural market (Barends-Jones, 2020), constituting 'a close-knit community bound by generational knowledge and

deep-etched relationships' (P11). Many successful, established farms are led by older generations, who 'tend to resist change' (P7), causing 'fluctuations in the supply of their inputs' (P1).

→ Hesitance to forego relationship selling

The input supply chain for agricultural products comprises direct, on-site relationship selling, facilitated by a robust network of distribution intermediaries, including resale agents and retailers (Barends-Jones, 2020). This structure 'links manufacturers with farmers, striving for profitability and competitiveness' (P8). Participants valued the interpersonal relationships. According to P7, '80% of business rests

on personalities, while 20% is on logistics' – a relational dependency that underscores the importance of intermediaries in maintaining connections within an expanding service market, 'where farmers are spoilt for choice' (P10) and 'can pick and choose' (P11). However, this situation makes manufacturers/farmers vulnerable, having to rely on intermediaries for market access (P9).

→ Insurmountable logistical problems

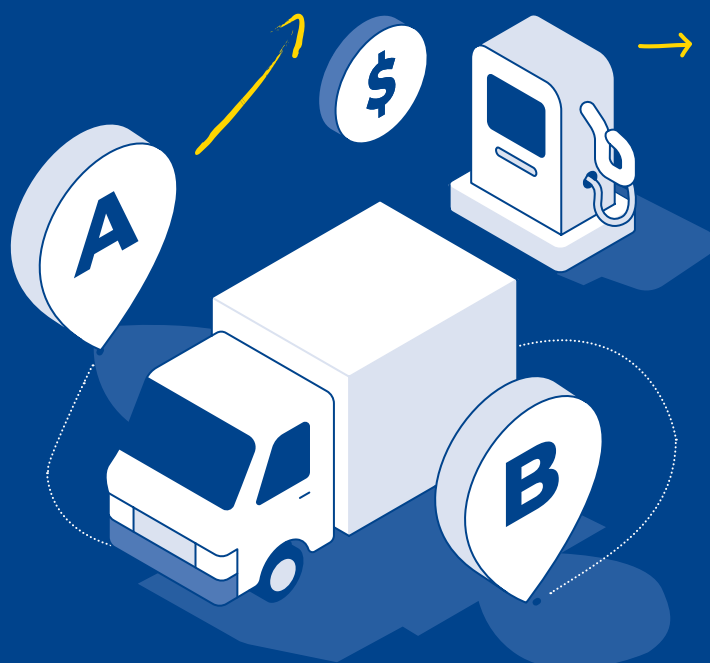
Farmers, especially those in remote areas of south Africa, face significant challenges and are generally hesitant to buy inputs before they need them. Aggravating circumstances are the changing weather conditions that limit the time to apply input products (P9). Subsequently, 'close-by storage facilities managed by intermediaries or dealerships are essential' (P3). Consequently, intermediaries are

important to manufacturers who rely on agents and their satellite depots to ensure proper distribution (P2, P5, P9). The intermediaries connect manufacturers and end users, particularly when logistical issues arise from poor infrastructure and unpredictable weather conditions (ASSOCHAM, 2023; Environment for Development, 2023).

→ Overhead costs

Intermediaries are useful, but increase overhead costs for manufacturers and farmers. The issue is exacerbated by South Africa's transport infrastructure, which causes delays and increases costs. P7 noted that 'logistical problems are immense and [a] constant frustration'. High transport costs are pushing some manufacturers and farmers to acquire and manage their own fleets (P9). Hesitancy to eliminate intermediaries to reduce costs was evident. Participants cautioned that while technology could improve logistics and reduce reliance on intermediaries and overhead costs, it may jeopardise established long-standing relationships (P1, P3, and P4).

FOR
SALE



→ Market complexities

For manufacturers of input products, success hinges on supplying farmers with 'good quality, consistent products' (P7) at an 'affordable price' (P1), and on providing tangible physical and technical support (P7). Due to the variety, specialised, and unpredictable nature of agricultural input products, as well as inconsistent application guidelines, this product category is complex to manage online. Consequently, participants perceived the variability and classification of agri-input products used

in south Africa as significant barriers to the e-market (P6 and P12), in contrast to commodity type, well-established products that are commonly in high volumes, 'which are easier to standardise and streamline' (P1). P5 mentioned the complexities caused by seasonal, weather, and situational changes on farms and in cropping plans. Some even suggested designing specific platforms and strategic considerations for certain commodities (P8, P9, P11, P12).

● Regulatory compliance and risk management

→ South Africa's regulatory framework

The country's regulatory framework does not yet effectively accommodate e-commerce, requiring registration and accreditation of sales personnel (P1, P3, P9-P11). Although streamlined orders and payment processes are convenient (Toman, Adamson and Gomez, 2017), the complex nature of crop health 'requires someone to be in the field making recommendations and decisions' (P7). Seven participants voiced concerns about regulations governing the sale of agri-inputs, particularly hazardous products sold on unregulated commercial

platforms, and the limited flexibility for specialised blends (P2-P5, P7, P8, P11).

Although e-commerce is included in the country's development plans (DALRRD, 2023), amendments to Act 36 of 1947 are needed to improve the transition process for agri-input e-commerce.

→ Concerns about data protection and risk management

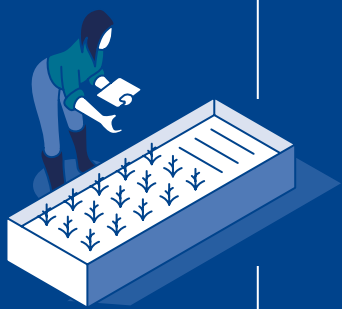
Participants were concerned about the security of organisational, personal, and financial data when ordering online, as well as stakeholder privacy (P7-P9), citing price wars (P7) and access to accurate product information (P9). Therefore, risk mitigation is vital – especially when dealing with poisonings or crop failures caused by incorrect application (P11).

Participants emphasised that, when buying online, farmers' and users' responsibility for their purchasing and application choices increases incrementally (P9, P10).

→ Inherent resistance and lack of confidence

Participants mentioned generational differences in e-commerce adoption in agriculture. Often, younger farmers do not consult sales representatives (P6, P10) because they are mostly tech-savvy and require little to no online training (P6), which makes them more confident in e-commerce trading. However, older farmers are often less confident about doing online transactions, although increased familiarity should build confidence over time (P6, P10).

Adoption challenges are similar for more established input manufacturing organisations (P1-P4). Seven participants noted that manufacturers are slow to utilise integrated, up-to-date information and communication technology (P1, P3, P5, P7-P9, P12). Of the three agri-input supply chain stakeholders, logistics and input resale intermediaries were the slowest adopters of e-commerce, jeopardising their future role in the supply chain (P8).





Question 2: stakeholders' perspectives

Strategic decision-making insights

Participants were cautiously optimistic, noting that **leaders shaping competitive outcomes** for an e-commerce platform for inputs in South Africa require a nuanced approach to accommodate the unique constructs of the local input market (April and Dalwai, 2019). A 'neutral hub' is 'potentially a start towards a better e-commerce platform for South Africa, but at the end of the day, farmers buy from people, and somebody will have to push the product' (P1), as scholars have proposed (Toman, Adamson and Gomez, 2017).

A senior executive (P9) recommended that manufacturers **invest in technology and digital marketing strategies** to brand their products' virtual presence, and to implement training and upskilling for users and administrative personnel. Customer service and product support should also be upskilled to handle product enquiries and technological user issues.

Participants believed that the success of e-commerce implementation hinges on **effective market segmentation** (P4). They mentioned that market segmentation strategies in agricultural e-commerce emphasise 'market type' (P1, P3), 'product' (eight participants), or 'crop' (P9, P11). Two of the study's participants proposed that launching e-commerce platforms in retail/nursery and subsistence markets would lead to early adoption and build momentum for commercial farmers' use (P1). Growth in retail/home markets poses fewer regulatory challenges and makes adoption easier, given existing trends in digital investment (P12). Since they are often regulated through government tenders, subsistence markets could support market expansion with policy support (P3).

Promoting **human-centred technical support** (P2) was important because '69% of the final buying decision lies with the farmer but depends on their technological competence to access products' (P9). This stresses the importance of technical product knowledge and support (P2), which

is tied to personal relationships, although P7 and P9 anticipated a growing trend towards consultation-based agronomic on-farm support. Four participants (P4, P7, P10, P11) drew attention to **artificial intelligence's potential** in this context, which is a novel phenomenon (Lee and Roberts, 2024).

Creating **an input e-commerce hub** that highlights product price advantages (P3), intermediary costs (P9), improved profitability (cost reduction), shorter lead times (P4), access to greater or fuller product offerings (P5), and simple ordering systems will improve adoption (P9). Four of the study's participants (P7-P9, P10) suggested that e-commerce could be advanced through adoption incentives like extended payment terms, as discussed in literature (Lamarre, Smaje, and Zimmel, 2023).

Practical and user-centric platforms should be designed around user experience that incorporates farm and manufacturing systems and personal touch links (P7, P8). According to the study's participants, e-commerce sites must be multi-device-friendly and include backup and offline features (P8).

The **way forward** is to understand that the conversion to e-commerce depends on user adoption rates to build demand (P6), which explains why organisations must optimise senior management support and leadership to promote change (P5). Notwithstanding, 'this process requires time and a shift in company vision and market positioning' (P5). P8 explained: 'Technology is a tool that we have to use to our advantage. It is not the solution, but you must know how and when to use it and what information is correct for you and the organisation.'

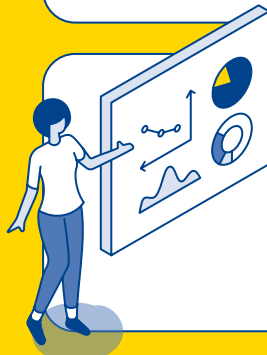
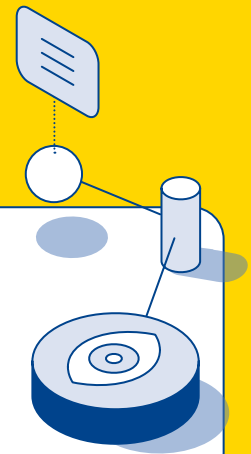


Stakeholders' interpretation of pros and cons

Agri e-commerce grew rapidly during and post COVID-19, especially in South Africa's produce supply chain (P8, P10, P12), but acceptance within the agri-input supply chain has been less successful (P1, P2, P4, P11). Based on their experience with e-commerce, senior managers of organisations were more convinced of its merits.

Resistance was largely personal

Resistance was fuelled by concerns about *jeopardising personal customer relationships and disrupting familiar business practices* (P1, P2, P4). Majority of participants did not know about e-commerce, but after the researcher explained and adapted the models, they changed their views, although P11 remained sceptical.



Positive attitudes were encouraging

Comments included: 'E-commerce, I would say, is something that we are unconsciously working towards' (P8); 'Training can overcome much of the tech adaptation challenges' (P5); 'Positive experiences and perceptions can counteract the current 'ominous' views about e-commerce in the market' (P10).

There was work to be done

Participants highlighted the importance of attending to organisations' internal processes and maintaining transparent communication to make the transition easier, encourage learning, and lessen resistance to change (P5, P7, P8, P10). Existing customers can be onboarded via good relationship-based and customer-led groundwork through purchasing (P5).



Recommendations for the future

The senior and more experienced participants believed it was unlikely that any organisation would not adopt e-commerce as a strategic choice. They believed that a hybrid approach was unrealistic and proposed full adoption, regardless of access to an established e-commerce hub.

Participants explained, 'This is not a perfect world' (P8), arguing that some stakeholders will adopt faster, resulting in individual organisations developing several smaller platforms, before 'eventually being consolidated into a superhub' (P10); 'one monopolistic or a few oligopolistic

platforms' (P7). However, some believed that 'farmers are not going to be willing to use many platforms to trade on' (P10).

In addition, participants' (stakeholders') market-perspective perceptions of e-commerce differed and were context-dependent. Many were negative about the introduction of agri e-commerce into the input market at the start of the interviews. Realising that this transformation is a critical organisational management and leadership consideration, the majority eventually changed their opinions 'to keep ahead of the competition' (P12).



Question 3: leadership requirements for agri-input organisations

Current leadership under scrutiny

An overlap of management, technical knowledge, and leadership complicates organisational leadership in many organisations. P2 noted that 'technical knowledge is more important than leadership skills ... previously, experience alone used to be enough' (P2). Since younger farmers have now graduated (P8), manufacturers have to upskill sales and frontline staff to match young farmers' technical knowledge (P11), driving organisations to recruit knowledgeable sales teams and implement product training at significant costs (P7, P8).

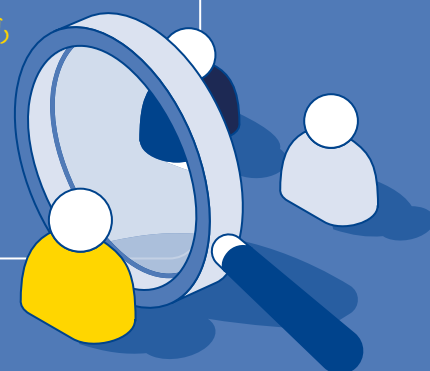
Conflicting priorities create fertile ground for tension. For example, when farmers' decisions prioritise relationships over business principles (P10, P11), agents bypass the system wanting to control the supply chain (P6, P7, P12), 'intermediaries prioritise speed over quality, putting both manufacturers and users at risk' (P11).

A primarily top-down, hierarchical approach in manufacturing organisations (P4, P5, P9) remains discernible, although some allow alternative approaches,

with senior management providing overarching guidance (P5, P9). **Situational leadership** was inevitable, given seasonal unpredictability, requiring leaders to be agile and accommodate farmers' personalities and markets (P1, P9).

Scholars propose that mercurial, authoritarian leadership styles are now being replaced by more laissez-faire approaches to accommodate changes in business relationships (Harbott, 2021). Participants agreed, noting that traditional leadership, although easier, lacks longevity and causes companies to deteriorate (P9, P11). P11 concluded that:

Effective leadership in the agri industry is characterised by listening, responding, and building relationships.

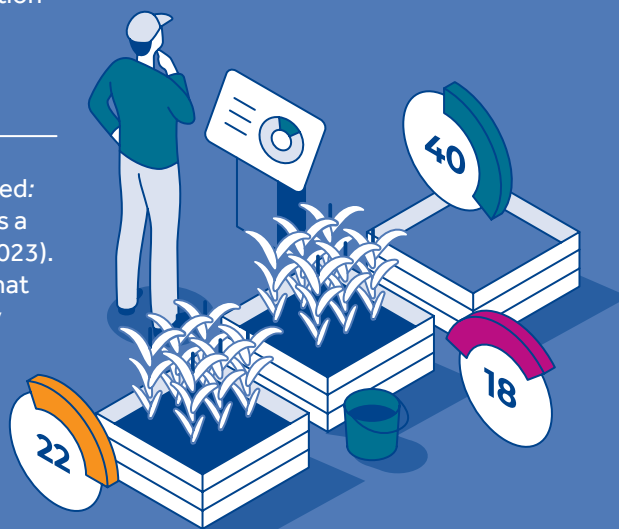


Recommended leadership practices and principles

Leadership in agri-input e-commerce was discussed in terms of three key areas:

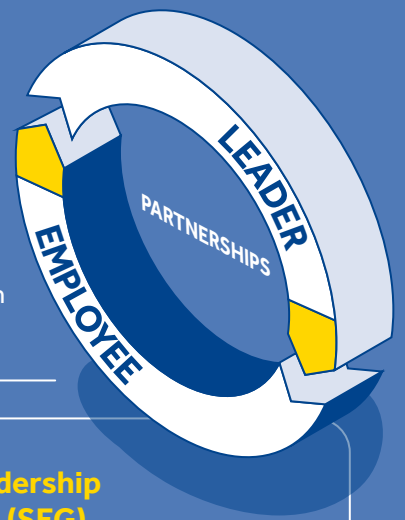
1 Stakeholders' internal organisational understanding of e-commerce. 'Executive buy-in and a supportive leadership style to succeed' was recommended (P11), although implementation remains complex (P8, P10, P11). Moreover, agri-input organisations need to secure their market positioning and revise their corporate strategy accordingly (P8, P12).

2 Changing stakeholder perceptions. Comments included: 'Help the farmer succeed ... a successful farmer means a happy customer' (P8), supporting Chakravorti et al. (2023). Trust was a common theme. Participants cautioned that stakeholders' perceptions of e-commerce vary widely (P8, P10, P11), confirming the findings of Kidschun et al. (2019).



3

Collaboration. Stronger leader-employee partnerships can decrease mistakes, empower teams (P7, P12), and 'speed up adoption' (P8). However, if leaders move too quickly without proper internal processes, e-commerce may fail (P8, P9), requiring attention to 'education, information, expectation, and conditioning' (P8) to strengthen relationships to facilitate successful changes (P7, P9, P11).



● Contemplating strategic decision-making and leadership in terms of sustainability and environmental goals (SEG)

Game theory was used to understand strategic decision-making in agri-input organisations. Most participants consistently preferred a **hybrid e-commerce model** for the agri-input sector, despite some choosing full adoption. Those in favour of a hybrid approach argued that combining online and traditional sales

methods would allow them to leverage both options, reducing risk, which is vital in agriculture, where trust, personal relationships, and good service are part of who they are. A sincere motivation for preferring a hybrid approach came from P7, who explained that organisations and businesses are:



never going to do away with personal interaction with the farmer – people are going to need to process and oversee smooth operations, but automation provides a tool that focuses on reducing mistakes by refining the process...building a data-driven ordering system with a feedback loop would provide users with a comprehensive, 360-degree view of their farm operations and procurement needs.

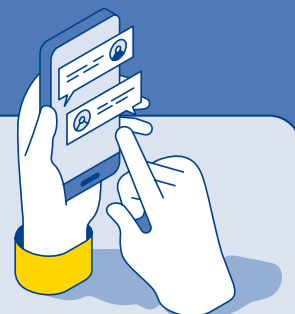
→ Implementation of a hybrid model

Converting to a hybrid e-commerce model for agri-inputs in South Africa implies several changes. Scholars suggest:



Decentralisation to empower local teams in terms of customer interactions, although it might challenge unified strategies (Harbott, 2021).

Enhancing collaboration among sales, marketing, logistics, and IT, which requires dismantling of traditional barriers to secure a consistent customer-centric approach (Fecke, Danne and Musshoff, 2018).



Investing in technology and digital training to empower employees and ease resource strain (Schulze Schwering, 2021).

→ Leadership's role

Transitioning to e-commerce and implementing a hybrid model for agri-inputs in South Africa requires leaders to:

Have a clear vision and be flexible to improve customer experience in both digital and physical spaces, helping to create personalised interactions that match farmers' technology skills (Fecke, Danne and Musshoff, 2018; Harbott, 2021).



Building a culture of innovation and agility to tackle challenges and create a sustainable e-commerce model for the agri-input sector. Teams should also be encouraged to improve their tech skills (Schulze Schwering, 2021).

Leaders should focus on customers, endeavour to reduce prices, improve logistics, and manage risks linked to market consolidation.



The speed of transition...

Regarding the time required for e-commerce to come to fruition in the agri-input sector, two participants were less optimistic, estimating more than a decade. P2 was adamant: 'I can't see that this technology will

be viable in our market'. Six participants believed it would take up to nine years. Three participants were more ambitious (P1, P6, P8), suggesting it would take less than five years.



Summary

This study explores the impact of e-commerce on the agri-input supply chain in South Africa, highlighting themes such as readiness to adopt technology, perceptions of the uptake of innovative technologies, and the surge in demand for sustainable practices. It addresses the challenges associated with the transition to e-commerce, including dependence on intermediaries, logistical hurdles, entrenched relationship-based transactions, and concerns about data security and product quality. Apprehensions about

limited technological skills and the potential loss of personal connections are noted, underscoring the necessity for training and customised implementation plans. Ultimately, the study identifies a hybrid approach to agri-input e-commerce, integrating traditional and digital methods, as the preferred strategy to fulfil the unique requirements of the South African agri-input sector. The findings highlight the critical role of adaptive leadership in fostering innovation and guiding strategic decision-making during this intricate transition.

Conclusions and recommendations

Discussions are presented in terms of the questions that directed the investigation.

Question 1:

the scope, success, and challenges related to agri-input e-commerce adoption in South Africa

Stakeholders in the agricultural sector agreed that adopting e-commerce can increase market share and profits. They advocated that businesses embrace the online shift and make significant organisational changes to enhance stakeholder value. A key challenge identified was determining when to innovate and when to adhere to established practices, which explains why hybrid e-commerce strategies are potential solutions to maintaining the sector's values.

Strong leadership with digital competence emerged as a crucial prerequisite for fostering innovation and adaptability in this sector. It was clear that strong, long-standing relationships within the agricultural sector, although dear to the heart, can hinder the adoption of new technologies. This is complicated by a generational gap. By creating user-friendly platforms and providing training, perceptions of agritech adoption can improve.

Question 2:

key stakeholders' perceptions of agri-input e-commerce in South Africa

Interviews indicated that introducing e-commerce to South Africa's agri-input sector involves more than just new technology; it requires building long-term personal relationships and trust. Understanding stakeholder perspectives,

current market trends, and supply chain factors, along with potential challenges is crucial. Stakeholders expressed concerns about how digital changes could impact existing business models.



Question 3:

leadership principles and practices required to facilitate the adoption of digitised supply chain solutions for agri-input e-commerce in South Africa

Business leadership is imperative for adopting a digitised agri-input supply chain, balancing technological advancements with the sector's emphasis on personal relationships. Effective leadership must be collaborative, dynamic, and transformative, focusing on strategy, while respecting the industry's cultural nuances.

Findings highlight the importance of empathetic and adaptable leadership in navigating VUCA market demands and successfully transitioning to a digital supply chain in agriculture. In summary, the industry requires strong, tech-savvy leaders who are strategic and culturally aware.

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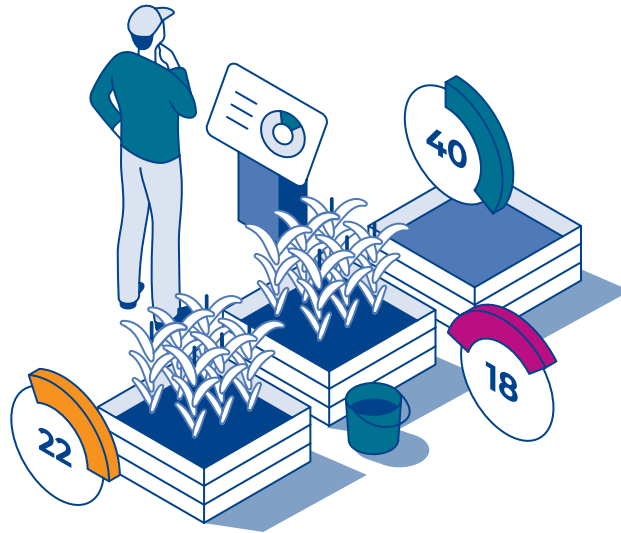
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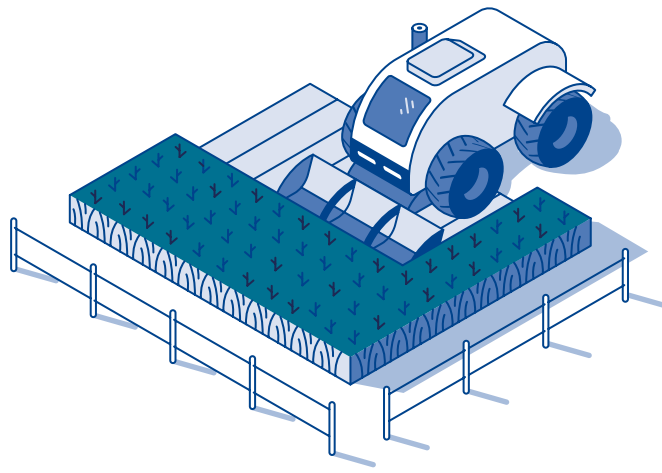
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Nuanced complexities surrounding the adoption of e-commerce in the agri-input value chain



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