AGRICULTURE AND TECHNOLOGY: NAVIGATING THE CHANGING LANDSCAPE AND SAFEGUARDING YOUR BUSINESS

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Food & Agriculture

The food and agriculture industry has consistently been at the forefront of innovation; constantly seeking ways to improve efficiencies, productivity, and sustainability. Technology has emerged as a powerful tool for revolutionizing the industry. From precision farming and automated machinery, to data analytics and artificial intelligence, technology has the potential to transform every aspect of agriculture.

However, despite immense potential, the implementation of technology in agriculture is challenging. This white paper aims to explore the role of technological disruption in food and agriculture, and examines both the opportunities and complications posed by its integration, with a view to creating a more sustainable and profitable future.

THE HURDLES

Family-run, or small-to-mid-sized independent farms, and even large scale ag operations may be cautious in approaching technology adoption. This hesitance is primarily based on reliance of traditional methods and concern that integrating technology may disrupt established best practices.

Integrating new technology can be intimidating and expensive. There is a need for reassurance that the long-term benefits will outweigh the up-front expenses.

The variety of tech options can also be daunting. A proper understanding of the functionalities and lasting benefits of different technologies is necessary to make informed decisions.

It is clear that artificial intelligence (AI) holds great promise for revolutionizing food and agriculture. However, it is still in its budding application stage which can create challenges and be time-consuming to learn and implement. It requires large amounts of quality data, complex algorithms, and practical expertise in AI to make its application in this sector successful.

To engage agriculture with technology, tech providers need to focus on proper education and awareness. Further research, development, and collaboration between technology providers and the end user can unlock the transformative power of AI in food and agriculture.

CURRENT INTEGRATION

Technology is set to revolutionize the industry through data-driven decision-making and precision growing techniques such as hydroponics and aeroponics. With the help of advanced tools and analytics, informed decisions can be made about planting, irrigation, fertilization, and harvesting.

Improved resource management is another key benefit of technological disruptions in food and agriculture. Using advanced sensors, soil moisture levels, weather patterns, and crop health can all be monitored in real-time. Technology enables precise irrigation scheduling and a significant reduction in the utilization of natural resources. Chemical usage can be reduced, and the ecosystem preserved, through targeted applications of fertilizers and pesticides. Through improved resource management, there is an opportunity to increase profitability to the bottom line.

From a broader perspective, technological integration in agriculture has enhanced crop quality through innovations like vertical farming, disease and pest management, and automated sorting:

- Vertical farming enables year-round cultivation in controlled environments, ensuring consistent crop quality without heavy dependency on weather conditions.
- Advanced disease and pest management systems utilize sensors and AI algorithms to detect and respond to threats in real time, minimizing crop losses and reducing the need for chemical interventions.
- Automated sorting technologies, like machine vision and robotics, ensure consistent quality and uniformity in harvested produce, improving marketability and consumer satisfaction.

With the help of technology, compliance with food safety regulations can be ensured; track and trace origin point, and transparency to consumers. This enhances market access and builds trust in the food and agriculture supply chain. Furthermore, automation in labor-intensive tasks can lead to improved labor conditions and reduce the risk of employee injuries and accidents.

Tech integration has the ability to improve logistics and transportation with real-time monitoring and tracking systems. Businesses and distributors can optimize transportation routes, reduce spoilage, and ensure timely delivery to markets. Ultimately, technology integration is able to significantly minimize logistics costs and food waste.

THE FUTURE

Over the next five years, it is highly likely that many will be using, in some form or another, robotics, drones, and autonomous vehicles to increase efficiency. This will significantly reduce labor-intensive tasks like planting and harvesting crops, monitoring soil conditions, and managing irrigation systems.

Use of precision agriculture tools, such as sensors, will optimize resource utilization and minimize agricultural waste. Moreover, farms will increasingly be able to reduce their reliance on traditional land-based farming methods by using smart irrigation systems and enhanced farming solutions.

The emergence of AI will play a crucial role in broadening the scope of advanced technology in agriculture. AI will be used in decision-making processes related to yield and fertilization. For example, AI-powered drones and robots could assist in pollination, compensating for the declining be populations.

Additionally, AI-driven algorithms have the capacity to analyze data on soil composition, weather patterns, and crop health to provide precise recommendations for fertilization and spraying. These algorithms have the ability to make real-time adjustments to temperature, humidity, light levels, and nutrient levels for optimizing plant growth at the individual plant level and achieving better yields.

CYBERSECURITY CONCERNS

In every industry, cybersecurity concerns go hand-in-hand with tech integration. There is constant risk of a data breach, so ensuring robust cybersecurity measures are in place is paramount.

Data breaches in the food and agriculture sector are rising. These can result in financial losses, reputational damage, compromised customer data, and impacted supply chains. While overall vigilance is vital, there are several key areas of susceptibility in this sector:

- **Vulnerabilities in infrastructure and a lack of security controls** make the industry an attractive target for cybercriminals. Many agriculture and processing systems and devices rely on legacy operating models and outdated software that increase the risk of exploitation. The alliance of agriculture networks and the integration of digital technologies also introduce new vulnerabilities.
- Employee training plays a crucial role in mitigating cybersecurity risks. **Phishing emails and business email compromise (BEC) attacks** are common tactics used by cybercriminals. By training employees to identify and report suspicious emails, businesses can significantly reduce the risk of falling victim to these attacks.
- **Supply chain attacks,** where malicious actors target vulnerabilities in third-party vendors or suppliers, can have severe impacts. Businesses must implement strong access controls and conduct thorough security assessments of their supply chain partners.
- The rise of the internet of things **(IoT) brings opportunities and risks. IoT devices, such as sensors and connected machinery,** can enhance productivity. However, these devices also introduce potential vulnerabilities, often lacking robust security features. Not only cybercriminals, but disgruntled employees or contractors can also exploit inadequately secured IoT devices to gain unauthorized network access.

BEST PRACTICES FOR RISK MITIGATION

In today's dynamic and uncertain business environment, conducting regular risk assessments and diversifying your operations is essential. Spreading your operations across different markets, products, or services can help mitigate the risk of relying too heavily on a single revenue stream. This approach provides a buffer against market fluctuations or disruptions in specific sectors.

Important factors for implementation to minimize risk exposure:

- Regular monitoring, maintenance, and training are key.
- Data security and privacy are critical to protecting digital business aspects.
- Contingency planning for natural disasters, supply chain interruptions, or economic downturns.
- Collaborating with industry stakeholders, such as suppliers, customers, and regulatory bodies, can provide valuable insights and support in identifying risks.
- Frequent evaluation and adaptation of risk management strategies are essential to staying ahead of evolving risks.

THE WAY FORWARD

Integrating technology in food and agriculture can improve productivity, sustainability, efficiency, and profitability. However, it is crucial to address the implementation challenges and cybersecurity concerns that come with this tech revolution. Collaborating with industry stakeholders and implementing comprehensive cyber insurance coverage are essential parts of your risk mitigation efforts. Only through embracing technology and proactively managing risks, can you confidently navigate the changing landscape and secure operations for long-term success.

PURCHASE THE RIGHT INSURANCE POLICY TO PROTECT YOUR BUSINESS AGAINST CYBER THREATS.

Your cyber policy should include cover for the following:

- Forensic investigation to determine the scope and extent of the breach
- Relevant legal expenses incurred
- Credit monitoring and/or identity theft services
- Public relations for reducing the potential exposure
- Call center support to respond to customer inquiries and concerns
- Regulatory fines and penalties to the extent allowed by law
- Resolving claims for damages by those affected by the breach, such as customers, clients, and business partners

About the Authors

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In his role as COO — Cyber Liability practice, Marty is responsible for the overall operation of Gallagher's Cyber Liability practice national sales team and strategic initiatives. He is focused on driving organic growth with clients and key prospects. In doing so, he supports producers, account executives, and brokers to protect clients' critical assets, utilizing Gallagher global cyber services.

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A graduate of California State University Fresno, Haley has spent the last 23 years living and working in California's fertile Central Valley. She joined Gallagher in 2020, specializing in food and agriculture. Haley works closely with middle-market businesses in this specialty, developing strategic solutions for mitigating risk and protecting bottom-line profitability. She is responsible for strategizing and negotiating insurance programs — in collaboration with clients — that meet the unique risk appetites of food, agriculture, and related industries.

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