

Agriculture Practice

# Creating value in digital-farming solutions

Many investments in digital farming have not fulfilled their full potential. What can companies do to improve returns?

*This article was a collaborative, global effort by Shane Bryan, David Fiocco, Mena Issler, RS Mallya Perdur, and Michael Taksyak, representing McKinsey's Agriculture Practice.*



**Over the past 20 years**, agriculture has undergone a digital revolution. It started quietly with original-equipment manufacturers that began to sell harvesters with guidance systems and auto steering,<sup>1</sup> then roared to life in 2013 with Monsanto's nearly \$1 billion acquisition of the digital-agriculture company Climate Corporation. Since then, there has been an arms race within the industry, with billions of dollars invested and hundreds of millions of acres affected by digital farming.

The rapid pace of investment and broad adoption of digital technologies on the farm are a testament to the power of digital to reduce costs, boost yields, and put more money in the pockets of growers.<sup>2</sup> However, despite the promise of digital-farming solutions, our research suggests that such investments have not lived up to expectations of the companies that made them. To explore why this might be the case and what could be done to improve outcomes, we conducted a survey of more than 100 industry executives from across the agriculture value chain.

For the purpose of this article, we define “digital farming” as any platform or application that processes input data to provide growers or crop advisers with agronomic decision-making support. These include proven digital offerings (such as variable-rate application) and ones that are more novel (such as in-season sensing). We excluded automation equipment, drones, and services that are not linked to agronomic decisions (for example, fleet-management software).

The survey found that most agriculture companies have invested in digital-farming solutions, but less than 40 percent of respondents (representing a broad swath of the industry) self-reported positive returns. To understand why, we tested a number of success factors, several of which dramatically

increase perceived success. These standout factors include:

- high attention from CEO and top team
- clear strategy and business case linked to value creation
- at-scale investment

About two-thirds of survey respondents indicated they had just one of these success factors in place; this suggests that the disappointing returns from digital-farming investments may be due to lack of adequate preparation.

Yet even some survey respondents with the right ingredients in place still reported negative returns. We believe other factors, such as offering proven digital solutions and pursuing multiple approaches to monetization, are also instrumental.

Beyond offering new business-growth avenues through digital farming, digital transformations in agriculture companies offer the prospect of enhancing commercial excellence and lowering cost. In fact, our experience shows us that digital leaders reap outside returns—but only when the right pieces are in place. In addition to the success factors noted above, several others bear mentioning in the broader context of a digital transformation:

- identifying value across the existing business in each domain (including commercial and operations) and new sources of value (such as digital-farming solutions)
- clarifying objectives (for example, cost leadership, commercial excellence, and new growth platforms) and prioritizing investments accordingly

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<sup>1</sup> Kevin Laczkowski, Asutosh Padhi, Niranjana Rajagopal, and Paolo Sandrone, “How OEMs can seize the high-tech future in agriculture and construction,” March 30, 2018, McKinsey.com.

<sup>2</sup> More than two-thirds of US acres are reported to be farmed with the aid of a digital technology; for more, see Bruce Erickson and J. Lowenberg-DeBoer, 2019 *Precision Agriculture Dealership Survey*, Departments of Agricultural Economics and Agronomy, Purdue University, February 2020, ag.purdue.edu.

- defining and tracking key performance indicators to prove the value to the business
- establishing the right enablers to ensure scalability (for example, full technology stack, ample digital talent, and agile ways of working)

Agriculture is ripe for digital reinvention and, with the right approach, companies all along the value chain can deliver outsize value from digital investments (exhibit).

#### Exhibit

### Digital-farming offerings are ubiquitous, yet only a minority of companies have realized positive returns.

#### Digital can provide many sources of value within the agriculture industry.



**Commercial**  
Reinvent the customer experience, pinpoint organic growth, and optimize margin



**Operations**  
Transform productivity from sourcing through production and across the supply chain

The focus of our survey was on digital farming solutions, the most common offering in this category



**New sources of agriculture value**  
Capture value on the farm and along food value chains

#### The vast majority of the 100+ companies surveyed have a digital-farming offering and a third investing significantly.

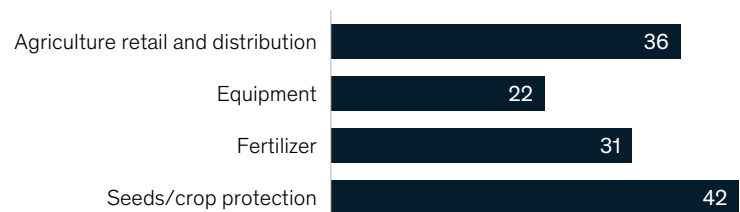


#### However, companies have seen mixed returns from digital-farming offerings across verticals.

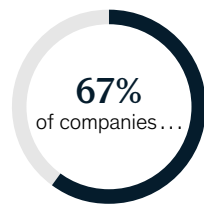


#### All verticals see mixed returns.

% of respondents with self-reported positive returns by vertical

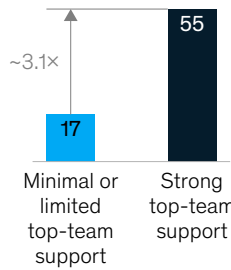


**Mixed success of digital-farming offerings relates to partial implementation of the top three success factors of digital efforts.**

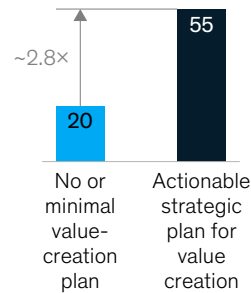


... failed to put in place two or more of the top three success factors of any digital effort.

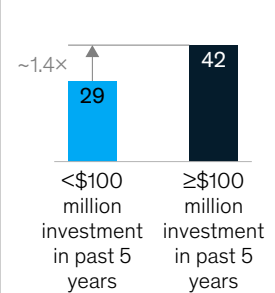
**1. High priority and attention of CEO and top team, % of respondents with self-reported positive returns**



**2. Clear strategy and business case linked to value creation, % of respondents with self-reported positive returns**



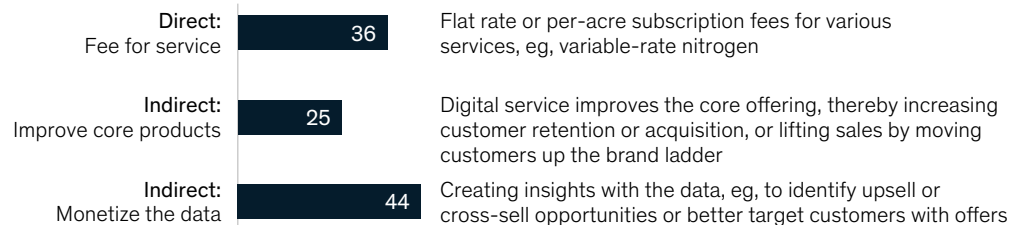
**3. Significant resources and high level of investment, % of respondents with self-reported positive returns**



**The monetization model of digital-farming offerings is another important success factor—but is difficult to get right.**

Survey respondents reported mixed results depending on the primary monetization approach, surprisingly seeing the greatest success by monetizing data insights. However, no single monetization approach appears well correlated with high returns and it is our belief that most companies should pursue multiple paths in parallel.

% of respondents with self-reported positive returns based on primary monetization model



Despite the open questions on monetization, the latest McKinsey, USDA and Purdue surveys show that over two thirds of US acres are farmed in assistance of digital technology and emphasize that the adoption and value creation of digital farming offerings go beyond specifics of monetization.

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