

## 5. Agroads case: technological solutions for the agricultural sector

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### LEARNING OBJECTIVES

- Learn how digital technology is transforming agribusiness.
- Identify the most relevant technological vectors of Industry 4.0 that the company uses in its products.
- Understand how e-commerce is affecting internationalization opportunities for small businesses.

### INTRODUCTION

Digital technologies – including digital platforms, sensors (Internet of Things), drones, big data, and artificial intelligence – play a significant role in agri-food chains at different levels. Some of these technologies can be applied directly to the agricultural production process, such as information platforms for decision making and precision agriculture machinery; others, such as big data, are employed by organizations that carry out research and development for agricultural applications (Sotomayor et al., 2021). In recent years, digital media and online platforms, in particular, are increasingly used by companies in the agricultural sector for sales and marketing applications.

Looking ahead, extraordinary growth is on the horizon. Digital innovations, for example, have accelerated the development of various services that provide up-to-date weather information, predict commodity price trends, and enable farmers to make online purchases. All of this in a sector that has typically been very conservative and slow to adopt technological innovations.

In business-to-business farmers' markets, online marketplaces empower buyers, give sellers access to new outlets and customers, make pricing more transparent, and simplify trading. This is the scenario in which Agroads was created, in an attempt to capture the business opportunities that the digital revolution was opening up in all sectors as well as in agriculture (Figure 5.1). Mr.

Rodriguez, CEO, and founder of Agroads, felt like a digital pioneer in the early 2000s when digital innovation was foreign to most operators in the industry. Fast forward 20 years and the pandemic changed everything. Forced by the roadblocks imposed by the COVID pandemic, many of Argentina's agribusinesses adopted videoconferencing, and were now more open to incorporating e-commerce into their sales operations. Agroads is now well-positioned to take advantage of its early vision that digital technology could change Argentine agriculture for the better, but new challenges now await (Agroads, 2020, 2022).



*Figure 5.1* Agroads logo

For many years agricultural machinery manufacturers had developed a network of dealers and distributors throughout the country using traditional methods of communication. These kinds of networks are still the main channels to reach out to customers in different areas of the country, even though companies operating in the agricultural sector are now more open to new technological applications. This centralized model is being impacted by platforms such as Agroads as well as by over-the-top operators like Facebook, and Google, which allow manufacturers to directly reach out to producers and contractors in a very targeted and direct way. In addition, any friction in communication has been eliminated thanks to popular social media and chat applications such as WhatsApp (which is very popular in Argentina).

The key for organizations and professionals is to be able to see digital change not as a threat but as a great opportunity. The main challenge for Agroads is to ride this momentum and position itself as a valid alternative

for sales and distribution beyond the market of innovators and early adopters. These challenges entail providing existing and new customers with an even more compelling value proposition to make clear the benefits of going digital. This is not an easy task in an industry that has been, until recent times, very reluctant to adopt digital technologies for cultural, industrial, and logistical reasons, including the difficulty of bringing high quality connections in remote areas in such a vast country as Argentina.

## INDUSTRY OVERVIEW

Global agricultural production more than tripled between 1969 and 2015, due in part to Green Revolution technologies that improved productivity, and to the significant expansion of the use of land, water, and other natural resources for agricultural purposes to cope with increasing demand from a fast-rising world population. In the same period, food and agriculture underwent a marked process of industrialization and globalization. Food supply chains have lengthened dramatically as the physical distance between farm and table has increased, and consumption of processed and packaged foods has skyrocketed in all but the most isolated rural areas.

To meet demand in 2050, FAO, the United Nations Food and Agriculture Organization, estimates that agriculture will have to produce almost 50 percent more food, feed, and biofuels than in 2012. In sub-Saharan Africa and South Asia, agricultural production would have to double to meet growing demand, while in the rest of the world, growth is expected to be about one-third above current levels. This assessment considers recent UN projections that the world population will reach 9.7 billion by 2050 (FAO, 2017).

To address this challenge, agri-food systems must become more productive, profitable, transparent, sustainable, and resilient to external shocks, such as those caused by climate change. Smallholder farmers, who manage 80 percent of the world's cropland and 60 percent of food production, are particularly vulnerable to these shocks. They will have to adopt new agricultural production processes and, in turn, face limited access to information and agricultural assets, finance, and markets. In the wake of COVID-19, it is more urgent than ever to transform the functioning of current food systems. They must be more agile and resilient to unforeseen events (IADB, 2021). This leads to the conclusion that companies operating along the agri-food production chain will also experience these challenges. Considering the characteristics of today's more connected and digitally savvy farmer, a promising scenario for Agroads' business model can be expected.

The COVID-19 pandemic caused complications of all kinds, which have inevitably affected all productive sectors. Yet, in Argentina, the agricultural and agro-industrial sectors have been considered "essential" since March 2020

(the month in which COVID-related restrictions began in the country), that is, subject to few operational limitations. Despite these obstacles, some positive aspects should be mentioned. One of them is related to the rapid and effective adoption of new technologies. In this sense, one of the great beneficiaries has been e-commerce, considering that the pandemic accelerated electronic marketing. As a result, Agroads consolidated its leadership as the number one marketplace for agricultural products and services in Argentina, particularly in the Pampas region.<sup>1</sup>

The agricultural machinery sector was the main protagonist of e-commerce in 2020 with the purchase and sale of equipment. In addition, Agroads' users were able to purchase inputs, spare parts, and equipment through the platform. The increasing availability of data, combined with the emergence of data analytics tools such as AI, big data, and machine learning, is making it possible for digital consulting firms to provide farmers with more detailed insights and recommendations. In previous generations of services, general information on market prices, weather, nutrition, and best practices was disseminated to a wide network of farmers through more traditional methods of interaction (phone, events such as fairs in which face-to-face interactions took place, visits by state extensionists, etc.). Those methods are gradually being replaced or complemented by virtual tools.

### **The Beginnings of Agroads and its Recent Trajectory**

In the beginning, Mr. Rodriguez did not work full time on the venture, and he was employed in the IT department of a company in the city of Rafaela, Argentina. His wife also worked part-time, until the workload in the company started to increase, which led them to focus 100 percent on their business. These were the early years of the commercial deployment of internet in the country (2002–5). Like mushrooms, a number of very small software firms were being created by young professionals in a number of cities in the Pampas (Albornoz, 2006).

The first programmer joined the business in 2006 and ended up spending 10 years with the company. Shortly thereafter, Mr. Rodriguez's wife began to assume full management responsibilities for the company. This three-person team ran the company for about five years. They worked from the living room of Mr. Rodriguez's parents' house until they finally moved into an office (Figure 5.2). That was a big change – Agroads was no longer a hobby, but was starting to look like a real business. The company continued to grow and increased its staff by adding sales and marketing people, as well as another programmer.

In 2005, there was very little competition and companies were starting to need digital solutions, and according to Mr. Rodriguez, now CEO of Agroads,

this early mover advantage put them in a privileged competitive position that allowed the company to generate some profits even during frequent financial crises. In years when traditional supply channels were characterized by fierce competition, the digital marketplace created by Agroads became a beacon in the darkness, because it helped small farming businesses to reach the market directly and at a very low cost. Agroads' expansion was also possible because of the existence of a large unified market of machinery, inputs, and services around extensive agricultural activities in the Pampas.



Source: Agroads.

Figure 5.2 One of the walls of the current Agroads offices

One of Agroads' key differentiating factors is that the company is obsessed with making user experience as simple and as effective as possible. For example, from the very beginning, Agroads invested significantly in the design of a powerful search engine into its platform, so that its customers could find the products they were looking for as quickly as possible (Figures 5.3 and 5.4). Since then, Agroads has made usability and simplicity key factors in guiding further improvement of its platform. Agroads learned to focus on these key aspects and decided to outsource non-core activities. Initially, employees performed a range of functions, some of which were not part of their job description, such as coders and programmers. This lack of clarity in the design of job positions led to the creation of a small in-house core team. Many functions were outsourced to help in scaling the business while remaining lean and agile. For example, the company relies mostly on external professional help when it comes to marketing. By focusing on its core business and the platform, Agroads found a way to create a scalable business model without having heavy and costly overheads.



*Note:* The website can be accessed at [www.agroads.com.ar](http://www.agroads.com.ar).  
*Source:* Agroads.

*Figure 5.3 Usability and simplicity in the design of desktop and mobile effective digital interfaces at Agroads*



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In terms of financing, Agroads has never accessed third-party financing; it has always financed itself with its own capital by reinvesting the proceeds coming from its sales. The platform is constantly being updated from the technological point of view, for instance through the addition of new functionalities to further improve user experience. However, Agroads' business model has remained relatively unchanged through the years.

Another factor that influenced the company's development was the introduction of mobile devices. Today, 80 percent of Agroads' online traffic originates from mobile devices. In 2019, Agroads added to its portfolio the product "Agroads Analytics." This tool enables farmers to make data-driven decisions, for example by providing information on the performance of ads on the Agroads platform. Thus, farmers can better manage their digital sales leading to more business opportunities. The tool provides an overview of the impact of publications made on Agroads with objective data (impressions, clicks, contacts, and ads), as well as by supporting the identification of the geographical origin of visits. Agroads Analytics makes it possible to visualize the impact of the products sold on the platform through the quantification of the clicks received by an ad and the transformation of such clicks into actual sales. This analytical engine also helps Agroads monitor the evolution in time of a client's business on the market in which it operates. Agroads uses these analytics to support its internal decision-making process. It also shares this information with its customers hoping they will adopt the same data-driven approach in making decisions for themselves.

This is a clear example of the application of an Industry 4.0 vector: business intelligence (BI). This technological enabler refers to the provision of data that allows all types of companies to make better decisions. The incorporation of new services and innovations to the platform is based on a process of quick and iterative validation of these novelties via agile methodologies. A rule of thumb is that each early idea must be tested within a week of its adoption. On more than one occasion, it would not be an exaggeration to say that Agroads was able to sell a product before it was fully developed.

As for the characteristics of the entrepreneurial team, perseverance, restless innovation, and genuine passion for what they do stand out. The company CEO and top management all excel in a fundamental entrepreneurial skill for the digital environment: the ability to listen to their customers and to identify a problem-driven approach to the development of new services.

The CEO of Agroads often mentions a key lesson learned over 15 years of work experience: the transformation from an operational entrepreneur to a strategic entrepreneur requires being part of broader technology and market ecosystems, building and managing talented teams, and learning how to create a digital strategy and execute it through proper planning.

## **Business Model**

Since the beginning, the Agroads revenue model has been based on a “free-mium” business model; that is, a model based on the idea that clients can, initially, opt for a free entry-level offer. Once in contact with the client, the firm offers a premium version that is paid for, with the possibility of accessing other functionalities, a greater volume of transactions or the simple fact of not having to display advertisements.

Only the clients who need more functionalities generate revenues for the company. That is why Agroads’ objective is to transfer as many free users as possible into paying customers via service customization. That was the first change the company recognized. Many clients only need an online commerce platform while others have more sophisticated needs (or can develop an appetite for more advanced services). Thus, Agroads began to design offers differentiated by type of customer.

Currently, it is one of the most important online platforms for agriculture in Argentina, made up of a community that exceeds 400,000 people connected to do business. Most of them have businesses in and around the large portion of the country dedicated to extensive agriculture and cattle raising (annual crops such as soybeans, wheat, maize, sorghum, etc.). This online platform generates a volume of information with high added value in a dynamic, volatile, and competitive business context. Agroads’ platform is grounded on three pillars: community, infrastructure, and data. As far as the community pillar is concerned, the company implements various activities to strengthen relationships with its more loyal and returning users so that they will consider using additional functionalities. This community aims to democratize knowledge. To do this, Agroads puts agricultural producers in contact with technicians and consultants as well as with the best information, and the major agricultural companies. By simply registering on the platform, users can make online inquiries to the most outstanding specialists in different agricultural topics, access quality technical information, and interact with peers to share experiences and information. The infrastructure of the platform is state of the art: customers have numerous functionalities, such as CRM, payments, logistics, and so on.

On the data side, the firm offers two products. One of those tools, to which we already made a reference, is Agroads Analytics: a tool based on real data on the impact of posts that considers variables such as impressions, clicks, contacts, and ads. This makes it possible to identify the geographical origin of the visitors and evaluate the scope of the publications according to the category. The objective is to optimize business strategy and contribute to marketing decisions and business planning thanks to market knowledge. From this data, the platform allows access to different reports having an intelligent visualization of the performance of the products.



The second tool the company is working on is an algorithm that allows farmers to predict what they need and offer them a “menu” of options that include the best offers based on their interests, such as commercial conditions, product characteristics, and geolocation. Agroads observed that clients often do not have time or do not have the training to interpret the data obtained, which is why over time this second product was created: # BeOne, an agency that provides services to companies that need to be in Agroads and at the same time on social networks. In other words, what the agency does is to leverage Agroads Analytics to generate hyper-segmented audiences and reach out to users with highly accurate marketing messages at the time they need them. Here the richness of the service offered by Agroads is evident. According to the General Director of the company, the objective is to support clients throughout each step of their buying or selling experience and simplify the process through the creation of different tools.

Agroads’ revenues are generated in various ways. The most important revenue source are the 1,500 premium clients who monthly pay from \$7,000 to \$60,000 (Argentine pesos). Other revenues are generated via ads and data analysis tools on the platform. Through this mix the company was able to close the year 2021 with over \$130 million in turnover (about 1.3 million US dollars at 2022 exchange rates).

In the future Agroads intends to offer payment solutions for the different needs of producers: agro cards and grain exchange. Logistics, on the other hand, is a complex issue. But the company is aware of this situation and is willing to build the foundations of a new, simpler business in the field, putting the end customer at the center. Agroads, these last 15 years, has been part of the digital transformation of the entire industry, but it is not alien to the reality that it is a constantly evolving market.

Through the data generated and the information analyzed, Agroads will have the challenge of improving user experience, in which all applications and functionalities for the producer are integrated. In this sense, community development will be a central theme in the company’s strategy: providing trust, a sense of belonging, and being useful with the tools that are provided.

Currently, Agroads has a series of competitive advantages that allow it to be one of the leading agro marketplaces in Argentina:

- First to market: 15 years of experience and organic growth.
- Brand recognition: 120,000 brand searches per month from Google.
- Data volume: due to the monthly processing of 100 million interactions.
- Network effects: having more than 600,000 users and 1.6 million monthly visits (95 percent organic).

## **E-Commerce as a Tool for the Internationalization of Companies**

The literature has basically dealt with the internationalization processes of production and service companies, while the internationalization of e-commerce companies has not been analyzed with similar interest by academia. In many existing accounts the internationalization process of a company normally begins with initially modest export operations, serving this experience as a platform for future international expansion (Lu and Beamish, 2001). Given that SMEs generally do not have sufficient resources to advance in more complex instances, it is the ideal means to begin internationalization (Dalli, 1995). Through exports and a progressive internationalization process, a company gains economies of scale and scope and diversifies its market destinations. The firm also gains new sources of income and may find new sources of ideas for product and process innovations (Golovko and Valentini, 2011). The Swedish school, through the so-called “Uppsala model,” developed the business internationalization model (Johanson and Vahlne, 1977), which focuses on a gradual process in stages. In the context of this model, four stages of internationalization are identified: exports, installation of marketing offices abroad, internationalization of the value chain (imports of inputs), and investment for production in the main destination markets (Johanson and Wiedersheim-Paul, 1975).

In the case of e-commerce firms such as Agroads, some (or all) of these steps may be bypassed, for, in essence, these firms are born global. Yet, because of a number of barriers their actual reach may only be national or regional. Some of those barriers are language, transaction restrictions (currency, payment methods, legal limitations, etc.), and delivery and logistics. For example, although Agroads’ platform has the potential to expand into neighboring countries where the same language is spoken (Spanish is also spoken in Uruguay, Paraguay, Chile, and Bolivia) other problems preclude its diffusion in its current format. In fact, Agroads’ expansion in Brazil has required not only the use of a different language (Portuguese) but the development of a different platform.

Agroads began its entry into Brazil a few years ago. The Brazilian website currently has 600,000 users operating on its platform and close to two million visits. The growth of agriculture in Brazil and the COVID-19 pandemic have encouraged a greater use of this digital platform among farmers.

Thus, although Agroads’ initial Argentinian platform was, in fact, born global, other factors limit the immediate global reach of the site. Paradoxically, the internationalization process is not checked by physical restrictions: physical borders have been crossed from the very beginning. An “analog geography” has, in fact, been superseded by a virtual network. Yet, several new restrictions and problems need to be solved. Perhaps surprisingly, local issues

such as legal restrictions, transaction limitations, the nature of local supplies, and logistics problems pose barriers and limitations that require new solutions.

### **Industry 4.0 in SMEs in Emerging Markets**

The level of diffusion of the new technologies involved in the so-called Industry 4.0 (I40) is still incipient in Latin America. The I40 has two dimensions. On the one hand, the top-down policies in which governments encourage the productive system to adopt the engines of this technological revolution. And, on the other, the business dimension promoted by large transnational companies and the network of smaller firms making up any value chain. The main motivations of SMEs for the incorporation of these new technologies are: the need to solve a number of business problems, the search for process efficiency, and the willingness to deliver higher quality products and services to customers. Digitization poses a qualitative leap for SMEs that forces them to rethink their operations. In that process, connections with customers and suppliers need to be revised while the skills of human resources have to be updated. The term I40 refers to a new model of organization of production processes and control of the value chain based on information and communication technologies. It is based on the possibility of configuring “intelligent” factories that will integrate the physical with the virtual, which implies the articulation of computer systems and manufacturing processes, the deployment of decentralized decisions and “self-organizing” optimization mechanisms (McKinsey, 2016; Basco et al., 2018).

The case of Agroads differs from what has been pointed out for “analog” SMEs as it operates in the ICT industry and by its very nature the company seeks to overcome the typical obstacles that SMEs must face in economies such as Argentina’s. Some of these obstacles are: the lack of knowledge about these new technologies; the lack of infrastructure; limited connectivity; the shortage of qualified human resources; culture, organizational habits and resistance to change; the difficulties of access to financing; and the deficiencies of the education and training system; among others. The partition of the production process and virtual internationalization allow Agroads to operate efficiently and competitively (Motta et al., 2019).

Of the set of digital technologies that comprise the I40 and affect production processes, the following can be highlighted: Internet of Things (IoT), advanced and collaborative robotics; big data, data science or data mining; cloud computing, artificial intelligence and machine learning; additive or 3D printing; and virtual reality and augmented reality. The case of Agroads presents as one of its competitive advantages the combination of the following technological vectors of the I40: IoT + Big Data + Machine Learning + Cybersecurity + Virtual Reality + Cloud Computing. This combination enables its business

model to integrate the information systems of suppliers, clients, and other users in the e-commerce platform.

## STUDENT CHALLENGES

### Discussion Questions

1. Why do you think agriculture is considered a traditional sector? Why would the introduction of digital technologies be particularly disruptive?
2. How can digital technology support the internationalization of the firm? Identify opportunities, obstacles, and barriers to adoption.
3. How would a similar situation unfold in the context of your country or region? Choose another example of a marketplace/industry and discuss the internationalization opportunities enabled by digital technologies that it offers.

### Assignments

1. Summarize the factors that were key in the development of Agroads as a technological business.
2. Which of the Industry 4.0 vectors do you see applied in the case of Agroads? Do some additional research on these technological enablers and identify possible applications for small businesses and which obstacles may hinder adoption.
3. What alternative business models might the company consider adopting? Is business model-driven innovation an option for the company? Identify and sketch an alternative business model using the Business Model Canvas.

## NOTES

1. Pampas, literally “plains,” is a large natural region in Center-East Argentina. This region concentrates some of the major cities of the country and the most fertile land for agriculture. It is currently dedicated mostly to the extensive cultivation of soybeans, wheat, maize, sorghum, and other middle-latitude crops. Other activities are also carried out such as cattle raising, dairy, and others.

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