

Digital as a lever of value co-creation between the actors of the agricultural ecosystem: the case of the digital platform “fodal.dz”

الرقمنة كآلية لرفع قيمة الإبداع المشترك بين الجهات الفاعلة في النظام البيئي الزراعي: حالة المنصة الرقمية “fodal.dz”

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Received: 27/03/2023;

Accepted : 31/12/2023;

Published: 31/12/2023;

Abstract:

The emergence of digital has opened new business opportunities where we could discover varieties of innovative ideas to meet the new challenges of the markets. Digital platforms appear as an answer to these challenges by creating digital interfaces. This allows agricultural companies, for example, to address directly the links of the supply chain and those who consume their products and services through virtual communities, social networks, data on their purchases and uses. The objective of our article is to present first, an overview of the digital platforms in Algeria through some examples. Then, we will present the role of digital platforms in the co-creation of value for the agricultural ecosystem through a case study of an Algerian platform called ‘Filière oléicole D’Algérie (FODAL.dz)’. This platform that we present has two components: the first concerns the geolocation of olive growers and oil producers. And the second includes the advice and training of olive growers. The objective of this type of service is to allow partners to have the necessary information for their productions through notifications about (prices, qualities, geolocation, climate changes and laws in force).

Keywords: digital platform, agricultural companies, agricultural ecosystem, Fodal.dz
Jel Classification Codes : Q16 ; Q19

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Introduction:

Like all sectors, whether administrative, commercial or economic, agriculture is undergoing a major transformation. A change imposed by the need for modernization and innovation in the face of exponential growth in the need for agricultural and livestock products, but also agri-foodstuffs.

Over the past few years, as the digital world has accelerated, agriculture has adapted to the changes and has entered this new era of solutions head on. Agriculture has embraced digital technology and robotics across all its sectors.

Big data technologies and machine algorithms have indeed brought about major upheavals by helping to improve decision support tools by taking advantage of the multiplication of data collected through sensors embedded in equipment. Many countries have begun and succeeded in this transition with the emergence of start-ups specializing in this area, while others are waiting to follow and develop the innovations needed for this purpose. These innovations depend on research and therefore on the financial resources and skills needed to successfully complete these high-stakes projects, particularly for agricultural activity and for the economy as a whole.

These challenges can only be met with the development of agricultural equipment and the deployment of digital tools among farmers, many of whom have smartphones and are connected to the Internet. A means that they will use tomorrow to optimize their harvests and limit their expenses at the same time. Platforms in this field are emerging.

At the Global Forum for Food and Agriculture conference in Berlin in January 2019, agriculture ministers from 74 states thus called for the potential of digitalization to be used to increase agricultural production and productivity, while improving sustainability, resource efficiency, employment and entrepreneurial opportunities and living conditions, especially in rural areas.

Algeria, like all countries, is called upon today to re-establish and develop its agricultural sector not only to meet the direct needs of the population in terms of production, but also to meet the needs of the agri-food industry. Today, the creation and development of small and medium-sized enterprises as well as start-ups in the agri-food industry sector depends above all on the digital development of agriculture.

In this context, we question here the role of digital platforms in the co-creation of value in the agriculture sector and we will present the FODAL.DZ platform in the olive growing sector as a case study. To be precise, we will try to answer the following question:

How does the digital platform “FODAL.DZ” intervene in the co-creation of value for the olive growing sector in the Soummam Valley cluster?

I-Co-creation of value on the internet: a review of the literature:

The first practice is the human cloud. First, the outsourcing of IT-related business processes, then the offshore outsourcing of IT and now the integrated ecosystem outsourcing (Kaganer et al., 2012).

Kaganer et al (2012, p23) state: ‘The human cloud is centered on an online middle man that engages a pool of virtual workers that can be tapped on demand to provide a wide range of services to any interested buyer. The human cloud is the use of a social platform, as an online middle man, in which a multitude of operating resources (skills, knowledge, expertise) collaborate online to provide a service to a business in need of solutions and innovations. These social platforms are growing rapidly and there are now more than 100 active platforms.

The second practice is crowdsourcing (CS), which is defined as the outsourcing of an activity previously performed by employees to a large network of people in the form of a tender: “Simply defined, crowdsourcing is the act of a company or institution taking a function previously performed by employees and outsourcing it to an undefined (and usually/y large) network of people

in the form of an open tender. This can take the form of peer production (where the work is done collaboratively), but is also often undertaken by single individuals. The essential prerequisite is the use of the open call format and the wide network of potential workers". (Howe, 2006).

Lebraty's definition (2007) seems to us to be more appropriate in the Web 2.0 era because it relies on the use of information and communication technologies to integrate individuals into the process of co-creating value: "Crowdsourcing means the outsourcing by an organization, via a website, of an activity to a large number of individuals whose identities are most often anonymous.

According to Lebraty (2009), five characteristics define the crowd: dispersion, time, diversity of individuals, identity and quantity of information.

The third practice is the concept of open innovation and user innovation. Initially, open innovation developed by Chesbrough (2003 a, b, 2007) puts forward the idea that a company can develop its innovation model by combining internal and external knowledge in order to accelerate innovation. We agree with Chesbrough (2003b, pp. 36 and 37) who states that "In this new mode of open innovation, firms commercialize externally as by deploying outside pathways to the market. Specifically, the company can commercialize intern ideas through channels outside of their current businesses in order to generate value for the organization. (. . .) In addition, ide as can also originate outside the firm's own lobs and be brought inside for commercialization. In other words, the boundary between a firm and its surrounding environment is more porous, enabling innovation to move easily between the two. Secondly, user innovation was initially developed by Von Hippel (1988, 2005). As its name suggests, its main foundation is to place the user, and more precisely the "lead users", at the center of the innovation process. Indeed, according to its theory, innovation comes first from the users of the product who modify it for their own needs. Manufacturers then discover this innovation and capitalize on it when they notice that the customer's innovation starts to spread to a larger group of users. Customer modification of the product creates higher value for the customer (Mangelsdorf, 2011). We note, on the one hand, the importance of integrating service users or other stakeholders in the innovation process, and, on the other hand, the indispensable role of these virtual platforms in this process.

In relation to the internet innovation platform, the scientific literature reports challenges related to the intrinsic motivation of members, recognition and the creation of a sustainable trust relationship as cultural norms and values to be established (Kaganer et al., 2012; Schenk and Guittard, 2012; Liotard, 2012).

Educating the members of the platform is a major challenge, especially in the presence of individuals from different cultures and educational backgrounds (Kaganer et al., 2012).

In the internet innovation platform, the scientific literature reports challenges related to the intrinsic motivation of members, recognition and the creation of a sustainable relationship of trust as cultural norms and values to be established (Kaganer et al., 2012; Schenk and Guittard, 2012; Liotard, 2012).

The logic of co-creating value with the actors of the business ecosystem constitutes a change in the innovation process and in the organization's business model. This implies redesigning the company's culture by adapting the norms, values and habits shared by its employees.

II- Typology of digital platforms:

By definition, digital platforms are virtual touchpoints enabled by technology and designed to provide structural support for ... exchange's (Hollebeek, 2019, p. 89). They are also channels for creating interactions and co-creating value (Ramaswamy and Ozcan, 2018; Breidbach et al., 2014). Although some platforms facilitate face-to-face interactions, our study is limited to digital platforms that enable interactions, collaboration, or communication with consumers via technological

touchpoints (Ramaswamy and Ozcan, 2016; Kannan and Li, 2017; Troisi et al., 2018). Given that digital platforms generate co-created value in different ways, we develop a typology of digital platforms that includes human-human and human-machine platforms.spacing).

II-1- Human-human interaction platforms:

Are technological touchpoints that mediate interactions, collaboration, or human-to-human communication. These platforms provide an interface that serves as an intermediary to connect individuals. An interaction partner may or may not be personally known (Brzozowski et al., 2008). The relational and communicational focus of these platforms can facilitate the development of strong or weak ties (Granovetter, 1983). Users can present themselves according to their true identity or play another character. Examples of these platforms are social networks, online communities, websites, mobile applications, social games, instant messaging, and online phone platforms (Raïes and GavardPerret, 2011; Kohler et al., 2011; Bernal-Merino, 2016; He and Yan, 2015; Algharabat, 2018).

II-2-Human-computer interaction platforms:

Are computerised touch points that connect with users. In other words, the technology based on such platforms is the interaction partner of the consumer where interactions can be initiated by the user or the platform. Although these platforms can fulfill a relational role. They perform particular tasks for consumers by improving their efficiency or performance, using artificial intelligence (Huang and Rust, 2020; Lee and Sathikh, 2013). Pradeep et al. (2019) classify these platforms as follows:

- Robotic process automation-based platforms: computerize existing labor-intensive processes. They operate through rule-based automation, where linear algorithms are used to answer basic queries via sensor-based signals (Hollebeek et al., 2020b).

- Machine/deep learning based platforms: operate relatively autonomously and automatically adjust their actions to meet or anticipate user needs, without requiring human intervention or support (Mende et al., 2019)

III-Examples of global digital platforms for agriculture:

Whether they facilitate the interaction between farmer and supplier, supplier and consumer, or directly between farmer and customer, or improve the efficiency and profitability of farms, digital startups are now an essential component of the agri-food economic landscape. Here are a few edifying examples:



Founded in 2014, this start-up offers mobile and connected weather solutions through a series of sensors including a rain gauge, a soil densitometer, an air hygrometer, a soil and air thermometer. The data collected by these sensors is then analyzed by software, which transmits useful information directly to farmers, enabling them to effectively monitor the weather, irrigation, temperature as close as possible to the buds, etc.



This Nigerian start-up proposes to increase the productivity of small farms (1 to 3 hectares) tenfold, by offering anyone interested in the opportunity to become a sponsor and to pay for the expenses related to the exploitation of additional agricultural units that are not used by the farmer himself due to a

lack of means, During the year, the farmer is trained in new agricultural techniques and his sponsor is kept informed of the progress of the work through reports, photos and videos twice a week, as well as visits to the site on request, then once the harvest is over, the sponsor recovers his initial investment, and the profits are divided as follows 40% goes to the farmer, 40% to the investor, 20% goes to the start-up.

Agriconomie.com

It is a French e-commerce site founded in 2014, aimed primarily at professionals in the world of agronomy, with the main objective of providing farmers with more transparency on their upstream purchases.

LA RUCHE QUI DIT OUI!

This start-up proposes to put the customer directly in touch with the producer without going through the traditional distribution chain, thanks to an ingenious system: the consumer orders his or her products online through a network of local suppliers, who supply “beehives” where the customer picks up the products ordered.

indigo

Using cutting-edge technologies such as machine learning and data analytics, this start-up has been able to compile and create a database of the highest-yielding microbes in crops, and thus offer seeds covered with its microbes for sale.

IV-Examples of Algerian digital platforms for agriculture:

In the following, we will present some examples of digital platforms dedicated to agriculture in Algeria



Elfirma.dz

It has a database storing information on 300 public sales outlets as well as 200 private sales outlets and farms across various wilayas in the country, with the aim of putting good quality fresh produce on the market at reasonable prices.



Souk Fellah.dz

It is an online platform for connecting stakeholders in the agricultural sector. Its objective is to promote agricultural trade by facilitating the exchange between all professionals in the agricultural and agro-industrial sector, an operation in which even private individuals can take part.



The digital platform called “Filahti” dedicated exclusively to the agricultural world in Algeria to the delight of farmers and actors in the agricultural sector. “Through this application, which will be officially launched on Playstore in particular, farmers will have every opportunity to express their technical or administrative concerns in various areas, ranging from production, sales and marketing, exports, health, investment, services and the acquisition of agricultural equipment, up to the search for labor,” explained the founder of this company and also a farmer, Mohamed El Amine Kabachi.

V- Qualitative Research Methodology: The Case Study:

As the objective is to understand the challenges of digital platforms in co-creating value for agricultural businesses, the research is exploratory in nature. We followed a qualitative approach through a single case study on the platform “FODAL.DZ”, and a semi-directive interview with the founder of the Platform, complemented by content analysis of their website as a data collection tool.

We agree with Huberman and Miles, (2003, p23) who point out that qualitative data contains rich descriptions and explanations of phenomena rooted in a local context (Huberman and Miles, 2003, p23).

We undertook a descriptive, qualitative approach, specifically through a single case study. This method of analysis is the most appropriate for our study object. The case study approach allows us to understand social phenomena as well as organizational and managerial processes in their globality and complexity.

The case study is used for descriptive studies of a phenomenon in order to understand the “what”, “who”, “where” and “how” of a situation. Also to explain phenomena in more depth, to establish relationships and thus answer the question of “why” and “how.”

According to Gagnon (2005): ‘The case study as a research method is appropriate for the description, explanation, prediction and control of processes inherent in different phenomena, whether these are individual, group or organizational.

The main limitations of this type of research are the impossibility of generalizing the results of the case to all organizations and the risk of researcher bias. It is risky to generalize when the phenomenon studied is complex and concerns only a single case.

VI- Results and discussions:

In this section, we will present our results from the “Fodal.dz” case study.

VI-1- Presentation of the platform:

The main challenges for the Algerian agricultural sector in the digitalization of this sector are numerous, namely to accompany the transition of Algerian agriculture and rural areas in order to meet the economic, environmental and climatic challenges facing the country and to respond to the requirements of food security.

The project to create the “Fodal.dz” platform is part of the “Programme d'Appui au Secteur de l'Agriculture, y compris dans la gestion de l'eau, l'agro-industrie et la pollution agricole (PASA)” (Support Programme for the Agriculture Sector, including water management, agro-industry and agricultural pollution), which is being implemented by Expertise France (EF) and Algeria’s National Institute of Agronomic Research (INRAA) for the Soummam pole in the wilayas of Bejaïa, Bouira and Tizi-Ouzou.

VI-2- What? is the context and overview:

In the current context, the environmental and economic performance of agricultural sectors are two sides of the same coin. Improved environmental performance cannot be achieved if the competitiveness of the agricultural sectors decreases. Increased sustainability requires more profitable economic sectors that are able to invest in environmental actions, to bear the costs while earning a living in today’s open world.

It is therefore time to think about a “new agriculture” that takes into account the past, its mistakes and its successes. A considerable body of agronomic knowledge and digital innovations can now be mobilized for the economic and environmental performance of farms and in the

interests of farmers and their consumers. To ensure the full success of such a digital evolution, it is necessary to:

- Convince people that encouraging this transition is more effective than seeing the future through the mirror of the past;
- To give the largest number of farmers access to these tools;
- Encourage the agricultural sector to innovate on the farm and to invest considerably in technical tools.

Faced with the need to show how important it is for the actors of the agricultural ecosystem to be fully involved in the digital transition, PASA has set up the Digital Agriculture Platform Filière oléicole Algeria “Fodal.dz” project, created by the company IMMAR, to share a common vision of the digitization of the agricultural sector: inclusive, centered on the needs of olive growers and in constant interaction with them.

For the development of the platform for the PASA service and to create the information system, numerous studies have been carried out by the IMMAR study cabinet among consumers, professional olive growers and ole factor and they have conducted a partnership with the PWC cabinet in Italy, Spain, USA, France, Canada and Belgium among Algerian diaspora who know and consume Algerian olive oil.

VI-3- The home screen:



VI-4- Why? Objectives, vision:

This platform aims to bring together agricultural sectors and operators who share both the need to go digital and to lead this change to meet the needs of farmers, in interaction with them. It aims to share experiences and highlight the benefits of such a change.

The specific objectives are as follows:

- To increase the competitiveness of economic actors in the three strategic and target agri-food sectors.
- Encourage governance at the central and territorial level through increased participation of all stakeholders and better information flow.

VI-5- How? work program and activities:

This platform is a space for formulation, recommendations and proposals for effective solutions to boost the olive sector in particular. This platform will organize its activities on two following components:

1.Data representation: cartographic tool for the visualization of the whole ecosystem of the olive sector for the Soummam pole.

2.Consulting support: Follow the activities of the advisors and enter the key information of each of the different training sessions organized. And the Reporting: Dashboard is made up of several performance indicators and statistics that help you make decisions.

VI-6- Target audience:

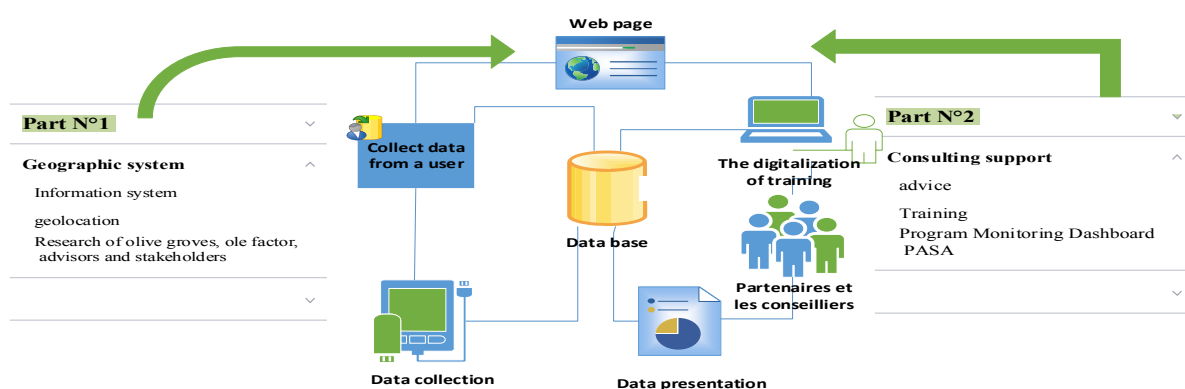
The target groups are small farmers organized in associations and cooperatives, very small enterprises (VSEs) and small and medium enterprises (SMEs) with a particular focus on youth and women. The public support structures are the beneficiaries of the project ensuring the implementation of the project's field activities. The target audience is composed of the following actors:

- 26 olive farmers - 44 olive growers -14 pilot sites - 19 trainers - 24 trainings - 65 advisors
- 34 themes -104 participants

VI-7- The value co-creation mechanism through the “Fodal.dz” platform:

Following the analysis of the content of the interview with the founder of the platform, we have produced the figure N° 1 using Visio software. It presents the main components of the digital platform “Fodal.dz”: (1) the geographical system and the location of the different actors of the olive sector (2) the advisory support. Thanks to the two components, the platform allows a dialogue between the olive growers, olive producers and the stakeholders of the olive sector ecosystem in the Soummam pole.

Figure n°1: The model of value co-creation by the “Fodal.dz” platform.



Source: produced by the authors

First part: it is the presentation of geographical data, which consists in the information system on all the main actors located at the Soummam pole in perspective of the extension of its services to other wilayas:

- ✓ Pilot site
- ✓ The olive growers the ole factor
- ✓ Advisors
- ✓ Stakeholders

Figure n°2: map of pilot sitesby the “Fodal.dz” platform.



Source: produced by the authors

This type of service is freely available to any information seeker concerning the geolocation of olive growers, olive factors, their addresses and the contacts of the attached institutions.

Second component: advisory support, training and advisory activities. The founders have resorted to the digitalization of training by means of training attendance sheets indicating for each training .

- ✓ The technical references
- ✓ The numbers of participants in the training
- ✓ The training evaluation form.

This allows the data to be transferred to the PASA who will continue to monitor the program and have real-time control over it as soon as the counselor enters the attendance sheet and the training evaluation grid. This information appears instantly on the platform with a dashboard designed for this purpose.

Conclusion:

Our study focused on the challenges of co-creating value on a digital platform within the agricultural sector. The aim was to develop existing theory and to provide real examples of the application of these platforms more specifically in a logic of co-creation of value with the different stakeholders.

The digital platform “FODAL.DZ” constitutes a lever for the co-creation of value between the different actors of the Algerian olive sector. It contributes to creating a dynamic through collaboration between the actors of the olive sector in the Soummam region following free access to the platform’s databases. The use of digital training within a large and dynamic rural population allows the development of the activity of small family farms that are not very specialized, and the introduction of new practices for a better production of olive oil.

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