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# Knowledge organization in the AgriFood sector in Algeria. Sharing information and communication through social media networks

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## **Abstract**

The objective of this work is to uncover the scientific and technical production of researchers and their preferred partnership type in research projects for innovative development. Our study discusses the new information devices, such as social networking. So, it focuses on social media communication tools between researchers and practitioners in the AgriFood sector. The control of information becomes more and more important and thus is essential for the competitive advantage for the global knowledge-based economy. This leads to the creation of competitive advantages. In this context, platforms are means that provide access to resources and facilitate interaction between partners in a collective innovation process.

## **Keywords**

Knowledge organization, Agricultural sector, Information sharing, Communication, Social media networks, Algeria

## **Titre**

Organisation des connaissances dans le secteur agroalimentaire en Algérie. Partage d'informations et de communication via les réseaux sociaux.

## **Résumé**

L'objectif de ce travail est de mettre en évidence la production scientifique et technique des chercheurs et leur type de partenariat privilégié dans des projets de recherche pour le développement innovant. Notre étude traite des nouveaux dispositifs d'information, tels que les réseaux sociaux. Le travail se concentre plus spécifiquement sur les outils de communication via les réseaux sociaux entre les chercheurs et les professionnels du secteur agroalimentaire. Le contrôle de l'information devient de plus en plus important. Il est devenu donc essentiel pour l'avantage concurrentiel de l'économie mondiale basée sur la connaissance. Ce qui conduit à la création d'avantages concurrentiels. Dans ce contexte précis, les plateformes sont considérées comme des moyens donnant accès aux ressources et facilitant l'interaction entre les partenaires dans un processus d'innovation collectif.

## **Mots clés**

Organisation de la connaissance, Secteur agricole, Partage d'information, Communication, Médias sociaux, Algérie

## INTRODUCTION

This paper argues for a radical improvement of the information and communication system in the AgriFood sector in Algeria in order to speed up the transfer of research results to practice – both farmers and food processing and distribution companies – in order to speed up innovation, increase productivity, and make the AgriFood sector in Algeria more competitive in the global economy. The control of information is essential for competitive advantage in the global knowledge-based economy. Information has a decisive impact on decision-support processes, planning, management, and scientific research. Finally, information production, storage, distribution, and information exchange become major issues for any organization. In this context, (Ambrosi et al., 2005) state that "*there is not an information society but societies, plural, moving, emerging, changing.*" Our project lies in what we will do with the information, the risks and the potentials attached to it. It is important to express, to increase the creativity and to circulate the knowledge.

Knowledge management is a fundamental need to ensure sustainability and innovation for organizations. So we ask about the link between knowledge management and the innovation process. The accumulation of knowledge with a view to proposing new methods and means leads to an application of adaptive research that ends with the innovation of products or technical processes.

In the domain of agriculture, one part of the AgriFood sector, this is characterized by the rapid transition from a traditional activity requiring a large workforce to a sector of the world economy where technology and information play a vital role. Access to modern information and communication tools has become a necessity for farmers around the world, especially those in developing countries. Only if the results of agricultural research are translated into innovations and new processes for agribusiness, will we have an improvement and increase in production that supports a country's sustainable development. The same is true for food processing companies, one focus of this paper.

Research has most potential for impact if it is integrated into a validated and certified dissemination and valuation process. In the field of agronomic research in Algeria, we notice an important absence of an organized and visible national memory of the Algerian research system. The scattering of scientific production and institutional limitations make it difficult to promote research results. Algeria, with a useful agricultural area of only 3% of its territory, is facing an obstacle in terms of agricultural development. Establishing a national information system is important to address the problems of a lack of interactivity and visibility of the skills available in the field of agronomic research.

Algeria has significant intellectual resources (universities, schools, research institutions, researchers, lecturers, and university students), but how can we mobilize and use this intellectual capital as recommended by all development specialists. (Ermine, 2003, p. 34) summarized it as follows: "*Considerable productivity gains, particularly in the design activities are now expected through better management of collective knowledge capital of the enterprise*". Is there any synergy between research and development of AgriFood products?

The research sector is linked to the concept of value-added knowledge for the development of the country. (Bouchet, 2005, p. 9) states that "*...the knowledge economy articulates individual knowledge in networks in order to have a collective production that exceeds the sum of the parts. Fundamental and applied research translated into innovation of processes and products intended for uses to satisfy needs of all kinds*". In this context it is important to create an information management system for Algerian agronomic research. In the area of agriculture we need

- a highly educated technology generation system (researchers),
- a relatively well educated technology dissemination system (extension agents,) and
- a large technology utilization system (farmers) who have little or no formal education.

But in Algeria the dysfunction in communication impedes companies and research institutions due to the absence of information system and the lack of support for and a culture of sharing information. Scientific research alone is not sufficient to ensure sustainable development. It requires information platforms capable of managing and acquiring information. Substantial effort is needed to make visible the results of the Algerian scientific research focused on improvements in production and economic development. It is important to propose a model of an information system able to manage the intellectual capital of the agricultural sector and to generate value from intellectual assets. Information and communication technologies, especially such platforms, make it possible to exploit collaborative processes that underlie collective innovation (Isckia, 2011).

Our question is: How can the scientific intellectual capital produced by research in Algeria come to the economy? And with which tools could companies and people in the AgriFood sector benefit from science in order to create innovations? How could new technologies generate prospects for innovation? Answering these questions requires a model of an information platform designed to make all these links between actors involved in research and development and in production. Today there are not only portals to share information, but also other channels, social media. To communicate and distribute research and development results to a large scientific and professional community in the AgriFood sector, we consider using Scientific Social Media.

For Reix and Rowe (2002), an information system is social capital and innovation. The aim of our paper is to discuss how social media is permitting processes along the new product development and how to create synergies between research and the economy sector. According to Sturialea and Scuderib (2013, p. 201), "*development of digital technology and spreading of computer networks are transforming production processes, access, transfer and use of information. Communication technologies allow the maximum use and creation of new knowledge thanks to information sharing – from emails to forums and social networks*".

So we want to know the extent to which researchers and practitioners in the AgriFood sector use social media as a communication tool. Do the researchers share their research results through social media? The scientific production communicated via social media would allow all communities in the AgriFood sector to follow the news on research results and participate in discussions online. This increases dissemination and sharing of current research between the units of research and the community of practitioners. Our hypothesis is that intellectual capital in the field of agronomic research helps AgriFood companies and people to improve in their production, while creating collective scientific and economic intelligence.

## **1 – Information system modelling**

Some lack of sharing information resulted from insufficient diffusing technological innovations in agriculture. Many scholars in the field of innovation management have argued that innovation processes are essentially communication and information processing activities (e.g. Allen, 1985; Brown and Utterback, 1985; Ebadi and Utterback, 1984; Fidler and Johnson, 1984; Souder and Moenaert, 1992; Tushman and Nadler, 1980).

Everett M. Rogers (2003) created a model to clarify the diffusion of innovation process through specific channels that are important for communication among the members of social system over time. To realize the creation of a collaborative space, we must go to the

potential beneficiaries to know if they use information as a tool for development. This allows us to get a clear idea of the real information practices used daily by the Algerian scientific and professional community in the AgriFood Sector before offering them the proposal of a national information system on AgriFood research. For Rogers (2003, p. 5), communication is *“a process in which participants create and share information with one another in order to reach a mutual understanding”*. We understand that social networks are part of the system of communication that has always been present over the centuries.

According to the literature review of Alborsa (2008), many authors have analyzed the efficacy of various modalities of sharing in knowledge networks. Clarke and Cooper (2000) support the idea of knowledge management collaboration in a social context or “shared context”. In a knowledge management system, human aspects must be considered, as well as those referring to information; establishing the culture of a community of practice can contribute to better use of research results in practice (Adams and Freeman, 2000).

## 2 – Methodology

To answer our questions, we carried out two surveys using a mix of quantitative and qualitative methods.

1 A survey of researchers specialized in agronomic sciences to analyze their information practices especially whether and how they use collaborative tools, including social media, to build a community of shared knowledge.

2 A survey of practitioners in AgriFood companies (not including farmers) to measure knowledge management and the level of transfer of research results to AgriFood businesses so as to understand how intellectual capital is transferred to food companies.

These two surveys will help us to think of a social media platform as an intelligence and development tool for the Algerian AgriFood sector.

For the survey of researchers the choice of research institutions was based on the current Organization of Agricultural Research and Higher Education in Algeria, the most important in teaching and research in Algeria.

Our investigation took place in two governmental institutions:

- INSA (Higher National Agronomical School of Algiers), founded in 1905, is an Algerian institution of higher education and scientific research in agronomy). It promotes INSA's relationship with its socio-economic environment and initiates partnership programs.
- INRAA (National Institute of Agricultural Research of Algeria) is under the supervision of the Ministry of Agriculture, Rural Development and Fisheries, created in 1966. It develops partnerships between INRAA and national economic operators in the AgriFood sector.

250 questionnaires were distributed and the answers collected from September to November 2018. We had 154 returns (response rate 62%).

For the survey of practitioners 250 questionnaires were distributed and the answers collected from October to December 2018. We had 140 returns (response rate of 56%). The choice of companies was based on the Cevital Group "AgriFood business".

Cevital has been built in 2007 to create an industrial group on a global scale that is highly competitive and focused on exports. The Food Processing and Distribution business sector

was set up in 2015, It is a leader in the Algerian AgriFood sector. It represents 80% of the activity in this business sector.

### **3 – DISCUSSION OF RESULTS: SOCIAL MEDIA IN THE AGRIFOOD SECTOR IN ALGERIA**

#### **3.1 Sharing of search results for researchers using social media networks**

The survey of researchers analyzed their information behavior and evaluated their level of interest in sharing knowledge and the process of collective intelligence. These data are needed for the creation of a collaborative platform in social networks on agronomic research in Algeria.

##### **3.1.1. Information behavior of researchers**

In the analysis of informational behavior of researchers, we have mainly focused on the use of social media as information sources. 99% of our respondents declare they have a need for national social media. The main reasons for a national social platform are as follows:

- 35% wish to contribute to a culture of knowledge sharing as a source of wealth creation.
- 20% hope to impose a culture of collective intelligence for a knowledge economy.
- 15% wish to establish contacts to individuals with shared interests (scientific, professional, political etc.).
- 15% believe they create added value for the industrial sector.
- 14% find it great to establish a collaborative platform for knowledge and knowledge management.

Most researchers have the same intention of sharing information and making sense out of shared findings to obtain economic goals.

##### **3.1.2. Motivation of sharing knowledge with other researchers**

The results show researchers' tendency to manage their scientific production with others. It is mainly required by the reinforcement of competence centers that develop collaborative research projects (36%) and the implementation of search tools for activities (list of experts by domain, expertise profiles, etc.; 33%). We notice that the dissemination in agricultural information permits the creation of exchange networks for development and sharing research results.

But only 21% of researchers intend to exchange information between national and international research institutions. And a very low rate of 9% considers facilitating exchange and collaborative work with other researchers (management of a common agenda, co-publication and shared edition of documents, etc.) These results demonstrate a partitioning in terms of integration into associative networks. There is a significant risk in not participating in the development of agronomic research projects at the national and international level. The insufficient diffusion of scientific output due to institutional silos and the lack of contact between researchers leads to redundancies in scientific projects. There is also a problem of integration of Algerian scientists and research teams in international exchange networks.



### 3.1.3. Motivation of sharing knowledge with companies

This attitude is very important for researchers, following the results of this survey. They express an important interest in establishing a relationship with the economic sector. Accordingly, different motivations are reported:

- 41% express interest in the transfer of new products or processes to the economic world.
- 27% think of pooling AgriFood companies and agronomic research institutions.
- 17% believe in establishing exchange networks between research and the economic sector.
- 14% encourage practitioners and scientists to communicate with each other and identify their needs.

The degree of motivation of researchers in sharing research results with companies seems to signal an implementation of the research policy that allows the evaluation of results in terms of innovation, publication, partnership agreements and transfer skills. These motivations are aimed at creating synergies between national research programs and between the research and the economy sectors.

### 3.1.4. Reasons of collaboration of researchers by social media platforms

Currently, the world of technology implies a major change in the field of research. In a very short time, new technologies of information and communication (ICTs) have become an inevitable part of scientific production and research projects. In the Algerian AgriFood sector, very few academic studies on information system needs have been undertaken. The aim of this study is to discuss the scientific and professional network collaboration. What role do they play in sharing information between researchers and practitioners in the AgriFood Sector?

The majority of researchers (96%) hope to share information in a social media platform. The reasons are rather divers. Most of the respondents (49%) aim for visibility of researchers at the international level. 22% demand the construction of a collective communication space favoring remote work in groups. 17% demand sustainability for the shared intellectual capital. Only 12% request a system for finding Algerian experts (peers or partners) based on their expertise and skills.

### 3.1.5. Contact with researchers via social networks

Most respondents (90%) are in contact with other researchers by using social networks. Table 1 shows the preference type of social networks that scholars are most in touch with. 41% have a contact with their colleagues via professional social networks. The social networks try to be productive with university and research labs. It is a use of collaborative spaces, initiatives and teams working in a specific areas research, followed by 31% which are using personal social networks. This kind of a tool allows the scientific work of researchers to be known to users who are not registered and will never subscribe to scientific networks, such as Academia.edu or ResearchGate. However, 20% are more interested in social network platforms. These platforms suggest establishing profiles of other researchers in order to



collaborate for their scientific project and to share their research results for a better visibility and citation.

These results can be summarized in this way, academic institutions are a catalyst for social interaction, exchange of information and co-production of knowledge: The activities characterize the social networks. Scholars are interested in three types of social networks in an academic institution: The social networks for the general public (personal social networks) which allow to manage the relationship of the institution to a large number, in particular to young researchers; academic social networks (professional social networks), which make available pedagogical or research content in different ways, and internal social networks (social network platforms) that allow increased collaboration between actors federated by a common project.

<b>Kind of researcher contact via social networks</b>	<b>in percent</b>
Professional social networks	41%
Personal social networks	31%
Social network platforms	20%
No answer	8%

**Table 1: Kind of researcher contact via social networks**

This implies discussions of the different social media networks according to the detailed answers of the researchers.

### **General social networks**

Social media is a social communication technology, it can be described as online technologies and practices that people use to share opinions, insights, experiences, and perspectives. Social media can take many different forms, including text, images, audio, and video. These sites typically use technologies such as blogs, message boards, podcasts, wikis, and vlogs or video blogs to allow users to interact (Cann *et al.*, 2011). We asked about some general social networks which are considered sometimes useful for researchers with companies because we suspect there is a strong interaction between the economic sector and the domain of science.

In terms of general social networks, the most used by researchers are Google+ (26%), LinkedIn (25%) and Instagram (12%) (Table 2). Our conviction is that if institutions of research already practice them, they must progress in the management of their content and their image, and this in particular by creating new skills or even new professions within their teams. So, the collaboration is done by using Instagram for free photo sharing together with other social networking services, including Facebook, Twitter, Tumblr and Flickr and as well using LinkedIn, a professional networking site that allows to create business contacts; or is done by manipulating Google+ to link to Googles' Blogger and YouTube.

<b>General social networks</b>	<b>in percent</b>
Google+	26%
LinkedIn	25%
Instagram	12%
Twitter	9%
Viadeo	9%
WhatsApp	5,6%
Facebook	4,5%
YouTube	4,3%
Pinterest	2,1%
Snapchat	2,1%
No answer	0,4%

**Table 2: Social networks via general public**

### **Academic social networking sites**

The subject of our research concerns a new hybrid model of media that originates online in the form of websites. We are examining the "social media" in the agronomic sector with respect of their potential to share scientific research results with the economic sector. The results of our survey reveal that three tools are predominantly used by researchers: ResearchGate (28%), Academia.edu (20%) and Sciencefeed (19%) (Table 3). These academic social media can expand scientific and professional opportunities for communication and technology transfer in the AgriFood sector for research and practice.

Among all the academic social networking sites (ASNS) that have evolved in recent years, Academia.edu and ResearchGate are considered as professional social networks of researchers. They are combining characteristics of social networks with the publication of studies and are adjusted to the needs and comportment of academic researchers (Ovadia, 2014). These sites allow uploading academic articles, abstracts, and links to published articles. They track demand for published articles, and engage in professional interaction by the acquisition of knowledge, belonging to a peer community. ScienceFeed platform allows users to post microblogs, sentences on scientific headlines, new findings, ideas related to science, controversies, and conferences. Community members can follow the feeds of fellow members and comment on topics in which they are interested in real-time for communication and transfer of ideas.

<b>Academic / scientific social networks</b>	<b>in percent</b>
ResearchGate	28%
Academia.edu	20%
ScienceFeed	19%
ScieVee	12%
Research Blogging	11%
MyExperiment	9%

No answer	0,3%
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**Table 3: Academic social networks**

### Discussion groups

For discussion in group by social networks, researchers are really interested in focus groups for sharing knowledge. They are more inspired by the mailing lists that facilitate exchange, communicate news and research updates (43%). The groups, forums, question/answers are represented by 29% interest. These collaborative tools allow participating in online discussion forums and providing question and answer debate. Next come blogs of researchers (blog platforms and wikis) with 28% attention (Table 4).

Discussion group	in percent
Mailing lists	43%
Groups, forums, question/answer	29%
Blogs of researchers (blog platforms and wikis)	27%
No answer	0,4%

**Table 4: Discussion group**

## 3.2 Sharing knowledge for practitioners using social media networks

### 3.2.1. Need of knowledge management in companies

The need of knowledge management in companies is expressed by a strong interest (76%) as far as knowledge management is set up within the practitioners' company. These data relating to the implementation of a knowledge management strategy within AgriFood companies show a professional awareness of the benefits of good knowledge management.

For the practitioners' perceptions of the benefits of knowledge management strategy in a company, we found the following responses.

- 23% It is necessary to capitalize and develop the internal best practices, skills and memory of the company.
- 22% Companies must develop an electronic information management system for existing documents.
- 12% It is important to ensure a better knowledge of the environment and to protect and to control the intellectual capital of the company.

We notice an important interest for the implementation of a knowledge management strategy. Practitioners are aware of the benefits of good knowledge management. Proposing an information system means a transmission of knowledge and the awareness of the whole environment for the visibility and sharing information. This implies that a collaborative approach is essential to implement, while connecting all stakeholders through this platform.

Weaknesses are also revealed by the practitioners regarding the benefits of knowledge management strategy in a company. 8% mentioned that it is essential to promote more usage of information technologies (e-mail, Intranet, etc.), to improve the quality of services, productivity and increase efficiency, and to strengthen training within the company. 6% reported interest in improving decision-making. Apparently there is a weakness of internal and external collaborative work. This lack of communication between practitioners and

external collaborators for knowledge transfer impoverishes the construction of a capital of competence. In addition, the weak tendency to access to discussion forums and news further reduces contacts and exchanges between practitioners. Collaborative work and relationships are new forms of organization and communication that can contribute to new business process performance and economic development. For the same purpose of implementing a knowledge management strategy, practitioners are neglecting the reinforcement of training within the company for the improvement of productivity and efficiency.

### 3.2.2. Sharing information in companies: Social media networks

97% of practitioners share information via social media networks. Table 5 illustrates the types of social networks that practitioners are most in touch with. They are in contact with their colleagues via professional social networks by the same rate as researchers (41%). 37% use the social network platforms, and 19% are more interested in personal social networks. As a conclusion, we notice a level of interest in using the different types of social networks which is similar to the researchers.

<b>Kind of practitioners' contact via social networks</b>	<b>in percent</b>
Professional social networks	42%
Platforms for social networks	37%
Personal social networks	19%
No answer	2,7%

**Table 5: Kind of practitioners' contact via social networks**

### 3.2.3. Contact of practitioners with researchers via social networks

The circulation and sharing of knowledge provides a level of dissemination and circulation of knowledge and information from which emerges an economic intelligence. Our survey data show that 51% of practitioner respondents are in contact with researchers via social networks. Hence, the impact of these new technologies should be the subject of a knowledge sharing strategy. But, curiously, we find that 35% of the practitioners do not report a usage of general social networks (Facebook, Twitter, etc.). In addition, contacts and collaborations with researchers focus on the usage of two main tools: LinkedIn and Google+, with 24% and 21% (Table 6). Referring to new information practices, this type of exchange is frequently used in social networks. From this point of view, these data reveal how many respondents lack knowledge about collaborative tools that can affect the partitioning of research activities and the isolation of practitioners.

<b>Kind of practitioners' contact with researchers via social networks</b>	<b>in percent</b>
LinkedIn	17%
WhatsApp	15%
Facebook	14%
Instagram	14%
Twitter	13%
Google+	8,8%
YouTube	8%
Viadeo	7,1%
Snapchat	2,4%
Pinterest	1,4%
No answer	0,6%

**Table 6 : Kind of practitioners' contact with researchers via social networks**

## CONCLUSION

In conclusion, we understand that the lack of collaboration and communication tools leads not only to partitioning of research activities and isolation of researchers, but also a lack of synergy between research and development. This creates difficulties to be at the same level as developed countries; especially with respect to the increase of universal knowledge. The model created by Everett M. Rogers illuminates us that the diffusion of the innovation process through specific channels is important for communication among the members of social system over time. To realize the creation of a collaborative space, we must go to the potential beneficiaries to know if they use information as a tool for development. This allows us to get a clear idea of the real information practices used daily by the Algerian scientific and practitioners' community in the field of the AgriFood Sector before offering them the proposal of a national social media platform as an information system for agricultural research.

Following the results of our study, we notice a strong interest of researchers for discussion groups using mailing lists, virtual community groups, forums, and blogs of researchers. This helps to increase collaboration for some issues of research by a direct discussion. In this way, we can propose on the one hand in the short term a social media platform for the AgriFood sector in Algeria, the use of tools such as blogs that offer an informal space where new ideas and research can be reviewed and discussed in a same field. So using blogs is a way to liberate the practitioners to share knowledge with their colleagues and to use the results of scientific research for innovation. "Firms believe such initiatives can break knowledge silos and lead to higher employee productivity. "(Singh et al., 2014, p. 50).

They permit to have information about research from online sources, blogs, comments and building positive relationships with others researchers. The benefits can contain more active collaboration, opportunities to share the results with the economic sector, profit from the

experience of others and drawing in expertise to help with research processes (use of techniques, methods, analysis...).

For the long term, we propose a comprehensive platform for the AgriFood sector as an open access tool for agricultural innovation. This platform, perhaps modeled after information systems in medicine, should include a wide range of research results – original documents, reviews addressed to researchers, analyses recommending best practices, data sets – in order to manage, to share information and knowledge data and to support collaboration with researchers, industry practitioners, and farmers.

So, it could increase the impact associated with the results of research that produces new innovations to resolve development problems. Therefore, open access to knowledge and data will motivate agricultural innovation and accelerate the progress of reaching a sustainable development.

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