

SMEs and technological innovation: a called-for innovation path

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SMEs are organizations that have pivotal importance in the EU economy. There are significant changes in the business environment in which small and medium-sized enterprises (SMEs) operate. COVID-19, the fourth industrial revolution, and new technological developments are recent events that are revolutionizing industries and creating the need for SMEs to innovate to remain competitive. Sum up these events with the ongoing technological developments and multiple requirements imposed by sectors, and you have SMEs being even more compelled to adopt technologies. In the agri-food sector (mainly composed of SMEs) is no different: technological innovation is becoming increasingly important for different reasons.

Why is technological innovation becoming increasingly important for agri-food SMEs?

The agri-food SMEs need to cope with different sectorial challenges:

- Ensuring food security, food safety, and traceability;
- Climate change: Climate change is expected to affect food availability and productivity.
- To meet the growing demand for food production: Demands for agri-food products are expected to rise by 50% between 2013 and 2050 with the global population growth.
- To meet new consumers' demands: there is an increasing demand for added-value food products such as healthier products, vegetarian products, and environmentally friendly food products.

New technologies can be applied to address the abovementioned challenges. Different technologies can be used and benefit the different stages of the food chain (farmers, processors, distributors, and retailers). These technologies can potentially improve productivity, and product quality, protect crops and innovate products, etc.

Given this background, we are daily presented with news and studies which generally assume a positive perspective of new technologies, promoting their benefits for SMEs (in general and agri-food sector). Moreover, there is an increasing interest and initiatives from the EU government in supporting technologies and innovation in SMEs, with some funds and projects in this regard.

However, despite all the promises and some level of incentives by media and institutions, what we see in practice is SMEs with a low technology adoption level. Why are these companies not adopting and, in many cases, unwilling to adopt technologies? What is then overlooked?

Technological innovation is complex, especially for SMEs

Technological innovation has two sides:

1. The “technology adoption side” implies innovations in the organization to enable its use. These innovations involve re-organizing business processes to make this technology functional and available for workers as well as a learning process about how to operate this technology
2. The “entrepreneurial side of technology” involves understanding how this technology may add value to products and services and how this value can be converted into money.

The "technology adoption side" is expected most, while the entrepreneurial side can be overlooked. However, the technology adoption side can be complicated depending on the technology and the context of the SME because:

- **Employees need to know how to use the technology.** New technology needs acquiring knowledge, which may require training or hiring new people. Depending on the level of expertise, it can be challenging for SMEs to hire employees with technical skills. Recently, studies and news showed that agri-food SMEs face difficulties hiring qualified people.
- **Employees need to accept the new technology.** Employees may resist the use of new technology due to mistrust or lack of knowledge. Therefore, new technology may require training in operating and accepting the technology.

Regarding the entrepreneur side of technology, it is common for companies to focus on technological side and not on customers side of innovation or business model. For example, agri-food companies may invest in High-Pressure Processing (HPP) to process juices and smoothies. HPP technology is used to inactivate harmful microorganisms and enzymes and to extend the shelf life. However, HPP is still an expensive technology, which implies increasing the price of juices and smoothies. However, consumers are not interested in technology treatment per se but in its benefits or other attributes (e.g., price, taste, colour). Therefore, the entrepreneurial side of technology can be challenging because:

- **It is not easy to translate technologies' added value to customers.** Some possible actions are promoting actions or by obtaining labels with specifications.
- **It is not easy to convince customers or acquire customers for new food products.** Convincing consumers to pay the new price may be challenging due to the technology's added value. Moreover, in the case of new technologies, consumers may also be reluctant to buy a product

Finally, both sides of technology adoption/use and the entrepreneurial side (or business model innovation) need to be combined in an overall process: what we refer to as technological transformation. Technological transformation requires time and resources and the need to assimilate new knowledge. However, SMEs are confronted with a small number of employees that work with different activities. In many cases, SMEs are unwilling to adopt the technology, especially new ones, because they cannot afford to fail.

In this regard, if technology is becoming more important and SMEs face different challenges, how to support these companies?

What to do to support SMEs?

Our work has concentrated on understanding how SMEs cope with technological transformation, especially in the case of agri-food SMEs. From our preliminary results, we understand that:

- The technology provider has an active role in supporting SMEs in technological transformation. In this regard, there is an opportunity for technology providers to change their value propositions to address SMEs' needs better and improve the level of technology adoption in SMEs. In this way, they can support SMEs while improving their service portfolio and acquiring more clients.
- One strategy often used by SMEs to cope with technological transformation is cooperating with other entities. This is an opportunity for different actors in society. Firstly, the government can support SMEs in up-taking the level of technology. This is especially relevant for a sector such as agri-food that is primarily for society and faces challenges such as increasing food production and decreasing the production impact. For academics, there are a lot of study gaps in innovation in SMEs that can be addressed and provide insight for practitioners. SMEs can also collaborate with other companies to promote new products and innovate.
- Finally, it is important to disseminate information to those companies. As already mentioned, the technological transformation has two sides and entails two processes. Providing information at the company level is relevant to support these companies in best practices and what to expect from technological transformation.