The Marketplaces and the Integration Between Physic and Virtual in the Business Models of Fruit and Vegetables e-Commerce

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Abstract. The Information and Communication Technologies (ICTs) have become the global platform for exchange, the space where an economic force of global dimensions operates, which has radically modified social and economic behavior. The new "e-commerce" frontier is represented by logistics adaptations for sale at Km zero of fresh products and same-day delivery. Amazon fresh (delivering in an hour in some urban areas of the USA) is the most prominent example, but there are other examples in several European countries. The objective of this study is to provide a first contribution to the knowledge of the recent phenomenon of the presence of e-marketplaces in the Italian agri-food economy and the analysis of the new e-commerce models for the fresh fruit and vegetables in Italy. The research is divided into two complementary phases aimed to highlight the propensity to buy fruit and vegetable online and the variables that influence the act of purchase.

Keywords: e-retailer; e-logistic, vertical platform; e-commerce models; O2O commerce.

1 Introduction

The development of digital technology and spreading of computer networks have transformed production processes, access to, transfer and use of information. Communication technologies allow the easiest access to knowledge and the easiest way to create it due to the simple sharing of information, from e-mails to forums to social networks, with the consequent reduction of space-time barriers (Sturiale, Scuderi, 2011).

The digital economy is growing at a rate 7 times faster than the real economy. Much of this growth was fueled by the Broadband Internet. Today, high-speed broadband networks are having an equally important impact than electricity and transport a century ago. They are also paving the way for innovative services such as online healthcare (eHealth), smart cities and data-based production

The ICTs opened new lands to economic competition, which is deeply affecting trade in different sectors and in some cases also altering the very competition rules themselves. Cultural aspects, safety and health of products represent obstacles to the diffusion of ICTs and web tools within the agrifood sectors, as well as the lack of quality of web sites and the scarce attention paid to the "interactivity" with web-consumers, which is fundamental instead for web-marketing. Besides, there is a poor level of standardization for these sector products and several difficulties to manage the quality by e-commerce (among works of literature we mention, in order of the year of publication, a few concerning farms and agrifood SMEs in Italy and abroad: Sturiale L., 2000; Sturiale, Scuderi, 2001; 2011; 2013; 2015; Fritz *et al.,* 2004; Bucca *et al.,* 2006; Brush, McIntosh, 2010; Neilson *et al.,* 2010; Lehmann *et al.,* 2012; Rapisarda *et al.,* 2015; Scuderi *et al.,* 2015).

The advent of new technologies has also led to major changes in consumer buying processes and market relationships. In fact, the interest in shopping places is shifting from large shopping malls to zero-kilometer shopping until online shopping.

The ICTs provide the consumer with more information, compares products and prices across sites, and verifies greater convenience, meeting the need to know the global scenario. However, there are several critical issues in the new online shopping models. Primarily, the inability to examine the purchased product (an action that still today remains primary in consumers through the five senses). Virtual purchasing also limits the time of conviviality and socialization, characteristic of offline purchases.

These limits are felt most important in the case of fresh agricultural products, for which e-commerce in Italy still lags behind other commodity sectors and other countries, although efood has recently made some interesting developments. In fact, there is interest in both international marketplaces (Amazon fresh) as well as retailers who have developed new online sales channels for fresh products, creating O2O (online to offline) models, virtual platforms, marketplaces, etc., And improving logistics services, to facilitate delivery to zero Km and in the same day (or within an hour in some cases).

These new dynamics in the agri-food sector in general and in fresh products, in particular, still appear to be underestimated in literature. This paper aims to give a first contribution to the construction of a framework, albeit synthetic, of the evolution of the new e-commerce models for fresh agricultural and agrifood products and the role of international and domestic marketplaces in the Italian efood market. In addition, a specific survey on Italian web consumers of fresh agricultural products, structured in two complementary phases, will allow to highlight the willingness to buy online these products and the variables that affect this choice.

2 The e-commerce phenomenon in the world: consistency and new frontiers

Increasing connectivity has led to a fundamental change in the business world: digital has enabled it to expand both online and offline and is already influencing various industries. The current consumer seeks and buys goods and services differently from previous generations

In the world, 1 billion and 300 million people buy online (with a total of 2.8 billion people connected to the Internet) with a penetration over total retail sales of 7% (8% in Europe, 5% in Italy) (Fig. 1).

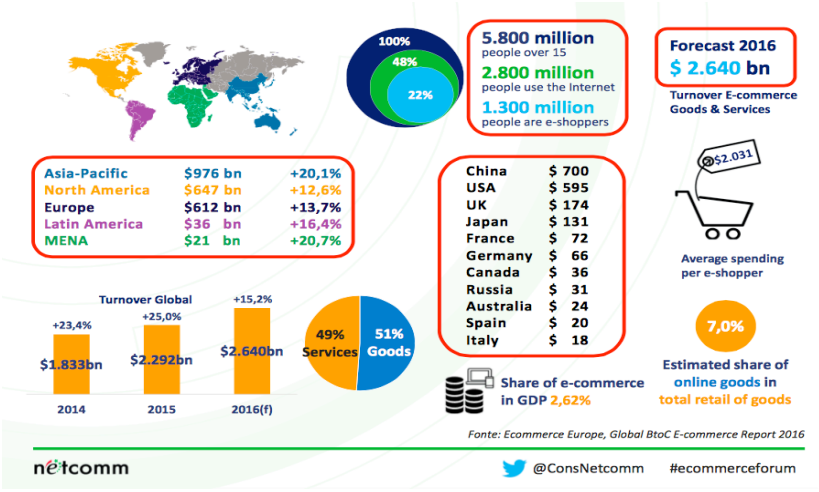

Fig.1. The numbers of e-commerce in the world (2016)

The online sale of products and services accounted in 2016 for 7,0% of the total of the retail market on a global level: a total near 2.7 billions dollars. By 2019, this value will be more than doubled to reach 3.578 billion dollars, while continuing to represent only a fraction (13,0%) of total retail purchases. In B2C market United States and China remain the most important markets and the major players in the market are global giants such as Amazon, and for the Chinese market, Alibaba.

The value of e-commerce in Europe is estimated to be 600 billion dollars in 2016 with the UK, Germany and France, which account for around two thirds of total sales. In seventh place after Russia, Spain and the Netherlands ranks Italy. European online sales by 8,0% on retail sales exceeding, albeit slightly, the US 7,0%, but in southern Europe will hardly reach 2,0%.

The ICTs have deeply changed consumers' attitude towards purchasing. In fact, consumers now look for into the web to compare offers and services towards the so-called info-commerce. 65% of web surfers show a multichannel-purchase attitude, where social media play a more and more important role.

There has been an evolution of sites and services in the Web, such as wiki sites and social networks, where interaction and sharing of content by users are fundamental. The web has become a "web ecosystem" in which users create value by sharing and creating experiences in the Web (through e-mail, blogs, networking, forums, communities, chat, etc.) (Sturiale, Scuderi, 2015). The Internet has become the global platform for exchange, the space where an economic force of global dimensions operates, which has radically modified social and economic behaviour and models of online sales (Brush *et al*., 2010; Fritz *et al.,* 2004; Kumar *et al.*, 2012;

Sturiale, Scuderi, 2013, 2016; Sturiale *et al.,* 2017; Whang, Zhang, 2012).

Shoppers are certainly changing, but some aspects of shopping remain the same. People enjoy it as a social activity and this is particularly true for the younger age group. The social nature of shopping has changed and is linked to the phenomenon of online socialization (Verdouw *et al.*, 2013; Ecommerce Europe, 2016).

As Amazon and other e-commerce players increasingly cut into the market share of traditional retailers, now seems like the perfect time to give O2O model and pickup services a second look.

The grocery landscape is changing quickly. Amazon has opened physical supermarkets, Walmart is heavily investing in e-commerce, and many regional players now offer either curbside pick-up or delivery.

Internet has significantly changed the commercial playing field for B2C sales. Many retailers and product brands already sell their products through (international) online marketplaces[1], present in different typologies (Groothuist, Gabriner, 2016). International examples of these marketplaces are Amazon, Zalando, Alibaba's TMall and Mercado Libre.

With regard to the fresh agri-food sector, there has been increasing interest in the most important marketplaces in recent years to widen the supply range with fresh products with very short delivery times. First of all, Amazon was the Amazon Fresh, but others are being added as well as creating special platforms for the marketing of fresh agri-food products.

The growing connectivity is transforming the business experience and the firms have also introduced new and engaging ways of marketing that have changed consumer behavior and broken business models that have long been consolidated. Marketplaces are claiming to be the dominant players in e-commerce. It is foreseeable that in Italy we will also witness a sustained growth of these actors over the next few years. The marketplaces that are placed on the Italian market are mainly Amazon (used by 63% of the dealers in the marketplace) and Ebay (57%) (Casaleggio Associati, 2016).

3 E-commerce in Italy towards a physical and virtual integration even for fresh agrifood products

The value of Italian e-commerce has the average annual growth rate of 14% between 2010 and 2016, but in the same period the value has more than doubled (from € 8,012 million in 2010 to € 19,282 million in 2016). The digital economy thus grows at considerably faster rhythms than the real one (Net Observatory, 2016).

There are differences between different product sectors. Tourism and consumer electronics have been pre-designed in Italian e-commerce, respectively, on services

[1] According Wikipedia "*An online* ***marketplace*** *(or online e-commerce marketplace) is a type of e-commerce site where product or service information is provided by multiple third parties, whereas transactions are processed by the marketplace operator. Online marketplaces are the primary type of multichannel e-commerce and can be described as a "simple and convenient portal" to streamline the production process".*

and products. But today there are many product categories that make up the online shopping basket and the composition (by 2016) is as follows:

- tourism 44%; computer and electronics 14%; clothing 9%; 7% insurance; publishing 4%; furnishings and home living 3%; Food and Grocery 3%; another 16%.

The contribution of emerging sectors (Food & Grocery, furniture and home living, beauty, toys) is increasingly important, with over € 1.5 billion in value and growing at rates ranging between +30 and 50%, sectors intended to record the highest growth rates in the future.

Although Food & Grocery represents one of the main items of Italian spending, its online distribution has been limited so far: the share of online purchases on total retail purchases is 0.35%.

The most important limit to the development of fresh meat is the lack of opportunity to see and choose the product before buying (49% of the sample) followed by inadequate quality and freshness (32%) and lack of confidence in mode of transport (25%) (Monitor Ortofrutta, 2016).

These data, on the one hand, point to the still limited use of e-commerce in the Italian agri-food sector, on the other, are well-deserved, as broad growth areas are foreseen, on the basis of what is already happening in other European countries, such as France, the UK, Germany, and the USA (a fast-growing phenomenon) and Japan.

Italy is trying to bridge the gap in the agri-food sector and especially in fresh products.

Very active are the platforms set up by the large distribution chains (Esselunga, Carrefour, Unes, Naturasì, etc.), specific online supermarkets offering the same assortment of retail outlets, with the advantage of using the fidelity card and deciding the delivery time (a commission is provided).

The *"subscription models*" are being launched, subscription sales models based on repeated purchases and low risk perceived, according to a logic that transforms customers into subscribers. In Italy, Cortilia is the example of a marketplace based on the subscription model in the food sector (Goodeggs in the USA). However, even single producers and distributors (Agrispesa, Zolle, Almaverde Bio and others) are making use of this new e-commerce model.

The new frontier of e-commerce for agri-food products and especially for fresh produce is represented by the integration between physical and virtual, with marketplace examples that in recent years are developing new forms of integration and multichannel, where stores physics are integrated into the digital ecosystem.

In fact, the physical presence of the physical store produces value over the ability to touch the product manually, withdraw the order online, live the online experience. Logistics has become more efficient in the services offered, with shorter delivery times.

The traditional physical sales space and the one dedicated to customer care (which represent most of the current cases) are expected to shrink to the advantage of physical space dedicated to delivering products purchased online (according to the "pick & collect" model) and the "*experimental*" physical space, aimed at creating a relationship with the client (such as "*experiential room*"). In the near future, they will also be able to take on other physical space functions, including the creation of online showroom products / services, "*temporary experimental*" spaces (Spiller, 2016).

The new "e-commerce" frontier is represented by logistics adaptations for sale at Km zero of fresh products and same-day delivery. Amazon Prime Now, which provides for the delivery in an hour in some urban areas of the United States, is the most prominent example, but there are other examples of the marketplace in several European countries. Amazon launched, also in France and in Spain, the "grocery" version of its service.

In Italy there are 16 thousand companies that make e-commerce in 2016 and will reach 50,000 in 2025. For the food, the e-commerce slowly begins to close the gap with other European countries. This is thanks to the growth of local players, but especially the arrival of international players that have entered the market through acquisitions. Just Eat for example, London-based company, has acquired Click and Eat in Milan, DeliveRex in Rome, Italy and HelloFood, PizzaBo (Casaleggio Associati, 2016)[2].

Also in the agrifood industry, in 2015 was the year of the launch of Amazon Prime Now for the delivery of shopping in Milan and in 34 municipalities of the hinterland. Launched in Italy in November 2015, it allows the purchase of more than 20,000 grocery products and other types, including fresh produce, and in February 2016 also more than 30 types of fresh fruit and vegetables. The purchase is only possible via the mobile app, with home delivery from 8 am to midnight every day of the week, within an hour of purchase in certain areas and in the preferred time slot by the customer in other areas. (Sturiale *et al.,* 2017).

Coop Italia responds to Amazon with the launch of the "Easy Coop" service for online shopping and home delivery of food products; You can order on the dedicated website "www.easycoop.com" 10,000 food, of which about 3,000 fresh fruit and vegetables, meat, fish, salami, dairy products, bread, pastry. Delivery takes place at home the day after the order date, indicating the preferred time.

So, we are developing e-commerce models in Italy where virtual and physical space is integrated, even for fresh agricultural products. In particular, it is about the O2O (online to offline) [3] channel, alongside the well-known "click and morter" model.

The agri-food enterprises will have to consider the mobile channel as a potentiator and amplifier at other points of contact throughout all stages of the buying process. All of this requires a transformation of business models into a logic of multichannel transformation, mobile marketing and service.

2 Even for wholesale fruit and vegetable markets, the web offers interesting online sales potential. Cesena's Fruit Market has been moving for a couple of years and has reached an agreement with the Tippest platform for sale on the web; also that of Florence operates online through MAXFRUIT.

[3] *Online-to-offline* (O2O) commerce is a business strategy that draws potential customers from online channels to physical stores. Online-to-offline commerce, or O2O, identifies customers in the online space, such as through emails and Internet advertising, and then uses a variety of tools and approaches to entice the customer to leave the online space. This type of strategy incorporates techniques used in online marketing with those used in brick-and-mortar marketing. Some companies that have both an online presence and an offline presence (physical stores) treat the two different channels as complements rather than competitors. The goal of online-to-offline commerce is to create product and service awareness online, allowing potential customers to research different offerings and then visit the local brick-and-mortar store to make a purchase (www.investopedia.com).

4 Methodology

As already confirmed in the previous chapter, studies of e-commerce have been influenced by the interaction between consumers on the buying process, especially if the latter has to buy a new product. Therefore, it is interesting to highlight in this survey the salient differences between traditional and on-line purchases, as the difference in the impact, is not well-distinguished in the literature, but also to clarify the emission process of messages from the consumer to other consumers in the two contexts, both traditional then virtual. We have interviewed 1,000 consumers in 2017, through the "ModulesGoogle.com" platform.

The first phase of the research aims to evaluate, through a consumer preference scale[4], what are the strengths and weaknesses of the online purchase of fruit and vegetables and the role of a physical point at the service of logistics of an online store to orient the consumer of fruit and vegetables to the e-commerce.

The analysis is continued in order to assess the consumer's intention to report to third parties their intention to purchase a product based on suggestions from other consumers (such as the phenomenon of e- wom. e word of mouth; Brown *et al.,* 2007; Scuderi, Sturiale, 2014). In particular, the study, called "*demand side*" was analyzed to focus attention on the figure of the consumer as a recipient of a message and as a decision maker in the buying process. The survey, therefore, aims to identify the structure of buying intent as a result of influences in the two environments, offline and online. The main purpose of the second phase is therefore to precisely determine the influence of inputs from two different environments and the assumption from which the research moves is the belief that the individual experiences different purchasing intentions in relation to different source of information (offline or online).

The parameter estimation process was done by a process of minimizing the distances between the data produced by the model and the observed data. The available estimation functions are different, we used the linear model "LM" to study the relationship between a dependent variable (y) and a set of independent variables (x1, x2, ... xn) To understand the impact these variables have on the object of study, adopting the following equation:

$$buy\_probi = \beta 0 + \beta 1\ BUY\_off + \beta 2\ BUY\_on + \beta 3POSTi + \beta 4WHYi + \beta 5GENDER + \beta 6AGEi + \beta 7EDU + \varepsilon t$$

5 Results

The research has analysed and understands, for the consumers interviewed, the evolving trends in the purchase of online agri-food products and the decisive factors influencing the buying process.

The results of the first part show that the elements that could lead to the online channel (fig. 2) are still the price today, which is a discriminating element in the choice of purchase. However, the discriminating element is the ease of purchase defined as "*satisfaction*" as a sum of services related to the comfort of payment,

[4] In particular, the scale of Likert (1 no influent, 2 little influential, 3 influent, 4 very influential, 5 determinant) will be used.

purchase and delivery of the product. Less influence is attributed to quality and origin as the first factor is assumed to be in compliance with the standards, and secondly, it is a discriminating factor in the choice factors from the beginning.

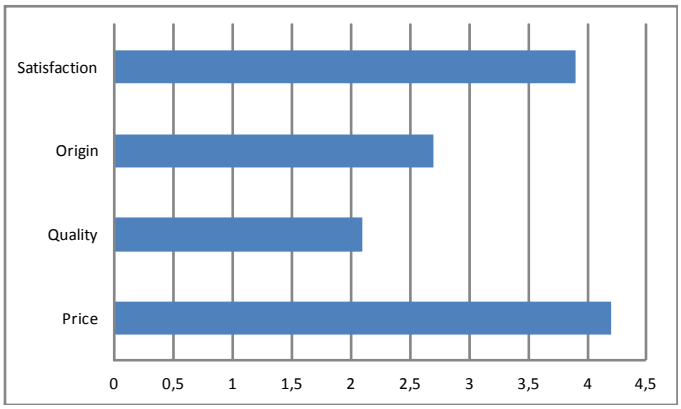

Fig. 2. The drive factors consumers to online shopping.

We have asked which shopping channel they prefer for the same quality, price, origin and packaging of fruit, it turns out that 84% of consumers interviewed always prefer the traditional channel, in relation to the normal shopping habits they see buying of fruit and vegetables included in the act of daily food expenditure made in traditional channels (supermarket, local shop, local market). However, the percentage of 16% represents a significant rate, which shows that current behavioral barriers are being cut down, confirms that there are growing spaces for very interesting fruit and vegetables.

Finally, it was asked the consumer whether to have a physical point of sale in the area, the online store, to orient the purchase and what are the reasons. The results (fig. 3) show that the physical selling point and withdrawal of the e-commerce channel is a major strength for the consumer as it represents a transition from off-line to online, a material element of purchase act, the possibility of withdrawing the product, as well as contact point both to verify the quality and to have the products of farmer market (direct sale - zero km).

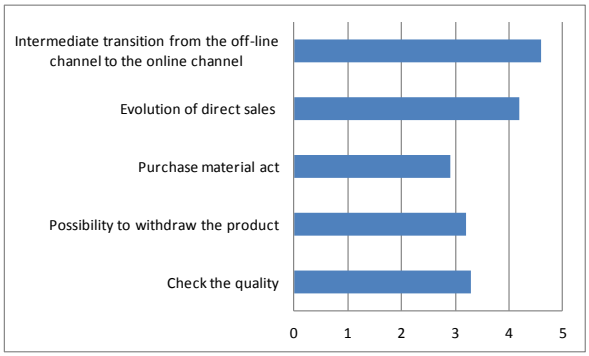

Fig 3. The presence of a traditional shop alongside the online site can guide consumer choices.

The series of regression models inherent in the part of the experiment called "*demand side"* focuses on some models (Tab. 1), which relate views from the traditional offline environment and from the online context of the potential impact they have on the intention to buy the consumer who receives such information. Table 1 shows the coefficients of the different variables chosen to observe a possible influence of the same on the dependent variable, ie the willingness to purchase a product, which in our experiment was 1 kg of oranges, measured in percentage terms.

Table 1. Estimated structural parameters of opinions deriving from the traditional (of_med, of_pos) and virtual (on_med, on_pos) and how they affect consumers on their intention to buy (buy_prob).

	Estimate	Std. Error	t value	Pr (>|t|)
(Intercept)	18.352	9.125	2.087	0,039258
med_off	3.987	4.687	1.025	0,325874
pos_off	14.259	3.257	2.253	0,016587
med_on	5.312	4.851	1.214	0,278957
pos_on	11.257	3.458	3.508	0,000258
no.rev	6.981	3.625	1.258	0,235784
post	6.235	1.259	3.398	0,000768

The opinions from other consumers regarding a product have a different impact on the consumer's intention to buy depending on whether they come from the online and offline environment. The impact on the intent to buy from information from online and offline environments varies according to the value of such opinions (positive, negative, neutral) is significant only if both opinions (on-and off-line) about a product I'm positive. In the case of negative opinions, the off-line channel prevails, even in the presence of positive online opinions. The results show that the impact on purchase intent is mainly from the off-line channel, but on-line comments have a meaning as a source of information but not decisive in the final purchase choices.

Based on the results collected and recent trends of international players (Amazon, Alibaba, etc.), it is reasonable to assume that in the coming years there will be a

growing online demand for fresh fruits and vegetables, especially at Km Zero.

According to some research, the success factors are:

- Shopper convenience: online shopping saves time, reduces the need to make a trip to the store and carry heavy loads.
- Growth in "click and collect": this will increase consumer participation in the online sales channel.
- Omnichannel growth: the complete integration of stores, e-commerce, mobile apps and social media, which will deepen consumer experiences.
- Increased internet usage: and increased usage of mobile and tablet devices for online shopping.
- Changes in purchase behaviour: consumers making bulk purchases online and using offline stores to 'top-up' on a daily basis.
- Demand for organic products through online channels. (Sturiale *et al.,*2017).

6 Conclusion

The ICTs have changed the way consumers shop and the way consumers wish to receive their purchases. Nearly all growth in retail comes from e-commerce. The e-commerce sector is booming. However the full potential of the European e-commerce market has not yet been reached. Today, 57% of European Internet users shop online, but only 16% of SMEs sell online – and less than half of those sell online across borders (7.5%) (E-commerce Europe, 2016).

Online and mobile have changed the face of retail forever and e-commerce is stage front and center when it comes to driving increased revenues. However, this digital channel is ever stronger when coupled with the physical store.

Consumers may start to shop for an item online, browsing different brands, finding the right style, the right price but they may well finish their purchase in-store deciding they want to touch and feel it just to be sure or because they want immediate gratification. And vice versa, they might spot something in-store and then go online to complete the transaction. Retailers need to couple bricks and mortar with digital to have a chance of satisfying shoppers. The experience needs to be seamless and connected. Consumers need to be able to see where their purchases are and when they can get their hands on it. Inventory availability in-store and online is crucial.

By opening up your supply chain and including stores to fulfil your online orders, you will find yourself able to respond effectively to those consumers who prefer click 'n collector indeed could offer same day delivery to their homes. Stores create an opportunity to enhance the customer experience and delight shoppers into coming back time and time again (E-commerce Europe, 2016).

Food is a key sector for e-commerce, and fruit and vegetables have the potential to grow. According to various surveys, in this report (Netcomm, 2016), food is expected to become the most important part of e-commerce over the last ten years worldwide. " Italy has become an interesting laboratory of alternative food experience, with the spread of phenomena such as delivery of orderly online food.

There is, however, a delay with regard to e-grocery, although almost all large retailers are developing e-commerce projects, "which see a synergy between off-line

and online. The research shows that the consumer of fruit and vegetables still bases its acquisitions on the values of the traditional market, but observes with interest what is happening in the online market. Based on the evolution of ICT consumption models and technology platforms that will be in the coming years, what will be the role of fruit in the online channel will be defined.

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