



Original research article

## Configuration challenges for the “Made in Italy” Agrifood industry

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### ABSTRACT

The paper presents the results of an exploratory investigation on the approaches to e-commerce strategies by firms in the agrifood sector, with a focus on Italian small and medium-sized enterprises (SMEs). The article tries to assess the fit between online sales configurators (OSCs) that enable product customization and the habits of Italian online buyers. The study elaborates the empirical results of two data collection efforts: (i) the first effort is to collect data on the food configurators' capabilities deployed by a sample of 105 active OSCs and (ii) the second effort is to collect data on the characteristics of the e-commerce websites from a sample of 522 Italian SMEs. Matching the results of the two analyses with existing literature on Italian customers' requirements while shopping for food online, the study provides insights on the opportunities offered by mass-customization delivered via OSCs to food SMEs, especially in terms of customer experience (CE) innovation.

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### 1. Introduction

The fourth Industrial revolution, also known as Industry 4.0 [1], requires firms to rapidly change their design processes, operations and ways of interacting with users. Organizations in many industries face new challenges, such as competing in international markets and making sense of the increasing “digital intensity” of consumers' lives.

As a result, local companies and regional and national production systems will be required to adopt novel strategies and operational models to benefit from this technological shift [2]. In this regard, risks need to be considered. Small and medium-sized en-

terprises (SMEs) are exposed to the risks associated with being unprepared to adopt and deploy digital technologies. Crises, such as the crisis unfolding from the Coronavirus Disease 2019 (COVID-19) pandemic, show how e-commerce platforms can become vital for the business continuity of producers of necessity goods, such as food. Therefore, food companies are called to adjust their strategies by renewing their marketing strategies to respond to the global demand and to the increasingly demanding consumer. E-commerce represents the most sought innovation by demand worldwide.

Users have become familiarized with e-commerce platforms, the ability to access to a virtually endless

variety of products and services and rapid delivery [3]. Thus, traditional points of sales are under dramatic pressure. They are challenged by electronically mediated forms of commerce, especially on the grounds of limited assortment and a limited geographical reach. In addition, digital technologies are engendering novel organizations of information and knowledge flows of many industries, including the agrifood sector. We refer to this scenario as “digital agrifood”.

Investigating innovative approaches to digital agrifood, we focused on online selling of customizable products to explore which path (if any) towards the business to customer (B2C) mass customization (MC) strategy is suitable for Italian food SMEs that are currently selling via e-shops. We also try to highlight the extent to which capabilities deployed by online sales configurators (OSCs) can respond to Italian customers’ requirements while shopping for food online. This study addresses the state of the art of both food customization via OSCs and current e-commerce strategies adopted by Italian food SMEs with two specific aims: (a) to describe the capabilities deployed by active food configurators, and (b) to detect how the implementation of food configurators can support Italian SMEs’ e-commerce strategies.

We analyze the capabilities deployed by food configurators currently active and available on the cyLEDGE database<sup>1</sup>; then, we single out and categorize the specificities of each SME’s e-shop using a sample of 522 Italian food firms. Data on the e-commerce of SMEs were complemented with results from a survey on the digital presence of SMEs and qualitative information collected through interviews with representatives of SMEs.

The results from this study contribute to the research on customers’ requirements while shopping for food online [4], in particular Italian customers [5, 6]. The study provides managerial insights on how the implementation of OSCs might be leveraged by Italian food SMEs to innovate their online customer experience (CE).

## 2. Theoretical background

### 2.1 Online Customer experience

#### 2.1.1 Customer experience offline and online and mass customization

Customer experience (CE) is a multidimensional

construct with many diverse dimensions: sensorial, emotional, cognitive, pragmatic, lifestyle-related, and relational [7]. CE involves customer journeys, from the search phase to the after-sale stage, which happens through interaction between a customer and a business at every touchpoint [8]. As stated by Meyer and Schwager [9], CE comprises the responses of customers to any direct or indirect contact with a company. Developing an environment where consumers can interact proactively, such as in the case of configurators, can influence the CE.

CE is important because it contributes to the value creation process of augmenting basic products, and thus, differentiating a firm’s offerings. Previous studies demonstrated that a positive customer experience impacts customers’ satisfaction, their purchase intentions and the likelihood of repeated purchase intention. Thus, CE ultimately contributes to a firm’s competitive advantage and profitability [10, 11] and should be enhanced by firms. The CE concept has been broadly investigated in offline contexts, but recently, the online CE (OCE) received an increased attention in scholarly and practitioners’ analyses. CE and OCE are not different constructs; they just refer to different contexts and can reinforce each other [12].

The main differences between CE and OCE are related to the degree of personal contact between firms and consumers, to the way in which information is provided, to the timing and sequencing of purchase processes and to how a brand is presented [10]. OCE is “a psychological state that is manifested as a subjective response to an e-retailer’s website” [13] and concerns the interaction with an online service provider, with other customers and with the online environment. Among the main factors affecting the OCE (e.g., ease of use, trust, and category diversity), previous research [11] demonstrated that online retail environments that facilitate and engage their shoppers impact affective experiences [13].

Mass customization (MC) is a strategy of product/service personalization that includes the online selling of customizable products and services. The distinctive goal of product customization strategy is to involve customers in the design of the product to meet their individual needs without a significant increase in production or distribution costs and without substantial trade-offs in quality performance [14]. MC has been an object of interest in the literature in a variety of fields [14, 15]. In the 1990s, in advance of the increased request for differentiation by customers

worldwide and given the need to preserve economies of scale, the opportunity to mix and match standard modules and components to customize clients' purchases appeared as a promising strategic avenue.

Large-scale mass customization struggled to reach the expected market development [16], especially in the food sector [17]. The Internet and online platforms, nonetheless, revived the concept and made the case for MC more compelling, as a result of the convergence of several trajectories in digital technologies, in the organization of supply chains and in automation [18].

As suggested by some scholars [12, 19] through MC the environment and the individual are united in the making of a customer experience. This unification is possible due to a distinctive driver of MC, that is, the integration of customers into value creation via their involvement in the design of a product prior to manufacturing. Moreover, the operational capability of MC enables configured products to fulfil customers' idiosyncratic need by countering a product's possible liability of foreignness, which also increases the perceived product quality in export markets [20].

### 2.1.2 Product customization via Online Sales Configurators

The B2C selling of customized products is increasingly occurring via online sales configurators [20-26]. OSCs are defined as knowledge-based software applications designed to help customers' decisions and to support and ease the mass customization

process. Specifically, OSCs are knowledge-based software applications that support both customers and company's representatives [27]. OSCs improve CE that supports their purchasing process in the decision phase, by singling out attribute's options that best fit the customers' needs; on the other hand, OSCs help companies to improve the quality of their products and processes, to better know their customers' requirements, and to reduce their time to market and costs [28].

Configurators, as a mass customization tool, depending on their characteristics can enhance the relationships between consumers and firms [29-31]. They can affect customer satisfaction and provide data to firms to increase their knowledge of their customers and to improve customer experience and their offerings [20,32-34]. Configurators can be employed for these purposes because customization can engage consumers [35] and give them perceived control of authorship during the self-design of their products, which affect the customer's affective state [13]. Randall et al.[36] suggest that, depending on a customer's expertise with a product, an OSC should present both product functions and product performance characteristics or design parameters to the potential customer.

A recent study [37] analyzed the synergic effect that OSC capabilities deployed by configurators have on customers' perceived benefit of mass-customized products. Table 1 provides a brief description of the five OSC capabilities, namely, benefit-cost communication, user-friendly product-space description (for

**Table 1.** Online Sales Configurator Capabilities

OSC Capabilities	Nominal definitions
Focused Navigation capability (FocN)	The ability of an OSC to quickly focus a potential customer's search on those solutions of a company's product space that are most relevant to the customer himself/herself
User-friendly product space description (UFD)	The ability of an SC to adapt the description of a company's product space to the individual characteristics of a potential customer as well as to the situational characteristics of his/her using of the SC
Flexible Navigation capability (FlexN)	The ability of an OSC to let its users easily and quickly modify a product configuration they have previously created or are currently creating
Easy comparison capability (EAC)	The ability of an OSC to support its users in comparing product configurations they have previously created
Benefit-cost communication capability (BCC)	The ability of an OSC to effectively communicate the consequences of the configuration choices made by a potential customer both in terms of what he/she would get and in terms of what he/she would give

Source: Trentin et al. [20]

short user-friendly description), easy comparison, flexible navigation, and focused navigation [21].

## 2.2 E-commerce in the food industry

### 2.2.1 Food products customization

Due to the wide-ranging product categories of non-perishable items (i.e., tea, coffee, cereals, sweets, pastry, etc.), the food sector has high potential for selling customizable products. Previous research identified three linked drivers to explain the quickly developing trend of food customization [38-39].

The first linked driver is customers' attention to food nutritional values. Consumers are increasingly demanding particular ingredients to personalize their dietary intake due to health, hedonic, and cultural reasons [23]. Because of the increased customers' awareness on the effects of diet on health, there was an increased demand for special food items. Food product customization enables consumers with specific needs to select ingredients that are suitable to their dietary needs or restrictions (e.g., vegan, vegetarian, gluten-free, yeast-free, organic, etc.).

The second factor is the customers' preference for their individual flavors, which have an essential role in choosing food products.

The third factor that makes food a suitable sector for customization is the enjoyment that food consumption provides to people. Based on this notion, food products are grouped into two categories, namely, hedonic and functional food [23]. Hedonic food items are those that provide enjoyment and reflect customers' lifestyles. Functional food items are those that provide dietary and health benefits in addition to basic nutritional benefits. The effects of functional foods can differ markedly between individuals.

In case of food, customer can be involved in two different type of mass customization[39]:

- **MC of sensory performance:** This relates to the customization of products appearance (e.g., appearance, design, color, for example) and to the other senses, such as taste and smell;
- **MC of functional performance:** This can relate to the customization of various aspects of product functionalities (e.g., speed, power and handling of automobiles, and speed, display size and memory capacity of computers).

### 2.2.2 E-commerce in the Italian food and beverage industry

One of the conditions to give the chance to customize products through online configurators is to sell online and then be able to deliver the personalized product to a customer. Therefore, firms need to develop a platform where consumers can choose among different options and to plan the delivery of the unique product to the customer. The practice of promoting products and selling them in an online context refers to e-commerce, whose adoption could create several benefits for Italian SMEs [5]. The low cost of expanding catalogues on the Internet and the lowering costs of logistics, allowed a variety of niches to become economically viable. Small and micro firms had the opportunity to cater to global niches, eliminating geographical constraints. Despite these new opportunities, Italian companies are adapting slowly to digital strategies, in particular when social media and e-commerce are considered [40].

In Italy, e-commerce transactions of food and beverage (F&B henceforward) products lag behind other industries, such as health & wellness or fashion. Advocates of the benefits of e-commerce for Italian food still struggle to persuade firms about the opportunities offered by online shops. Despite the economic relevance of the sector, there are still relatively few studies on how Italian F&B SMEs are engaging in e-commerce to capitalize on the potential of online selling strategies, such as enhancing customers' perceived value of the products, product value creation, and open innovation. Firms willing to exploit the advantages of e-commerce need to redefine their sales strategies to respond to the factors influencing the use of e-commerce platforms by, and the choice processes of, customers [40, 41].

Previous studies detected consumers' preferences while buying food online [4-6]. In particular, Italian customers living in Northeast Italy prefer to buy long-expiring food products; they claim to appreciate the opportunity to read food labels and to become aware of food ingredients before purchasing (especially women) [5]. Female customers and young individuals constitute the majority of e-grocery shoppers: they keep the same habits when buying in groceries and e-groceries online [6]. Receiving food at home in specific time slots (especially for employees) is perceived to have great value [5].

Italian consumers, as well as consumers from other countries [42], are more willing to purchase packed food when shopping online. The demand for packed food is probably going to increase because of

new attitudes and because of the attention that Italian customers are paying to the current health emergency due to COVID-19. The security of packaging in terms of food protection from external agents and/or its cleanliness might be key in Italian customers' decisions. Consumers do not complete their online purchases of food when they are unsure of a product's quality and features. Moreover, they abandon the purchasing process if the delivery is too expensive or if they do not receive information about shipping costs before adding products to their cart. Another determinant that discourages Italian customers is being forced to subscribe to a vendor's website to complete their purchase. Other determinants that persuade Italian customers to buy food online are the opportunity to reduce costs both in terms of saving time and low prices and the possibility to buy local food from other regions and/or countries. The preferred food categories purchased online by Italian customers are coffee and tea, sweets and cookies, wine, pasta, and cereals [5].

Based on qualitative and quantitative research methods we attempted to address the following research questions:

1. What is the state of the art of food customization via online sales configurators?
2. What capabilities are deployed by food configurators?
3. Are Italian food SMEs ready to adopt OSCs?

### 3. Method

To address the first research question, we analyze a sample of 105 food configurators listed in the cyLEDGE database, which is one of the only publicly available database at the study date. Data collection and analysis follow the methodology adopted in existing literature on mass customization strategy via online sales configurators [29]. The analysis of food configurators includes data collection with questionnaires structured with multiple-choice answers, which were completed after performing at least one product configuration experience on each configurator. At this stage, the study focuses on pragmatic and cognitive components of customer experience via food configurators.

To pursue the second research goal, we analyze the e-commerce websites of a sample of 522 SMEs to detect the existence of features that address the most important requests of food customers, such as the availability of information related to product offers, information on delivery, etc. [5]. Subsequently we

match findings from the two analyses to detect how the implementation of food configurators can support the e-commerce strategies of Italian food SMEs.

An empirical study was conducted from January 2020 to March 2020 by one of the authors based on her expertise in MC strategies via online sales configurators. To avoid subjective biases in the analysis, user configuration experience refers to objective dimensions. Sensorial, emotional, relational and lifestyle elements of customer experience [7] are not included in the framework. Her observations of OSCs in the food industry and her analysis of the state-of-the-art of e-commerce in food SMEs in Italy were discussed with the whole research team, and the interpretation of data was a collaborative endeavor. The empirical study on the e-commerce implemented by SMEs was conducted as part of a project on the digital presence of Italian food SMEs.

#### 3.1 Analysis of food configurators

Food configurators are selected from the cyLEDGE database, the only publicly available list of online sales configurators. Among the 1,360 entries in the database, an initial selection was made according to industry criteria. As a result, a total of 105 configurators were selected from the food and packaging industry.

A second stratum of selection follows the food sector category; as a result, 75 food configurators were selected. We focused on B2C food configurators, excluding configurators of beverages (28 in total), packaging for B2B (1) and pet food s (1)

A third selection step followed the language criteria: all the configurators that use the English language or were translated into English were included (e.g., with an English version available on the configurator website or an English version provided by the translate option enabled when the configurator is open with the Google Chrome browser). English as a selection criterion was employed since English is recognized as the predominant language for business [43]. As a result of the selection process, 34 food configurators were suitable to be included in the sample. The remaining 39 food configurators were not valid because they either did not comply with some or all the selection criteria or they were no longer active at the moment of data collection.

Each of the 34 selected configurators was evaluated through direct observation. The researcher browsed and underwent an entire product configuration experience to collect data. The evaluation followed the following criteria:

**Product offer:** typologies of product offered in food customization.

**Type of customization allowed:** functional/sensorial. Based on the type of product customization enabled by each configurator, the OSCs were grouped into two classes: functional and sensorial [38]. Functional configurators are those that allow users to personalize ingredients; sensorial configurators are those that allow packaging personalization.

**Capabilities deployed by each configurator.** Following previous studies [29, 34], each configurator was evaluated by fulfilling a questionnaire with a set of questions on the configurator's capabilities. The researcher fulfilled each questionnaire after performing at least one configuration experience on each configurator.

### 3.2 Analysis of e-commerce in Italian food SMEs

To obtain a significant view on the e-commerce strategies of Italian food SMEs and a general overview of the adoption of e-commerce, we analyze a sample of 522 SMEs (10-250 employees) in North-east Italy (Veneto, Friuli Venezia Giulia and Trentino Alto Adige). The selection was made through an extraction of company records from Bureau Van Dijk's AIDA database and using the Ateco codes (national statistical industrial classification) related to the different sectors, excluding the beverage sector.

The e-commerce strategy of the selected firms is analyzed through (a) a desk analysis, (b) a survey and (c) qualitative interviews. Regarding the desk analysis, the e-commerce websites were evaluated following the criteria identified in a previous study [5], in which some determinants of impact on Italian customers' intention to purchase food online, namely, product offer, information and delivery, are detected. For each of them, the following list of elements were considered during the desk analysis:

#### Product offer

- The variety of items offered by the website;
- The online availability of items that are difficult to find in physical stores located near the customer's area of residence;
- The availability of typical local foods/products that are not easily available in customers' area of residence.

#### Product information

- The opportunity to read food labels before the actual purchase of the good;

- Expiration date.

#### Product delivery

- The possibility to clearly define the timing of the delivery of the purchased good;
- The delivery of food and beverage during weekends and at night.

Regarding the survey, a questionnaire structured with multiple-choice questions on firms' digital presence, including e-commerce implementation, was sent by e-mail to our sample of SMEs. The survey aims to identify the e-commerce strategy of the companies, thus, the survey questions are related to the experience of selling online, type of online sales channels or platform, target market, e-commerce turnover and intention to launch e-commerce websites in the short/medium term.

Qualitative information about SMEs' e-commerce strategies was collected through structured interviews addressed to SMEs representatives. In particular, the aim of the interviews is to further our understanding of the determinants that affect the implementation of e-commerce and the barriers to the adoption of configurators.

## 4. Results

### 4.1 Results on Food configurators

To answer RQ1, the analysis of the food configurators sample is developed. Our findings reveal that the most offered products in food configurators are sweet foods: cakes, biscuits (26%), chocolate and candies (26%). They allow the selection of different tastes, shapes, and ingredients to be combined into chocolate bars, cakes, or biscuits, including packaging personalization.

Cereals, both muesli or nutritional bars, are also widely offered product categories (21%). The majority of cereal configurators allow users to assemble their products by following the nutritional values indicated for each ingredient to obtain their preferred combination.

Salads, coffee and tea are products offered to a lesser extent but are still interesting product categories (9%). With coffee and tea configurators, users can choose the size of the package and the flavors of the different blends. With salad configurators, users can combine their preferred fresh vegetables, choose their favorite dressing, add seeds, and be informed about the nutritional value of their combination.

Regarding the customization allowed, our find-

ings show that 62% of the selected configurators enable the customization of both aesthetic elements (i.e., packaging, product name, and images on the package) and functional elements (i.e., ingredients, product size or quantity, and nutritional value information); 21% of OSCs only enable aesthetic customization, while 18% of OSCs enable exclusively functional customization. Of the sample, 85% of OSCs enable changes in the packaging, such as inserting a name to label the configured product (41%) or personalizing the product with a user's picture (24%).

The majority of configurators enable at least one functional option, such as the selection of product ingredients (79%), 26% of OSCs enable a change in product shape, while 34% of OSCs provide information about nutritional value and/or calories. Only configurators of cereals and salads provide this information.

#### 4.1.1 Capabilities deployed by food configurators

To analyze the capability deployed by food configurators (RQ2) each food configurator was tested with the aim of measuring the capabilities described in Table 1. The findings are reported in Table 2. Regarding the focus on navigation capability (FocN), the results show that 66% of OSCs deploy the capability to drive the user to focus specifically on their desire space of options. Only 12% of the analyzed configurators do not guide the user to their choices of interest. Another 12% of the analyzed configurators do not indicate whether they are implementing this capability.

Related to user friendly description (UFD), among the food configurators, 41% provide users with a proper description of products in each option and provide descriptions in a format that is compre-

hensible to both expert and inexpert user; 35% of configurators do not implement this capability, while in 24% of the cases, it is not clearly detectable whether this capability is implemented.

Flexible navigation (FlexN) is the capability detected in the majority of food configurators (82%). In the majority of cases, the user was supported in easily and quickly modifying a product configuration during the configuration process.

We assessed benefit-cost communication (BCC). Of the food configurators, 38% properly communicate the value of each choice option: thus, the user is aware of the ways in which each choice would impact his/her final configuration in terms of costs and benefits. While 42% of OSCs do not provide users with benefit-cost capability, in 21% of the cases, it is not clearly detectable whether the capability is deployed. The easy comparison (EAC) is a capability less detected; it is detected in only 3% of cases. While for 88% of configurators, users cannot easily compare two or more configurations that were previously realized by the user. This capability requires an account registration to save a chronicle of the various configurations self-designed by each user. In the majority of configurations, it was not easy to detect how to proceed to be supported by this capability. Table 2 synthesized the different degrees to which a user of food configurators perceives each capability.

## 4.2 Results on the Italian food SMEs e-commerce

To answer our RQ3 and understand whether the SMEs are ready to adopt online configurators in their selling strategy, we analyzed their e-shops (if any) and sent them a questionnaire to collect data about ecommerce. We then interviewed 12 representatives of firms in the sample to obtain an in-depth under-

**Table 2.** User's perception of capabilities deployed by food configurators

Level of user's agreement with the support derived by each capability	FocN	UFD	FlexN	BCC	EAC
Strongly agree	26%	21%	26%	12%	0%
Agree	50%	21%	56%	26%	3%
Neutral	12%	24%	3%	21%	9%
Disagree	6%	26%	6%	21%	3%
Strongly disagree	6%	9%	9%	21%	85%
Total	100%	100%	100%	100%	100%

Capabilities abbreviations: FlexN: flexible navigation; UFC:user friendly description ;FocN: focus navigation;BCC: benefit cost communication; EAC: easy comparison. Neutral: neither agree nor disagree

standing about their strategies. Among the 522 SMEs of our sample, 76 SMEs are currently selling their products via e-shops. This subgroup of food firms belongs to the macro-sectors reported in Table 3.

Concerning the adoption of configurators as tools to support e-commerce, our results show that, to the date of this study, none of the 522 food SMEs implements e-commerce with OSCs. The data were verified by browsing the CyLEDGE database that provides a list of 21 configurators adopted by Italian companies, including companies of the “Made in Italy” group but none from the food industry.

Products and variety offer. As reported in Table 3, bakery and flour-based products are the most-represented category. Approximately 35.5% of firms offer online a variety of different products, both freshly made and pre-packaged (e.g., pasta, bread, pizza, and biscuits). Other food items, such as coffee, tea, sugar, dietary and energy food, are sold online by 27.6% of firms. Grains and flours are sold online by 13.2% of firms; 10.5% of firms sell meat and cured meat, while products such as pickled vegetables, pâtés, and jams are sold by 7.9% of firms through e-commerce. Milk and dairy products, e.g., cheese and yogurt, are sold by 3.9% of firms via e-commerce; only 1.3% of firms sell online oils and fats

Regarding the online availability of items that are difficult to find in physical stores located in a custom-

er’s area of residence, we found that all e-commerce websites fulfil this criterion by considering the health emergency due to COVID-19.

We then proceeded to analyze the availability of typical local foods. All the analyzed SMEs with an active e-commerce website sell their local products online. Data on the regional adoption of e-commerce websites show that the Friuli Venezia Giulia region registered 8% of the active e-commerce websites that sell products from the Ateco code 108, such as coffee, pastry and miscellaneous items. The Trentino Alto Adige region registered 25% of the active e-commerce websites that sell mostly typical regional products from Ateco 101, such as speck and backed products. The Veneto region has 67% of the active e-commerce websites that mostly sell products from the Ateco 107 sector: pasta, variety of flours and bakery items.

Next, we analyzed product information. To the time of data collection, none of the firms provides information about the nutritional value of their products or presents the option to read the product labels or the expiring dates of the selected food items.

Regarding the nutritional information, it is interesting to mention a company that produces rice, which describes the nutritional value and properties of rice as a gluten-free food, which renders rice suitable for consumers with celiac disease.

**Table 3.** SMEs with e-commerce by sector

Ateco code <sup>2</sup>	Macro-economic sector	e-commerce
101	Meat and meat-based products	10.5%
102	Fish, crustaceans and molluscs	0%
103	Fruits and vegetables	7.9%
104	Oils and Fats	1.3%
105	Milk and dairy products	3.9%
106	Grains, flour, starches	13.2%
107	Bakery and flour based products	35.5%
108	Other food products (e.g. coffee, tea, sugar, dietary food)	27.6%

Each SMEs of our sample belongs to a specific alphanumeric combination (Ateco code) that identifies an economic activity with different degrees of detail of the economic sectors themselves.

<sup>2</sup> Ateco code refers to an alphanumeric combination that identifies an economic activity with different degrees of detail of the economic sectors themselves. The Ateco classification is approved by Italian National Institute of Statistic (ISTAT) and is adopted for statistical, tax and social security purposes



Product delivery. None of the firms in the sample provides information about delivery time slots prior to a product purchase. They do not provide the option to book a delivery based on customers' preferences.

Concerning the survey, almost 9% of the SMEs completed the questionnaire digitally. The results show that among the 41 fulfilled questionnaires, the majority of firms (37) answered the questions on e-commerce adoption. Among this latter group, in 32.4% of cases, the respondents confirm that their company had an e-commerce website, while in 67.6% of cases, the adoption of e-commerce is not active. Of the SMEs with active e-commerce websites, the majority owns an e-shop, while a few of them sell on third-party e-commerce platforms in addition to their e-shop. The remaining cases sell online on third-party e-shops only. The results on the intention to adopt e-commerce show that in the majority of cases, SMEs are planning to implement it within a period of three to twelve months. Within the group of SMEs without active e-commerce, firms with a positive intention to implement it have an income from B2C sales that increases from 5% to 53%, while SMEs with no intention to adopt e-commerce gain between 5% and 11% of income from this market. The findings suggest that SMEs with lower income from selling to customers have minimal interest in investing in the online selling of their products.

Based on the findings from the twelve interviews realized with firms' representatives, the main issues that retain SMEs from the implementation of e-commerce are related to logistic issues. In particular, the main obstacles are related to product distribution, especially for those SMEs that sell fresh and perishable food products. Another critical aspect in e-commerce implementation is the concern of not being able to structure and govern the entire supply chain, a challenge that implies the implementation of e-commerce strategies, acquisition of adequate human and economic resources, and development of capabilities to monitor and manage complex relationships with partners and suppliers. Another issue a respondent highlighted is related to the target: most of the respondents stated that e-commerce is an interesting strategy, especially for the B2C market. The respondents also maintained that the main benefit of e-commerce implementation is the possibility to sell all their products and not just a selection, as commonly occurs in physical stores. Moreover, they can interact with their customers without intermediaries.

## 5. Discussion

Matching the overall results, we detect the following insights on how the capability of each OSC can strengthen the e-commerce of SMEs in terms of customer experience. First, our results show that the food configurators considered in this present at least one of the five capabilities recognized in the literature [21]

**Focused navigation (FocN).** This capability is detected in 76% of the analyzed food configurators that are able to guide users towards items that are more relevant for him/her, which enables time savings during shopping via OSCs. Personalized recommendation improves CE [44], and the implementation of FocN in food configurators could satisfy customers' demand for saving time while shopping online [45]. One way to achieve this goal is, for instance, to present at the beginning of the configuration process ingredients and/or a combination of them that are more relevant to users.

**User-friendly space description (UFD).** Based on our analysis, this capability is detected in 42% of food configurators that provide to both informed (expert) and uninformed (non-expert) users a description of the ingredients and/or a combination of them that relate to users' expertise with the selected item. The implementation of UFDs could satisfy customers' demand for ingredient information and product label availability before purchasing food online [4]. For example, providing detailed descriptions of the nutritional value of each ingredient and the nutritional value of combinations of ingredients (e.g., cereals mix, nutrition bars, chocolate, and coffee).

**Flexible navigation (FlexN).** This capability is detected in 82% of food configurators that allow users to quickly change any option at any time during their buying process, even when the configuration is completed. The implementation of FlexN in the food configurator could respond to customers' demand for saving time and might provide them with the confidence needed to finalize a purchase [46] of food products that match with their personal requirements.

One way to obtain these results, for instance, is to give users the opportunity to modify their cart at any time before purchase.

**Easy comparison (EAC).** This capability is detected in the 3% of food configurators that enable a comparison among previously made configurations. It requires that users register a personal account on the configurator website to create their archive of

configurations. In the case of Italian users, the implementation of a food configurator with EAC capability is not suggested because it requires the registration of a user account, which could cause Italian users to abandon before purchasing [5]

**Benefit-cost communication capability (BCC).** This capability is detected in 38% of food configurators that inform users about the value of each selected choice and the corresponding costs, including the delivery costs. This information is extremely relevant [45] and can enhance trust, which is an important factor in online purchasing [46]. The implementation of BCC in food configurators addressed to Italian users could satisfy their demand for information and strengthen their confidence to proceed with a purchase [6]. For example, providing a clear and complete set of information on values and costs of their purchase is one of the practical ways to obtain these results.

Our research on the state-of-the-art of e-commerce of Italian food SMEs suggests that none of 76 food SMEs implements their e-commerce with the sale of personalized products via OSCs. Moreover, our findings highlight that companies have to address scarce resources and capabilities, as well as the digital transition of complex processes. OSCs are still not considered by Italian food SMEs: they do not seem ready to implement these platforms even if they could be a promising means to enhance their interactions with customers. Moreover, due to capabilities, such as easy comparison and flexible navigation, companies could improve their knowledge about attribute preferences and then enhance their offerings. Since the implementation of OSCs will be a new selling process, a first step to implement food customization without assuming supply chain and production re-organization might be to involve customers in two configuration processes: (a) assembly box of pre-packed products and (b) combination of product ingredients.

The first process is suggested based on the fact that Italian food SMEs sell packed boxes that include different mixes of their products to create a gift idea. Involving customers in creating personal boxes of products or gift baskets will respond to Italian customers' willingness to purchase packaged food when shopping online.

The second process could respond to Italian customers demand for typical and regional items by supporting them in the customization of their preferred local food. For example, in the case of the typical Italian mix of vegetables in a jar, named "Giardi-

niera", with the support of a configurator, users could personalize their final combination by selecting their preferred vegetables and the corresponding quantity in accordance with their tastes (e.g., to add more carrots and less onions or to avoid an ingredient). Similarly, with the support of a configurator, users can assemble an exotic combination of ingredients, where exotic refers to a combination not usually sold online by the firm.

The implementation of OSCs that enable ingredient combinations would enable an advanced product search in an e-shop for SMEs that already sell online a variety of products. In particular, SMEs from Ateco 106 address their products to specific targets, thus allowing an advanced product search of flours, grains and starches depending on whether the buyer is a restaurant owner, chef, consumer or baker. This segmentation could enable different product configurations that respond to specific customers' purposes by directly focusing the navigation on the product space of interest. In the case of SMEs from Ateco 108 that sell coffee, a first stage in the adoption of product configuration can be finalized to involve users in the selection of the blend to add to their coffee combination. In the case of SMEs that sell bakery products, the adoption of a product configurator could involve users in the selection of stuffing and or decorative ingredients. In all these cases, food configurators could also provide users with information about the possibility of avoiding specific undesired ingredients (e.g., eggs, gluten, sugar, etc.).

The results also show that some SMEs in our sample are not going to adopt an e-commerce. In particular, 23.9% of SMEs that answered the survey do not have any intention to implement e-commerce. For this sub-group of SMEs, it is not recommended to adopt the selling of customizable products via OSCs. Embracing MC strategies requires a company to be successful in changing a host of processes and practices in their organization and in all of its operations [47, 48]. Specifically, the selling of configurable products via OSCs implies for the company to structure (a) timely and appropriate responses to customers' customization requirements; (b) the production and/or supply process to avoid increases in costs or ineffective or impossible combinations of mixes of products from different suppliers.

## 6. Conclusions

The present exploratory study contributes to research on innovative e-commerce strategies for

"Made in Italy" agrifood and its transition to digital agrifood. The article provides Italian food SMEs with insights related to how the sale of customizable products via OSCs can respond to Italian customers' requirements while shopping online for food. In particular, the results point out that food SMEs can benefit in terms of customer experience innovation by implementing two possible selling processes via OSCs: (i) the sale of personalized boxes of items for personal consumption and/or as gifts, and (ii) the sale of customizable combination of ingredients (e.g., coffee and or tea blend, flour types).

Moreover, insights from this study point out that to engage Italian users while shopping via OSCs, food configurators should deploy four of the five capabilities, namely, user friendly description, focus navigation, flexible navigation and benefit-cost communication. The first capability properly informs users about each food ingredient or about their combination; the second capability can directly guide users to the items of interest; the third capability provides users with a complete set of information on value and cost, including delivery costs and timing; the fourth capability enables changes at any time during the shopping process.

All the suggested capabilities can contribute to addressing the specificity of Italian users' demands by saving time and reducing their efforts in product selection while shopping for food online. Assuming there is no penalty to an organization, the results from this explorative study suggest that the more Italian food SMEs innovate their e-commerce strategies with proper product configuration strategies, the greater the potential competitive benefit for the company.

This study contributes to research on the opportunities to adopt OSCs for small and medium-sized enterprises [49-51]. At this stage, the study explores the opportunities to adopt OSCs for food SMEs in Northeast Italy; further research should expand its scope to a national sample of SMEs with attention to those in the Made in Italy group.

Future research on digital agrifood should investigate the effect of food configurations on sensorial, relational and emotional components of the customer experience (CE) and not only the pragmatic or cognitive components. Surveys on consumers and experiments involving different types of configurators should be conducted to highlight these important dimensions of CE. From a company perspective, future research can address Italian food SMEs intentions to implement food customization as a digital innovative approach for their e-commerce strategies aimed at foreign markets.

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