

Technological and Organisational Innovations in Catering Businesses

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The main aim of the article is to present certain aspects of technological and organisational innovations on the basis of literature and the results of the authors' survey carried out among 99 representatives of catering businesses. The research was carried out in 2014-2016 and focused on technological innovations. Its results indicate that improvements in the production process are contingent on the financial status of the firm and the scope of its activity. Low-calorie, organic and regional dishes were novelties introduced by companies from the sector. When it comes to the organisational innovations, respondents tended to indicate the following: cheaper sources of supplies, new operation strategies, reorganisation of organisational structures and new marketing methods.

Keywords: technology innovations, organizational innovations, catering firms, products, processes, gastronomy and hospitality.

Innowacje technologiczne i organizacyjne w przedsiębiorstwach gastronomicznych

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Głównym celem artykułu było zaprezentowanie wybranych aspektów innowacyjności organizacyjnej i technologicznej w oparciu o literaturę przedmiotu oraz wyniki badań własnych przeprowadzonych w grupie 99 respondentów z firm gastronomicznych. Jak wynika z badań przeprowadzonych w latach 2014–2016 w zakresie innowacji technologicznych udoskonalanie procesu produkcji zależne było od kondycji finansowej przedsiębiorstw oraz rozmiarów działalności. Nowością produktową były dania dietyka, ekologiczne i kuchni regionalnej. Wśród innowacji organizacyjnych najczęściej wskazywano tańsze

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źródło zaopatrzenia, nową strategię działalności, reorganizację struktur organizacyjnych oraz udoskonalanie działań marketingowych.

Słowa kluczowe: innowacje technologiczne, innowacje organizacyjne, usługi gastronomiczne, produkty, procesy, gastronomia i hotelarstwo.

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1. Introduction

Nowadays, consumers are attracted to catering services by the diversity of goods and services, as well as their convenience. The popularity of catering services has been growing and, consequently, the revenue of suppliers has gone up. Customers are influenced by a number of factors when choosing an eatery, the most important being the sensations and impressions related to the experience.

The development of the catering services requires innovations from businesses. Nowadays, they are faced with numerous challenges due to the rapid technological and technical development; they need to adjust flexibly to ever-changing needs and expectations of consumers. Living up to these expectations allows them to achieve a strong competitive advantage on the market. The role of innovations in this process cannot be stressed enough.

The aim of this study is to explore certain aspects of innovative activities undertaken by catering businesses. The main focus has been on changes to ranges of products offered, processes (service provision), and the organisation of business operations. The analysis was based on primary research in which a questionnaire was filled out by 99 respondents who were responsible for the process of managing and implementing innovations in catering firms. The analysis was based on interviews carried out in 2014–2016 among 99 persons responsible for the management and implementation of innovative solutions in catering enterprises.

2. Modern Technological and Organisational Solutions Implemented by Catering Businesses

Innovative solutions implemented by businesses are the result of global changes taking place on the food market, different needs and attitudes of consumers, such as new lifestyles or focus on environmental sustainability. It has given rise to a new, advanced market structure, the so-called ‘experience economy’, where catering firms compete on the basis of product differences and the capability to adjust their goods and services to individual needs of each customer (Gajewska & Szewczyk, 2012, p. 114; Tul-Krzyszczuk et al., 2015, p. 575).

Current trends in catering require the formulation of a complex and attractive proposal of innovations that would be broadly available to the target group, i.e. business providing these types of services. The product, also called gastronomic or catering service, is of tangible/intangible nature. The term 'innovation' (meaning the introduction of a new idea, a new production, marketing or organisational method) is crucial here, as the service exists when it is being provided (Drucker, 1998; Oslo Manual, 2005, p. 48; Firlej & Szychalska 2015, p. 213; Sawicki et al., 2013, p. 67). Innovations in this area refer to products, the process of providing services, management, logistics and the environment. The line of communication between the client and the provider is the most important, and yet the most challenging object of innovation in services (Kusa, 2004, p. 384; Oslo Manual, 2005, p. 41).

The constant evolution of the needs of consumers, both in terms of food products and consumption practices, makes the of implementation of technological innovations in gastronomy particularly hard. Those changes are usually determined by aesthetic, lifestyle, health or cultural factors. As a result, a new complex, approach toward the transformation of food products or dishes emerges. Moreover, new design solutions in the entire cycle of creating and introducing innovations have been observed (Krajewski & Tul-Krzyszczuk, 2014, p. 399). Aesthetic, functional and communicative aspects have recently become more important, in addition to the nutritional value and taste of food (Di Lucchio, 2012; Tul-Krzyszczuk et al., 2015). At present, the process of designing dishes in the menu resembles art more than a business process. Similarly, the role of chefs and their responsibilities are now considered crucial. Visually attractive meals draw the attention of consumers attracted by an original forms; the result is a source of information about different characteristics of a product (Richards, 2012).

Polish catering service has recently seen the development of new concepts, namely 'fast casual' and 'casual dining', seen as a compromise between fast food joints and restaurants. Similarly, 'street food' places, cafes and vegetarian bars have mushroomed, usually in shopping malls ('food courts'), business malls and petrol stations Franchising, system catering and sustainable food service are leading forms of catering operations (Sawicka & Tul-Krzyszczuk, 2017, pp. 25, 158).

Catering has been greatly influenced by technological factors, which can be explained by rapid technological progress that has taken place in recent years. Entrepreneurs are thus required to modernise and upgrade their equipment and processes towards a greater automation of services provided. (Puciato & Zmigrodzki, 2009, p. 91). Table 1 shows examples of technological innovations in the catering sector.

PRODUCT INNOVATIONS
<ul style="list-style-type: none"> • New items on the menu, popularity of healthy, diet, organic, regional, fresh (locally supplied) food etc.; • Alimentary products with new functional features (e.g. margarine that lowers levels of blood cholesterol, digestion-enhancing yoghurt), gluten-free products, vegetarian dishes etc.; • Brunch, dinner, lunch, breakfast sets, breakfast menu available throughout the day; • Exotic, fusion and molecular cuisine, food design; • Liquid nitrogen, dry ice, algae, etc.;
PROCESS INNOVATIONS
<ul style="list-style-type: none"> • Food production methods, e.g. the sous-vide method, carving, frying in water, specification, foams, deconstruction, etc.; • Adjusting orders to the price paid (customers decide how much they wish to pay); • Open cuisine – customers can watch production processes and are welcome to participate; • Machines and devices: molecular smokers, thermal immersion circulators, anti-grills, sous-vide devices, modern food processors; • Small kitchen appliances, tableware, eating room furnishings, decorations, etc.; • Devices, systems and mobile apps to manage, book and sell: POS, booking systems, mobile waiting staff (e.g. AppetiQ, Paychef apps); interactive tables, an iPad instead of a paper menu etc.; • Loyalty apps allowing customers to collect points using a smartphone/tablet, e.g. Kekemeke, Everytap, Justtag, freebee, etc.

Tab. 1. Examples of technological innovations in the catering sector. Source: own research based on Puciato, Żmigrodzki (2009, p. 92); Narczyk (2013, pp. 259–262); Wyszyński (2014); Okopień (2014); Firlej and Spychalska (2015); Tul-Krzyszczuk et al. (2015, pp. 575–580); Sawicka (2015, p. 176).

A growing number of chefs are introducing into their menus food considered healthful, ethnic (both dishes and spices), comfortable, organic, regional, targeted at children, or small portions (snacks) known as ‘finger food’. Unconventional methods of food preparation and decoration, for instance molecular cuisine, fusion, carving, etc. are also becoming increasingly popular. Eating places can also provide additional services, such as WiFi hot-spots, there are café-bookstores, cafes and restaurants that host concerts, performances, exhibitions, or those that have special play-areas for children (Sawicka & Tul-Krzyszczuk, 2017, pp. 25, 158). It has become important how an eating place, in its purely physical meaning, as well as its surroundings are creatively organised and shaped (Tul-Krzyszczuk & Krajewski, 2014, p. 399).

The market for catering services in Poland is now characterised by the virtualisation of orders and reservations via online systems and mobile apps. Modern technologies that are already used include smartphone apps for booking a table in a restaurant, ordering food in a restaurant or for home delivery, as well as tablets or interactive tables that have replaced

information folders or paper menus in restaurants (Wyszyński, 2014; Bujnik, 2018a). IT systems are used to facilitate company management and optimize the performance of the waiting staff. Appropriate software can speed up and increase the efficiency of services, as well as reduce costs related to staff's mistakes, wrong dosage of ingredients or theft (Bujnik, 2018b).

Given the current market situation, any radical technological innovations are rather expensive and the risk of failure seems high.

On that account, innovations in organisation seem to be a better option, as they provide a cheaper alternative (Mamica, 2010, p. 217). Innovations will include new ways of operating, the reorganisation of the workplace or its relations with the environment, which has yet to be implemented, but is the result of strategic decisions taken by the management board, aimed at increasing the efficiency of operations. Certain instruments, such as the implementation of new methods in organising routine activities and operation procedures e.g. managing deliveries, **reengineering**, lean production, JiT (Just-in-Time) or systems controlling quality management have already been incorporated into business practice. When it comes to the organisation of the workplace, new methods of task division and decision-making are implemented, e.g. new systems regulating accountability, teamwork, decentralisation, work division within departments and between departments, integration or disintegration of branches, training systems etc. Relations with the environment entail contacts with other enterprises or public institutions, e.g. through the operation of unions (partnership, alliance), co-partnerships, outsourcing (specialised outside firms performing certain tasks for the enterprise e.g. transport, security, supplies etc.), new methods of integration with suppliers or new methods of food distribution to consumers (home delivery via Uber Eats) (Greaver Junior, 1999; Tul-Krzyszczuk & Krajewski, 2014).

Not only do organisational innovations support changes to the range of products, but they also have an impact on efficiency through boosting quality and productivity, the capacity of businesses to learn, intensifying the exchange of information, using the acquired knowledge and new technologies. They have a positive impact on the security and hygiene of staff.

The market of catering services is constantly evolving. Innovations are soon becoming standard solutions and, as a consequence, new products and solutions are sought. Quality, in its broadest meaning, is taken for granted and expected from any product or service. In order to attract consumers' attention, entrepreneurs need to stand out and offer a products or service that is one of a kind, appeals to many senses of the target group and evokes positive associations with a certain place or product. Therefore, a visit to an extraordinary restaurant is an experience that combines a unique atmosphere of the place and the remarkable flavours of the food and drinks served (Gajewska & Szewczyk, 2012, p. 114).

3. Methods and Materials

The study was based on micro data from individual, structured interviews conducted in 2014–2016 with 99 persons responsible for the management and implementation of innovations in catering businesses.

The majority of the surveyed catering firms operated in Mazowieckie Voivodeship (approx. 75%); other firms were located in the following voivodeships: Kujawsko-Pomorskie (2 entities), Łódzkie (2), Dolnośląskie (1), Lubelskie (1), Opolskie (1), and Śląskie (1), Świętokrzyskie and Wielkopolskie (1).

Research related to product novelties (dishes, spices, cuisines etc.), as well as new or improved processes, including technologies or changes in the structure of service and a streamlined provision of services. The third group of studied innovations were organisational changes associated with the operation and management of a catering business.

The study was carried out using SPSS 24 (Imago4.0). The percentage share of enterprises that implemented selected forms of innovations was evaluated. Statistical analysis was based on the chi-square test; it was used to verify the existence of statistically relevant differences among enterprises in terms of such variables as the organisational and legal form of the enterprise, the duration and area of its operation, as well as its financial situation.

In terms of the organisational and legal form, the following entities prevailed: sole proprietorships (35% of respondents), limited liability companies (25%) and civil partnerships (13%). Entities operating for less than 5 years predominated (45%); they were followed by those operating for more than 15 years (21%) and 10–15 years (19%).

The surveyed businesses usually operate locally (67%); significantly fewer are present at the regional and national level (8 and 12% respectively). Only 13% of firms operate abroad.

The sample included businesses providing catering services. The scope of the study encompassed corporate social responsibility, human resource management, innovation process management, brand management and promotion strategies. For the purpose of this study, issues related to innovative technological processes, i.e. product and process innovations have been included: the introduction of new or upgraded machinery, equipment and tools, implementation of new or the improvement of the existing production processes and logistics, as well as measures taken in preparation for the implementation of these changes.

Another group of analyzed innovations were organizational changes related to the management of catering businesses. Organizational changes included new or significantly modified organizational structures, operational strategies, supplies, work organization, and personnel management.

4. Innovations Introduced by Hotels and Catering Businesses in the Light of Research

A significant number of studies indicate that firms operating in the generative sector (e.g. food) are oriented toward process and product innovations (Grunert et al., 1997, pp. 1–6; Alfranca et al., 2002, p. 349). Similar results have been found in reports about the sector of hotel and gastronomical services (Puciato & Zmigrodzki, 2009, p. 92; Firlej & Spychalska, 2015; Wszyński, 2014; Bujnik, 2018b). It is further confirmed by the microdata shown in Table 2.

TECHNOLOGICAL INNOVATIONS	% choices	Legal form	Operation time	Area of operation	Financial form
1. Has successfully introduced or significantly improved products or services	64,6	ns	ns	ns	p = 0,01 V = 0,291
2. Has introduced new or upgraded machines, devices and tools	66,7	ns	ns	p = 0,038 V = 0,311	ns
3. Has successfully introduced new or significantly improved existing processes of delivery, production or logistics	50,5	ns	ns	ns	ns
4. Has been preparing to introduce new or significantly improved products or processes, e.g. feasibility studies, testing, standard development and improvement of software, instrumentation, engineering etc.	15,2	ns	ns	ns	ns

ns –lack of statistically relevant correlation at the level of $p < 0.05$

p – level of statistical relevance

V – Cramer's V determining the level of statistical correlation between variables

Tab. 2. Technological innovations implemented in hotels and catering businesses in 2014–2016 (N = 99). Source: own study, 2014–2016.

In 2014–2016, analysed businesses introduced new or upgraded existing machines, devices or tools, thus streamlining the production process and the provision of services (nearly 65%); they also introduced or significantly improved their products or services. Businesses with a better financial situation introduced or significantly improved product or service notably more often. They extended are of their operation, and introduced a greater number of new machines, devices and tools. In both cases, Cramer's V was

approximately 0,3, which indicates a relatively high correlation between variables.

The most popular product novelty introduced in eating places were low-calorie dishes, followed by organic and regional dishes. Diet and organic meals are very popular among consumers as a result of the public debate on healthy eating. Ethnic (exotic), fusion and molecular cuisine, which involves the creation of new flavours through unusual, original food combinations, proved to be less popular among respondents, as they require special skills and additional expenditure related to the purchase of special equipment and production resources (Maj, 2016, p. 165; Pielak & Czarniecka-Skubina, 2016, p. 6; Sawicka & Tul-Krzyszczuk, 2017, p. 158). The majority of managers in catering businesses purchase basic kitchen appliances, automatic slicers, new tableware or combi steamers. Catering businesses, in particular hotel restaurants that serve large numbers of guests and where fast service is particularly important, often choose to equip their kitchens with combi steamers that are both quite universal in terms of application and energy-efficient.

In the analysed period, only 15% of firms was preparing to introduce new or significantly improved products or process based e.g. on feasibility studies, testing, standard development and improvement of software, instrumentation, engineering etc. The above results confirm that firms invest mostly in capital assets, that is, new machines and technical devices, means of transport, tools, movables and equipment (Nowak, 2015, p. 190; Tul-Krzyszczuk et al., 2016, p. 23).

From the point of view of enterprises, innovations ought to be introduced at several levels. The design of new dishes is one of key elements that need to be taken into consideration in the business strategy of an enterprise. Moreover, firms rarely introduce innovative products without an earlier implementation of innovations in the production process. This can be accounted for by the fact that firms that wish to create a new product must first invest in new machines and equipment. Likewise, a certain degree of innovation in production lines is needed in order to respond to the demand (Szopik-Depczyńska & Depczyński, 2012, p. 378). Such innovations are usually triggered by organisational changes within the enterprise and may involve various aspects of business operation, as shown in Table 3.

Owners of catering firms declared using new, cheaper sources of supplies as one of the organisational innovations implemented in 2014–16 (Table 3). This is further confirmed by research conducted in HoReCa (Stępnik, 2015). The selection of and cooperation with the right supplier guarantees the continuity of production that is necessary for a restaurant or a cafe to operate. Managers tend to use services provided by a specific supplier or several suppliers, but well known and tested. Given the ever-changing needs of demanding consumers, firms would be at a higher risk of failure if it was not for their trust-worthy and reliable partners (Tul-Krzyszczuk

et al., 2017; Stangierska et al., 2018, p. 93). A larger number of suppliers lowers the risk of shortage of the necessary resources, even if it increases the expenditure and the cost of operating the entire supply system (e.g. transport, storage etc.). Cooperation with local suppliers would be most effective economically, as they are flexible and can easily adjust to the particular needs of a catering business, also in terms of convenient deadlines and the size of deliveries (depending on the demand, season etc.), thus limiting storage costs (Stangierska et al., 2018, p. 93).

ORGANISATIONAL INNOVATIONS	% choices	Legal form	Operation time	Area of operation	Financial form
1. New, cheaper sources of supplies	35,4	ns	ns	ns	ns
2. New or notably modified operation strategy	29,3	ns	ns	ns	ns
3. New systems of accountability, teamwork or organisation	26,3	ns	ns	$p = 0,049$ $V = 0,3$	ns
4. New or notably changed relations: partnership	24,2	ns	ns	$p = 0,027$ $V = 0,291$	ns
5. New or modified organisational structures	22,2	ns	ns	ns	ns
6. New division of duties, work regulations	20,2	ns	ns	ns	ns
7. ECR (efficient consumer response)	16,2	ns	ns	$p = 0,046$ $V = 0,303$	ns
8. Outsourcing of trainings	16,2	ns	ns	ns	ns
9. New or notably modified relations: alliances, subcontracting	11,1	ns	$p = 0,049$ $V = 0,296$	$p = 0,014$ $V = 0,35$	ns
10. Outsourcing of transport, employees, research, quality control and marketing	9,1	$p = 0,016$ $V = 0,395$	ns	$p = 0,004$ $V = 0,39$	ns

ns – lack of statistically significant correlation at $p < 0.05$

p – degree of statistical relevance

V – Cramer's V determining degree of statistical correlation between variables

Tab. 3. Organisational innovations implemented in catering businesses in 2014-2016, $N = 99$. Source: own study, 2014-2016.

Strategic cooperation with suppliers or competitors, e.g. in the form of partnerships or alliances, was also often resorted to (24% and 11%

respectively). Another key innovation is the introduction of ECR, or efficient consumer response (16%), which is a strategy of managing the supply chain based on a partnership where producers, distributors, wholesalers and logistics service suppliers cooperate in order to ensure better, faster and more efficient fulfilment of consumer's needs (ECR Europe, 2008). These innovations were implemented mostly by businesses operating at a regional and national scale. Alliances and subcontracting are observed mostly in enterprises that have operated for more than 15 years at the national or international level (Table 3). It has been noted that relations based on partnerships are strengthened by mutual trust and respect. This kind of familiarity allows partners to react faster to the new needs of consumers, thus providing the enterprise with a greater sense of security. Relations based on partnership and trust lead to satisfying cooperation (Tul-Krzyszczuk & Krajewski, 2014; Czerski, 2017; Domańska, 2018, p. 399).

Managers of analysed businesses admitted to innovations in the area of strategic operation of the enterprise through the introduction of new or significantly modified strategies (approx. 29%). Such innovations may relate to financial issues, company development, marketing, staff management, relations with the environment (both clients and consumers) or supply chains. Two crucial strategies are implemented in order to ensure the development of catering enterprises: they involve financial aspects (reduction of internal costs of operation, materials, components and services) and factors related to a greater flexibility of operation and response of the enterprise to the changing needs of the market. The intensification and improvement of marketing activities is considered important as well (Jeznach et al., 2016, p. 58).

Respondents also admitted to modifying systems of employee responsibility, teamwork or work organisation (approx. 26%). These innovations were introduced predominantly by enterprises operating at the national level. In addition, organisational structures were reorganised (approx. 22%), and new divisions of duties and work regulations were introduced (approx. 20%). These changes were supposed to boost the efficiency of the enterprise, regulate the work of employees and managers.

Managers of the restaurants surveyed in 2014–16 also hired outside firms (subcontracting or outsourcing) for the organisation of trainings (16%), transport, studies, quality control, marketing etc. (9%) (cf. Table 3). The outsourcing of these services was implemented mainly by general partnerships and joint-stock companies operating at the national level.

In all cases significant correlation of variables was observed, Cramer's V remained within the 0,3–0,4 range, which indicates a high degree of correlation.

5. Conclusions

The catering sector has been increasingly implementing technological and organizational innovations, mainly in order to diversify and widen the range of products and services, introduce new production and management methods.

Product and process innovations seem to be the main form of modernization of catering enterprises. In the analysed entities, new products (services) were introduced or significantly improved; in addition new machines, devices and tools supporting the production process or the provision of services were implemented or upgraded.

Cheaper sources of supplies were the most commonly used new organisational tools. In addition, new or significantly modified strategies of operation, employee accountability systems, teamwork or work organization strategies in the company were introduced. We also ought to mention the growing importance of relations with partners (suppliers or other entities) in order to meet customer needs faster and more effectively, which is of utmost importance in the catering sector.

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