Study on the Utilisation of Artificial Intelligence in Online Food Delivery Platforms

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Abstract: *The advantages of online food delivery (FD) became evident during the worldwide pandemic in 2020 as it enabled clients to participate in planned meals and allowed food providers to continue their operations. Online FD has faced criticism, with reports of both buyer and restaurant blacklists. Hence, it is an opportune moment to assess the current circumstances and contemplate the broader ramifications of online financial data and the implications they have for the involved parties. This paper presents the latest research in this field, uncovering a wide range of positive and negative consequences by using the three pillars of manageability as a focal point for analyzing the implications. Online food delivery (OFD) has faced financial criticism due to the substantial fees it charges cafés and the challenging working conditions it imposes on delivery personnel, despite offering job and business prospects. Online food delivery has a significant impact on traffic patterns, general health results, and the customer-food interaction from a sociological standpoint. The substantial quantity of waste and its significant carbon emissions have ecological consequences. In the future, partners should consider strategies to efficiently promote and govern the advantageous aspects of online FD in order to ensure its overall manageability*

Keywords: online food delivery, sustainability, economic consequences, social impacts, environmental impacts

I. INTRODUCTION

E-commerce is expanding worldwide as a result of economic expansion and increasing access to high-speed internet. As customers' disposable money increases, they are increasingly utilizing online services. This trend is driven by the improved security of electronic payments and the expansion of both the number of providers and the extent of their delivery networks. Customers are attracted to a product or service through online means and motivated to carry out a transaction at a distant place. This type of internet corporation is referred to as an online-to-offline (O2O) company. Online meal delivery systems are experiencing significant growth as a segment of the O2O market. The emergence of online food delivery platforms has fundamentally transformed the worldwide dynamics between consumers and food producers, however the ultimate consequences of this shift remain uncertain. An obstacle in assessing its influence is the diverse array of academic fields from which scholars are examining this subject. The purpose of this audit is threefold: firstly, to conduct an interdisciplinary study that consolidates academic research on the various areas affected by the growing utilization of online FD; secondly, to examine the opportunities and challenges presented by these effects; and thirdly, to emphasize the potential actions that can be taken by all stakeholders, including industry experts, strategists, customers, and academics, to enhance the positive impacts and mitigate the negative consequences. In order to provide a comprehensive understanding of the survey's results, it is crucial to first provide an overview of the online meal delivery industry before delving into the study itself.

Investigation of the online food delivery industry

The market for web-based enterprises has witnessed consistent growth over the past decade due to the growing dependence of customers on the internet. Various variables, which vary depending on the business sector or region, have played a role in this shift in consumer purchasing behavior. Additional elements encompass overall advancements. Some of the changes include higher wages for removal services, especially in developing countries, longer working and

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driving hours, greater access to broadband internet, improved security for electronic payments, fewer restrictions on currency exchange, more retailers selling products online, and increased consumer knowledge and comfort with online shopping.

China, the second-largest market, has had the most substantial expansion in online commerce during the past few years. China dominates the worldwide internet business market with a share of 54.7%, which is almost double the combined shares of the next five most significant countries (the US, UK, Japan, South Korea, and Germany).

The rapid expansion of internet commerce has given rise to a multitude of new business models, such as B2B (business to business) and C2C (client to client). O2O, or Online-to-Offline, is a marketing approach that utilizes information and communications technology (ICT). It involves clients placing orders for labor and products online and then physically picking them up at a faraway site [7,8]. The emergence of payment and delivery systems, along with the widespread adoption of smartphones and tablets, has played a crucial role in driving the rapid growth of the O2O sector. In 2019, there were a total of 5.2 billion cell phone connections worldwide. It is projected that by the end of 2020, approximately half of the global population would be utilizing mobile internet services.

O2O services have been prevalent in several sectors, encompassing the acquisition of various commodities and service categories, such as food, lodging, real estate, or vehicle rentals [10]. Online FD is the method by which food that has been ordered online gets delivered to the customer. The emergence of synchronized internet-based food delivery services, such as Uber Eats, Deliveroo, Swingy, Zomato, and Maiduan, has facilitated the expansion of online food delivery. Online FD platforms offer several functionalities, such as providing customers with a diverse range of food choices, processing and forwarding orders to food producers, overseeing payments, managing food delivery, and arranging additional services (Figure 1) [11]. meal delivery apps, often known as "applications" (FDA), operate as part of the broader online meal delivery system by facilitating the process of ordering food through portable applications [12].

Online financial service providers and their delivery methods

From the perspective of providers such as KFC, McDonald's, and Domino's, the delivery of coffee involves the production and transportation of the meal by suppliers. The request can be filed either via the restaurant's website or through a third-party platform. The external phases differ across countries and encompass platforms such as Uber Eats in the United States. Platform-to-Consumer Delivery refers to the process when external platforms offer internet delivery services on behalf of restaurants that do not have their own delivery services. Online FD requires highly proficient and flexible continuous delivery services. Cafés have the option to utilize their existing staff for self-delivery, for example by assigning servers at smaller restaurants. Alternatively, they can opt for specialized delivery services that are specifically trained and equipped for this purpose, as is the practice with some prominent food chains such as KFC, Domino's, and Xabi. Restaurants can adopt publically backed coordination's, which are associations of independent contractors offering transportation services, as a cost-effective and efficient approach to managing food delivery. Online food delivery platforms may assume the responsibility of finding and training proficient delivery drivers, or they may alternatively depend on publically supported organizations, utilizing drivers who are not exclusively employed by the web-based food delivery platform. Proficient transportation professionals are typically well-prepared, and in some instances, a portion of their salary is assured while another portion is based on commission. In contrast, individuals who utilize complimentary transportation, sometimes known as "riders," get compensation based on a commission structure, with payment being made per request.

Global expansion of online fixed deposit (FD) investments

There is a worldwide phenomenon of increasing online meal delivery, with nearly every country having at least one prominent platform for food delivery. The online FD industry has shown remarkable initiative in diversifying new business areas and transforming consumers' dietary preferences. In 2018, Food panda, an online FD firm located in India, implemented an advertising campaign that offered consumers significant constraints. As a result, Food panda experienced a tenfold increase in the number of clients. In 2018, Eleme, a company in China, invested three billion yuan (equivalent to US$443 million) over a period of 90 days to expand its market share to over 50% in the Chinese market. Although internet-based financial development (FD) is remarkable in many areas, it is still in the process of

global development. Significant investment will be required to support advancements, initiatives, and offer financial support to participating cafés. For example, a café may implement a promotion on a specific day where a customer is given an 8 unit reduction in price if the total amount spent is less than or equal to 20 units. Actually, the restaurant may have only incurred a cost of $2 for this deal, as it will be reimbursed $6 by the FD stage (although the specific regulations may vary between different stages). Implementing such a plan is advantageous for a café as it will attract a larger client base and increase the number of orders. It is imperative for the future of online meal delivery to influence consumers' nutritional habits by providing education on selecting and buying food through online platforms. Online food delivery platforms and providers are offering clients the opportunity to avoid cooking at home or dining out by giving them the choice to have dinner at a reduced price or by providing additional assistance, such as free delivery. In general, online financial decision-making is increasingly being embraced and embraced by young adults, with China being the place where this tendency is most noticeable. A survey conducted in 2019 among 1000 college students in Nanjing revealed that 85.1% of the participants utilized web-based financial data (FD) at least once or twice a week, while 71.45% had been using it for approximately two years.

Online food delivery has gained popularity among Chinese college students due to its time-saving benefits, as reported by 50.35% of the 141 students in Hebei, China. Additionally, 44.35% of the 124 students in Jiangxi, China finds it practical. Furthermore, 39.52% of the same group of students appreciate the option of more delectable or unique meals compared to flask dinners. Clearly, various people around the globe possess varying degrees of freedom to engage in online food purchases, influenced by social, technological, and economical factors. These disparities may explain the contrasting rates of adoption of online meal delivery observed worldwide. Contrasting with China, a study conducted in 2019 on 252 Greek college students aged 18 to 23 revealed that the majority of them prefer to cook at home and rarely dine out or order food for delivery (45.6%). Another group typically eats at the on-campus café or prepares meals at home (23.4%), while only 21% of the surveyed students reported using food delivery services.

II. METHODOLOGY

To fully comprehend the effects of online food delivery on monetary, social, and environmental sustainability, it was necessary to conduct a thorough and interdisciplinary analysis of contemporary research. A total of over 60 reports on the impact of online meal delivery were found by utilizing the search engines mentioned. The extensive search was conducted across many databases to account for the multidisciplinary character of the research topic and to include information in two different languages. Aside from journal entries, the research also encompassed books and book portions, government procedures, reports, working papers, and other obscure written materials. Due to the newness of the web-based FD field, our investigation found that it was not feasible to conduct a thorough review of the existing academic literature. This is because there is insufficient evidence available to make definitive conclusions regarding the sustainability consequences and the current condition of the area. Consequently, a little more investigative approach was utilized, which highlighted noteworthy themes that warranted additional research and sought to illustrate them in order to facilitate future investigation. Source information published from 2010 to 2020 in either English or Chinese was consolidated. Our evaluation aimed to understand the global impact of online financial distress (FD). We chose to include both Chinese and English language publications because the web-based FD sector is primarily developed in China. As a result, online FD in China has been the subject of extensive scholarly research. Undoubtedly, our inquiry results clearly showed that the majority of the literature on web-based FD focused on describing FD in a Chinese context. In order to analyze and synthesize the results of the studies, we employed a narrative synthesis technique [27], which is a flexible method that enables the researchers to be both intelligent and direct [28] while summarizing the investigations included in the review [29].

The effects of online food delivery

The emergence of the web-based food delivery business has opened up chances for individuals in several professions, such as chefs and regulatory personnel in cafes, delivery personnel, and developers of apps and online platforms. Moreover, the online FD industry has proven to be highly lucrative for support enterprises, encompassing manufacturers, sellers, and managers of electric bikes, as well as those engaged in the manufacturing and distribution of food packaging. Internet-based food delivery platforms such as Maiduan and Eleme in China have a significant

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workforce, with over 1.17 million employees working as delivery professionals. In addition, Swingy has a workforce of 17 thousand transportation employees in India, while the US-based online food delivery company Uber Eats has over 10 thousand staff members. Although the web-based food delivery (FD) industry has created numerous job opportunities, especially in the conveyance sector, there are concerns regarding the unfavorable working conditions experienced by delivery personnel. These concerns include the devaluation of their work, their significant level of responsibility, inadequate training, and the risks they face to their personal safety during the food transportation process. These limitations indicate that although there are many available positions for food delivery workers, job satisfaction is generally low, and there is a significant attrition rate.

The Effects of Online Social Interactions

FD transforms the dynamic between clients and their food by modifying the methods through which they acquire, organize, and eat their meals. Consequently, these technological improvements have a significant impact on interpersonal relationships, leading to extensive discussions on whether internet-based communication improves or diminishes the quality of family time and local community collaboration. Historically, families engaged in conversation and enjoyed the solace of one other's presence while carrying out routine food-related activities, such as grocery shopping and cooking meals at home. Indeed, there have been reports indicating that married Korean women are less inclined to utilize online food delivery services due to their strong belief in fulfilling their responsibility of preparing meals for their family. Contrary to that, several studies indicate that certain Chinese and UK consumers view online food delivery as a convenient and efficient method to receive meals, enabling them to have more quality time with their families. In Guangzhou, a survey conducted among individuals aged 18 to 35 who regularly ordered takeout meals once a week found that they preferred using online food delivery services. This was because it allowed them to enjoy the comfort of their homes while still experiencing a wide range of food options and culinary traditions that they enjoyed, without the hassle of shopping for and cooking meals.

The exponential increase in web-based FD has unveiled the urgent ecological dilemma of effectively managing the vast quantity of plastic waste produced. The ability of different countries to handle the plastic waste produced by online food delivery depends on the strength of their existing recycling infrastructure and the pace of development of online food delivery services. In China, the overall amount of bundling has risen due to the growth of internet-based financial services. A total of 19,507 batteries were disposed of in 2016, with 17,285 of them being lead-acid batteries. China's car charging and waste management activities were anticipated to emit an unusually high amount of greenhouse gas (GHG) emissions, specifically 73.89 Gt CO2eq, in 2016. Due to the COVID-19 pandemic, there was a rise in the usage of single-use, disposable food packaging worldwide in 2020. This was mostly driven by consumer acceptance of the fact that single-use packaging offered greater safety and hygiene.

The benefits of technology in the food industry

Not only have customers experienced the effects of innovation on food services. Food firms are benefiting from the integration of innovation into their daily operations. Supervisors now possess a more comprehensive understanding of stock management due to the implementation of the Internet of Things. Reports provide insights into customer behavior within a specific market or the product availability from a manufacturer. The Internet of Things (IoT) can also assist in forecasting alterations in a certain area and determining how a company can adjust accordingly. These organizations have the ability to promptly convey relevant information to clients who are interested in tracking the location of their food or who desire updates on their meal delivery. Clients can track the whereabouts of their belongings via connected devices and continuous GPS technology. In addition, individuals have the option to directly file a report or get in touch with a company, and the company's workers can then provide a response, which ideally encourages more direct criticism. In addition to the advantages in the backend, innovation primarily affects the efficient delivery of meals to clients by minimizing the time lost during necessary adjustments.

An organization can utilize the data generated from every customer interaction. This information is crucial for firms seeking opportunities for growth and identifying areas of inefficiency. Artificial intelligence, machine-to-machine connectivity via the Internet of Things, and device management in business all provide vast quantities of data for food companies. It is essential for organizations to save and organize all of this data in order to effectively gain knowledge

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and distinguish issues or streamline operations. The collected data enables companies to have a more profound comprehension of their customer base and the market. For instance, an examination of the underlying disparities between rural and urban practices, the latest happenings in each region, and specific items of interest.

Although customer support entries continue to be significant for companies, there are innovative and ongoing methods for effectively interacting with customers that are particularly valuable in the food delivery industry. Voice technologies and chatbots facilitate novel modes of communication between organizations and their clients. Buyers can use in-home speech innovation devices, such as smart speakers or cell phones, to arrange their meals while relaxing in their lounge chairs. Organizations can enhance their visibility to clients by integrating voice search capabilities on their website, allowing them to address common inquiries about their culinary offerings. Updating business hours and menu details might help a company maintain a prominent position on the list. There are alternative methods of customizing and informing clients that do not use traditional forms of contact. Information data can be stored to enlighten individuals through many means. In addition, food delivery firms can modify their information regardless of the platform they use, thanks to the availability of new tools.

When a consumer submits a request, the message pop-ups that appear throughout the entire interaction now display the customer's name. Moreover, the messages delivered to clients contain their name, together with information about the basic products they have requested or any discounted bargains on their preferred things. Indeed, social media messages can specifically target a recently visited client's website and suggest things they have viewed. Enables the user to bypass line breaks using innovative methods. No longer do we have to endure the inconvenience of waiting in queues or frantically searching around a store to locate desired items. Customers now have more alternatives to circumvent a long queue or overlook something significant. Whether clients are purchasing online or visiting a physical site for pickup, innovation has completely transformed the way they may save time.

In addition to home delivery, innovation has also facilitated advancements in the physical aspects of the food sector. Numerous establishments have transitioned their menus to the online platform and integrated them with ordering software, enabling consumers to conveniently make orders and have them delivered to a designated spot in close proximity to their residence. Some cafés even offer the option to submit a request by SMS. Visitors to physical sites have the option to independently make requests by utilizing self-service kiosks. Nevertheless, it is not solely the process of collecting dinner that is undergoing transformation.

Another tool that enables you to avoid waiting is subscription services or utilizing a staple delivery service, both of which make ordering regular meal items quite convenient. Customers have the option to order products either in person or online and have them delivered right to their doorstep from popular supermarkets or internet companies. Individuals have an abundance of choices when it comes to expressing themselves, ranging from readily available pharmaceuticals to alcoholic beverages. All of these options are easily accessible with just a simple click. Being in close proximity is also beneficial for businesses.

Handheld technology, such as mobile phones and tablets, enables customers to remain constantly linked to their needs. It additionally allows organizations to exert greater control over the business devices provided to their delivery workers. This suggests that organizations have the ability to consistently reach their target audience while maintaining a high level of customer support. However, this necessitates them to consistently perform at their best. The existing customer base appreciates having advantageous choices. Individuals have certain needs that must be met promptly, regardless of whether they are making a request through a delivery application, the internet, or self-service kiosks. Food delivery services could greatly benefit from round-the-clock access to their customers.

Customers are developing a growing expectation for restaurants to own software that facilitate the management of delivery or pickup services. They necessitate a more extensive array of choices for acquiring meals in advance and modifying their orders. Client-side technology is facilitating the delivery of food products to clients and presenting information to individuals for meal delivery companies. Self-administration entails providing telephones/tablets to delivery drivers, which enhances smartphone management for food delivery organizations. Moreover, the utilization of technology has led to a rise in the quantity of client information data accessible to firms for analysis and the distribution of corporate enhancements. Innovation has broadened the channels of client connection, simultaneously enabling more customized interactions with customers. Emerging technologies empower users to minimize waiting periods when

placing food orders or retrieving things. Moreover, these devices are being utilized to present convenient information and advancements to individuals irrespective of the time of day or their geographical location.

III. CONCLUSION

This investigation uncovered a substantial aggregation of effects resulting from online financial distress that are influencing a diverse set of partners in various manners, as illustrated in Table 3. Although attempts have been made to categorize the consequences as either 'positive' or 'bad,' it is possible to argue for each effect to be classified in an unconventional manner. During the COVID-19 emergencies, online food delivery (FD) had a beneficial impact by enabling people to obtain food without having to leave their homes. This was particularly advantageous for purchasers. However, the increased reliance on online FD also resulted in heightened exposure for delivery personnel, raising concerns about their well-being. This is the inaugural interdisciplinary evaluation that consolidates scholarly study on the various domains impacted by the growing utilization of internet FD. Furthermore, it has examined the potential advantages and difficulties that arise from these outcomes. Furthermore, it offers prospects for various stakeholders, such as experts in the internet FD business, strategists, purchasers, and scholars, to amplify its advantageous outcomes and diminish its detrimental effects. The future of online meal delivery has great promise. To ensure equitable development in this industry, it is imperative that we continue to critically analyze current practices and explore opportunities for improvement.

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